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INNOVATION IN LOCAL AND GLOBAL LEARNING SYSTEMS FOR SUSTAINABILITY

ACADEMIA AND COMMUNITIES: ENGAGING FOR CHANGE

LEARNING CONTRIBUTIONS OF REGIONAL CENTRES OF EXPERTISE ON EDUCATION FOR SUSTAINABLE DEVELOPMENT

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Foreword by UNU-IAS

The question of developing knowledge for sustainable change has been receiving increasing attention not only due to the growing understanding of the complexity of world challenges but also because of the increasing ambitions of humanity to attend to such challenges. While Sustainable Development Goals (SDGs) inspire more integral actions across diverse (and interconnected) aspects of development, an Education for Sustainable Development (ESD) approach enables collective efforts to become more transformative.

In the context of academia, reaching for transformation – within and outside the walls of one's own organisation – calls for overcoming fragmented and reductionist approaches in education and learning through developing more cross-sectoral visions and engaging with diverse systems of knowledge. This ambition requires different styles and principles of working with stakeholders of academia, including with the local communities.

The Regional Centres of Expertise on ESD movement, launched in 2005, is inspired by a unique concept of working across formal and informal educational sectors in cultivating learning environments that are participatory, reflective, action-focused and change-oriented. Many years later, the RCE community, that today counts nearly 170 members, is a good place to seek insights into partnerships between knowledge institutions and communities.

The ESD team at the United Nations University Institute for the Advanced Study of Sustainability (UNU-IAS) has been engaged with the champions of the RCEs in consolidating knowledge of their regions and across the regions. This collaboration has proven to be productive in reflecting on multiple areas of development where analysis has been made accessible for the international community through the earlier publications including *Traditional Knowledge and Biodiversity* [1], *Towards More Sustainable Consumption and Production Systems and Sustainable Livelihoods*[2], and *Ensure Healthy Lives and Promote Well-Being for All*[3]. In this new book on relations between knowledge institutions and communities, the chapters explore innovative and locally grounded ways of addressing challenges of unsustainability.

The analysis presented in the book is a critical response to the call of the Global Action Programme on ESD to scale up sustainability solutions at the local level. We would like to congratulate the RCEs that were inspired and conducted the work presented in this volume for their ambition, creativity and perseverance in the pursuit of change. We thank the authors, the editors and the reviewers for the analysis that brought the golden nuggets of ingenuity and wisdom of the multi-stakeholder learning networks to all of us.

Kazuhiko Takemoto
Director
United Nations University Institute for the Advanced Study of Sustainability (UNU-IAS)

[1] *www.rcenetwork.org/portal/sites/default/files/public_resource/TKB%20Book%20FINAL%20Jan%202013_1.pdf*

[2] *www.rcenetwork.org/portal/sites/default/files/public_resource/Final%20FULL%20UNU%20SCP%20Booklet%20Single%20Pages.pdf*

[3] *www.rcenetwork.org/portal/sites/default/files/EnsureHealthyLives2018_ONLINE.pdf*

Foreword by IAU

Many experiences have been shared over the course of the UN Decade of Education for Sustainable Development (2005-2014) leading to a high level of co-learning from one another in finding what works best in different parts of the world. Institutions of higher education and other learning organisations assume important roles in this undertaking.

This publication is particularly relevant for higher education institutions (HEIs) as it shares experiences from across various communities in practical ways. At the end of the day, it is community engagement and participation that brings meaning to what sustainable development is all about. The scope of participation and consultation as well as the strategies of research and education are broadened when many more grassroot community members get involved; practices labelled as 'new' but that have been proven to be sustainable long before becoming a concept recognised at the level of the United Nations and UNESCO more specifically can be brought to light. There are varying contexts in which sustainable development can be enhanced by the various cultures, including in particular local and traditional knowledge and wisdom, that is too often ignored due to a top-down approach more focused on one specific model with a particular culture considered as mainstream.

The introduction and development of the concept of Regional Centres of Expertise (RCEs) on Education for Sustainable Development since 2005 has been key in developing the kind of mechanisms leading to better and more creative cooperation, participation and consultation between a wide range of stakeholders, including for HEIs. RCEs are deemed as de facto universities of the future which are more aligned with ESD. As conventional HEIs are not 'purpose-built' for ESD there may be a need for such institutions to adapt/adopt the concept put forward by the RCEs in transforming education for sustainable development.

This concept of RCEs allows for flexibility that genuinely encourages inclusion and infusion of grassroot in-depth articulation and involvement in a bottom-up fashion. It is therefore not surprising that the RCEs have multiplied by leaps and bounds to close to 170 entities worldwide in the last decade. This provides windows of opportunity to collaborate and co-create while translating 'new' and 'novel' experiences into mainstream practices. In this way, RCEs deepen the understanding of sustainable development so that it will be better rooted and become a way of life, translating valuable lessons from the past for the benefit of the future generations thus connecting the two. In short, communities become the central dynamic repositories where sustainable development practices, well documented and alive, can be anchored and referenced for others to emulate and improvise.

This collection of chapters reflects the above as it brings to life what 'best' practices in a given context can provide to meeting the overarching SDG aspirations. In other words, this publication is more than just a companion to those who are serious and committed to making sustainable future a reality.

Dzulkifli Abdul Razak
Convenor, RCE Penang
14th President of the International Association of Universities (IAU)

Hilligje van't Land
Secretary General
International Association of Universities (IAU)

Global Map of RCEs

There are 164 acknowledged RCEs as of December 2017.

The ESD Programme at UNU-IAS has created a global network of more than 160 Regional Centres of Expertise on Education for Sustainable Development (RCE) worldwide. The RCEs provide a framework for strategic thinking and action on sustainability by creating diverse partnerships among educators, researchers, policymakers, scientists, youth, leaders within indigenous communities and throughout the public, private and non-governmental sectors.

Because of each RCE's diverse network of partners and their wealth of local knowledge and resources, they have a potential to transform the ways of engagement between knowledge institutions and communities. Globally, the RCEs have launched a number of ground-breaking initiatives that bring together systems of knowledge critical for learning in order to make changes towards sustainability.

Zinaida Fadeeva and Laima Galkute

From Knowledge Transfer to Knowledge Co-creation

Engagement between Knowledge Institutions and Communities

Higher education institutions (HEIs) and other knowledge organisations engaged with research and education are increasingly expanding their activities to address the challenges of today and tomorrow. In some cases, the reason and motivation for engagement is a growing understanding that the modern style of development has produced a number of contradictions and tensions that led German sociologist Ulrich Beck to characterise our lives as an existence in a 'risk society' (*Beck 1992, 2009*). Distribution of socio-ecological and economic risks is, to a large extent, a matter of knowledge about them, which gives knowledge institutions[1] (KI) a special position. Moreover, the landscape of risks changes and so does our perception of sustainable development as development that puts us on a trajectory to eliminate or mitigate the risks. This provides KIs with the opportunity to contribute to such development through research. With regard to education, their task becomes the development of competencies among graduates to deal with the risks facing the world today and those likely in the future. In support of such understanding, the Nagoya Declaration on Higher Education for Sustainable Development[2] (2014) recognised that HEIs are responsible "to develop students and all types of learners into critical and creative thinkers and professionals to acquire relevant competences and capabilities for future-oriented innovation in order to find solutions to complex, transdisciplinary and transboundary issues, and to foster understanding and practice of collective values and principles that guide attitudes and transformations, respecting the environmental limits of our planet, through education, training, research and outreach activities."

Yet, as argued by the authors in this book, HEIs' societal change mission has a much more complex relationship with the global discourse and practice of sustainability. Histories of different countries and regions offer different and often contested perspectives, making the changes outlined by Agenda 2030 a process that requires different types of engagements. The chapter by O'Donoghue looks at the emergence of sustainability education in response to colonial modernity in which universities were a part of the colonial ideology, and of their failure to produce the required changes in society following South Africa's independence (Chapter 9). Dakhin and Arzhenovsky (Chapter 11) present strategies, and the thinking behind them, that are expected to compensate for the culture of non-engagement of the general public with development decisions and actions in Russia. These strategies were conceived within academia but gained ground in the planning process with the government and the private sector in changing the ways of their collective thinking and engagement.

[1] For the purpose of this publication, the term *Knowledge Institutions* refers to organisations, such as universities, research centres, think-tanks, NGOs, which explicitly acknowledge knowledge generation as their core activity.

[2] The Nagoya Declaration on Higher Education for Sustainable Development was adopted by the participants of the International Conference on Higher Education for Sustainable Development in Nagoya, Japan on 9 November 2014.

The shift from a market to society focus has important implications for the ways in which KIs and their stakeholders engage. The stories shared by the authors demonstrate a variety of motivations, strategies and roles adopted by the partners. They also share common principles that lead to societal transformation, which could serve as guidelines for future developments that are discussed in the following sections.

Coping with Complexities

Knowledge co-creation seems to be a key to solving complex problems, particularly at the local level, and implementing innovation by involvement of a variety of stakeholders. The innovation process is based on synergistic relationships of people, knowledge and resources, thereby forming an innovation ecosystem that makes the induced transformation long-lasting and resilient to changing conditions, both internal and external.

Knowledge transfer, exchange and co-creation represent an issue widely experienced and discussed in academia and the business environment. For example, university-business collaboration leading to research-based innovation was a precondition in creating a variety of models of the so-called 'Innovation Ecosystems'. They included knowledge transfer offices fully owned by the university, but also multi-stakeholder associations such as Science and (or) Technology Parks, Centres of Excellence, joint laboratories, interdisciplinary centres, etc. Capacity development along business supply chains and within innovation clusters are largely developed on knowledge co-engagement between business and other stakeholders.

Sustainable development challenges for knowledge-based policy, as well as specific decisions at the local level, are particularly relevant for considerations of multidimensional problems of quality of life. These are concerned not only with knowledge transfer, but also with co-generation of new knowledge for solving problems under consideration. The sustainability science approach by UNESCO[3], and a programme 'Science for society and with society'[4] by the European Commission are initiatives in stimulating research and education institutions to be actively involved with local/regional innovation for sustainable development.

The evolution of knowledge co-creation concepts and practices is reflected in the discussions of different fields and sectors. In the area of innovation, it refers to the triple and quadruple helixes, with the first signifying innovations in predominantly the economic area, and the second being innovative developments for the society co-created with societal partners (*e.g. Trueman et al. 2014*). In the educational sphere, it reflects changing positions towards the capability of the knowledge institutions to provide input to answers for the most pressing problems of humanity, and to their accountability (*Hazelkorn 2014*).

These, conceptualised as a need for learning and education to transform society as well as educational systems, are ultimately captured by the dual ambitions of the Global Action Programme[5] (GAP) on Education for Sustainable Development (ESD) where values, behaviours and lifestyle for a sustainable future will be achieved through "integrating sustainable development into education; and integrating education into sustainable development". The structure of the book reflects the GAP approach by looking at ways of approaching local problems through sustainability innovation based on learning (Part I: Education for Transformation), and educational innovations, based on ESD principles and situated learning, in

[3] *https://en.unesco.org/sustainability-science/guidelines*

[4] *https://ec.europa.eu/programmes/horizon2020/en/h2020-section/science-and-society*

[5] *https://en.unesco.org/gap*

particular (Part II: Education as Transformation). Part III deals with multi-stakeholder learning networks, and draws on the experiences of the Regional Centres of Expertise on ESD (RCEs) in understanding relations and structures that enable both ambitions of GAP.

Partnerships

The chapters in this book are written by the champions of the RCEs and reflect experiences of their partnerships. An RCE is a network of existing formal, non-formal and informal organisations that facilitate learning towards sustainable development in local and regional communities. The RCE concept, strategy for its implementation as well as ensuing work for supporting the global RCE network was developed as a response to the United Nations Decade of Education for Sustainable Development.

Among the stakeholders of RCEs are schools, HEIs, environmental non-governmental organisations, museums, zoos, botanical gardens, local governments, local enterprises, and civil society organisations working towards changing learning systems and practices towards sustainability. To be recognised as an RCE, the network should agree on four core elements – its governance and coordination, its membership and collaborative system, common actions in the area of (action) research, and transformative learning. The global RCE network comprises nearly 170 partnerships around the world, and all RCEs are engaged in activities in their communities.

Local as well as national contexts provided understandable reasons for the communities' stakeholders to engage with academia and other institutions professionally engaged in knowledge development. Tapping into understanding and interpretations of the local contexts, as was done in the case of RCE Greater Western Sydney through telling local stories and discussions of symbolic artefacts (Chapter 5), facilitated continuity of engagements towards the change of community practices.

Authors of the chapters bring into the discussion of contexts critical questions of relationships and power of the KIs and the communities. The region of Bordeaux, as many regions in Europe, long debated 'knowledge sanctuary' positions of HEIs against the backdrop of a rapidly expanding landscape of other sustainability knowledge partners. RCEs in Lima and Bogotá (Chapters 10 and 15 respectively) highlight the contributions of the indigenous community members as partners of HEIs, who bring critical knowledge, inspire local solutions and develop better strategies for the implementation of solutions. Importantly, the chapters highlight the role of community actors not only as beneficiaries but as active partners at each stage of co-engaged learning processes.

This book, while being far from painting a full and coherent picture of changes in engagement between learning institutions and the communities, traces the contours of such changes from the practices of the RCE community. The authors, in response to socio-ecological and economic challenges, describe and analyse the terms of engagement and, consequently, power relations between the perceived 'experts' and 'non-experts' in the course of the learning for change. What becomes increasingly obvious is that the 'case' for engagement with local communities goes significantly further than reliance on the communities for implementation of an idea and even beyond appreciation of complementarity of thinking on an issue between different stakeholders. What it indicates strongly is the significance of the process behind the engagement and its long-term implications for social transformation and for transformations within learning systems.

Mutual Empowerment of Partners: Evolving Roles and Agencies

The chapters in the book present a process of mutual empowerment of the local partners. The engagement is based on a strong contention that the partners – academics, land-owners, community youth and sages, and others – have the expertise and knowledge needed to understand the impact of internally and externally-driven development on wildlife, water, land, air, traffic, public safety, social and economic relations, heritage and culture. Empowerment and a sense of agency have been manifested by organisations and individuals who have been part of the collaborative processes.

In a movement against the proposal for potash mining informed by an apparently weak commitment to and knowledge of sustainability, Havestock Special Project Committee (HSPC), representing an alliance of affected land-owners, and RCE Saskatchewan collaborated (Chapter 1), and proved the value of local knowledge and ability to conduct serious data gathering on good practices that would provide alternative ways of mine development. By doing so, they showed the limitations of 'expert' knowledge that had earlier been solicited by the government, as it was not grounded in local knowledge and community engagement. Through its eight member HEIs, the RCE has supported the work of HSPC with technical data from research related to relevant sustainability practices. In the relationship between academia and the community, the Okayama model of development (Chapter 13), is built on the Community-Based Learning (CBL) approach to strengthen civic engagement. The strategy appears to have led to increased mutual confidence, and mobilised Okayama University and the community towards creating a more liveable city.

Empowerment through collaboration resulted in the evolution of new agencies and assuming of new roles among the partners. For example, schools were "transformed into centres of environmental activism" and the communities became empowered in making decisions about protection and sustainable use of their forests in the case presented by RCE Shangri-la (Chapter 6). In the case of RCE Lima-Callao, members of the indigenous communities gained a new recognition as educators in delivering innovative courses at the university (Chapter 10). The collaborative work of RCE Saskatchewan, mentioned in the previous paragraph, reaffirmed the role of the Eco-museum as the host of a collaborative space for all the partners. The students who actively engaged in actions of Hands On Greater Portland through the service-learning and TeamWorks model of learning at RCE Greater Portland shared deep satisfaction from direct engagement with the societal challenges (Chapter 12). The farmers who shared their water-saving agricultural practices on the radio have become advocates of the practice for other members of the RCE Makana and Rural Eastern Cape agricultural community (Chapter 9).

By being a part of the research teams, together with scientists, representatives of local and indigenous communities in Bogotá and Lesotho (Chapters 15 and 2 respectively) strengthened their understanding of the problems and, as a result, became more able to develop mitigating solutions. Work through initial stages of the process led to broader engagement of the local communities with livelihood and educational programmes. Learning from the case of RCE Okayama (Chapter 13) emphasises that local engagement is foundational for local democracy, if done with respect to the variety of voices and support for the variety of processes, as it leads to increased responsibility and to self-governance. Collective decision making with sensitivity to different interests has been demonstrated in the context of Pune through the process of deliberative democracy discussions for a more sustainable transportation system (Chapter 4). Interestingly, new agency also evolved among

the academic disciplines that gained association with sustainability engagements later than natural sciences and technologies. When sharing insights into practices that enabled co-engaged learning of the community stakeholders, the authors emphasise two streams of knowledge and skills that HEIs bring to the table. One relates to the knowledge, frequently technical in nature, for the generation of solutions to community problems. It is often offered by natural sciences and technology. The second is the set of competencies that comes from professions and disciplines that help understand and facilitate learning processes, collaborative engagements and transformation. A clear demonstration of this observation comes from Subramanian & Payyappallimana who emphasise the importance of the understanding of processes and of disciplinary (technical) knowledge for community-to-community exchanges towards sustaining ecosystems (Chapter 8), and from Menon & Rapur for the deliberative democracy (DD) process towards more sustainable transportation solutions in Pune (Chapter 4).

Strategies for Engagement

The authors of this book have demonstrated examples of engagement where academic and non-academic partners have been working jointly to define the problem, conduct research and undertake follow-up actions. Importantly, the engagements have demonstrated ways in which research, education and outreach activities have coherently supported each other. This has made the strict traditional differentiation among these irrelevant, and has shown potentially new ways of organisation of knowledge development processes.

Methodologies presented by the authors have aimed at the development of genuine relationships between academics and community members. Mutual respect and understanding emerged as a result of deep listening and appreciation of people's interests and aspirations. Specific value of this approach becomes apparent when the engagement is with traditional communities (cases from RCE Lima-Callao and RCE Bogotá) that are guided not by market and competition but by value of sufficiency and land preservation.

The point that the authors of the book put forth in relation to engagement with local communities is not that every research process has to be, from the start, defined collaboratively. While some of the practices, as in the case of RCE Borderlands México-USA and RCE Shangri-la (Chapters 3 and 6 respectively), have synchronised contributions from various stakeholders, the key question is: What is the position of the scientific knowledge in relation to traditional knowledge, and at which stage in addressing local challenges might it be engaged? The work of RCEs Lesotho, Saskatchewan and Makana and Rural Eastern Cape built on the research that had already been conducted to address a particular challenge (deterioration of ecosystems in Lesotho and water scarcity in Eastern Cape of South Africa) or to mobilise data about various aspects of regional ecosystems and socio-economic development (reaction to undesired potash mining in Saskatchewan). What is significant is that the knowledge of academia has 'co-engaged,' through collaborative processes, with the knowledge of community partners based on considerations of trust, appropriateness and ownership of actions by the communities. This aspect highlights the critical importance of relations between knowledge institutions and the communities.

Engagement between universities and the society in Nizhny Novgorod (Chapter 11) allowed two methodologies – cognitive modelling and the 'Academy of New Faces' – to be applied for cross-sectoral engagement with professionals and experts. As a result, the collaboration has become more system- and future-oriented based on simulation of scenarios of regional development. It also led to the development of working infrastructure for sustainability and support for multi-stakeholder networking.

The outcomes of the engagement between knowledge institutions and the local communities resulted in changes at different levels related either to transformations in the systems of education and learning, or in changes related to development trajectories, including in the ways of engagement between stakeholders. These transformations were grounded in the cultural values of the regions (RCEs Lesotho, Bogotá, Lima-Callao as well as the chapters by Subramanian & Payyappallimana and Dzulkifli *et al.*) and their history (RCE Nizhny Novgorod).

The collaborative curriculum development processes of RCEs Lima-Callao and Makana and Rural Eastern Cape demonstrate the process of bringing together knowledge of the sciences and the traditional inter-generational knowledge of communities (indigenous community in Peru and the farming community in South Africa respectively). Attention to learner recognition of shared concerns, associated social-emotional assessments and action are at the centre of the methodology used by the Environmental Learning Research Centre (ELRC) at Rhodes University. Chapter 9 presents the application of this methodology in relation to the challenges of food security in the region. The Amanzi for Food project was developed to engage communities of food growers and agricultural colleges into water conservation farming. To bring together expert knowledge, specifically of the Water Research Commission (WRC), and knowledge of the local communities, the project used the course-activated processes of social learning developed around activities developed by farmers and educators who participated in the project.

The process assumes engagement of learners, i.e. farmers and the colleges, as co-developers of the course materials that are brought to them, deliberately, in incomplete form. To sustain and expand the actions, the project incorporated radio programmes to enlarge the learning network. RCE Pune's engagement with the problems of city mobility and street design also brought to the fore applications of Deliberative Democracy (DD) – a process with strong attention to the local and expert knowledge and methods of engagement that give voice to the traditionally marginalised members of the community. The process, recognised as social learning, puts a premium on value-based learning, power distribution in deliberations and in decision making. Finding collective understanding of the challenges of the transportation system in Pune led to a strong attempt at engagement with the municipal authorities, following a history of engagement with decision makers on other issues.

The case of RCE Lesotho (Chapter 2) illustrates the application of strategies of learning and action in the circumstances where the perception of the challenge – threat to the local ecosystems and bird species – was not seen by the local communities as a problem. A number of consultations, educational activities relating local ecosystems and the traditional Botho philosophy regarding current and potential community actions has instilled considerations of co-existence between the environment and humans. A culturally sensitive engagement process created the foundation for appropriate livelihood practices in the community.

By looking at the strategies of engagement, many authors have pointed out the need to evolve ways of developing and applying knowledge for addressing complex challenges. Notably, rather than being a one-sided flow of training or application of a solution to the immediate problem, the authors reiterate the need for both expert and community knowledge for the sake of reliability of data, soundness of actions, and trust among the stakeholders. The contributors to the book have

demonstrated how, through the structures and strategies inspired by the RCEs, local communities, HEIs, and other academics and experts overcame traditional barriers for meaningful engagement.

The 'New Life' of Traditional Knowledge

The importance and relevance of acknowledging, respecting and drawing upon knowledge developed by indigenous and local communities over many generations is reflected in several chapters in this book. Since the Rio 'Earth Summit' in 1992, the United Nations system too has promoted the role of traditional knowledge, particularly "Recognition of their values, traditional knowledge and resource management practices with a view to promoting environmentally sound and sustainable development" (*Agenda 21, Chapter 26, Recognizing And Strengthening The Role Of Indigenous People And Their Communities*). In the selection of articles the terms 'traditional knowledge', 'indigenous knowledge' and 'local knowledge' are often used interchangeably.

> ***"Traditional knowledge issues cross-cut across many domains in relation to global environmental issues, from biodiversity conservation and natural resource management, to use of genetic resources and to climate change observations, mitigation and adaptation. Work on indigenous knowledge provides support to understanding the role of customary livelihoods within sustainable development and the links between environmental management, science and well-being."*** [6]

In the field of sustainability, the growing interest among scientists and decision-makers about local and traditional knowledge is often related to its potential to advance environmentally friendly solutions in industry and agriculture. However, chapters in this book pay attention to cultural aspects in approaching traditional knowledge as they lead to values orientation and ethical choices in complex and controversial situations and processes. In other words, even in relation to very practical questions of development, traditional and local knowledge leads to careful considerations of the interrelationship between nature and human beings.

The authors present a variety of examples of how to integrate cultural contexts into ESD to strengthen values-orientation as a foundation in developing key competences. Dzulkifli *et al.* (Chapter 14) analyse the concept of *'sejahtera'* (in the Malay language), which carries a positive connotation of abundance, happiness, prosperity, peace and tranquility. It underscores that indigenous knowledge and wisdom have had their own uniqueness, strength and relevance for the local community over the years. In recent years, the concept of *sejahtera* was first introduced in Universiti Sains Malaysia (USM) as a way to empower students to 'bring home' traditional wisdom and cultural values. Research on cultural diversity is a particular interest of RCE Bogotá (Chapter 15) which involved young indigenous students and graduates in research together with university researchers. The research is considered 'as a bridge between the past and the present' and is expected to be included in the educational curriculum in order to explore and value cultural roots. The Diploma Course in Biodiversity offered at the Ricardo Palma University (Chapter 10) was designed 'to connect techno-science and traditional knowledge for the mutual transfer of knowledge and good practices' and to recover community values in order to empower students to deal with local and global challenges. The contextual nature of knowledge is particularly emphasised in the article by Mokuku (Chapter 2) in connection with *'botho'* philosophy, which promotes ethical considerations in the co-existence between people and the environment. This was demonstrated in the preparation of educational materials and activities in the project on ecological tourism, which incorporated elements of *botho* philosophy along with scientific knowledge on biodiversity and ecosystems. In the collaborative process of the Living Labs researchers of the Autonomous University of Chihuahua and small farmers, the participants developed solutions based on a combination of traditional and innovative, technologically-supported agricultural practices (Chapter 3). The authors note that "(re)-instilling pride in traditional ways is crucial to the preservation of both culture and biodiversity". The case from Tongyeong (Chapter 17) emphasises the importance of trust for the engagement of local partners, which was achieved by ensuring respect for the local way of life and acknowledgement of the sustainability wisdom embedded in the local traditions.

Innovations in ESD Approaches

> ***"ESD is transformative education in that it aims at reorienting societies towards sustainable development. This, ultimately, requires a reorientation of education systems and structures as well as a reframing of teaching and learning. ESD concerns the core of teaching and learning and cannot be considered an add-on to existing educational practices."***
>
> ***"ESD entails including key sustainable development issues into teaching and learning and requires innovative, participatory teaching and learning methods that empower and motivate learners to take action for sustainable development. ESD promotes skills like critical thinking, understanding complex systems, imagining future scenarios, and making decisions in a participatory and collaborative way."***

Source: Global Action Programme on Education for Sustainable Development (GAP).

ESD innovations presented in the book include two categories of education processes: non-formal education in the community and formal education mainly in the HEIs. However, it is common that this distinction is conditional depending on the 'entry point' and becomes more and more complex during the process. While starting from the 'non-formal' edge, ESD is based on community involvement by providing information about the problem under consideration, as seen by examples from RCEs Saskatchewan, Borderlands México-USA, Tongyeong, and Grand Rapids. The chapter from RCE Greater Western Sydney presents more 'emotional' socio-cultural ESD approaches that were undertaken to identify the local challenges. The first was the creative use of storytelling and objects to identify local places of importance; participants were asked to bring an artefact from or representing their favourite place, and to tell a story about that place. This approach generated powerful insights into how, why and where the community members connected to their local places. The second innovation involved 'Open Space Technology' with the aim to bring together clusters of people interested in taking specific environmental action. The community education methods used by Mokuku (Chapter 2) included outdoor nature trails and ecotourism activities led by youth from the community. An open-minded approach to allow organic formation of networks and links with individuals and organisations throughout the project has been pivotal to innovation and project sustainability. The chapter of DeBruyn (Chapter 7) highlights the principles of innovative engagement across the sectors to develop LEED protocols as well as learning

[6] See: The Knowledge of Indigenous Peoples and Policies for Sustainable Development: Updates and trends in the second decade of the world's indigenous people *http://www.un.org/en/ga/president/68/pdf/wcip/IASG%20Thematic%20Paper_%20Traditional%20Knowledge%20-%20rev1.pdf*

processes assuring relevance of the competencies of the engaged professionals. Menon & Rapur's chapter (Chapter 4) concentrates on understanding sustainable mobility while focusing on promoting equity in the decision-making process. Peer learning or social learning methods are common in non-formal education. The notable features of the examples in this book could be used for knowledge-led discussions about future decisions and participatory problem solving.

ESD initiatives in formal education usually are connected with introducing new interdisciplinary courses and research activities in the community. For example, López and her colleagues (Chapter 3) initiated the 'Living Lab' in order to empower the community by getting them to work closely with researchers and students at the Autonomous University of Chihuahua. In this collaborative process, researchers and small farmers developed solutions based on a combination of traditional and innovative, technologically-supported agricultural practices. Iwabuchi (Chapter 13) presents a case of a university providing the community with scientific analysis, while the community gives the university opportunities to engage with citizens, thereby enabling enrichment of the students' emotions and minds. In the process, citizens learn how they are needed by society, and students experience the challenge and satisfaction of trying to solve real-life issues.

Establishing relevant partnerships is a starting point in several examples. Ricard emphasises "we have therefore assumed that each of the actors plays an equally important role at the level of society" (Chapter 16). Mokuku points to the importance of respect for the community and its culture, valorisation of traditional knowledge of the community, identification of unsustainable community knowledge and practices, and integration of scientific knowledge and practices within the community to enhance sustainability (Chapter 2). Service-learning as a method described by Smith provides greater efficacy in teaching and learning within and beyond courses in secondary schools and higher education institutions (Chapter 12). Defining learning objectives, by inclusion of service and reflection, appear to offer four key benefits to advancing knowledge: active learning, empowerment, community building, and citizenship. In the chapter by Bermúdez Guerrero (Chapter 15), the local Guide or *'Baquiano'* was used as a methodological resource by including in the research team people considered inexperienced in the academy but having practical experience and deep knowledge of the cultural context.

All these examples call our attention to rethinking the role of universities and to their responsibility to bring knowledge and innovation into community practices. Equally importantly, experiences presented are also about the integration of HEIs into societal development, and the transformation of the institution itself.

Concluding Reflections

Rethinking the role of education in contemporary society could be considered as an essential topic in the discourse of global sustainable development policy, starting from Agenda 21 in 1992 to Sustainable Development Goals in 2015. Different countries are looking for their own unique approaches and strategies on how to develop human resources and create new knowledge in order to achieve desirable transformation in particular sectors and in society as a whole. Research-based innovation becomes a key instrument in developing new solutions to economic, social and environmental problems in line with educating on the ability to understand new concepts, think critically and creatively and act to implement new ideas. It requires closer cooperation between educational or knowledge institutions and society by integrating real life issues into curricula, involving the local community in teaching and research projects as well as facilitating participatory decision-making at the policy level. The selection of examples presented in this book is not only about the diversity of educational approaches in solving community problems. The experience from different parts of the world also tells us about the common principles that lead to societal transformation and could serve as guidelines for future developments.

The stories shared in this book bring to the fore a variety of regional challenges and the ways they have been interpreted by the partners. Importantly, though not surprisingly, the key problems were not addressed in isolation or by the means of single strategies. The problems, instead, were presented as a motivation and an entry point for a number of issues across the development agenda.

***Holistic approach**. A way to understand multiple aspects of a situation and its development needs in order to provide realistic and sustainable solutions.*

***Knowledge co-creation.** Partnership of academia and community brings 'real life problems' back to the research and educational practices making them transformative.*

***Values orientation.** Understanding of values and cultural context is essential in communication with communities in order to understand and respect their expectations.*

The stories deal with processes of reconciliation of (narrowly defined) economic development and the environment, protection of biodiversity and encouraging local livelihood opportunities, city development and quality of life. The projects brought together questions of culture, environment and the broader questions of development. Coexistence of multiple thematic priorities went hand in hand with the alignment of the activities that simultaneously addressed the concerns of research, education, and development. Differences in local context, naturally, brought forward regional priorities but highlight the similarity in holistic strategies of ESD.

Critical thinking about the nature of knowledge and change brought to the fore the importance of *multi-stakeholder local practical* engagement and signalled growing disappointment with a learning and teaching approach that distances knowledge from its context and fails to address everyday concerns of society. In academia and in the community, learning without practice aiming at change averts attention of actors from conventions of everyday life and, as a result, from the everyday challenges. This also points our attention to the need to carefully examine, with the help of this book's authors, methodologies of engagement that support such *co-produced transformative learning in the local context*.

Thinking about abstracted (or disciplinary) learning does not imply irrelevance of abstract (including disciplinary) knowledge. Rather it calls for carefully thought-through mediation processes that would bring them together with the situated knowledge and experiences. The partners of the projects – those who seek to change teaching or development practices – are engaged, with a clear understanding of their change mission, into exploration of their own, and those of others, perspectives, contradictions and finding ways of acting together.

ESD principles that inspire RCE partners show promise in developing transformative practices by encouraging more participatory, reflexive and action-oriented approaches. While these approaches find similarity with principles of other knowledge processes that pioneer sustainable development, they have an explicit characteristic of focusing on local value systems. In the examples presented in the book, one can recognise the

emerging qualities of sustainability science[7] that focus on the dynamic interactions between nature and society. However, ESD practices of RCEs and their attention to local knowledge brings an additional feature: the importance of values orientation and ethical dimension of the research and knowledge towards sustainability. Together, the partners explored contradictions of existing (un)sustainable knowledge and practices and learned new ways of addressing the problems. This way of working provided them with more open ways of learning and changing the practices of the communities as well as their own.

The cross-cutting principle that emerged from the practices and, indeed, the whole RCE movement, is the limitation of acting alone and the profound importance of local or 'traditional' knowledge as a part of the experience of development. As Donella Meadows observed many years ago: "We can listen to what the system tells us, and discover how its properties and our values can work together to bring forth something much better than could ever be produced by our will alone."

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Part I

Education for Transformation

Global Action Programme on Education for Sustainable Development, Objective 2:

"to strengthen education and learning in all agendas, programmes and activities that promote sustainable development"

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Roger A. Petry, Raymond Ambrosi, Lynn Digney Davis,
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Chapter 1

Community Knowledge Mobilisation for Sustainable Development in Saskatchewan

Summary

ESD Innovation

In seeking to halt (or significantly alter) the proposal for a large-scale potash mine deemed highly disruptive to local livelihoods in Havelock, Saskatchewan (Canada), several educational strategies were employed.

The first was a facilitated process to allow the local community to frame its own vision for long-term sustainable development and articulate its concerns about the mine in relation to this larger vision. A second educational strategy targeted municipal, provincial, and federal governmental ministries through their own approval processes. This strategy employed both the community and the larger UN vision of Sustainable Development Goals (SDGs) focused on sustainable water use, and academic expertise mobilised through RCE Saskatchewan.

Public awareness activities involved various mediums targeted towards local landowners, downstream water users, individual politicians (including the Canadian Prime Minister), and members of the global RCE community.

Societal Transformation

The local rural community of Havelock together with residents of the Rural Municipality of Longlaketon, have formed the needed social capital and civic participation to set terms for the proposed mine's development (and likely future developments) in the area. The mining company is undertaking an internal review of its community engagement and expressed willingness to address a number of community concerns.

Flaws, limitations and conflicts of interest in existing provincial regulatory processes have been highlighted to enable reforms that hopefully embody broader principles of sustainable development and the SDGs. Ongoing federal government observation of the provincial process may also lead to strengthening of federal environmental assessment legislation.

Implications of Development for Knowledge Institutions

The mutual legitimation and reinforcement of local knowledge and expertise of the Havelock community with that of traditional university scholars led to a stronger recognition of both. This rectified potential biases from the government's side of seeking to restrict who is considered an 'expert' in 'streamlining' approval of large-scale, one-size-fits-all corporate developments. Through the lens of sustainability, scholarly documentation of deficiencies in existing governmental and corporate citizen engagment processes allowed reflection on their inadequacies and the research and political mobilisation needed for their reform.

The Challenges of Potash Mining

Saskatchewan is a landlocked province in western Canada. Its southern portion is characterised by mixed grasslands that support both farming and ranching livelihoods, while the north is forested, transitioning from aspen parkland to boreal forest. In addition to a wealth of renewable resources, Saskatchewan also has significant mineral and other non-renewable resources, including oil and natural gas. With the collapse in the price of oil, rather than focusing on developing renewable resources, the Government of Saskatchewan began strategically focusing on the exploitation of other mineral resources to create employment and offset its revenue shortfalls. One such mineral is potash. Canada has 46% of the world's potash reserves compared to Russia with 35%, Belarus 8%, Brazil 3%, and China 2% (*PotashCorp 2017*). Potash is used overwhelmingly as an agricultural fertiliser to address potassium deficiencies in soil.

At first glance, promoting further development of Saskatchewan's potash industry for economic diversification seems viable. Saskatchewan possesses the lion's share of global potash supplies needed to meet the needs of increasing future demand[1] for potash. However, the potash market, currently characterised by oversupply and reduced demand has resulted in historically low prices (*IndexMundi 2017*).[2] In addition, the market power of Canpotex (or Canadian Potash Exporters), the Canadian joint potash marketing company that aims to maximise returns from potash sales, has weakened. At the same time as declining economic benefits to the province, the long-term sustainability of potash mining is further eroded when potential ecological and social impacts are fully considered. In the case of solution mining, potential impacts include negative effects on water, air, landscape and sociocultural resources. Water resources are impacted in diverse ways. Solution mining requires the use of large quantities of fresh water, and pits industrial use against other more socially urgent uses of fresh water in a prairie region characterised by water uncertainty. Potash mining involves risk to ground and surface water in the form of pollution from brines and salt tailings, salt spray contamination, and other forms of surface and subsurface land and water degradation (*UNEP 2002*).

In the midst of the province's macro-level concern with economic development and industry's drive for profit, at the micro-level, the rural community of Havelock (near Southey, Saskatchewan) faces the proposed development of a solution potash mine to be operated by Yancoal Canada Resources Co. Ltd., a state-owned enterprise of the Government of China incorporated in Canada). The mine, according to its original Environmental Impact Statement (EIS) would extract 2.8 million tonnes of potash per year for 100 years, employing 2,200 full-time equivalent (F.T.E.) positions per year during construction, and 350 F.T.E. workers during ongoing operations (*Golder Associates and Yancoal Canada 2016*, *E-6*, *E-11*). This chapter examines how the Regional Centre of Expertise on Education for Sustainable Development in Saskatchewan (RCE Saskatchewan) collaborated with community groups, namely the Havelock Special Projects Committee (HSPC), and the Calling Lakes Ecomuseum (CLEM) to respond to the mine proposal. RCE Saskatchewan includes post-secondary researchers. CLEM, a flagship project of the RCE, educates and advocates for water protection in the Qu'Appelle Valley river basin. The HSPC was formed by concerned agricultural landowners most directly affected by the proposed mine. One-hundred-and-twenty-nine farms lie within 8km of the proposed core potash facility and 12 farms lie within 1.6km of the facility.

[1] Future demand is projected to increase given current global agricultural production that requires substantial agricultural inputs to offset soil degradation.

[2] Potassium chloride reached a peak value of $872.50 (USD)/tonne in February of 2009; in May 2017 it was down to $216 (USD)/tonne.

In particular the case study focuses on how these groups became involved in the governmental approval process for the proposed mine. This process has included local government (the Rural Municipality (RM) of Longlaketon), the provincial government (Government of Saskatchewan), and the federal government (Government of Canada). The collaboration among the HSPC and the RCE has to date, led to improved procedural fairness and transparency. By giving a greater voice to community knowledge supported by university scholarship, this has provided an informed and critical response to the project proposal, and led to the formation of far more rigorous sustainable development criteria than appears in current environmental impact assessments. In doing so, specific UN SDGs have emerged as central to the debate. Some are more obvious, including economic sustainability goals dealing with sustainable agriculture (Goal 2), sustainable production (Goal 12), resilient infrastructure (Goal 9), inclusive economic activity (Goal 8), environmental sustainability goals tied to halting land degradation (Goal 15), ensuring water access for all (Goal 6), and combating climate change (Goal 13). Significantly, the collaboration identified social concerns that include concerns for healthy lives and well-being for all (Goal 3), greater equality (Goal 10), and promoting just, peaceful, and inclusive societies (Goal 16).

Facing off against the corporate interests of a powerful mining conglomerate supported by a provincial government motivated by a narrow agenda of economic benefit, mutual empowerment among the RCE and community groups forced a broader debate that includes the need for a social license as a basis for corporate development, planning that respects existing livelihoods while demonstrating short and long-term benefits for local communities, and a general citizen interest articulated in the SDGs.

The Main Partners for Collaboration

In cases where a community seeks to pro-actively advance Sustainable Development (SD) through collaboration with Higher Education (HE) partners, there always exists the question of "who will participate". A community-led initiative presupposes the existence of a local planning structure mandated to advance SD. HE institutions can help these communities liaise with researchers who have expertise that provides a solution that is more sustainable than current practice. If led by HE, a researcher or cluster of researchers may potentially have expertise in a particular kind of technological solution (where 'technology' is broadly understood) deemed more sustainable than current practice. There might also be a general scholarly interest in mobilising a particular community's sustainability efforts, a community to which one or more HE organisations have historic ties or structural accountabilities. If advancing a sustainable technology, this will define the participation of groups that benefit and have a means to implement the technology; mobilisation by HE of an entire community for sustainability presupposes groups defined within a given geographic or virtual setting. However, in situations where a community is responding to an externally imposed form of development such as a proposed potash mine, where local livelihoods will potentially be disrupted and the project's sustainability is contested by one or more affected communities, the definition of 'main actors' is tied to the proposed development. The development and its associated technologies will have transformative impacts affecting particular groups and interests. In addition, external forms of development bring in other actors as they are (1) subject to formal regulatory review by various levels of government, (2) employ private contracts to obtain land, labour and other resources, and (3) are affected by informal social institutions and community norms

	Organisation Type:			
Geographic Scale:	*Community/ Volunteer*	*Education*	*Government*	*Business*
National/ International		UN University, RCEs of the Americas	Ministry of Environment and Climate Change Canada	Yancoal Canada Resources Co. Ltd.
Regional/Provincial		RCE Saskatchewan	Saskatchewan Ministry of Environment	
Local	Havelock Special Projects Committee (HSPC)	Calling Lakes Ecomuseum (CLEM)	Rural Municipality of Longlaketon	

Table 1: *Participating organisations by type and geographic scale.*

that influence how and whether development is undertaken. In the case of the proposed Yancoal Southey Potash Mine, Yancoal Canada Resources Canada Co. Ltd. (hereafter referred to as Yancoal) began an exploration campaign to build a site for the mine in 2012-2013. The main community actors were defined when Yancoal started the process to purchase land from landowners residing in Division Six of the RM of Longlaketon (#219) between January and March 2014 (*HSPC 2017, slide 6*)[3]. Although directly impacted by the proposed Yancoal Southey Potash Mine development, these landowners were unable to effectively mobilise for a couple of reasons. Firstly, landowners were individually approached by Yancoal and given tight deadlines to decide whether to sell their land to the company. Secondly, with each land purchase, Yancoal demanded confidentiality agreements that prevented consultation with neighbours. This caused considerable strife and stress in the community as landowners had to face life-changing decisions to sell the family farm within a short time frame and with limited knowledge of other local sales. Concerned about their community and long-term social ties that bonded them together, on 5 March, 2014, the landowners met to discuss the proposed mine. This initial meeting brought to light the need for further community discussion and later that month 30 landowners requested to meet with Yancoal, a request that was denied. Subsequently three organisations with a local and regional interest in sustainability intentionally collaborated to address the proposed mine: the Havelock Special Projects Committee (HSPC), the Calling Lakes Ecomuseum (CLEM), and the Regional Centre of Expertise on Education for Sustainable Development in Saskatchewan (RCE Saskatchewan). *Table 1* outlines the various organisations engaged in the process by organisational type and geographic scale.

Havelock Special Projects Committee

Seeing the need to organise, the landowners in RM Longlaketon most affected by the proposed mine formed the Havelock Special Projects Committee (HSPC) shortly after.[4] HSPC represents over 20 families impacted by the proposed mine's main processing facility, well-field from which the potash is extracted, and access routes needed by the mine including utilities and railway lines. The group's mandate involves both research and education.

[3] A second attempt at land acquisition occurred in November 2014, with Yancoal indicating in January of 2016 that no more land would be needed for 10 to 15 years.

[4] The name 'Havelock' refers to a former school district that was integral to the local history of this area.

This includes gathering research on best practice in solution mining in order to ensure the project follows the highest environmental standards, and becoming familiar with alternative viewpoints that offer insightful, critical perspectives of the dominant development and business narratives. The collected information informs the HSPC's work in public education, whether in public meetings, through traditional media, social media and information sharing. HSPC has a Facebook page, a YouTube channel, and regularly responds and initiates discussion on Twitter (*HSPC 2017*). Members of HSPC have been interviewed by provincial media and have spoken on talk shows.

HSPC also seeks to inform government through staying connected with government officials and government processes. These governmental consultations have been extensive including meetings with provincial Members of the Legislative Assembly (MLAs), federal Members of Parliament (MPs), the Provincial Ministry of Environment, and the Ministry of Economy and Ministry of Government Relations (*HSPC 2017, slides 8 and 9*). HSPC has attended public forums and discussions organised by Yancoal including the company's Poster Board Meeting in March, 2015, when plans for its core facility were unveiled, and a Yancoal Town Hall Meeting in July, 2015 (*ibid., slide 5*). These engagements have been effective in garnering broader community engagement and in voicing community concerns to various levels of government and to Yancoal regarding the proposed industrial development. HSPC's active work with the Saskatchewan Ministry of Environment during 2015 led to Yancoal seeking greater engagement with the community throughout 2016. Similarly, a press conference at the provincial legislature and a meeting with the Official Opposition in the provincial legislative assembly helped secure further meetings with provincial ministries (*ibid., slide 10*). The overall goal of HSPC is "to be recognised as the most impacted stakeholder group" and "to set the bar high for development so that people in the immediate project area are willing to grant social license and be comfortable living beside Yancoal for the next 100 years" (*ibid., slide 3*). With their goals clearly stated, HSPC has been instilling awareness that the local community has not granted social license for the project to proceed.

Calling Lakes Ecomuseum

Considering the long-term implications of the project that include environmental, social, and economic concerns, including the potential impact on agricultural livelihoods, it is quite understandable that local residents have begun to understand the project from the perspective of SD.

Two other organisations, CLEM and RCE Saskatchewan, also took on influential roles owing to their regional interest in sustainability issues and education for sustainable development. CLEM is part of the Saskatchewan Ecomuseum Initiative (SEI) (*Heritage Saskatchewan 2017*) and works through local networking and events, advocacy, and other forms of public education to improve the water quality of the Qu'Appelle River system. Raising concern over water quality is the means by which CLEM mobilises towns, indigenous/First Nations communities, and cottage owners along the five lakes that are part of this system. The Qu'Appelle River system is located downstream from the city of Regina, the provincial capital. Regina (population 236,481 in 2016) draws its water from Buffalo Pound Lake, the lake from which water for the proposed potash mine is to be sourced. The proposed water use is substantial, amounting to 1,602m^3/h during initial stages of solution mining that relies on the injection of fresh water to create large underground caverns. Normal operation of the mine at full production will require 1,450 m^3/h (*Saskatchewan Ministry of Environment 2016c, 6-7*). This amounts to 0.445 or about 0.5m^3/s, or a quantity equal to approximately one-half of the city's annual use. This is of particular concern given the impacts of climate change on a region that has long been deemed a semi-arid region (*Dale-Burnette 2006*). The City of Regina has previously noted the need for proper management of water resources:

Regina, Saskatchewan, is a city of 200,000 situated in the middle of the vast southern prairies, the driest major region of Canada. The city has very little local access to water. The only body of water running through the city is Wascana Creek, a formerly ephemeral stream that was dammed in 1883 to create an artificial lake that today acts as a downtown landmark (*City of Regina 2017*).

Because the removal of this quantity of water upstream would, in turn, reduce water flow into the Qu'Appelle River system and affect water quality, the Yancoal proposal became a concern for CLEM. CLEM became involved after being informally contacted by Havelock community members who were aware of CLEM's focus on water quality and their successful engagement with community partners. The existence of CLEM as a local 'living laboratory' for SD, which in turn, had formal links to post-secondary education partners in the region, was an important vehicle for connecting the HSPC with RCE Saskatchewan and university researchers. Aura Lee MacPherson, Chair of the Calling Lakes Ecomuseum, recalled:

"I really cannot remember how the Havelock community found us – but I am so very grateful they did. They had the passion for the land and we had the passion for the water. We used email and phone calls to keep in touch. And built a communication network to splash the really important information to our communities."

Through its network of community volunteers, CLEM spread the word about the proposed mine, and mobilised other members of the community to submit input to the Government of Saskatchewan. MacPherson describes how the local community mobilised to make government submissions:

"It was hard to wake cottage country up to the reality of what we had to lose. When the Minister of Environment asked for our input, we were ready with a communication package – a very easy way for our communities to get involved. I credit Marj Hutchinson for a great amount of work. She cared

and walked door to door to help bring in 325 of the [final] 803 [letters] that were submitted. Sometimes that is all you need; one very passionate, well-educated person to get it done."

Regional Centre of Expertise on Education for Sustainable Development in Saskatchewan

CLEM, or the Calling Lakes Ecomuseum is, in turn, a flagship project of RCE Saskatchewan. RCE Saskatchewan is one of 164 Regional Centres of Expertise on Education for Sustainable Development that have been acknowledged by the United Nations University (UNU) around the world since the start of the UNU's RCE Initiative in 2005 (*United Nations University 2017*). RCEs are self-organised regional networks involving post-secondary education, schools, and community partners to advance Education for Sustainable Development. The RCE Initiative was designed originally to advance the United Nations' Decade of Education for Sustainable Development (2005-2014). The RCEs have been highly successful and are committed to advancing the United Nation's 17 SDGs, in particular Goal 4 on education (*UNESCO 2017b*). In September 2015, Canada was one of 193 countries that formally approved the 17 SDGs to guide the global development agenda until 2030. This global commitment by the Government of Canada commits the ten provinces and three territories making up Canada's federation to pursue implementation of the SDGs. These provincial commitments include the delegation of provincial authority to lower levels of local government. Thus, in Saskatchewan, the provincial responsibility to implement SDGs also applies to municipal authorities such as cities, towns, and rural municipalities. RCEs play an integral part in advancing the SDGs through the Global Action Programme (GAP) on ESD of UNESCO, especially Priority Action Area 5 of the GAP: 'Accelerating Sustainable Solutions at the Local Level' (*UNESCO 2017a*.)

After being contacted by the HSPC and CLEM, RCE Saskatchewan decided to become involved in the project for several reasons. First, the proposed potash mine site falls centrally within the geographic territory of the RCE, the region it is mandated to serve under its original proposal to the UN University (*RCE Saskatchewan 2006, 3; RCE Saskatchewan 2016a, 1*).[5] Secondly, the proposed potash mine would have a direct impact on one of the nine theme areas that are of central concern to the RCE, namely 'sustainable infrastructure including water and energy'. Thirdly, the proposed development would also have an effect on communities with regards to the RCE's cross-cutting theme of 'sustaining rural communities' (*ibid., 4*). RCE Saskatchewan's partnership with eight HE partners meant that it also had a distinctive capability to provide formal scholarly technical input in assessing the proposed development (*ibid., 2*). Finally, RCE Saskatchewan's mandate to advance the SDGs along with the Federal and Provincial Governments of Canada's similar commitment, provided an underlying rationale for the RCE to provide input regarding the Yancoal proposal to the Government of Saskatchewan.[6]

Collaboration and Engagement at Multiple Scales

People who would be directly or indirectly affected by the development or operation of the

[5] Viewed on a map, this territory is a large oval that includes the province's two largest cities of Regina and Saskatoon and extends to the north-east to include the town of Nipawin.

[6] RCE Saskatchewan had previously submitted this type of technical input to the Province's Uranium Development Partnership (UDP) Hearings in 2009 (*RCE Saskatchewan 2009*).

Havelock residents meet with RCE Saskatchewan and CLEM, form discussion groups, and articulate concerns regarding environmental and sociocultural impacts regarding the proposed mine.

Yancoal potash mine proposal undertook strategic interventions at varying organisational and geographic scales. Groups ranged in organisational capacity from small grass-roots organisations to academic institutions. The geographic scale varied from concern over localised impacts of the mine, to broader macro-scale concerns over environmental impacts in a vastly larger area downstream from the proposed mine site, and approval and regulatory issues at both provincial and national levels.

Initial Collaboration in the Local Community of Havelock

The Havelock community was first able to voice concerns with the Government of Saskatchewan on 16 April, 2016 when the Yancoal Environmental Impact Statement (EIS) was opened to the public for comments. The Saskatchewan Ministry of Environment extended deadline for accepting public comments was 6 June, 2016 (*Saskatchewan Ministry of Environment 2016c, 20*). The two co-coordinators of the RCE's Sustainable Infrastructure Theme Area Working Group, Dr. Raymond Ambrosi and Dr. Garth Pickard, along with other RCE members met numerous times with members of the affected Havelock community in the RM of Longlaketon. At one HSPC community meeting on 11 May, 2016, the RCE helped facilitate documentation of local concerns about the project, expectations as to how community engagement should occur, and the community's long-term vision for sustainability. Four key concerns were raised by the community of Havelock: (1) lack of participatory engagement with those directly impacted, (2)

Table 2: *Elaboration of key concerns of community of Havelock.*

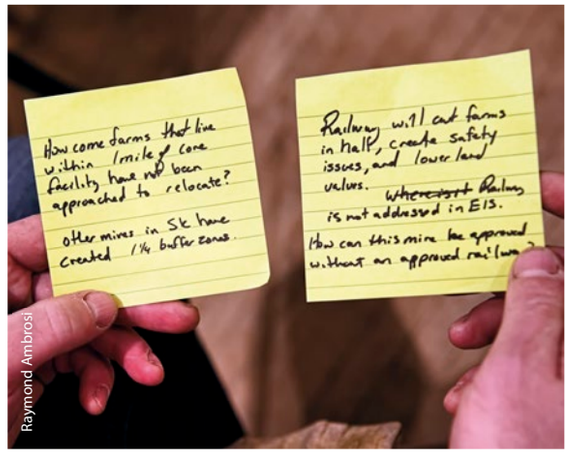
Lack of participatory engagement with those directly impacted	The only participatory meetings to this point had been hosted by the RM and volunteers. The RM had not received provincial assistance to evaluate the mine proposal, and no partnership existed with those most impacted. The only communication by Yancoal with the community was direct offers to purchase land requiring a response within ten days and the signature of confidentiality agreements.
Inadequate consideration of possible impact on drinking water sources	This was viewed as lacking given the substantive use of water from Buffalo Pound Lake, contamination risks from drilling through the Hatfield Aquifer (a pristine drinking water source used by farms and communities in the area), and inadequate research into using other water sources including non-potable water available from the saline Quill Lakes.[7]
Salt spray contamination	Construction of the mine would result in the creation of a large 40-80m salt tailings pile which, owing to the effects of wind and precipitation, could contaminate downstream water sources. The salt tailings pile would be located within 4.8km of Loon Creek, a tributary of Pasqua Lake.
Lack of adequate study	Prior to 2012, a project of this scale would have required environmental impact approval through the Federal Government's Environmental Impact Assessment process. The previous Conservative Government of Canada under Stephen Harper weakened environmental protection law by removing this requirement for potash mines in an ill-conceived effort to fast-track industrial project development. The Federal Impact Study would have subjected the Yancoal mine proposal to far stricter standards than did the Government of Saskatchewan. In addition, the community was concerned with a lack of contingency planning, for example, in the event of water and soil contamination.

inadequate consideration of possible impact on drinking water sources, (3) salt spray contamination, and (4) lack of adequate study. These are elaborated upon in Table 2. In general, the community felt the project proposal showed a lack of commitment to sustainable practices typified by a poor understanding of impacts on fish, wildlife, water, land, air, traffic, public safety, heritage and culture. Perhaps not surprisingly, much of this knowledge was held by members of the local community, which had been effectively ignored by Yancoal, Golder Associates (the company that authored the EIS) and the provincial government.

[7] The inadequate review of the opportunity costs associated with other water sources, including more nearby sources, seemed to be due to a reliance on an earlier study done by SaskWater, the SaskWater Buffalo Pound Non-Potable Water Supply System Expansion Project EIS.

In order to create a more comprehensive and sustainable view of development, the RCE facilitated participatory discussion with Havelock residents in which they discussed their vision of a sustainable community. The meeting gathered quotations from participants and photographed consenting attendees as a way to document community processes. Key elements of their vision for development and a sustainable community are outlined in Table 3.

A further comment summarised the community's view: "The goal is sustainable communities. Mining needs to contribute to that". It is noteworthy that the community's concerns reflected many of those found in the UN's SDGs including good health and



Working together to identify the ways the mine may impact the local social and natural environment helped empower community members and encourage them.

Table 3: *Havelock community vision for development and a sustainable community.*

1.	Strong public consultation and public dialogue, engagement with those directly impacted (with those impacted consulted first), and timely responses to concerns raised.
2.	Truth and transparency without confidentiality agreements.
3.	Fair planning and best practice from corporate and government regulators, and trust that regulatory agencies are on the side of the people as much as business.
4.	Employment of best research (e.g., current practices often include drilling through aquifers and deep well disposal of mining wastes, but are these indeed best practice in light of new research?) and finding specific data that is necessary for solid decision-making versus making unsubstantiated assertions (e.g.,"we think...").
5.	Provincial government support for the local government RM of Longlaketon in dealing with Yancoal. Previously, the province did not offer any support at all leaving local communities alone to bear the burden of evaluating and living with provincial economic development.
6.	Fair compensation including community investments to offset impacts in upstream, downstream and surrounding residences and communities.
7.	Prevention of problems rather than accepting high levels of risk and adopting reactive responses if things go wrong.
8.	Outlining environmental benefits, not just mitigating negative impacts.
9.	Protection of quality of life.
10.	Viewing water as a precious resource and not something to be utilised and compromised.

Focus group discussions encourage residents to act in solidarity, take an active role in expressing opinions, refining one another's ideas, and expressing concerns.

well-being (Goal 3), clean water (Goal 6), sustainable communities (Goal 11), responsible production (Goal 12), life below water (Goal 14), life on land (Goal 15), peace, justice and strong institutions (Goal 16), and the need for partnerships for the goals (Goal 17) (*UNESCO 2017b*). In addition to mirroring the goals of the SDGs, the community was interested in taking a proactive stance in order to minimise risk, closely mirroring the longstanding commitment to the precautionary principle found in Principle 15 of the 1992 Rio Declaration (*UN General Assembly 1992*).[8] Many of the principles also mirror those now required in legal 'duties to consult' with indigenous or First Nations communities in Saskatchewan when developments are proposed. In November 2008, Yancoal undertook initial consultations with 15 First Nations and Métis[9] communities "identified based on their proximity to the Project location as well as potential interest in the Project"; none of these were subsequently engaged in it (*Saskatchewan Ministry of Environment 2016c, 9*). The Saskatchewan Ministry of Environment notes how this affected duties to consult:

"As the project is located on private land and no impact to Treaty and Aboriginal Rights or traditional uses are anticipated, no duty to consult has been triggered for this project as set out in the First Nation and Métis Consultation Policy Framework, 2010" (*ibid., 9*).

It is unclear whether this legal duty to consult with these groups was a factor in choosing to locate the mine in a long-settled, heavily populated (by Saskatchewan standards) rural farming area – a location choice that for many residents remains, to date, inexplicable given the geographic extent of potash deposits elsewhere in the province (*Reeves 2017*).

Collaborative Meetings in Regina

The success of this meeting in Havelock was due partially to the HSPC and RCE Saskatchewan having a shared interest in sustainability and common concerns about the proposed development. This led to subsequent meetings in Regina, the provincial capital city, between members of HSPC, CLEM and RCE Saskatchewan to share further information about the proposed project. At the meetings, HSPC shared an extensive amount of documented, highly technical information gathered by the local community as well as verbal accounts of the process to date. RCE Saskatchewan provided research assistance to HSPC in the form of international undertakings on SD, in particular on environmental sustainability.

Engagement with the Government of Saskatchewan

Both HSPC and RCE Saskatchewan extended great efforts to provide written submissions to the Saskatchewan Ministry of Environment prior to its 6 June, 2016 deadline. Each organisation strove to provide differing critiques and perspectives based on each group's specific specialisation. HSPC extensively questioned the data provided in the Environmental Impact Statement (EIS) prepared by Yancoal and emphasised the Havelock community's four key concerns. RCE Saskatchewan's submission built upon the key points of the HSPC submission by providing a more technically critical examination of the issues based on interdisciplinary scholarly research.

Readers may be curious how RCE Saskatchewan managed to rapidly prepare relevant academic materials in light of the fact that scholarly work and publications traditionally require lengthy periods of preparation. Several factors were at play. First, the research process was shortened since the RCE was able to draw upon the extensive collection of relevant research already accumulated by the Havelock community. Second, the RCE has maintained close relationships with academics and researchers through its broad academic network that includes the province's three largest post-secondary institutions. As a result, the RCE was able to rapidly connect with relevant experts and quickly follow-up on issues raised by HSPC and CLEM. Third, as already noted, RCE Saskatchewan is mandated to do this educational work on SD within its geographic region where this is understood to include non-formal educational settings (whether non-academic organisations or the public at large). This direct mandate allows for immediate action versus needing to obtain permissions that would cause considerable delay in other organisations lacking such a mandate. Fourth, the highly flexible and decentralised organisational structure of RCE Saskatchewan and its related partner organisations greatly contributed to the speed at which the RCE was able to respond[10]. Fifth, because the submission to the Saskatchewan Ministry of Environment only had to address a relatively narrow range of issues, the RCE only raised important questions that were either overlooked or inadequately addressed in the EIS.[11]

RCE Saskatchewan's initial submission to the Saskatchewan Environment Minister on 6 June, 2016, first provided an overview of the RCE's mandate explaining the rationale for its submission

[8] Principle 15 states: "In order to protect the environment, the precautionary approach shall be widely applied by States according to their capabilities. Where there are threats of serious or irreversible damage, lack of full scientific certainty shall not be used as a reason for postponing cost-effective measures to prevent environmental degradation."

[9] The Métis refer to those who have both American Indian and Euro-American ancestry with a significant population found in western Canada.

[10] As already noted, RCE Saskatchewan is mandated to undertake educational work on SD in non-formal educational settings that include grass-roots organisations and basic public education. In order to undertake this work over a large geographic area, the RCE is decentralised according to theme areas and local centres of expertise on ESD allowing those with expertise in an area the authority to work autonomously and quickly. In this case the Theme Area Working Group Coordinators on sustainable infrastructure and the Chair of CLEM as a local centre of expertise were able to mobilise their resources and respond quickly.

[11] While RCE Saskatchewan has no responsibility to produce detailed research that would lead to needed changes in governmental or corporate organisational policy, e.g. addressing the research errors and omissions in the Yancoal EIS, the RCE's aim is to point out the deficiencies and show that further work is needed. This does not, however, prevent either governments or corporations following up with the Regional Centre of Expertise to facilitate the funding of needed research where identified (either by a HE partner or appropriate scholar in the community with the expertise). The RCE offered to provide this service in its submission to Saskatchewan Environment.

and the government's responsibilities to promote ESD and the SDGs, given Canada's previous international commitments (*RCE Saskatchewan 2016b, 1*). The submission then outlined how the RCE had participated in gathering information, both through local community engagement and scholarly review of the EIS document. Its analysis concluded that "[a] project of such magnitude warranted a far more complex EIS" that included the potential impact of the Yancoal Southey project on the upper and lower Qu'Appelle watersheds. In addition, it critiqued the EIS as employing an outdated understanding of "appropriate development" given: (1) the lack of inclusion of SD criteria, opportunity costs[12], and the precautionary principle, (2) inadequate evaluation of climate change impacts, (3) potential degradation of agricultural livelihoods and the environment (including species at risk known by residents to be in the area), and (4) failure to meet existing potash industry standards. Lastly, it contended that the EIS did not include research examining "how the construction of the mine and its continued operation might affect the social and cultural aspects of the communities, including the potential loss of social capital and other cultural assets" (*ibid., 2-3*).

The Appendix to the RCE submission elaborated on these areas, with a particular emphasis on the EIS's inadequate consideration of sociocultural conditions. Field research in the Havelock community by RCE volunteers noted a serious breakdown of social trust among people living near the proposed mine site, and between the residents and Yancoal that had occurred as a result of the company's interventions to date, along with a "failure to understand lifestyle and culture are not commodities". RCE research pointed to the necessity of examining the Yancoal's documented environmental record in China and Australia that showed violation of numerous environmental protection laws, and the company's social record demonstrating their use of illegal surveillance and hacking of employee email accounts (*ibid., Appendix A*). RCE Saskatchewan was able to rapidly compile its report in part; owing to prior work the RCE built from a knowledge base of academic research on Federal and Provincial legislation. The RCE drew on its internal experts to investigate Yancoal's environmental record in China by reading media reports in Chinese.[13] Considering the severe restrictions placed on the media by the Chinese Government (*Duan and Takahashi 2015; Freedom House 2015*), the actual number of infractions of environmental protection is likely much higher. Based on these concerns, RCE Saskatchewan "recommended that the Government of Saskatchewan commission a comprehensive independent Yancoal Southey Project environmental impact study that would be in accordance with Section 14(1) of the Saskatchewan Environmental Assessment Act" (*RCE Saskatchewan 2016b, 3*).

Several weeks after submitting its document to the Saskatchewan Ministry of Environment, the RCE received a reply from its Minister that was both surprising and unsurprising (*Saskatchewan Ministry of Environment 2016d*). The Ministry receives many hundreds of submissions from the public, it was unsurprising that the response received by the RCE was a generic letter sent out to everyone who had made a submission. It noted that the purpose of the Environmental Impact Assessment (EIA) process was to "ensure economic development proceeds with appropriate environmental safeguards and in a manner broadly understood and acceptable to the public", stress the importance of public participation, and to assert that all individuals who submitted comments would be "notified once a decision ha[d] been made". What was surprising was how inappropriate these comments were in light of the issues raised in RCE Saskatchewan's original submission. The original submission had highlighted the inadequacy of environmental safeguards and the need to view the project through the lens of sustainability, which, given the Government of Canada's commitments "is a manner broadly understood and acceptable to the public". The RCE submission also clearly documented the inadequacy of the public participation process and the need for a much expanded process. Lastly, the RCE recommended a decision on whether the Yancoal project should proceed or should not be made (much less communicated) until a larger public inquiry had been undertaken – an action at the discretion of the Minister according to the provincial act governing environmental impact assessments.

Surprised by the Ministry's response, the RCE sent a follow-up letter on 29 June, 2016 to raise these three concerns and to ask again whether the Minister would hold a public inquiry (*Pickard and Ambrosi 2016a*). On 13 July, 2016, the RCE received a reply to this specific question, which stated that a public inquiry would not be held. According to the Minister's letter, the decision had been made in light of the "significant experience regulating the potash industry" and "strong understanding of the technical and environmental issues surrounding potash mining in the province" held by the Government of Saskatchewan, and the view that the current provincial and municipal regulatory regime provided the necessary oversight of environmental, socio-economic, and cultural issues (*Saskatchewan Ministry of Environment 2016d*). The RCE's questions and supporting evidence in relation to the Yancoal project were not addressed in the letter.

To the surprise of community groups, on 9 August, 2016, the Minister of the Environment announced a Ministerial Decision that approved the project subject to specific terms and conditions. These stipulations required Yancoal reaching a signed development agreement with the RM of Longlaketon prior to commencing the project, developing a community involvement plan that included a number of sub-conditions by 9 August, 2017, and incorporating additional environmental monitoring and reporting of the surrounding land and along Loon Creek, with a duty to report environmental damage to the Ministry within 24 hours (*Saskatchewan Ministry of Environment 2016a, Sec. 6-8*). The announcement was accompanied by a list of reasons explaining the Minister's decision (*Saskatchewan Ministry of Environment 2016b*).

Upon receiving the news of the decision, the RCE reviewed the Ministerial rationale and provided a general response in the form of a media release to RCE members and the public (*Pickard and Ambrosi 2016e*). The RCE viewed the Ministerial rationale as inadequate given several concerns including: (1) the current elected members of the RM of Longlaketon having no electoral mandate to negotiate with Yancoal[14], (2) the need for independent bodies to establish the community involvement plan and the environmental protection plan vs. Yancoal, and (3) the existence of conflicts of interest in water licensing in the province where the Minister of Environment also quite inexplicably serves as chair of the Water Security Agency (WSA) and SaskWater (which enables the Ministry to unduly influence the

[12] An evaluation of opportunity costs would include examining other possible developments that used the proposed land and water resources to provide greater and more sustainable benefits.

[13] It is important to note that obtaining information on environmental conditions in China is difficult. In one of the most restrictive journalistic and media environments in the world, journalists are unable to report freely on the vast number of corporate environmental infractions.

[14] This was due to the Ministerial approval occurring after the election of RM counsellors, where voters were not able to choose council members mindful of a candidate's knowledge and views on mining development.

mandate of the Water Security Agency to protect water resources); at the same time SaskWater is seeking to sell water and generate profits for the Provincial Government creating an internal conflict with its own water protection mandate (*ibid.*). The controversial nature of the government's decision may have been reflected in the resignation of the Provincial Minister of Environment and Provincial Minister of Economy within three days of the 9 August announcement (*CBC News 2016*).

Engagement with the Government of Canada

The next phase of involvement by HSPC and RCE Saskatchewan centred on the Federal Government of Canada, employing both formal and informal strategies to draw attention to inadequacies of the Yancoal proposal. The first strategy involved appealing directly to the Prime Minister's Office. A serendipitous event provided a direct means of reaching the Prime Minister's Office. While the Prime Minister of Canada, Justin Trudeau, was visiting the city of Saskatoon (approximately 250km northwest of Havelock), a member of HSPC, Roxane Wagner, managed to speak briefly to the Prime Minister while he was exiting a meeting. She asked Mr. Trudeau whether he would agree to watch a 5-minute presentation about the situation faced by Havelock. He agreed. A video entitled 'A Community Response to a Non-Democratic Process' was subsequently produced and edited by Roxane Wagner of HSPC, Dr. Raymond Ambrosi (RCE Saskatchewan's Sustainable Infrastructure co-coordinator), and Frederic Dupre, a staff member at the University of Regina (*Wagner et al. 2016*). The video relied on interviews with people living in the Havelock community in the RM of Longlaketon who are directly affected by the proposed mine[15].

The video was completed at the end of August 2016, and formally shared with the Prime Minister's Office and the Federal Minister of Environment and Climate Change, Catherine McKenna, in separate correspondence from both HSPC and RCE Saskatchewan (*Pickard and Ambrosi 2016b*). The video was also widely disseminated by HSPC and the RCE.

The Federal Ministry was also aware of developments to date as it had been cc'd on all earlier RCE correspondence with the Saskatchewan Ministry of Environment. The RCE correspondence with the Prime Minister's Office, and earlier correspondence with the Federal Ministry of Environment specifically requested the Federal Government to seek information from the Saskatchewan Ministry of Environment it presumably held, regarding the approval of the Yancoal EIS without first holding an extensive inquiry. The RCE also requested the Federal Government to undertake a comprehensive Environmental Impact Study, a power available to the Ministry under Section 14 of the Canadian Environmental Assessment Act (CEAA) (*Government of Canada 2012*)[16]. This formal request by RCE Saskatchewan prompted the Federal Government to seriously review the Yancoal mine proposal and make a decision on whether they would subject the mine to a federal-level comprehensive Environmental Impact Study. On 9 November, 2016, a decision was made: the Federal Ministry of Environment and Climate Change rejected the RCE request on the basis that the mine proposal was not listed in the Regulations Designating Physical Activities under the Federal Government CEAA 2012, and the responsibility then fell to the Saskatchewan Ministry of the Environment which had completed its review. Despite this discouraging response from the Federal Government, the RCE maintained an optimistic perspective that the local experiences of the community of Havelock might help bring about positive changes to the Federal Act that was currently under review.

Global Engagement with other RCEs and the UN University

The ability to share the story of the Havelock community with other communities and universities around the world arose with the 5th RCE Conference of the Americas that took place in Curitiba, Brazil, from 19-23 October, 2016, and was jointly hosted by RCE Curitiba-Parana and the UN University Institute for the Advanced Study of Sustainability (UNU-IAS). At this meeting, each RCE was provided with 30 minutes to report on its activities to the RCEs gathered from North, South, and Central America. RCE Saskatchewan's presentation was devoted primarily to how farmers of the Havelock community drew upon the RCE's network of dedicated volunteers to challenge a corporate development they did not see as sustainable. The presentation was richly punctuated by a range of slides from HSPC and RCE Saskatchewan together with a video presentation, all of which illustrated how rural people took direct action in organising for SD and against what they viewed as a poorly thought-out mine development that had tried to push their interests aside.

Other RCEs were inspired by the collaboration among farmers and academics in Saskatchewan and noted that many of the RCEs in the Americas face similar problems regarding unsustainable mining activities. As the majority of the offending mining companies are Canadian, the RCEs were relieved to know many people in Canada opposed the oppressive behaviour of Canadian mining companies elsewhere in the Americas – practices that resembled the situation faced by the Havelock

RCE Proposal for Baseline Radiation Study

RCE Saskatchewan's literature research on various forms of drilling, fracking, and mining activities, and their concomitant ground disturbance raised questions about a possible risk of environmental contamination from normally occurring radioactive materials (NORMS).

Following a precautionary approach[17], RCE Saskatchewan's Sustainable Infrastructure Working Group decided to engage local communities in Saskatchewan to measure baseline levels of radiation, including around the Havelock community. After some confusion and miscommunication about the baseline radiation project in the Havelock area, RCE Saskatchewan issued a statement on 6 December, 2016, to clarify the project and provide supporting documentation regarding ground disturbance and accumulation of NORMS. It also stressed the precautionary approach and its relationship to establishing citizen-based knowledge networks (*Pickard and Ambrosi 2016d*). This RCE intervention was important in asserting the power of community residents of Havelock to engage in their own ongoing environmental monitoring of the development and the academic freedom of RCE Saskatchewan scholars to engage in such research.

[15] Assistance was also given by the Qu'Appelle Valley Environmental Association and the Calling Lakes Ecomuseum with additional HSPC and RCE members helping to edit the text.

[16] This power was still available despite the 2012 amendments that had weakened environmental protections. See Pickard and Ambrosi (*2016c*).

[17] The need for a precautionary approach is found in Principle 15 of the 1992 Rio Declaration. Failure to adopt precautionary approaches regarding baseline radiation levels came into prominence after the Japanese Fukushima nuclear disaster in March 2011. Following the disaster, Japanese citizens did not know what the original radiation levels had been in their communities and so were unable to make claims about the change in radiation levels as a result of the disaster. A group of volunteers subsequently formed the Safecast organisation in which individuals could volunteer to upload baseline radiation data from their local communities to the Safecast site. To fully address the lack of baseline radiation data, Safecast had developed a highly portable device with built-in GPS that could be easily used by volunteers to accurately measure radiation levels over a wide geographical area – an outstanding example of citizen science; see *Safecast, 2017*.

community. These sentiments are captured in the following from RCE Cuenca del Plata (Argentina): "Very impressive work. Unfortunately Argentina has been having serious problems with the mining industry all along the Andes, in several provinces, and guess where the mining companies come from? Canada. I think we should bring to the table that there are also Canadians fighting back within their own borders against this irresponsible way of doing business all around the world, and within the framework of the UN SDGs, show that this is a global issue... Justin Trudeau went to Paris saying "Canada's back" and that's a big statement. I think it should serve us big time if we can align this strategy on both continents."

The value of documenting such a case study and the role that RCEs can assume was well articulated by RCE Curitiba-Parana (Brazil):

"That was amazing. An RCE being an active player in this situation is amazing. I wish we could spread this to other Brazilians... It's a very good case study. I congratulate you."

Engagement with the Rural Municipality of Longlaketon

A further development also occurred in October 2016 that helped in understanding the role of the local RM in the mine's development. It was confirmed by the Government of Saskatchewan that the local RM of Longlaketon had the power not to proceed with the proposed Yancoal potash mine as long as they negotiated in good faith, and the RM could also choose to implement its own additional conditions with the mine's development. Based on HSPC meetings with provincial government officials, HSPC was able to secure the following commitments in response to specific questions:

HSPC: "What happens if the RM cannot reach a development agreement with Yancoal?"
Reply: "The Local Government has authority at their level... to decide if they want to zone that area and issue a Development Agreement. It's the permission granted at the local level." (*Sharla Hordenchuk, Executive Director, Environmental Assessment, Saskatchewan Environment*)

HSPC: "Would the Provincial Government step in and mediate or mandate that the Development Agreement goes forward?"
Reply: "As long as everyone is acting in good faith, I can't think of situations where a higher level government has stepped in." (*Cam Swan, Deputy Minister, Saskatchewan Environment*)

HSPC also discovered that the Provincial Government would not expropriate land on behalf of a private company. This left considerable control with landowners living in the vicinity of the mine project who had not yet sold.

Local elections held in the RM on 26 October, 2016, also suggested greater community empowerment. During the vote for three Counsellors and one Reeve (the President of the Council), all of the incumbents were defeated (*Saskatchewan Association of Rural Municipalities 2016*). HSPC members saw this as indication the new council would be more objective in its negotiations with Yancoal, a view supported by the RM Counsel surveying residents on their support for or against the project[18]. In addition, the RM hired Paul James and Dennis Sherrit, experienced project evaluators, to help navigate an agreement with Yancoal, "doing it carefully and in the right way". The RM's job was made easier by the countless hours of volunteer research by HSPC.

On 17 January, 2017, HSPC met the new RM Counsel to provide them with background on HSPC, its time line of engagement (including meetings with government and briefs from these meetings noted above), HSPC's views on the Terms of Reference for Yancoal's Community Engagement Plan, and key considerations for any signed development agreement between the RM and HSPC. HSPC recommended the RM undertake a cost-benefit analysis, specifically related to economic benefits of the mine. While Yancoal claimed the mine would provide $2.135 billion (CAD) of wages and salaries in Saskatchewan, and $811 million (CAD) in Federal and Provincial revenue during the first eight years of the project (*Yancoal Canada n.d.*), according to the Yancoal EIS (pages 16-29) "Only 0.8% of the population (980 individuals) in the socio-economic local serving area is employed in mining. All of these individuals are located in Regina." The EIS concluded that "[given existing labour force conditions, most of the workforce may come from outside the province" despite Yancoal's commitment to give priority to skilled local labour (*Golder Associates and Yancoal Canada 2016, 16-63*). In light of this contradictory information, HSPC was concerned with real economic benefits to the local region and Saskatchewan, as opposed to 'economic leakage' out-of-province and the resulting loss of provincial tax revenue (*ibid., 16-29*). Economic leakages, especially during the eight year construction phase, might be considerable if the majority of jobs come from out of province. In addition, HSPC questioned if the tax revenues received by the government would be sufficient to cover the costs of services, infrastructure, maintenance of secondary roads surrounding the mine, staffing impacts on local businesses, and loss of productive farmland. HSPC requested the RM to encourage Yancoal to include impacted residents on the Community Advisory Board, to continue efforts to increase the setback distance from the mine, to initiate third party consultations with impacted residents, and to establish an 'Expression of Interest' for firms to propose a Cost-benefit Analysis Report. Ultimately HSPC reaffirmed its concern that Yancoal strive to achieve a 'social license to operate' from the community. As stated in the HSPC presentation to the RM, "Governments grant permits, communities grant permission". HSPC subsequently presented these same concerns to Yancoal representatives in Earl Grey and to Saskatchewan Ministry of Environment along with a binder of information that detailed the process and research to date.

(Re)engagement with Yancoal

Knowing that Saskatchewan Environment required Yancoal to submit a Community Involvement Plan by 9 August, 2017, but had only minimally engaged the community as of March, HSPC sent a letter asking if the Government of Saskatchewan had heard from Yancoal and whether there was any reason for the government to extend the deadline in these circumstances. HSPC learnt that the lack of communication was partially because the Yancoal employee previously responsible for community engagement had left the position and a new employee recently hired. In addition, the Chairman of Yancoal Canada had also been replaced and the new Chairman, originally scheduled to arrive in Saskatchewan in March, was unable to visit until June.

Yancoal subsequently held a meeting on 29 June, 2017, in Havelock with the newly arrived Chairman, Victor Tian, along with landowners, RM Counsellors and consultants of the RM, and RCE representatives. In the meeting, the Chairman responded to seven questions previously submitted by HSPC followed by a question period. During his introduction, the Chairman apologised to the community for the way things had unfolded to date, and stressed that he wished to build a new relationship with the local community characterised by mutual benefit rather than confrontation. He noted that lack of ethical dimensions in industrial development is a risk that can be mitigated by (1) trust, (2) transparency, and (3) fair play. He indicated he had met with Saskatchewan Environment and the RM regarding a Draft Community Engagement Plan that would

[18] These results had not been released at the time of writing.

Table 4: *Yancoal Canada commitments in response to earlier issues raised.*

Local Employment	Development of a local employment policy that would be made by a future board inhouse (rather than relying on consultants who had developed the Yancoal Southey EIS).
Independent Governance	A future independent board with two local board members, a limit of 40% ownership by the parent company, and the company's listing on a Canadian stock exchange with the community given the opportunity to name the new company.
Transparency	A transparent communication strategy with all questions and replies of the company being formally documented and available for public scrutiny.
Land Acquisition	A transparent land acquisition strategy moving ahead that would provide the same deal to all landowners with a fair price, determined in consultation with other Saskatchewan crown corporations (i.e. state enterprises) and potash mining companies along with the use of existing models.
Land Use	A lease back of unused lands for original purpose (e.g. if only 20% of a parcel of land is used for a utility corridor, 80% would go back to its original farming use).
Property Rights	Respect for existing property rights (though in response to a question about what Yancoal would do if landowners refused to sell, especially if money was not an issue, the Chairman indicated he would find alternative routes around the property, again raising questions on how this would affect the individual landowner and their relationship with the community).
Community Engagement	An internal assessment within Yancoal's headquarters to investigate what had gone wrong and who had instructed the previous Chairman on how to engage the local community.
Respect for Institutions	A commitment to observe all laws and common practices, including community rules and local practices.

define the best ways to engage the community. Yancoal would then assemble a functioning platform with representation from all stakeholders to reflect public interest. The Chairman also noted receipt of a letter of advice from the RM. During the discussions the new Chairman committed to actions to address earlier community concerns. These are outlined in Table 4.

The new Chairman also acknowledged that the original Yancoal EIS was flawed in numerous ways and would be reviewed. Community members appreciated the acknowledgement the EIS was flawed, a fact long-since established by HSPC's substantial analysis.

However, the meeting did not clarify how such flaws might be remedied given that the Ministry of Environment had already approved the original EIS. The tone of the meeting was much improved with the Chairman expressing empathy for the land, water and existing livelihoods. Notwithstanding Yancoal's significantly improved approach, the reconstruction of social trust will be a difficult task

Table 5: *Timeline of events.*

Date	Event
2013-2014	Yancoal undertakes exploration campaign in Saskatchewan
January -March 2014	Yancoal offers to purchase land in Havelock area
March 2014	Local landowners request formal meeting with Yancoal; Yancoal declines
March 2015	Yancoal Poster Board information session
Summer 2015	Yancoal submits EIS to Saskatchewan Ministry of Environment
September 2015	HSPC formed
January 2016	Yancoal opens local office; community leads information session
April 2016	Yancoal EIS opened for public comments
May 2016	HSPC hosts meeting with participation of RCE Saskatchewan to develop community vision for sustainability; further collaborative meetings of HSPC, CLEM, and RCE Saskatchewan held
June 2016	Formal submissions by HSPC and RCE Saskatchewan to Saskatchewan Ministry of Environment on Yancoal EIS
August 2016	Saskatchewan Ministry of Environment announces conditional approval of Yancoal project; RCE Saskatchewan formally requests Federal comprehensive Environmental Impact Assessment
September 2016	Video of Havelock residents sent to Prime Minister of Canada and Federal Minister of Environment and Climate Change
October 2016	Local elections in RM of Longlaketon; RCE Saskatchewan presentation to 5th RCE Conference of the Americas in Curitiba, Brazil
November 2016	Federal Ministry of Environment and Climate Change rejects RCE Saskatchewan request for Federal Environmental Impact Assessment
January 2017	HSPC meets with new RM counsel and requests cost-benefit analysis
Spring 2017	HSPC communicates with Saskatchewan Ministry of Environment regarding Yancoal's duty to submit Community Involvement Plan by August 2017
June 2017	New Yancoal Chairman holds meeting in Havelock that includes RM counsellors, HSPC and RCE Saskatchewan representatives; company announces a 'restart' with its community engagement

Raymond Ambrosi

The government EIS process did not take into account rural people's affinity towards place and space – a concept well-developed in the social sciences. Here, residents hold signs articulating their affective bond with the land, nature, and an agricultural lifestyle. An overarching message is clear: rural people are deeply connected to the land and are not willing to see their land converted into an industrial site knowing that such a transformation will destroy their community.

and will depend on the company's actions rather than words. While it is still unknown whether the mine construction will proceed, or how events will unfold, the improvements in process that have been noted will lead to a better outcome for all concerned, even if the end result is not the perfect 'happy ending' for all stakeholders. The timeline in *Table 5* summarises the important events in this case study.

Key Findings from the Case Study

This case study illustrates how a local community can work with HE researchers through an RCE and how such structures can help communities bridge traditional gaps with the university and other locally-mobilised academics and experts. The two key representatives of the RCE, Dr. Garth Pickard and Dr. Raymond Ambrosi, are an example of the latter with Dr. Pickard being a recently retired professor emeritus of the Faculty of Education at the University of Regina, and Dr. Ambrosi having done extensive academic work and study in Canada and China but not holding an academic post at a university. The case study also illustrates what will likely be a precedent, at least in Canada and most certainly in Saskatchewan, namely, the ability of a community to stand up and organise its knowledge-gathering to challenge a development project it deemed environmentally unsustainable given the glaring problems with its Environmental Impact Assessment, and socially unsustainable and unacceptable to the local community with whom the developer failed to build trust and obtain social license. A number of further observations can be made.

Mutual Legitimation and Effectiveness of Research

In the case of the collaboration between HSPC and RCE Saskatchewan, the local knowledge gathering by HSPC was indispensable to the work of RCE researchers in identifying key issues requiring further study. At the same time, RCE Saskatchewan was able to demonstrate how the government's requirement for 'expert' knowledge in evaluating proposed industrial projects, and undertaking related EIS reports had the effect of preventing local participation and invalidating local knowledge. As such, there was a mutual legitimation of the research work of both groups, instilling confidence in each to undertake future work. The case study also demonstrated the power of combining several forms of knowledge that intentionally relate the local and global, along with the specific and general. This knowledge was derived from (1) grounded, place-based research gathered by the local community, (2) local narratives and understanding of sustainability documented by HSPC and RCE Saskatchewan, (3) general theoretical knowledge related to ecosystems and social and cultural well-being, and (4) knowledge of global SD definitions, processes, and agreements. Somewhat paradoxically, the case study also exemplifies how resilient social trust can be built fairly rapidly over time, in this case between HSPC, CLEM, and RCE Saskatchewan, in contrast to the failure of Yancoal, to create social trust with HSPC and the erosion of this trust over time. Social trust can be easily built where there is a common set of underlying values expressly stated - in this case a love of the land, appreciation of existing rural agricultural livelihoods and social interactions among residents, and concern for long-term sustainable land uses and cohesive communities for the sake of future generations.

Understanding of Existing Structures and Strategic Interventions

The case study also helped exemplify the importance of understanding existing institutional arrangements and how development projects are rejected, modified or approved. By repeatedly questioning and navigating amidst the state authority structures that had given approval to the mine, HSPC came to understand the opaque system of local, provincial, and federal institutional structures. At the same time researchers with RCE Saskatchewan were aware of the Provincial and Federal Environmental Assessment Acts, and how these had changed over time, particularly in relation to potash. RCE Saskatchewan and HSPC were able to show how changes in the Assessment Acts were not in the best interest of residents, and were able to register their concerns through the existing local, provincial and federal systems for public input. This was greatly enhanced by the local networking undertaken by HSPC and the regional and international linkages provided by RCE Saskatchewan.

The Role of Ethics

As many groups became involved and were monitoring the project closely, sustainability and ethical criteria were brought to the forefront in issues surrounding the assessment process. The collaborative efforts by community groups kept sustainability issues in front of government and the media. An ethic of mutual support was also important. When HSPC members, most of whom are farmers, were busy with seeding and harvesting and unable to initiate activity opposing the mine, other grass-roots organisations such as RCE Saskatchewan helped support their work. Ethical criteria pertaining to the mines' relationship with the community and the natural environment became increasingly significant as the involved stakeholder organisations, including government, became more engaged with accountability to citizens – especially with regard to due process and respect for fair rules of interaction. This occurred despite the substantial power imbalances between parties found in the case study.

Shared Commitments to SD and Collaboration

The ability to collaborate around shared goals including long-term sustainability concerns was also enhanced by work that clarified the underlying

values motivating each group. This occurred early during the formation of RCE Saskatchewan and its commitments to advancing research in Education for Sustainable Development made to the UN University and the UN system. In the case of HSPC, they too clarified their underlying values early on in their formation. Individuals, who faced potential adverse impacts because of the development, came together based on shared concerns about the environment, existing livelihoods, and quality of life. Focus group discussions were employed to help identify Havelock's vision of a sustainable community and sustainable development. This enabled Havelock to network with RCE Saskatchewan and CLEM, and to articulate its critique of the Yancoal EIS and proposed recommendations to various levels of government. Ongoing learning occurred between all three organisations as each engaged in specific activities tied to its respective organisational mandates. This led to co-creative solutions to diverse sets of problems. The cooperation among the groups was based on a common belief that processes engineered outside the community could be changed and improved by providing solid evidence, reasoning, and strategic interventions through education. In this case, education involved providing relevant information to key officials in other organisations, the general public, and other scholars in the RCE region and the global RCE network. It also required detailed documentation at each stage in formats appropriate to diverse audiences.

The Need for Sound Processes that Incorporate Past Performance

The case study highlights the importance of good processes in advancing development that are acceptable to a community and are sustainable over the long term. The central problem to this case was neither the Government of Saskatchewan or Yancoal adequately consulted the local community, prior to the environmental approval granted to Yancoal that allowed the project to proceed. A second problem was the failure to consider the prior history of Yancoal regarding its environmental protection record and its experience with this kind of development. Yancoal is a coal-mining company without prior experience in solution-based potash mining. An investigation by RCE Saskatchewan on the history of Yancoal's coal mining operations demonstrated that the company had violated common environmental standards in a number of instances. The government's evaluation process did not appear to consider Yancoal's prior corporate performance. An additional procedural shortcoming was that the Saskatchewan Government had not meaningfully consulted local communities regarding its general development strategy. The government appears to have assumed that once elected, it held a broad public mandate to proceed with resource development. This was exacerbated by the mining company's failure to negotiate with affected landowners as a community, and by engaging in generally poor practices for community involvement and consultation. Ultimately, it was the participation of community groups and researchers who helped develop improved practices for social consultation, and environmental protection by drawing upon solutions found in other areas around the world that are based in multidisciplinary approaches, including the social and natural sciences and the humanities.

Building of Competencies

By engaging in federal and provincial processes designed for the evaluation and approval of large-scale industrial developments, HSPC, CLEM, and RCE Saskatchewan developed a number of specific competencies. Responding to the potash mine proposal enabled the groups to build shared visions and objectives. This engagement also enabled communities to develop self-awareness of their ecological, social and cultural assets. In addition, the groups developed diverse communication skills that included public presentations, explanations of technical briefs, formal letter writing, petitions, and the creation of videos and media releases.

Concluding Reflections

In general, the case study demonstrates the need to value the agency, voice, and autonomy of local citizens rooted in their history as a community, in their attachment to an agricultural lifestyle and the land itself. Development needs to be undertaken by working with people rather than be done to people. Working with people involves employing meaningful forms of engagement that seek to thoughtfully engage all stakeholders, particularly those most affected by a proposed development. Such forms of meaningful engagement rely heavily on existing local knowledge, and an understanding of the complexities associated with each local ecological and social context. Since the local community holds this knowledge, in order to access it, and employ, rather than resist, the capacity of local individuals and groups, it follows that the governmental approval process must be reformed. Such reforms will improve local development projects for all members of a community. Community-based research is enhanced by post-secondary researchers, who hold an express commitment to advancing the long-term sustainability of the local community.

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Tšepo Mokuku

Chapter 2

A Mountainous Journey in Lesotho: Seeking University-community Engagement

Summary

ESD Innovation

The project has been a conduit for university-community engagement in terms of research and students' outdoor learning. The underpinning tenets for the methodology used were: environmental degradation concerns, empathy with the community in its afflictions and development challenges, respect for the community and its culture, valorisation of traditional knowledge found in the community, identification of unsustainable community knowledge and practices, and integration of scientific knowledge and practices in the community to enhance sustainability.

A participatory approach was employed at various phases of the project. The baseline study established the community's prior knowledge and its viability in respect of sustainability and informed educational interventions. The community education methods used took the form of outdoor nature trails and ecotourism activities that are led by youth from the community. An open-minded approach to allow organic formation of networks and links with individuals and organisations throughout the project has been pivotal to innovation and project sustainability.

Societal Transformation

This project is an innovative approach to promoting a community-driven management of biodiversity while improving people's livelihoods in the Tlokoeng valley. It has established ongoing ecotourism and biodiversity education activities, focused on the landscape, biodiversity (birds in particular), wetlands and culture of the Tlokoeng valley. Educational materials in the form of posters, cards and brochures based on these themes have been developed and are used to support learning in the community and among visitors. The content of the educational materials and activities reflects a positive amalgamation of the scientific biodiversity knowledge that enhances scientifically rational understanding of the environment, and the traditional *botho* philosophy, that promotes the ethical considerations in relation to coexistence with others and the environment. While ecotourism is not yet flourishing, the local and international tourists continue to visit the community, and the youth tour guides show a commitment that mirrors a sense of new purpose and vision for their community.

Implications of Development for Knowledge Institutions

This university-led endeavour continues to enable and facilitate sustainability learning, knowledge generation and improve community livelihoods. A conscious effort to valorise sustainability-related indigenous knowledge in the community through participatory research and to integrate appropriate scientific environmental knowledge, created a new space for university-community interaction. This points to the need to redefine university-community engagement and students' excursions as more of culturally-sensitive processes of amalgamation of knowledge systems geared for sustainable development, rather than unidirectional strategies of transferring scientific knowledge to enlighten communities.

Initial Research on Biodiversity in the Tlokoeng Valley

When I grew up in Tlokoeng, my home village, it used to be a beautiful valley; a well-vegetated mountainous landscape that would take different appearances with the changing seasons. The main river, Moroeroe, had several active tributaries. The valley was inhabited by a variety of birds, aquatic plants and animals, such as crabs, frogs, tadpoles and water beetles. I vividly remember how we spent much of our childhood playing in the streams, chasing butterflies, dragonflies, grasshoppers, locusts, and hunting rodents in the fields. That was more than 40 years ago. But recently my visits to my home village revealed a worrisome situation about the catchment. The landscape was eroded, the paths we used to walk on had turned into gulleys, new paths were being formed by walking on new undisturbed areas, small streams had dried up, and what used to be marshy wetlands with reeds and inhabited by Southern Masked-weavers, Southern Red-bishops and Long-tailed Widowbirds were now trampled and silted. Only a few wetlands seemed to barely survive the pressure of incessant livestock grazing. Realising the overwhelming scale of the problem, I made a few visits to the chief of the village to express my wish to work with the community to contribute to the development of the area and the improvement of livelihoods. In my conversations with him I stressed the scenic nature of the village and the rich culture, and how these could attract tourists. To further conceptualise a possible project, I invited a colleague, Johan van Niekerk, an ornithologist, for a joint reconnaissance tour of the valley.

On 22 October, 2011, Johan van Niekerk and I left for Tlokoeng from Maseru very early in the morning to explore the state of the natural environment. Soon after breakfast in Tlokoeng, Tseko Lekhela, the chief's nephew joined us, and the three of us set off to visit the Bald Ibis sites. Johan brought with him a pair of binoculars, a telescope and a camera; I had a camera too. On our way Johan conjectured that the Bald Ibises might only be visitors to the area, as they normally nest on cliffs located near waterfalls. He further argued even if they happened to nest, the nesting season had just ended in September and we should only expect to find them roosting on the cliffs. We climbed the Liphokoaneng hill, and Tseko advised us to walk closer to the summit near a huge rock, where we were likely to find other birds of interest. I felt he was unnecessarily making our journey longer as our destination was the Bald Ibis cliffs. When we got close to the rock, Johan immediately noticed the droppings of some birds on the ground. Most striking were the droppings of an owl. We discovered that this was the home of an owl, which I subsequently identified as a Barn Owl based on the feathers collected at the site. We took a few photographs and moved on. The droppings were quite fascinating; not only were they huge but it had pronounced and intact bones and skulls of rodents. We took some time discussing how the site could be used for tourism activities and for education with neighbouring schools.

While at this site, we realised that it was a good position for viewing the Thaba-Khubelu cliff with a telescope. We set up the telescope and began to move it around in search of possible nests. To our surprise we located one Bald Ibis that was perched comfortably in its nest. This was really exciting! Tseko also found this fascinating; even though he lives in Tlokoeng, he had not seen a nesting ibis so close. We took a few photographs and moved on to the next cliff, Makoabating, where we had been told we might find more ibises.

After a 20-minute walk we arrived at the Makoabating cliff. It faces eastwards, located on the same mountain as Thaba-Khubelu cliff, which faces north-northeast. We set up our telescope and here again we got a couple of surprises; we located three nesting ibises, and several others flying around. As we were observing the birds, a few bypassers joined

Community member viewing birds at Thaba-Khubeli Cliff.

A close observation of nesting ibises.

us to look through the telescope. They too were fascinated by the close-range observation of the nesting birds.

We explained to them our intention to explore the state of the Bald Ibis in the area, and to establish the prospect of working with them to promote conservation of the birds and tourism in their village. They liked the idea.

In our conversation with the villagers we discovered that some of their practices threatened the bird population; for example, boys often took the chicks from the nests to eat them. I could not understand how they reached the birds that were located on such a steep and dangerous cliff. They explained that this was done in two ways. They fixed a rope firmly on top of the cliff and used it to descend the slope to reach the nests. The second method was by lowering a ball of fire down to the cliff, close to the chicks, so that they fell off the cliff escaping the heat.

We moved on to explore the wetlands. Not far from the Makoabating village, there was a huge gulley that was actively expanding.

The nearby fields had been affected and the recent collapse of retaining walls was evident. The Forestry Division had built the walls to curb the expansion of the gulley many years ago. We discussed the significance of including wetlands in the proposed project when our primary interest was in birds. We concluded that as the birds foraged in the fields, the bird-conservation project should also conserve land. We walked down the gulley till we got to its head where it deposits a huge amount of silt that washed down during the rainy season. It appeared to us that the area was originally a wetland but with gradual overgrazing and heavy run-off, it eroded into a gulley. The remnants of the wetland were apparent; these too were under anthropogenic pressures. We saw grazing livestock in the area, and a dam made in the wetland close to the village. Women and children were gathered around the dam with water from the reservoir, washing with their laundry. Journeying further in a NNE direction, we arrived at another wetland near the main river, Moroeroe. This one was relatively intact, but appeared to be under a huge pressure from livestock grazing. Sheep were grazing, vegetation cover was limited, and plants were not flourishing as expected. The obvious challenge for any conservation initiative here was that the herders were not just the Tlokoeng community but also from the surrounding villages. Hardin's notion of the 'tragedy of the commons' seemed to be at play (*Barrow 1995*). As we walked down through

Nesting Bald Ibises at Makoabating Cliff.

A close observation of nesting ibises.

the wetland to a point where its water percolated into the river, the importance of the system was clear, a significant amount of water was draining into a tributary leading to the Moroeroe River. We followed the tributary to where it joined Moroeroe, its water looked sparkling clean. We meandered around Moroeroe and headed home. The sound of Moroeroe was refreshing, and it gradually faded as we walked further and further away from it. Just as we parted from Moroeroe, I saw its main point of entry, a path that I vividly recalled using more than three decades ago while visiting my grandparents. But my nostalgia turned to horror; the path had now turned into deep gorge and was no longer usable. Piles of rocks in the gulley had been placed in an attempt to curb erosion, but it was clear that the effort was insignificant and made too late.

The Project on Biodiversity Conservation and Ecotourism

The project was initiated by RCE Lesotho and coordinated by the author as a principal researcher from the National University of Lesotho (NUL), with the support of GEF-Small Grants Programme (SGP). For the principal researcher, the project presented itself as a means of achieving the objectives of

the network, of which the University is a member, and of carrying out the 'community engagement' mandate of the University. The initial key partners of the University were identified as the community of Tlokoeng, an ornithologist consultant, and a specialist based at a non-governmental Outdoor Education Centre. Later, links were developed with BirdLife South Africa and the Wildlife and Environment Society of South Africa (WESSA). The project specifically focused on working with the Tlokoeng valley (28°46' S; 28°16' E) community, in the Botha-Bothe district, to conserve birds, wetlands and related biodiversity in the valley. The Southern Bald Ibis (Geronticus calvus), confined to Lesotho, the eastern parts of South Africa and the western parts of Swaziland, was the flagship species of the project. A further dimension of the project was to address the dire socio-economic needs of the Tlokoeng valley community by initiating ecotourism. Community participation was regarded as key to the success of the project, and measures were taken at the early stages of the project to lay a strong foundation for that. Prior project-related community knowledge was brought to the fore and a village association that would drive the conservation and ecotourism initiative was established.

RCE Lesotho

RCE Lesotho, or the Environmental and Sustainability Education Network of Lesotho (ESENeL), is a legally registered multi-stakeholder network of institutions and was acknowledged by the United Nations University (in Japan) as a Regional Centre of Expertise on Education for Sustainable Development (RCE) in December 2011. The National University of Lesotho is the Chair of the Network, and the host of the Youth Coordinator office. This chapter is based on a project that was initially funded by UNDP-GEF from 2012-2015.

With focus on the project aim of facilitating biodiversity conservation and initiating ecotourism, this chapter discusses the following key ideas: processes followed to identify the project problem, partnerships established to support the project, delineation of the participating community and processes of communication involved, involvement of higher education institutions and their role, and sustainable development competencies that emerge as essential for the success of this and similar projects.

Gulley erosion.

Community Engagement

Participatory Approaches

The project focused on the Tlokoeng valley community and nearby villages. It set out to work with men, women, youth, herders, as well as teachers and students in the local schools. In order to achieve the project's aim, a two-tiered approach was employed that involved a scientific survey on the occurrence of birds and a biodiversity-related social study. This chapter focuses on the latter. Participatory approaches in recognition of the contextual nature of knowledge were employed, and thus created space for viable and relevant Traditional Knowledge of the community. This process also enhanced the community's sense of ownership of the project. The participatory methods were also motivated by the principal researchers' previous similar studies in the highlands where they had uncovered the existence of unique local knowledge about biodiversity conservation (*Mokuku and Mokuku 2004*). The researchers used Rapid Rural Appraisal (RRA) to elicit the community's prior knowledge as a key element of the baseline survey and Participatory Rural Appraisal (PRA) methods for empowerment of the local community to conserve biodiversity (*Chambers 1999*). The pre-project knowledge was considered essential in terms of making apparent the strengths and limitations of the community's understanding of aspects of the local biodiversity. The social base-line survey involved the use of RRA methods such as semi-structured interviews and Focus Group interviews to establish the communities' knowledge and perceptions of identified aspects of biodiversity such as birds and wetlands. The results were to be used to monitor changes brought about by project interventions and to develop appropriate environmental education and awareness resources. PRA methods such as listing, estimating and comparing were undertaken during the environmental trails (*ibid.*). Seven trained research assistants collected data in the valley over seven days in December 2012. They conducted Focus Group Interviews (FGIs) and individual interviews among the community. The FGI data were generated in conversation with 15 groups comprising a total of 105 research participants. Five villages in the valley took part in the study.

Investigating Local Knowledge

Community Perceptions on the Benefits and Problems of Wetlands

Several questions on wetlands were formulated for community Focus Group Discussions (FGDs) to determine their understanding of the benefits of wetlands. Below are responses to two key questions selected for this chapter. The first question sought to establish the community's understanding, and the initial probe was *'what are the benefits of wetlands?'* The second question determined their perception of the associated problems, and the initial probe was *'what are the problems that affect wetlands in your area?'*

A number of responses were generated in relation to the first question that reflected the community's varied understandings about the benefits of wetlands. The predominant responses alluded to the ecosystem services to the community such as potable water, grazing of livestock in times of drought, land for planting of crops, provision of edible plants and irrigation. While the community derives a variety of livelihood benefits from the wetlands, it was apparent these were used unsustainably. The significant destructive impacts of the wetlands that the researchers observed were grazing of livestock, tillage and digging of wells and ponds. Therefore, the environmental education activities were planned to deepen the peoples' understanding of the structure and function of

the wetlands, as well as their sensitivity to current anthropogenic pressures. Some responses explicitly reflected a lack of understanding of the benefits of wetlands beyond the provision of services to humans in the community. Thus the planned education interventions were intended to broaden the community's understanding of wetlands to include their ecological significance and how the community could derive sustainable services from them.

There were also responses that could be described as related to ecology, stressing the biophysical importance of wetlands as sources of river water, in supporting plant and animal life and in nourishment of soils. However, the ecological perspective was rather limited, as the responses did not mention the role of the wetlands in the water cycle and supply, and as a habitat for a diversity of unique plant and animal species found in the valley that could attract tourists.

In a FGD with a group of five women and one man from a village located not far from wetlands supplying the main river of the valley, there seemed to be uncertainty about the meaning of 'wetland' (*mokhoabo*), and lack of knowledge about the location of the wetlands in the valley. This response was unexpected, but indicated the need to begin education initiatives on wetlands with the basics, such as establishing a common understanding of the meaning of wetlands and taking the respondents and other villagers on excursions/ trails to observe their location in the valley.

The community expressed a number of views about the problems that affect wetlands. The problems mentioned can be broadly categorised as human-induced, natural, and related to limited knowledge about wetlands. Anthropogenic problems mentioned were overgrazing, overharvesting of medicinal plants and the digging of wells in the wetlands. Some views reflected a limited understanding of wetlands and the associated problems in terms of knowledge of their location, possible adverse impacts, and mismanagement of a drying wetland. Responses such as "It is drought; people do not affect it" reflected the limited perceptions about problems of wetlands as associated with natural events. This suggested the importance of educational activities that should inform the community about the possible impact of climate change on the wetlands and how humans can exacerbate the situation. Some perceptions were anthropocentric and were reflected in responses that described the problems that wetlands can cause to humans: "Where there is Qobo (*Gunnera perpensa*) in the wetland, animals can sink", "When it rains heavily, wetlands can be dangerous".

Based on the foregoing responses, educational activities on wetlands were perceived essential in order to broaden the Tlokoeng valley community's understanding of the problems that the wetlands were faced with in terms of the impact of their own actions as well as the impact of natural events.

Community Pre-knowledge about Southern Bald Ibis

Southern Bald Ibis (*Geronticus calvus*) is one of the four bird species in Lesotho classified as vulnerable according to the Red Data Book Species (*National Environment Secretariat 2000, 53*). The species is confined to Lesotho, the eastern parts of South Africa and the western parts of Swaziland. These ibises are considered to be facing a high risk of extinction in the wild (*Barnes 2000; BirdLife International 2000*).

In view of the significance of the Southern Bald Ibis as indicated above, and its apparent occurrence at Tlokoeng, people's knowledge about its occurrence was established. They were specifically asked: "Are Southern Ibises found in this area?" The majority of respondents (84%), most of them males (57%), knew that the bird existed in the valley. While most people (58%) were aware that the bird was being killed in the valley, many (42%) said it was not. Several reasons for killing the bird were stated with the two main reasons being that it was killed for consumption, and for medicinal purposes. When being asked about the benefits of conserving the bird, the most frequent response was that there was no benefit (21%), followed by those who said they did not know the benefit (15%). Other responses included a scientific understanding that "it feeds on worms and caterpillars in the fields" (10%), aesthetic reasons such as "it decorates the cliffs" (2%), "the village becomes attractive" (3%), "it is [a] beautiful bird" (4%), as well as a future-oriented concern that "children should know about it" (1%).

The findings provided a useful knowledge base for the development of educational material on the bird. The established pre-knowledge alluded to the need to emphasize the scientific knowledge about the benefits of the bird.

Pre-knowledge about Owls

Seven species of owls have been recorded in Lesotho (*Ambrose 1998; National Environment Secretariat 2000*). At Tlokoeng, the scientific survey confirmed the existence of three species, namely Barn Owl, Cape Eagle Owl and Spotted Eagle Owl. The community was asked "Are owls found in this area?". Most respondents (93%) knew that owls existed in the valley, 4% said no or did not know, and 3% had no idea. Many of those who knew about the owls also said they were being killed (60%). Two most frequently mentioned reasons for killing of the birds were that they were used for medicine (52%) and that they were eaten (32%). These were followed by much fewer responses stating that the owls were killed to be sold (six people) and because they were believed to cause death (when they hoot). Another study in the Lesotho Highlands (*Mokuku and Mokuku 2004*) had found that owls were considered to be messengers that 'warn' people about a possible occurrence of death by hooting, but were not necessarily killed for fear that they cause death.

The emerging understanding of owls put an emphasis on the ecological and scientifically rational content in the educational materials that were subsequently developed.

Botho Philosophy

Based on the assumption that *botho/ubuntu* could be a useful epistemological framework complementary to an ecological and scientific understanding of the environment, we explored the community's knowledge of the philosophy through FGDs. The discussions were guided by three questions: "Is there *botho/ubuntu* in your community? Explain"; "How would you know when a village does not have *botho/ubuntu*?"; "How would you know when a village does have *botho/ubuntu?*" The information gathered at the FGDs was subsequently validated at a workshop with a smaller group of participants from the village. The community articulated *botho* by defining its meaning, and in terms of a life that reflects *botho*, a life that does not reflect *botho*, an ideal/dream village and proverbs on *botho*.

Botho was described in relation to the socio-economic and spiritual aspects of life. It was understood as a way of life characterised by peace and good relationship between people. In this context people were viewed as an embodiment of God their creator and that "if you know a person you know God". Religion was interpreted as a conduit for expression of *botho*. A life that reflected *botho* was considered to be characterised by people living in peace among themselves and with nature (*tlholeho*) – where *botho* occurred, nature would exist and function well because it would not be 'hurt'/ *ha e utluisui bohloko*. *Botho* was interpreted to be about the protection of wild animals and plants, and sustainable use of resources.

Overall, the findings on *botho* reflected the community's strong valuation of a peaceful relationship among people, which is practically achieved through care and concern for others, as well as sharing with and support for those in need. Humans were described as a sacred embodiment/image of God their creator, and that knowing others is to know God. The extension of *botho* to nature is expressed in terms of its care and protection as well as its sustainable use so that future generations may also benefit from it. These tenets of *botho* were later developed into an educational booklet that is used in the project.

Sustainability Learning and Ecotourism

The research team, comprising ornithologist Johan van Niekerk, outdoor activities specialist Steve Mabula, and environmental educator Tšepo Mokuku, created a framework for sustainable community-based learning. Environmental education trails were conceptualised, covering key stations of learning. These trails were also envisaged to eventually serve as ecotourism routes in the community. The trails have been tried out several times during community awareness and education activities, and the researchers in collaboration with the community are continuing to work on their improvement. Educational materials on ecological knowledge related to birds and to landscape formation, history and *botho* have been developed, in both Sesotho and English, as reference material for facilitators. Twenty youth from the community, coordinated by Leopa Khabisi, have been actively participating in the trails as both trainees and facilitators. Environmental education activities have to-date focused on the Tlokoeng valley community youth, herd boys, men and women, with an emphasis on the Southern Bald Ibis, owls and wetlands, guided by the findings of the social survey.

Three trails of varying distances and experience were mapped out and are currently being used for education and for the development of ecotourism. The trails offer opportunities to learn about birds using the project-purchased equipment, valley landscape formations, lifestyles of the communities in the valley, as well as environmental issues faced by the community. The three trails are:

a) The *valley trail* passes through the lower parts of Tlokoeng valley. It is approximately 2km long and passes over gently undulating terrain.
b) The *Moshoeshoe* trail takes one up to the plateau of Thaba Botha-Bothe where a number of ruins dating from the time of Moshoeshoe I (c. 1786–1870) are located. The ascent and decent of Thaba Botha-Bothe is fairly steep. The trail is approximately 7km.
c) From Tlokoeng valley the *sandstone trail* leads one into the sandstone zone below the basaltic Maluti Mountains. The trail provides scenic views, a thrilling sandstone cave, a waterfall and rich environmental learning opportunities. The 7km-long trail can serve as an excellent introduction to hiking in mountains. It offers the option of spending the night in a cattle post located in serene surroundings and with scenic views and good stargazing opportunities. The accompanying community guides ensure a safe stay, but visitors bring along their own food, tents and sleeping bags for the night.

Prior to setting off on the learning trail journeys, a lecture on *botho* is offered. A booklet developed on *botho*, as well as cards to illustrate concepts guides the session. The session aims to complement the scientific and ecological content taught during the trails, and integrate the values of peace and connectedness among the people of the valley, and enhance compassion and care for other living things. The *botho* lecture and the trails experiences have been positively received by both the local people and the visiting tourists.

Through a partnership with WESSA, the team has been working on wetlands education, with specific focus on water quality monitoring, using the mini-Streams Assessment and Scoring System (mini-SASS). This system uses macro-invertebrates to monitor the quality of the valley streams, as scientific evidence for the state of the streams, and a basis for community intervention to maintain healthy streams. With its scientific approach, and potential academic-tourist attraction, this activity is still developing. As part of the baseline study and understanding of the wetlands, Jim Taylor (Director of Environmental Education at WESSA) and Tšepo Mokuku wrote a journal article entitled, *'Tlokoeng Valley Community's Conceptions of Wetlands'* in 2015. WESSA have further contributed towards wetlands education in the community by offering training to two youths from the Tlokoeng valley on mini-SASS, and by financing the principal researcher's attendance at the Environmental Education Association of Southern Africa conference in Namibia, in 2014, to co-present early manuscripts of the journal article. The attendance at this international conference, which the University was unable to fund, became significant in enabling the principal researcher to realise his core university function of engaging with the scholarly community for sharing and generating new knowledge. Other preliminary community-based achievements in this area include the purchase of full waterproof gear for working in the streams and several mini-SASS trials undertaken with the community youth in the streams. Going forward, the plan is to develop a regular and more systematic assessment of the streams and associated ongoing educational activities on wetlands in partnership with the recently established Ministry of Water.

Discussion of Project Results

This project has presented learning opportunities in the various contexts and stages of its evolution. The setting of baseline studies, trial of mini-SASS activities and ongoing ecotourism activities generated knowledge as well as created spaces for knowledge sharing. By researching and documenting *botho* philosophy and relating it to biodiversity conservation and further documenting scientifically-based biodiversity materials, the researchers and the community are working towards creating a holistic paradigm that recognises the value of plurality of knowledge. This took some creativity, as the team explored the innovative teaching that is rooted in the fabric of the community's culture. For the community youth tour/education guides and those who participated in the educational sessions, *botho* philosophy offers an opportunity for dialogue and clarification of values in relation to coexistence with others and nature. The scientific ecological knowledge on birds, wetlands and landscape also contributes to the scientifically rational understanding of the interconnectedness of living things in terms of energy flows and their adaption to their environment. The outdoor learning (*Beames, Higgins and Nicol 2012*) associated with the educational trails brings about experiential learning, which has been much appreciated by the participants, while also contributing to the improvement of community livelihoods as an ecotourism service.

The annually run university course on 'Development of Science Technology in Society', where students were taken to the Tlokoeng community project as 'tourists and learners' has, over the years, pointed to the learning significance of this community initiative. During the visits, it has been noticed how students are inspired and challenged by the transition from university to a community-based learning space, due to: (1) a shift from learning in the classroom setting to a community-based outdoor context, (2) being taught environmental concepts in their mother tongue, (3) being taught by youth instead of an adult lecturer, and (4) the appreciation of the relevance and application of

Tsepo Mokuku

Students closely watching nesting Southern Bald Ibises on the cliff, with the guidance of community youth tour guides.

traditional knowledge. The community-based research and publications have been incorporated in Tšepo Mokuku's teaching (*Mokuku and Jobo 2017*), and have also inspired a systemic thinking in respect of reorienting the university curricula for greater relevance and sustainability (*Mokuku 2015*).

Participatory approaches are fundamental to community-engagement approaches that generate viable knowledge in communities, and represent variance with the dominant approaches used for community engagement initiatives in this context. Typical community engagement activities at the University would characteristically involve a transfer of expert knowledge from the University to the communities, with little interest in integration of the sciences and local knowledge. The use of these approaches itself reflects new learning and even change of mindset on the part of the lead researchers and research assistants. For the principal researcher and assistants, technical and practical knowledge in relation to FGDs and interviews were essential; and for the entire research team the values of patience, perseverance, empathy, respect for others, care and embracement of the pluralistic nature of knowledge were essential to work with the community.

The multi-stakeholder and collaborative links established during the project have had unanticipated benefits. These relate to knowledge, capacity-building and resources, which were not initially part of the project. Such a partnership could even mitigate potential setbacks that would have limited project achievements. Partnership in this case brought many minds and experiences together and magnified creativity and possibilities.

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Chapter 3

Transformational Research Methodology and Strategies for Community Engagement in the State of Chihuahua, México

Summary

ESD Innovation

The Transformative Research, or Research as Service approach of the Living Lab/Centro de Diálogo y Transformación (LL/CDT) is truly different from the norms of conventional academic research. It does not follow the global trend towards commodification and commercialisation of knowledge as reflected in the eagerness to publish in Web of Science and other 'high impact' journals thought to push universities up the global rankings. In contrast, the presented research methodology begins with service, as it seeks to genuinely serve, educate and accompany communities on their path toward sustainable development while still succeeding in scientific publishing.

Everyone is welcome to propose Living Lab projects that, after consultations and reviews become part of the LL/CDT work package, with proponents of the projects accepted as LL/CDT staff for the duration of his or her project. If project proponents are non-academic, they are matched with researchers at the university. If they are academic, they are engaged with community leaders with whom they will further co-design, co-implement and co-evaluate the project.

Societal Transformation

As the title of this chapter reflects, Transformative Research aims to encourage genuine societal transformations toward sustainability by raising awareness, and increasing knowledge, values, attitudes and lifestyles in line with sustainable development. This is done through a co-created, co-implemented and co-valuated process, where results are interpreted and scaled up to studies of policy implications. These are presented to legislative bodies, and both LL/CDT researchers and community members join in the policy process as a way of gradually institutionalising sustainable development through the legal regimes holding sway over each locality.

Implications of Development for Knowledge Institutions

The Autonomous University of Chihuahua has been supportive of the LL/CDT efforts, sending students, research colleagues and community members when they sense a match and complementarity in interests. Though LL/CDT functions very differently from the institutional norm, University authorities share its desire to (1) have transformative impacts on the lives of local communities, (2) produce and disseminate academic material resulting from project implementation, and (3) act as a transformative force as the State of Chihuahua moves forward in human development, environmental restoration and sustainable usage, and sustainable economic development.

Introduction: Collaborative Work of the Living Lab

Located in Chihuahua, México, Living Lab/Centro de Diálogo y Transformación's personnel (LL/CDT) work closely with researchers and students at the Autonomous University of Chihuahua (UACH) on community and environmental endeavours. Projects can be proposed in the areas of (1) human development, (2) environmental restoration and sustainable usage and, (3) sustainable economic development. On 8 December, 2016, LL/CDT and its regional partners were acknowledged by the United Nations as a 'Regional Centre of Expertise on Education for Sustainable Development: Borderlands México-USA' (RCE BMU). The purpose of all work facilitated through the LL/CDT is threefold: first, it serves the community and the environment by assisting in the transformation toward sustainable and inclusive development. Second, it evaluates all projects in light of objectives that have been co-created by community members and LL/CDT personnel for each intervention. Research findings are compiled and the resulting manuscripts are submitted for publication in refereed journals, books and other sources of knowledge dissemination. Additional interventions may be requested by community members or by governmental agencies, at which time LL/CDT members offer an interactive workshop or a short course designed to multiply effects that will empower the community to move forward toward sustainable development (SD). Third, project outcomes are analysed, and resulting Policy Implications Studies are presented to the appropriate legislative bodies in order to help institutionalise SD through local, state and national legal regimes. RCE BMU hopes to become a voice in the international and intergovernmental policy arenas in order to help usher in an era of truly global sustainability.

Regional Context: Interdependence and Complementarity in the México-US Borderlands

The México-US borderland region is a fast growing socio-economically interdependent area comprised of a complex blend of Mexican and US customs, languages and cultures. Its socioculture is characterised by a deeply-rooted synthesis of Mexican, Anglo-American and Native American influences. In terms of economics, the US is México's largest trading partner, providing the greatest amount of foreign direct investment for Mexican industry and agriculture. Cross-border trade and commerce are vital to the economies of both countries. The geographical scope of research and activities at the Borderlands Living Lab/Centre for Dialogue & Transformation covers about one-third of the international border, reaching from Delicias, Chihuahua, México, and El Paso, Texas, USA, on the east, to San Quintín, Baja California, México, and San Diego, California on the west.

The borderlands region is considered one of the most biodiverse in the world in terms of endemism and diversity within species. Between the Chihuahuan and the Sonoran Desert, more than 1,000 species of native bees, 350 species of birds, more than 100 species of reptiles, 60 mammal species, 30 native fish species, 20 amphibian species, and more than 2,000 native plant species are found (*WWF n.d.*).

All of the projects mentioned in this chapter were implemented in the state of Chihuahua in North Central México. The region is an extraordinary source of biological diversity because it is shaped by a variety of ecological forms, including deserts, forests, plains, mountains and river valleys.

Environmental challenges faced in the region include limited surface water availability, depletion of groundwater, drought, hazardous waste, solid waste disposal, water and air pollution,

soil depletion, soil contamination through the extensive use of agrochemicals, food safety, clean energy production, climate change, conservation of natural ecosystems and concerns about habitat and resource protection. Overgrazing has brought changes in the flora, and the Mexican wolf, native to the area, has been largely extirpated (*DesertUSA.com n.d.*).

Research conducted at the LL/CDT reveals an extensive lack of awareness of the aforementioned challenges among the region's inhabitants. For this and other reasons, it engages in formal, non-formal and informal education activities in order to increase awareness, knowledge and skills leading to greater stewardship attitudes and behaviours in the short term, while enhancing SD in the medium and long term. Policy studies derived from project evaluation data urge lawmakers to legislate toward SD policies and their implementation.

The state of Chihuahua has one of the highest literacy rates nationwide, with 98% of the population being literate. It has the twelfth largest economy, accounting for 2.7% of the national GDP. According to the Census, 59.28% of the state's economy depends on the service sector, 34.4% on manufacturing, and 6.4% on agricultural production (I*NEGI 2016*).

The Transformative Research, or Research as a Service Approach

Over the years of working with communities, disseminating research findings, and providing policy studies, a method has emerged which helps systematise the work carried out through the Centres[1], referred to as Transformative Research, or Research as a Service. This section provides an overview of the Transformative Research Approach commonly used in LL/CDT projects (*López 2014*).

Introduction into a locality often begins with an invitation from community members, from an NGO, or from a government entity that has identified problems or challenges for which intervention is requested. Prior to co-designing a project, it is important to develop genuine relationships with individuals and community members with whom the Centre will be working. It is valuable to be brought in initially under the good graces of a well-respected member of the community, whether she or he be a community leader, a local official, clergy or other known individuals or organisations that are considered part of the 'in-group' in the locality (*Jackson 2011*). An excellent way to begin relationships is a social setting, where people feel relaxed, and they are in a context where informal communications can allow genuine friendships and mutual esteem to begin forming. In all relations, it is imperative to genuinely listen to people, out of respect, and in order to get to know who they are and what their interests and aspirations are.[2]

Prior to initiating a project, it is important to 'do our homework', meaning that a preliminary contextual analysis is conducted by learning as much as possible about a community and its surrounding environment before becoming part of a local project. Previous research, newspaper articles, census data, information from governmental archives, libraries and from local museums all serve as preliminary contextual information. An on-site visit is also important in order to have an understanding of the physical surroundings in which the Centre shall be operating in conjunction with community members.

The Needs Analysis stage is referred to as 'Finding the pulse of the people.' It is here that the Centre seeks to know the heart, the mind, the aspirations, loves, fears and the beliefs of the local populace, with students and colleagues doing research using data collection instruments such as surveys, questionnaires and interviews. It is important to note that LL/CDT researchers go into a community with a general idea of the research they would like to conduct[3]. However, the project design is left open and flexible because if LL/CDT is truly a service organisation – as it claims to be – its interventions first seek to facilitate positive transformation in the lives of the people and the environment in which it is working. Project design is co-created with the community, and its researchers assess the results of a project that has been collaboratively designed by LL/CDT and community members.

Once the Needs Analysis is completed, LL/CDT staff sit with key community members to collaboratively develop the project objectives. LL/CDT believes mutual benefits are always possible in collaborative projects; for example, students obtain their graduate degree by researching and writing about a project while the community gains empowerment and advancement toward the sustainability objectives which they have helped to design[4].

The LL/CDT researcher often takes the lead in designing a Research and Intervention proposal[5], which is fed back to community members for re-drafting and approval. The design task generally falls to internal staff to ensure coverage of university requirements for granting academic degrees, for reporting, for utilisation of grant funding and so on. Once the community and the researcher are satisfied with the proposal, the intervention stage begins.

The community is involved as much as possible in project implementation so that people will see themselves as part of, or 'owners' of the transformative project. The LL/CDT researcher assists with the implementation and the ongoing monitoring and evaluation. Data collected is used for both research projects and studies of policy implications that derive from each project.

Monitoring and evaluation are conducted throughout the implementation and the post-implementation stages. Data from project outcomes

[1] RCE BMU's first Centre was founded in Tecnológico de Monterrey University, Chihuahua México at the beginning of the millennium under the name *Centro de Diálogo y Bienestar Humano* (Centre for Dialogue & Human Wellbeing); the second Centre was established as *Living Lab/Centre for Dialogue & Transformation* (LL/CDT) under University of Malaya in Malaysia. This is the Centre through which RCE Central Semenanjung was acknowledged by the Ubuntu Committee in 2014. The third Centre is *Living Lab/Centro de Diálogo y Transformación Inc.*, a binational research and service organisation in the borderlands region of México and the USA. Branch offices of the LL/CDT exist in El Paso, Texas USA and in Trivandrum, Kerala India. A proposed branch may open soon in Quito, Ecuador using a Spanish name *Laboratorio Viviente/Centro de Diálogo y Transformación*.

[2] Special thanks are due to Charisse S. Yenko for her valuable insights concerning the importance of relational issues among 'outsiders' and community members, which, although unseen, invariably come to bear on the success or the lack thereof of any community-related project.

[3] When students enter a community, they often have a research topic in mind. In collaboration with the community, they develop the particulars of the topic to ensure its usefulness for community transformation. Other times, LL/CDT personnel enter into a project on request from the community, the authorities, an NGO or some other actor requesting its services.

[4] Living Lab/Centro de Diálogo y Transformación work very closely with Autonomous University of Chihuahua, where the Centre's founder, Prof. Carolina López C., holds a post as a Professor-Researcher. Prof. López's students and others who are interested, place a request with LL/CDT to conduct thesis research, or possibly to carry out their professional practicum or their social service obligations through the centres. The spirit of service and academic production that the centres offer draws other students and community members.

[5] In addition to student and community-linked researchers, professorial colleagues at Autonomous University of Chihuahua often request to carry out research through the centres. They submit a proposal, which is vetted and refereed and, if approved, researchers from the university place their projects with the centres following the same processes mentioned above.

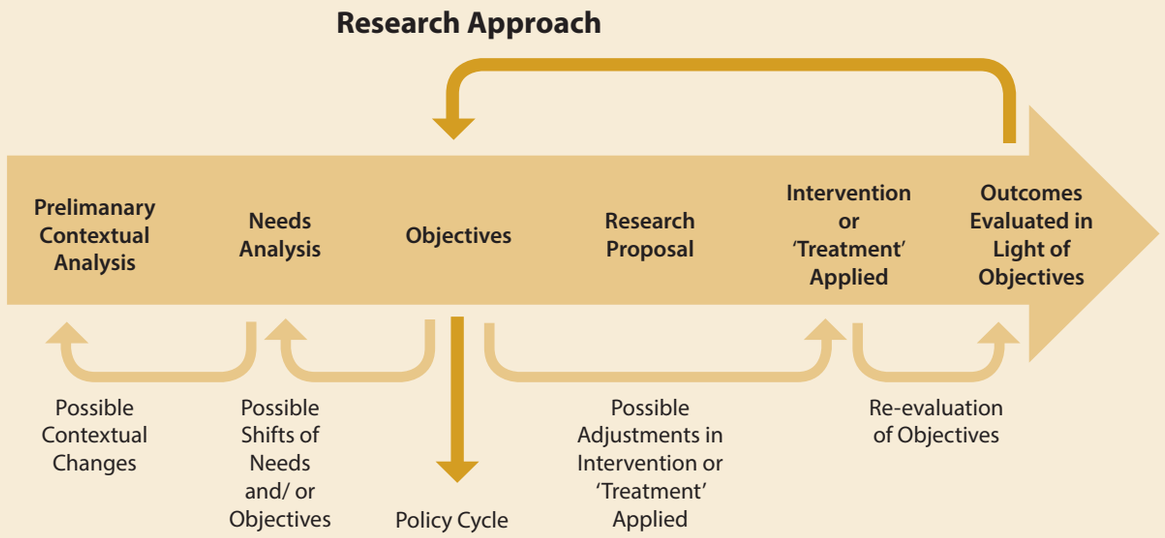

Figure 1: *Engagement and Research Approach – when a problem or a concern has been identified for intervention, LL/CDT personnel begin by conducting a Preliminary Contextual Analysis, which provides a broad understanding of the history and the particulars surrounding the topic of study. The second step is to carry out a Needs Analysis in order to understand people's concerns, desires, goals and fears pertaining to the issue. Objectives are then developed in conjunction with community members and authorities. A Research and Intervention Proposal is presented, which includes a section specifying the perceived benefits the project will provide for the locality. The intervention is applied, and data analysed in light of the stated objectives. Based on the findings, policy recommendations are presented to appropriate legislative bodies, and resulting manuscripts are submitted for publication in refereed journals, books, or other sources of knowledge dissemination. If necessary, adaptations may be made as indicated by the feedback arrows depicted in the graph.*

is compared against the objectives set at the proposal stage. Community members are actively consulted in this process in order to know their perceptions about whether the stated objectives have been reached. Interviews, informal chats, surveys and questionnaires may be applied as well in order to understand people's level of satisfaction with project outcomes. Since empowerment is an underlying goal of all LL/CDT projects, the community is engaged in order to discuss plans for continuing with the project as they progress toward sustainability.

LL/CDT intervenes as needed in terms of creating future plans, assigning leadership roles, creating implementation timetables and so on.

LL/CDT's goals upon conclusion of a project are (1) to encourage and support continuity of the community's transformation, and (2) to not be needed, but always available when called upon – through Skype, WhatsApp, e-mail and, if necessary, through future on-site visits designed to support leaders as they continue the journey towards the desired transformations.

Encouraging Structural Changes: The Policy Research Component

Policy studies are carried out using data collected from the onset to the completion of each project, since LL/CDT personnel believe that for changes to be lasting, they must become institutionalised through the legislative process.

Policy recommendations are presented to the pertinent legislative bodies in written form and, ideally together with an oral presentation. LL/CDT researchers approach the appropriate lawmaking body, i.e. Congress of the State of Chihuahua, to secure permission to present the findings in actual legislative gatherings. If granted, a brief presentation of findings and recommendations is given, and the written policy implications study is submitted to the body. If speaking time before the Chamber is not granted, the written study is simply presented to the lawmakers in the hope that part, most, or all of the recommendations will be heeded.

Policy Implementation and Evaluation Studies

The next step entails approaching the implementing body/bodies and requesting permission to conduct policy implementation studies. These are based on the legislation pertaining to the subject at hand, and on the stated goals and outcomes of programmes to be implemented for the public good. At times, LL/CDT staff may be hired as consultants, or students may do internships with the implementing bodies. Proximity to policy implementers gives the advantage of direct observation of the implementation process. However, a drawback of this sort of arrangement lies in the implicit pressure to present positive outcomes for the evaluations. On other occasions, staff and research students use archival and interview data to assess implementation results by comparing the directives expressed in the law with actual outcomes. Further recommendations are presented based on conclusions of the evaluation, and in this manner, participation in the policy cycle continues (*López 2014*).

Community-based Projects Conducted by Living Lab/Centro de Diálogo y Transformación and Its Collaborators

The ensuing section provides a summary of four community-based projects conducted by LL/CDT and its collaborators. These include the 'Young Authors for the Sustainable Development Goals,' the 'Traditional Knowledge and Biodiversity Conservation' project, the 'Rural Community Development and Food Sovereignty' project, and the 'Agronomists against Hunger Plan.'

Young Authors for the Sustainable Development Goals: Regional Centre of Expertise Borderlands México-USA Youth (RCE BMU Youth)

RCE BMU Youth enrolled in Programa y Diseño en Educación (Educational Programmes and Design) at Autonomous University of Chihuahua (UACH) have been developing the United Nations Sustainable Development Goals Resource Book[6] for primary school teachers intending to teach the Sustainable Development Goals (SDGs) using English as the language of instruction. The publication is being designed with enough flexibility to be adapted to the needs and contexts of different localities throughout the state and the country to address local and national problems. Electronic and hard copies of the book will be developed by the Young Authors (YA) in collaboration with Secretaría de Extensión y Difusión Cultural Press[7] Autonomous University of Chihuahua, and copies will be sold at local bookstores and through the offices of the national *Secretaría de Educación Pública* (Secretariat of Public Education).

[6] The RCE BMU Young Authors developing the Resource Book and other SDG Teaching Materials are Ramón Arturo Hernández-Ramírez, Roberto Alonso Hidalgo-Villalobos, Cristian José López-Carrillo, Jesús Armando López-Valles, Silvia Griselda Lozano-Guerrero, Javier Pichardo-Vargas, Andrea Rivera-Hernández, Brenda Michelle Rivera-Hernández and Luis Edwin Gómez Portillo.

[7] Members of the Editorial Design team for the United Nations Sustainable Development Goals Resource Book are José Alfredo Caro Espinoza and Luis Fernando Rangel Flores.

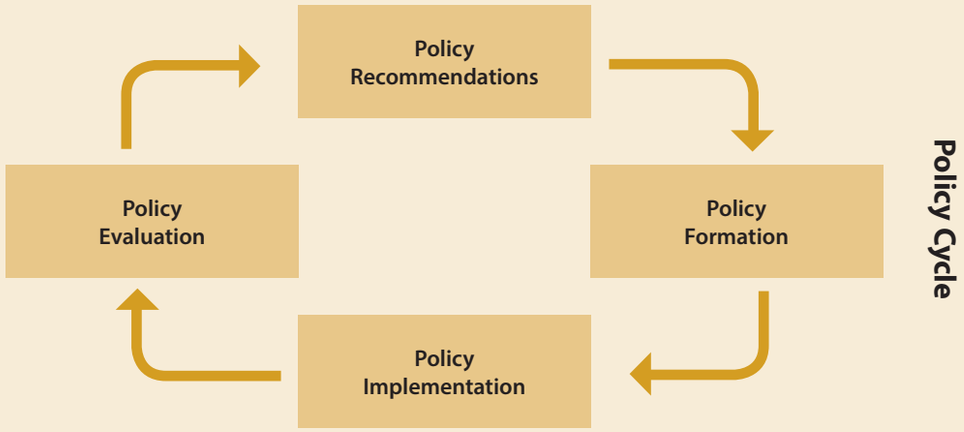

Figure 2: *Joining the Policy Cycle – Research carried out at the LL/CDT is conducted in collaboration with relevant actors, including ordinary people, local authorities and the private sector. The Centre's researchers join the Policy Cycle by providing recommendations based on research findings. Next, they approach administrative bodies and offer to conduct ongoing evaluation of the implementation process in order to provide feedback designed to help reach policy objectives as enshrined in the corresponding legislation. Implementation processes are checked against the letter of the law. Outcomes are assessed for their effectiveness; further recommendations are given, and on goes the policy process.*

Community Engagement Insights and Commentary from the Young Authors for the Sustainable Development Goals

While RCE BMU projects generally follow the approach summarised above, members of the implementing teams glean valuable insights into community engagement each time they carry out a project. Below is a synthesis of ideas expressed by the Young Authors when asked to reflect upon each of the steps followed in the Transformative Research Method[8].

Relational Concerns – It is important for the Young Authors (YA) for the Sustainable Development Goals to adopt, honour and respect the cultural context found in the locality where they teach their ESD material in schools and in the wider community. ESD instruction and activities are designed so that "the programme is truly permeated by the community and permeates the community. This provides a sense of ownership, belonging and pride among participants. Furthermore, the children find it exciting to go home and teach their parents about what they are learning with us" (*Young Authors for ESD interview 25 August 2017*).

Preliminary Contextual Analysis – In addition to archival research, for the Preliminary Analysis the YA read local newspapers to understand current events in the community. They ask about 'urban legends' and stories that are well known to the community.

Finding the Pulse of the People – For the Needs Analysis, the Young Authors seek a popular, well-liked 'hangout' where they can meet, talk and socialise with youth, elders, leaders and a cross-sectoral mix of community members. They reiterate the importance of listening and observing people's behaviours as well as taking note of the surrounding environment. "Allow people to complain, to curse, to emote – whatever they wish to do and say, take it all in without judgement; accept; observe; take mental note. Actually socialise with people; get to know them [and] care for them. Be open to what they want and need. We always find ways to adapt our interventions to what arises from the local people" (*Young Authors for ESD interview 25 August 2017*).

Objectives – The YA talk to elders and to children separately, seeking to hear their understandings of the present and their projections of the future. As teachers designing activities where children can apply their new-found knowledge, our YA reiterated the importance of 'listening to the children, in order to know what is going on in their minds and hearts.' Their input is taken into account when creating 'Living Lab-type' activities[9] in which both children and the community will engage. A timeline is created for reaching the objectives that have emerged – planning for the short, medium and long-term based on the needs and objectives that have been established. According to the YA, "in the process of moving together toward the objectives, people's paradigms and usual ways of doing things begin to shift as they become more aware and they learn about their environment and community. In the process of journeying together, people learn and begin to adopt sustainable living strategies" (*Young Authors for ESD interview 25 August 2017*).

Implementation – The YA state "We must involve the community as project implementers. Knowledge and skills learned in the classroom are applied by students, their parents and community leaders in real projects designed to create positive transformations in the community. We as teachers-researchers are there to act more as guides or facilitators. When the people become involved and see positive results of their projects, this is when genuine lifestyle changes begin to emerge. We want to be sure that when we leave, the positive changes in lifestyle, and the empowerment for people to continue constructing together will remain in the 'collective mind' of the community. Once people are self-empowered, they no longer need us, and they will continue to grow on their own as a community and as individuals" (*Young Authors for ESD interview 25 August 2017*).

Assessment in Light of Objectives – "In our context of teaching ESD, we like to evaluate by having participants present a project idea based on what they have been learning through our workshops and courses. Children have a transformative impact on their parents. Often parents and elders come to tell us that their children are teaching them about sustainable lifestyle issues; so the parents begin to change habits in their households, which eventually extends to the larger community. We have on occasion asked the children to help co-facilitate SDG workshops offered to the community members. For them to act as 'teachers' for their parents and elders is an extremely empowering activity!" "Further evaluation strategies involve observing people's behaviours, and taking note of the transformative changes in the environment. Toward the end of a project, we use Teacher-, Peer- and Self-evaluation rubrics asking people to reflect on their personal role in the actual transformative changes which have emerged through their

[8] Young Authors whose responses appear here include Ramón Arturo Hernández-Ramírez, Roberto Alonso Hidalgo-Villalobos, Cristian José López-Carrillo, Silvia Griselda Lozano-Guerrero, Javier Pichardo-Vargas, Andrea Rivera-Hernández and Brenda Michelle Rivera-Hernández. The interview was conducted by the primary author on 25 August, 2017.

[9] At LL/CDT the immediate environment is considered as a 'Living Lab' where all knowledge, skills, values and attitudinal changes acquired through its services can be applied by community members to create positive transformations in their lives and their locality.

projects. We also conduct a Participant Satisfaction Group Interview to get a sense of people's overall feeling about the project" (*Young Authors for ESD interview 25 August 2017*).

Policy Implications – Results from the aforementioned evaluations are "taken to key actors who can influence the policy process. We also help facilitate the 'multiplier effect', where children and adults from the now self-empowered community go to neighbouring towns and share what they have learned through workshops, chats, and other activities that they design and teach. Our practice is to not separate the policymakers from the community. They are a part of the community, whether or not they realise it. So, we involve municipal officials from the onset, while giving them and their fellow community members critical-thinking tools so that they may play an active part in policy discussions designed to move the locality toward more sustainable ways of being" (*Young Authors for ESD interview 25 August 2017*).

Traditional Knowledge and Biodiversity Conservation

Prof. Braulio Cañas, Director of the University's (UACH) Centre for Oral and Public History (COPH), heads a multi-site project where four native corn seed varieties are cultivated for local consumption and sold by members of the indigenous tribes[10] of the state of Chihuahua. Cañas (*2017*) pointed to the symbiotic and interdependent relationship where preserving traditional culture depends on native seed preservation, since tribal cosmology itself centres on local corn and its cultivation. Seed conservation is equally dependent on preserving traditional agriculture, because the local seeds and the yield they produce are unable to compete with high-yield genetically-modified (GMO) corn that

Consultation meeting on governance.

floods local, national and international markets. In contrast to GMO and agribusiness practices, the traditional methods have been benign to the soil, keeping it healthy through a crop rotation and periodic fallow system. Consumption and sale of local corn, beans, oregano, cactus and chile that have been cultivated over the centuries, has indeed helped to keep up the caloric intake, the general nutrition, and the economic well-being of indigenous families found primarily in the mountainous regions of the state.

Community Engagement Insights and Commentary

When asked to reflect on insights about relational issues gained through project implementation, Cañas replied, "Most of the United Nations' and other projects that I review don't fit into the cosmovision (worldview) of the Rarámuri people. Many of these projects are designed to put traditional communities into the global marketplace. Rarámuris see nature and the everyday occurrences of life as unique, so they are not worried about future planning. A system should be created to establish a common ground where we

[10] The four primary tribes of Chihuahua are the Rarámuri-Tarahumara, Tepehuán, Guarijío and Pima. Throughout the interview, Prof. Cañas focused primarily on the Rarámuri, who are the largest tribe in the state; thus, the information contained above refers mostly to this ethnic group.

understand how they value life in the *Sierra*[11] and not the other way around, otherwise, most of the traditional knowledge and biodiversity projects are destined to fail. Western-educated Rarámuris are an important resource, as they can act as a bridge for understanding, for policies and for biodiversity preservation, helping us to establish a common ground for collaboration" (*Cañas interview 25 August 2017*).

Preliminary Contextual Analysis – Cañas reports that COPH personnel make use of the 50 or so years of research put forth by UACH and the National Institute for Anthropology and History (INAH) about the cultures and the practices of indigenous tribes in the state. In addition, COPH researchers design historiographical studies on the culture, agricultural practices and the traditions of the community with which they will be working. Due to the poverty within the region, researchers try to build economic considerations into their intervention, in the hope that their presence among the people can provide opportunities for increased income to the communities.

Finding the Pulse of the People – Cañas states, "It's difficult to do a 'needs analysis' of the Rarámuri people because they don't need us; they haven't

Georgina Gaona Pando in collaborative work with the community on behalf of the Centre for Oral and Public History.

Collaborative work with the community.

historically needed us, and they are not a conquered nation. However, we do need them. Their very cosmology is tied to corn and bean production; preserving their traditional culture helps us implicitly in biodiversity conservation. They will survive without us; however, without their culture and traditional practices, the biodiversity that we seek to preserve will not likely survive in the face of GMO agricultural products flooding every corner of our food supply" (*Cañas interview 25 August 2017*).

Objectives – "We dialogue with community members, conduct interviews and use observation techniques in order to determine project objectives. There is always an underlying goal of promoting pride and self-sufficiency within the Rarámuri community. Once we understand how people perceive their needs, we develop objectives designed to help solve these needs, and leave empowerment in the hands of community members" (*Cañas interview 25 August 2017*).

[11] The southern part of the *Sierra Madre Occidental*, known in English as 'the Rocky Mountains,' runs through the State of Chihuahua.

Proposal for Intervention and Evaluation – "We generally don't do post-intervention evaluation *per se*. Instead, we disseminate findings through public forums. Rarámuri leaders look forward to us sharing their stories with Westernised cultures, since it makes their voices heard, allowing others to get to know about them, what they value, and how they see the world. Other dissemination activities are designed around the radio, which is broadcast throughout the *Sierra* in people's native languages… We have a limited time window for traditional culture and knowledge preservation, due to the out-migration of Rarámuri youth. In about ten years' time, I'm afraid that those who pass on traditional knowledge will tend to disappear through death… Community pride and pride in traditional knowledge must be preserved. The fact that mainstream culture does not value these traditions creates an implicit pressure that drives the loss of youth to the cities, as well as the suppression and the danger of disappearance of traditional knowledge and practices. Re-instilling pride in traditional ways is crucial to the preservation of both culture and biodiversity. It should be noted that due partly to knowledge and biodiversity conservation efforts, many Western-educated Rarámuri have begun to return to their homelands, in the effort to keep traditions and conservation alive. So maybe these many years of work have begun to bear fruit in terms of community self-esteem – which helps to keep traditions alive" (*Cañas interview 25 August 2017*).

Assessment in Light of Objectives – "We generally offer workshops where traditional knowledge is fed back to community members, as not all are aware of their ancestral practices. For example, we may give a workshop around corn preservation using traditional, non-harmful agricultural techniques. By knowing the traditional ways, Rarámuri farmers can develop a 'methodology' of sorts to be offered for other people to plant, and to cultivate in ways that are beneficial to their land and their families. Our goal is not so much production, but rather dissemination and preservation in ways that allow farmers food self-sufficiency and the ability to sell or trade their excess harvest in the local context. When well executed, these projects help local economic sustainability and self-sufficiency" (*Cañas interview 25 August 2017*).

Policy Implications – Cañas states, "When communities embrace the objectives of traditional knowledge preservation for making a better environment and way of life, they understand that lobbying government institutions for support can be beneficial to them. Upon seeing tangible benefits, the farmers become willing to establish long-term projects that are mutually beneficial to the political institutions and to themselves. When these projects are well run, they do encourage long-term economic, social and environmental self-sufficiency" (*Cañas interview 25 August 2017*).

Rural Community Development and Food Sovereignty

Prof. Hazel Hoffmann-Esteves and her students in Territorial Development, Faculty of Agrotechnology, Autonomous University of Chihuahua, work with rural settlements to help ensure food sovereignty, and community development in the most remote and hard-to-reach areas of Chihuahua. Hoffmann-Esteves notes that the warm relationships that develop between her students and community members are often transformative to both. The agrotechnological knowledge offered by the University comes face-to-face with traditional knowledge and practices found in each locality. Through dialogue, experimentation and warm relations, university members and locals reach a synthesis of sorts, where the best of technology and the best of traditional practice combine in order to achieve maximum results in terms of rural community development and food sovereignty. Hoffmann speaks of a deep transformation in students who have begun engaging with the communities, noting that they develop a genuine love and a deep commitment to both the land and the people who have so warmly received them.

After a day's work, the University's Food Security and Sovereignty team takes a rest. Taken in Las Huertas, Temósachic, Chihuahua.

Community Engagement Insights and Commentary

An interview was conducted with co-author, Hazel Hoffmann-Esteves on 24 August, 2017 in order to capture insights gleaned from Rural Community Development and Food Sovereignty (RCDFS) efforts that she and her students conducted.

Relational Issues – Hoffmann-Esteves and the RCDFS Group are taken into communities by municipal authorities. In most areas where they intervene, projects are funded by the United Nations Food and Agriculture Organisation (FAO), and are implemented by national, state and municipal authorities. Since Autonomous University of Chihuahua is a state-funded institution, the RCDFS helps to facilitate the FAO-Mexican Government-run programmes designed to enhance rural development and to guarantee food sovereignty. Once on site, RCDFS identifies key actors in the community. Working groups are created based on technical expertise and traditional knowledge concerning the topic at hand. Over the last five years of working with communities, Hoffmann-Esteves reports a deep commitment of the RCDFS group toward the communities and the municipalities where they work, and a deep affection and appreciation from the community toward the university for the years of collaboration.

Family pantry with plentiful and nutritious food. Food Security and Sovereignty Project in Ocampo, Chihuahua.

Preliminary Contextual Analysis – The RCDFS Group conducts a three-step diagnosis involving (1) documentation – consulting maps, bibliography, statistics, etc., (2) on-site visit and physical observation of the locality – including flora, fauna, rivers, dams, slopes, infrastructure, among others, and (3) identification of key stakeholders (*Geilfus 2005*). Hoffmann-Esteves states, "Municipal authorities are consulted to help identify key people to involve in our interventions. We make clear from the onset that we will not be handing out money or payments to community members. This clarification opens the way for creating genuine relationships and lasting friendships with the

One of the most effective ways to understand the needs of a community is through the participation of children and elders.

people. We are always touched because people give us gifts, such as the fruits of their harvest, precious tokens brought in by a relative from outside the locality, etc. We always promise to give a final copy of our work to community leaders; they often use this document to approach different levels of government for continuing support for community development once we have gone" (*Hoffmann-Esteves interview 24 August 2017*).

Finding the Pulse of the People – "For the Needs Analysis, we use the following question: 'Why have you not left your community in search of other opportunities?' This question invariably leads us to the heart of people, their thoughts, their attachments and their love of the land where they live. Furthermore," says Hoffmann-Esteves, "when establishing new relationships, it is important to make use of our students coming from a rural background, since they are able to relate easily to rural community members. For students coming from an urban background, this social service work with rural communities opens their eyes to realities much beyond their computers and smartphones. It lets them see, often for the first time, that there are many areas in our state where people have never even heard of the university" (*Hoffmann-Esteves interview 24 August 2017*).

Objectives – Possibly owing to the FAO funding, Hoffmann-Esteves goes into communities with her project objectives already established. The objectives of RCDFS interventions are as stated:

- We seek the empowerment of rural communities and their inhabitants, who may not have electricity, computers or other artefacts of modernity
- We want them to know that they do not need to migrate to the United States, nor do they need to live on handouts from the government
- Students should realise that there are realities much beyond the urban environment; that there is much that they as individuals can do to encourage the sustainable development of our state
- The University should be able to reach remote areas where people often do not even know of its existence

Proposal for Intervention and Evaluation – Hoffmann-Esteves shares, "We begin creating an intervention plan upon initiating the first site visit. Workshops are developed based on perceived needs or deficits in the community. For example, in a 'Production Activities' workshop we invite both the male farmers and the women, trying to keep group numbers to around ten participants. We act as workshop guides and facilitators; community members usually draw – rather than write – and they correct the information we provide by adapting it to their local reality, that is, concerning their crops, crop cycles, rainfall, etc" (*Hoffmann-Esteves interview 24 August 2017*).

Assessment in Light of Objectives – "Actually, so far we haven't carried out follow-up studies; hopefully this can be done by Living Lab/Centro de Diálogo y Transformación researchers as you begin to join us in our work. By giving communities copies of our reports, they have been able to request funding to continue implementing the projects we helped them initiate, and to create new ones as they see new needs arising. Some community leaders attend conferences on Rural Development to share about the activities and the fruits of our interventions. Many of my students are so moved by the experience that they choose to write their theses based on their experiences with rural communities" (*Hoffmann-Esteves interview 24 August 2017*).

Policy Implications – "There is a National Law for Sustainable Rural Development (NLSRD) (*Congreso de la Unión* – México 2001) that is very well written and attractive. However, we find that it is not applied as indicated. For example, the law stipulates that people should participate in the sustainable development of their communities, and that policies should arise from the genuine needs and concerns found on the ground. Hopefully, your LL/CDT Policy Implications Studies will serve to align actual development practice with the beautiful ideas and concepts expressed in the NLSRD. I believe that the government would like to see these principles implemented, and now that you are joining us, we are taking steps to begin aligning policy with actual implementation in rural communities throughout the state" (*Hoffmann-Esteves interview 24 August 2017*).

Agronomists Against Hunger

Los Fundadores is a group comprised of student leaders and the first Agricultural Engineers to graduate from UACH in the 1970s – precisely at the height of the Green Revolution agrotechnological experimentation that was carried out in the northern states of México (*Hanson et al. 1982*). Having worked as agricultural experts for

Fundadores members explaining the 'Agricultural Engineers against Hunger Program' at the Municipal Offices of Guachochi, Chihuahua in the Sierra (Rocky Mountains). The Municipal President and representatives of local communities are present.

50 years, *Los Fundadores* has developed two programmes that they believe combine the best of agrotechnology and natural cultivation methods to produce high yields in corn and beans, while restoring degraded soils using only natural soil nutrients and biological pest control methods. *Los Fundadores* utilises magnetic resonance imaging (MRI) technology to test soil quality, plant physiology, and moisture levels, including pest and disease risks at regular intervals through a cultivated piece of land. Results of the MRI analyses show precisely the needs of both land and crops in diverse segments of a given field. Water, natural pest control and soil nutrients are dispersed exactly as needed, leading to roughly a doubling in crop yield compared to similar parcels where agro-industrial (Green Revolution-based) methods and chemicals are used (*Fundadores 2017*). Owing to their success in restoring soils, decreasing costs and increasing yields, the *Fundadores* and their work are in growing demand with both communities and government agencies throughout the state. Their

two focal areas include urban agriculture and rural farms in the *Sierra Madre*, or the Rocky Mountain region of the state. In both urban and rural settings, they take care to create rainwater capture systems to help households and their crops through the dry months of the year.

Community Engagement Insights and Commentary

Wishing to hear the insights gained over 50 years of intervention by the *Fundadores* in agriculture and rural development, an interview was carried out with Ing.[12] Pablo Martell Santos on 24 August, 2017.

Relational Issues – The Fundadores establish their intervention with a personal contact, such as *Fundadores* member Ing. Luis Espino, who has worked over the past five years with remote rural communities in the State of Chihuahua. *Fundadores* projects aim to bring agrotechnological advances to rural communities and to train small farmers in their usage. In order to convince rural landholders of the technology's usefulness, the *Fundadores* create a demonstration site with a local farmer who is willing to give the technology a try. After the first crop cycle, other small farmers see (1) increased yield and, (2) reduced production costs of using MRI technologies. This helps the *Fundadores* to expand their intervention more broadly in the region.

Preliminary Contextual Analysis – Martell Santos states, "We make use of statistical information from the National Institute of Statistics and Geography (*INEGI 2010*) to learn about the area we plan to enter" (*Martell Santos interview 24 August 2017*).

Finding the Pulse of the People – For the Needs Analysis, the *Fundadores* dialogue with local farmers, cross-checking INEGI's archival information with experiences of the farmers. They ask the farmers about the challenges they face and how

Ing. Pablo Martell Santos of Fundadores in Colonia Huizarochi, Municipio de Guachochi, Chihuahua with the Espino Rodríguez family, who are piloting the Basic Crops and the Urban Agriculture projects.

they would like to move forward in their locality. Upon hearing each other, the *Fundadores* and the small farmers co-develop solutions based on a combination of traditional and technologically-supported agricultural practices. Thereafter, *Fundadores* offers a training event where farmers learn to apply the MRI technology.

Objectives – Over the years of project implementation, the *Fundadores* have developed a set of objectives, which they aim to intertwine with the specific interests of each community. Their goal is to help local farmers move away from damaging Green Revolution agricultural practices towards life-giving techniques that eliminate the existing dependence on agrochemicals. They aim to increase yield and productivity, to restore chemically-damaged soils, and through these 'cleaner' practices, make the food supply and the natural environment less contaminated and safer for all. Finally, the *Fundadores* want the profits and the benefits of agricultural production to come back to the Mexican producers, as they have been largely taken away over the years of transnational agro-

[12] Ing. before a name stands for 'ingeniero' or engineer.

The Fundadores planting cotton with the Magnetic Resonance Technique at a demonstration site in Asención, Chihuahua, México.

industrial incursion into national lands since the North American Free Trade Agreement came into force on 1 January, 1994 (*Martell Santos interview 24 August 2017*).

Proposal for Intervention and Evaluation – Martell Santos states, "We conduct pre-intervention studies to be compared with yields, costs and other data at the outcome of the first crop cycle where MRI technology was used. While working with the community, we constantly rely on the Autonomous University of Chihuahua as a support for the academic and scientific side of our projects. We let community members take a leadership role in implementation so that they will have a sense of ownership of the project. Once they are convinced by higher yields and reduced costs, we multiply the intervention by creating 'train the trainer' and capacity-building workshops where local agriculturalists then train other farmers within their municipalities and beyond" (*Martell Santos interview 24 August 2017*).

Assessment in Light of Objectives – "We compare pre-implementation data with outcomes after the first crop cycle in which we've intervened, and invariably, costs are down and yields are up. This is what truly brings more farmers on board as it has a favourable impact on the economy at the community and the familial levels by increasing farmers' profit margins" (*Martell Santos interview 24 August 2017*).

Policy Implications – "We have just spoken with Chihuahua State Governor Javier Corral-Jurado (on 22 August, 2017). He sounded very convinced of the value of our work. Now we need to see if his enthusiasm manifests itself in policies designed to support the kind of agrotechnological intervention that we offer. Another topic we discussed with Governor Corral-Jurado concerns proposed legislation that would require construction companies to build rainwater capture infrastructure into all new subdivisions they create under state or national schemes. We expect resistance from the construction contractors, since this will mean an additional cost for them. Nonetheless, we are pushing for this sort of change in the construction of new houses, primarily in urban areas of the state" (*Martell Santos interview 24 August 2017*).

Final Comments

All people are welcome to propose Living Lab projects methodology. Once submitted, LL/CDT leadership reviews a proposal; it is sent for external review; and the proponent is called in to discuss modifications and re-drafting of the proposal. Once both sides are in agreement, the proponent becomes a part of LL/CDT's personal staff for the duration of his or her project. Proposals placed at LL/CDT are rarely rejected; instead, LL/CDT helps to strengthen them through the refereeing process. For funding, project implementers are often referred to colleagues at FONDEA[13]. If project proponents are non-academic, they are matched with researchers at the University. If they are academic, they are matched with community leaders with whom they

[13] FONDEA *http://www.fondea.co/*

will co-design, co-implement and co-evaluate the project.

Over the years of collaborating in community development through the LL/CDT, a Transformational Research, or a Research as Service approach to community engagement has emerged. The steps include giving attention to Relational Issues, conducting a Preliminary Contextual Analysis and a Needs Analysis, after which project objectives are co-created by LL/CDT personnel and community members. With the objectives established, a Proposal for Intervention is developed, and Ongoing Monitoring and Evaluation are conducted of both the intervention process and the project's end results. From this and other data, studies are written and sent to the academic and the popular press for publication and knowledge dissemination. Policy Implication Studies are developed and presented to legislative bodies in order to help institutionalise sustainable development through shifts in the corresponding legal regimes at the municipal, state and national levels. Having been recognised as a Regional Centre of Expertise by United Nations University's Institute for the Advanced Study of Sustainability in December 2016, LL/CDT hopes to become a voice that extends beyond México in order to help usher in policy shifts towards SD in intergovernmental and international arenas.

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Sanskriti Menon and Sneha Rapur

Chapter 4

Deliberative Democracy and Learning for Sustainable Mobility in Pune

Summary

ESD Innovation

Viewed from the lens of ESD (Education for Sustainable Development) innovation, this deliberative democracy process aimed to enhance understanding about sustainable mobility and streets, as well as the equity in the decision-making process. Efforts such as community-led design and participatory planning have been used for many years, especially in the developed world. The value of such processes for social learning has also been highlighted. However, such efforts are rather rare in Indian cities. Street space is highly contested as there are multiple uses. The needs of the more marginalised can be, and are often quashed. A structured process that values learning and deliberation, seeks out multiple points of view as contributors to our collective understanding, and thereby places all participants on an equal footing, may be one way of addressing sustainability challenges locally.

Societal Transformation

The experience has also brought about some learning for public governance. Considering India's own experience of the implementation of Panchayati Raj[1], and examples from around the world, such as participatory budgeting, Dialogue for the City in Perth, and several others, Deliberative Democracy (DD) can be a powerful way of societal transformation. To reach a point where high quality deliberative democratic processes are institutionalised is itself a transformative journey for a society. Deliberative democratic forums have much to offer even when not institutionalised. Work areas have emerged among RCE Pune members following the work described here. These include using and demonstrating DD tools and techniques in various fora, and using these as part of RCE Pune's dialogues and within its networks.

Implications of Development for Knowledge Institutions

Students and faculty from an architecture college played an important role in creating an information base for the deliberation. These inputs were invaluable. This experience and subsequent processes carried out by RCE Pune indicate the need for greater engagement of knowledge institutions in the domain of DD in India. Practice and research efforts are needed to examine democratic governance, together with the realisation of citizenship from multiple disciplinary lenses, including political economy, sociology, communication and public discourse, among others.

These desired outcomes in relation to ESD innovations and societal transformation, and the deeper engagement of knowledge institutions are areas for further work in RCE Pune and at the Centre for Environment Education (CEE).

[1] 'Panchayati Raj' in India is a system of governance in which elected bodies at the village level and ward committees in urban wards are the basic units of local administration. These systems were introduced through amendments to the Indian Constitution in 1992.

Context

Among the top issues identified by citizens in Pune is traffic and transportation. This chapter presents an attempt at a DD process carried out in 2013 in Pune. This was a multi-stakeholder process of learning and action on sustainable mobility and street design, anchored by members of RCE Pune. RCE Pune was recognised in 2007 and has been anchored by the Centre for Environment Education (CEE). The work presented here involved a partnership between RCE Pune members, CEE and Parisar (a local NGO from Pune), the BN College of Architecture, and the Curtin University Sustainability Policy Institute (CUSP). The work was supported by AusAid. The work offers some learnings for Education for Sustainable Development (ESD), in particular in the engagement of local actors in cities.

Urban Mobility and Public Governance

Traffic and transportation are among the top civic issues in many Indian cities. Pune, a city located in western India with a population of about 3.2 million (2011 Census) is no different. It has seen a high growth rate of motorised traffic with more than 500 vehicles being registered every day. Local impacts include high air and noise pollution, a large number of traffic accidents, and time wasted caught in road congestion. The vehicular emissions contribute to global climate change.

The transportation situation, and the usage of streets as a particular element of the transportation system, is a complex problem – there are many types of road space users, and there is little initial agreement among them about what the problem is. Measures such as widening roads, building flyovers and increasing space for parking in response to increases in motorised traffic have not helped, and may have worsened the situation, which has been the experience in other parts of the world.

Efforts to streamline urban mobility in Pune have come up short, when faced with the practical reality of having to deal with the street space claims of pedestrians, cyclists, street vendors, users of private motor vehicles, paratransit, public transit, utilities, waste collectors, and a multitude of others. How to design and devise the transitions becomes a complex exercise leading to much angst, accusations of non-transparency, and a waste of the creative energies of administrators, political leaders, consultants and citizens alike. Furthermore, the claims of some segments, such as informal workers or cyclists, are not even formally or adequately recognised, leading to further stresses in the urban fabric.

In 2009, RCE members, namely CEE, along with Parisar and the Institute of Democracy and Sustainability initiated a country-level network of NGOs and individuals on sustainable mobility. A core question for this Sustainable Urban Mobility Network (SUM Net) has been 'how can people be better informed and active partners in decisions on urban mobility and street design?'. In 2013, this ongoing exploration and a chance meeting with the CUSP, led CEE to anchor an effort for participatory street design in a neighbourhood of Pune, through a public deliberation process, in particular, a 'high quality deliberative democracy' process.

Deliberative Democracy as a Multi-stakeholder Process

'Multi-stakeholder partnership' (MSP) is described as an 'overarching concept which highlights the idea that different groups can share a common problem or aspiration, while having different interests or stakes'. MSPs are typically iterative and may take place over several weeks, months or longer durations. While an MSP may also be a short consultation, typically it would not be a 'one-off' workshop or a simple multi-actor gathering. It is a semi-structured process that helps people work together on a common problem over a shorter or longer time. The MSP Guide suggests four main

Deliberative democracy (DD), or participatory democracy, has been described as a nascent social movement, a response to the perceived inadequacies of representative democracy (*Bohman 1998; Dryzek 1990; Smith and Wales 2000*).

According to Levine (*2003*), democracy requires deliberation for three reasons:

- To enable citizens to discuss public issues and form opinions
- To give democratically elected leaders better insight into public issues than elections are able to do
- To enable people to justify their views in order to determine the better from the worse

phases: initiating the process, adaptive planning, collaborative action, and reflective monitoring (*Brouwer 2016, 12*).

A variety of deliberative processes exist around the world that use methods such as citizens' juries, citizens' panels, consensus conferences, deliberative polls, ChoiceDialogues, focus groups etc. (*Fishkin 2000; Hendriks 2002; Abelson 2003; Fung 2003*).

Carson and Hartz-Karp (*2005*) characterise 'high quality deliberative democracy' as a process that requires:

- Influence: capacity to influence policy and decision-making
- Inclusion: representative of population, inclusive of diverse viewpoints and values, equal opportunity to participate
- Deliberation: open dialogue, access to information, space to understand and reframe issues, respect, and movement toward consensus

Deliberative democracy strengthens citizen voices in governance by including people of all races, classes, ages and geographies in deliberations that directly affect public decisions. As a result, citizens influence the policy and resource decisions that impact their daily lives and their future (*Deliberative Democracy Consortium 2003*).

While there are many commonalities in the underlying concerns, approaches and tools of deliberative democratic processes and multi-stakeholder processes, there is a difference. While members from MSPs are included, DD is more sharply attuned to the processes of public decision-making.

The presence of different points of view pertaining to the problem or problem cluster, enables the emergence of a better and more holistic picture of the system, and therefore highly valued in MSPs and DD. Indeed, this is what fosters learning from, and about other points of view.

In India, while the government and civil society organisations realise the importance of involving citizenry in decision-making processes, the actual progress in strengthening democratic institutions and processes at the local level in urban areas has been rather slow. The 73rd and 74th Amendments in the Indian Constitution in 1992-93 were the major steps taken toward creation and strengthening of local self-government institutions. These amendments provided for the structures of participatory democracy to be created at the village, city and district levels, with elections every five years, and reservations for women and representatives of marginalised groups. The formal institution of the *gram sabha*, that is a village assembly, within the representative structure of the *gram panchayat*, which is an elected local body, is recognised as a big step for deepening democracy.

However, there are many institutional and societal challenges in the effective functioning of *gram sabhas*. While the framework for participatory and localised governance was created through the constitutional amendments, the actual devolution and decentralisation of governance functions and the funds to carry them out was left to State governments to decide on. This has taken place in varying degrees across different states. Structural inequities in society, inadequacy of procedures for conducting *gram sabhas*, inadequacy of information on which to base decisions, and the weak influence of *gram sabha* deliberations on decision-making, are some large barriers for effective public participatory governance.

Urban areas in India however, lack even a structure for regular and formal assembly of lay citizens for public governance, analogous to the *gram sabha*. In more recent years, the Maharashtra Municipal Corporations Act has been amended to include a fourth tier of urban governance, in the form of *Area Sabhas*. These are meant to be set up as assemblies at the very local level for citizens to participate in municipal functions, which are matters of their everyday concern. While this provision has been included in law, the rules for implementing the provision have not yet been prepared and the provision is thus not yet implemented in Maharashtra. With the advent of the Smart Cities Mission[2], there is some interest in citizens' engagement in urban governance since the extent of engagement is among the criteria used to select cities for participation in the programme. Early critiques of the engagement processes done in the Smart Cities Mission indicate that these have been rather light-touch survey processes or very simple engagements, and certainly not public deliberations.

Thus, while the democratic framework exists at the local level, its usability for organising a local multi-stakeholder deliberation leading to public decisions has been limited.

Promoting Deliberation in Pune

Preparation and Engagement Phase

The process of preparation and engagement took place over several months in 2013. It started with the coming together of a core team consisting of CEE, the BN College of Architecture, Parisar, and faculty from the Curtin University Sustainability Policy Institute, Perth (CUSP). The project was supported by AusAid. The CUSP research team, led by Prof. Janette Hartz-Karp, designed the Deliberative Process for the research and was involved in training the facilitators. Prof. Hartz-Karp guided the partners in understanding the principles of DD and applying these in the Indian context.

The core team assembled in Pune in early 2013. The first steps were to select a site for the deliberative process, which was done through a discussion process, and to orient the architecture students and faculty on sustainable transportation and methods of studying street usage.

For site selection, the team members initially listed eight neighbourhoods in the city, considering attributes such as number of pedestrians using the streets, activities on the streets, importance of streets in terms of being located close to temples, educational institutions, or commercial areas. The participants listed the criteria that would help them jointly select a site:

[2] The Smart Cities Mission was launched in 2015 by the Government of India. The objective is to promote cities that provide core infrastructure and give a decent quality of life to its citizens, a clean and sustainable environment and application of 'Smart' Solutions. The approaches include 1. Area-based Development, where multiple projects are taken up in a specific area; and 2. Pan-city projects. The area-based approach is expected to create a replicable model which will act like a light house to other aspiring cities. The Smart Cities Mission is meant to set examples that can be replicated both within and outside the Smart City. 100 cities are being selected over 5 years as part of the Mission. More information: *https://india.gov.in/spotlight/smart-cities-mission-step-towards-smart-india and http://smartcities.gov.in/content/*

- Interest for the research team and community
- Replicable in other parts of the city
- Innovative in design and process
- Implementable due to political support for the initiative
- Measurable impact on traffic and community

The second day of the workshop had around 60 participants from many other organisations, including the Pune Municipal Corporation. The purpose of the workshop was to introduce the project to this wider group of stakeholders and seek their inputs on the project process design. This workshop also demonstrated a process of, and a few tools for deliberative discussion. Dattawadi was finalised as the area for carrying out the participatory street design work, having satisfied the criteria developed on the previous day.

The next step was to understand the existing uses of the neighbourhood streets, identify areas for improvement, and to evolve future usage patterns and physical designs that, when implemented, would help enhance the liveability of the neighbourhood. Soon after this step, a researcher at CEE was trained in deliberative processes and tools. CEE also discussed the proposed process with political leaders from the beginning.

Study Phase

Dattawadi, the locality selected, is a small neighbourhood of about 1km^2. The area has been settled for several decades and is characterised by a dense, low-rise urban form. The character of a neighbourhood is influenced to a great extent by the quality of its streets. Streets that are safe and pleasant for walking, cycling, street vending, for children to play in and for elders to sit around, help make a neighbourhood more liveable. Such street uses are very much evident in Dattawadi. However, increasing motorisation and on-street parking are changing the quality of the street space and its usage.

CEE staff, and the students and staff of BNCA undertook studies of transportation issues in general and in Dattawadi, over five to six months. Three neighbourhood streets and a junction were chosen for a detailed study of street usage.

The BNCA students took up transportation studies as a semester-long landscape design studio. They studied transportation issues in Pune and conducted macro studies in different wards of the city about connectivity, pedestrian and cycle friendliness. A team of students prepared an in-depth investigation on the Dattawadi area. They studied transportation patterns, conflicts between different modes, different uses and activities on the streets, and facilities for non-motorised transport. These studies formed the inputs for the deliberations later in the process.

CEE conducted several small meetings to understand the characteristics of the public and specific stakeholders, as well as their views on the neighbourhood public and street spaces. Discussions with local families, different user groups, municipal ward officials and elected representatives helped the CEE team gain some insights into the current localised processes of decision-making for small neighbourhood projects, and the societal structures within them. CEE also provided the elected representatives and some community members a preliminary introduction to a process where different groups could come together to express their views about street use, difficulties encountered and jointly arrive at solutions.

This study phase helped in developing a detailed understanding of the physical and social context. The discussions helped prepare the ground for the deliberative process, such as some familiarity with the members of the anchor team who were by this time not perceived as total strangers.

The insights gained from the discussions with the community and others helped identify different stakeholder groups, their concerns and perspectives about the usage of street space. Study findings were converted into communication and information material including the invitation to a deliberative event, and presentations about the situation and issues. The invitations were sent out based on the understanding gained about the local community.

Good quality information as an input to the decision-making process is one of the key tenets for DD. The information needed may not already exist. For example, conflict between pedestrians and motorists is generally known, however the specific issues of this type to be addressed in Dattawadi had to be mapped and represented for use in the deliberative workshop held at the next stage.

Deliberative Event

The deliberative event was a formal workshop held in October 2013. The proceedings of the first day was held at the campus of BNCA, which is about 3km from Dattawadi. The venue for the second day was a local school in Dattawadi.

Prior to the deliberative event, the CUSP faculty trained a set of facilitators and scribes. They were assembled from member groups of RCE Pune and explained their roles. Some of the facilitators also helped translate the discussions into Marathi and English during the workshop.

A multi-stakeholder group of participants including residents, young people, teachers, hawkers and others from Dattawadi, municipal officials, NGOs, and students and faculty from BNCA was created. Around 60 participants on both days looked at how to design their local streets to be more 'people focused'.

At the formal inaugural session, a Member of Parliament and the local Corporator (elected representative) of Dattawadi were present and briefed about the exercise and the process. The Corporator participated throughout the day, lending seriousness to the process.

In terms of the process and tools of deliberation, a broad Design Charrette process was followed for the workshops. A charrette is an 'intensive, multi-disciplinary design workshop designed to facilitate an open discussion between stakeholders of a development project' (*Charrette Centre n.d.*). In these workshops, professionals work with community groups, developers and other stakeholders over the course of a few days. After the initial stage of information gathering, an iterative process of preparation of design solutions by the professionals and then critiquing by different stakeholders follows.

The charrette had embedded within it, processes of information inputs and multi-stakeholder deliberation.

Input to the Deliberative Process

External information provided as input into the deliberation included:

- An expert presentation of current thinking about sustainable mobility
- Findings from the studies in Dattawadi

The deliberation processes were designed and facilitated to explore the views of every individual present, finding commonality and providing an opportunity to explore and examine differences in views. The deliberation tools used were 21st Century Dialogue on Day 1, and a 'Station Rounds' process on Day 2.

Deliberation Using the 21st Century Dialogue Technique[3]

The deliberative process has:

- A 'mini public' consisting of diverse people, drawn as representative of the concerned population, inclusive of various points of view
- A team of facilitators and scribes and a Theme Team with networked computers running a platform such as 'Civic Evolution' that permits collation of text
- An observation team, if possible

The participants' seating is arranged to provide a comfortable discussion environment, where all participants of the deliberating mini public are treated as equals in the seating structure.

Each table has:

- A diverse group of five to eight people
- A trained facilitator whose task is to ensure all members of the group have an opportunity to express their views on the questions being deliberated upon, to help explore underlying values and to maintain a conducive discussion environment
- A scribe to record the responses of the group including common views, majority views and minority views, on a computer that is linked (through the internet) to the computers of the Theme Team

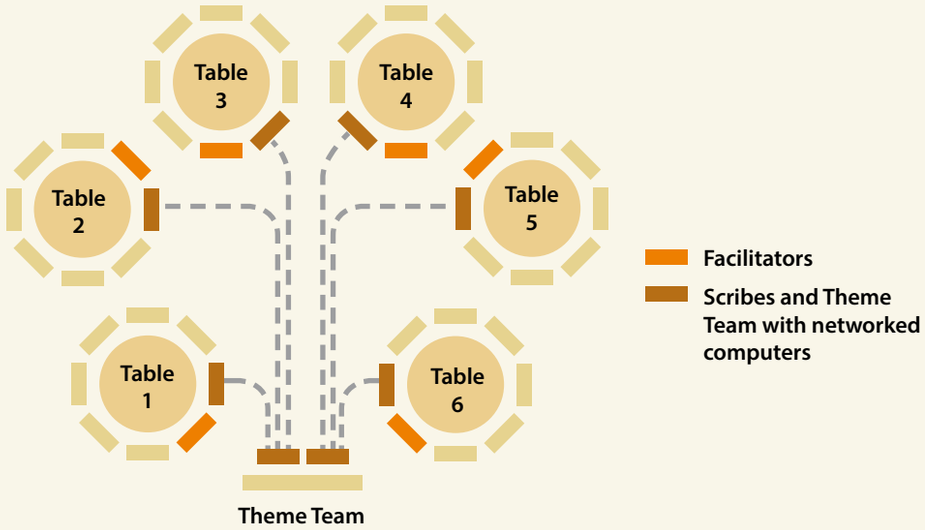
Each table discusses the question given for deliberation. The scribe 'sends' the discussion outcomes to the Theme Team. The Theme Team collates the inputs from each table, clustering the responses, indicating agreement and counter views. The sum of the responses is presented back to the room for further discussion or prioritisation, which is done at each table. The results of the table prioritisation are again collated and presented in an iterative manner until there is adequate deliberation, and a view emerges that people can accept.

In Dattawadi, the questions posed for deliberation were:

- What is valued about Dattawadi?
- What should be kept, what should be changed and what are the 'hot spots' likely to be?
- What are the participants' priorities?

[3] Video on 21st Century Deliberation: *https://whatdowethink.com/*

Figure 1: *The room arrangement for 21st Century Dialogue.*



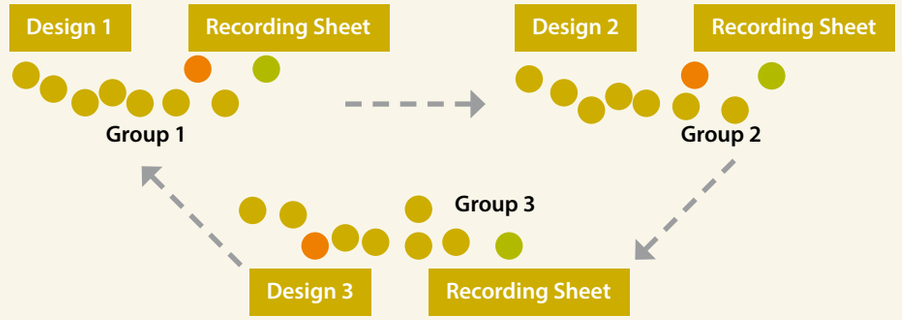


Figure 2: *Arrangement for 'Station Rounds'.*

The 21st Century Dialogue technique with networked computers makes it possible to collate the discussions happening at each table, in real-time (*Hartz-Karp 2006*). A consolidated picture can be presented to the whole group in minutes after the group discussions. The clustering and sense-making of varied views from each discussion table, very rapidly helps sustain the interest and create trust about the process among the participants. At the end of Day 1 in Dattawadi, the outputs of this process were used to refine the rough street designs prepared by BN College of Architecture students and faculty. The 21st Century Dialogue helped understand the community's views on aspects of value in the neighbourhood, aspects in which change was needed, and to prioritise the changes needed. An outcomes report was produced for all participants at the close of the deliberation on Day 1. The report documented the group outcomes from each of these areas.

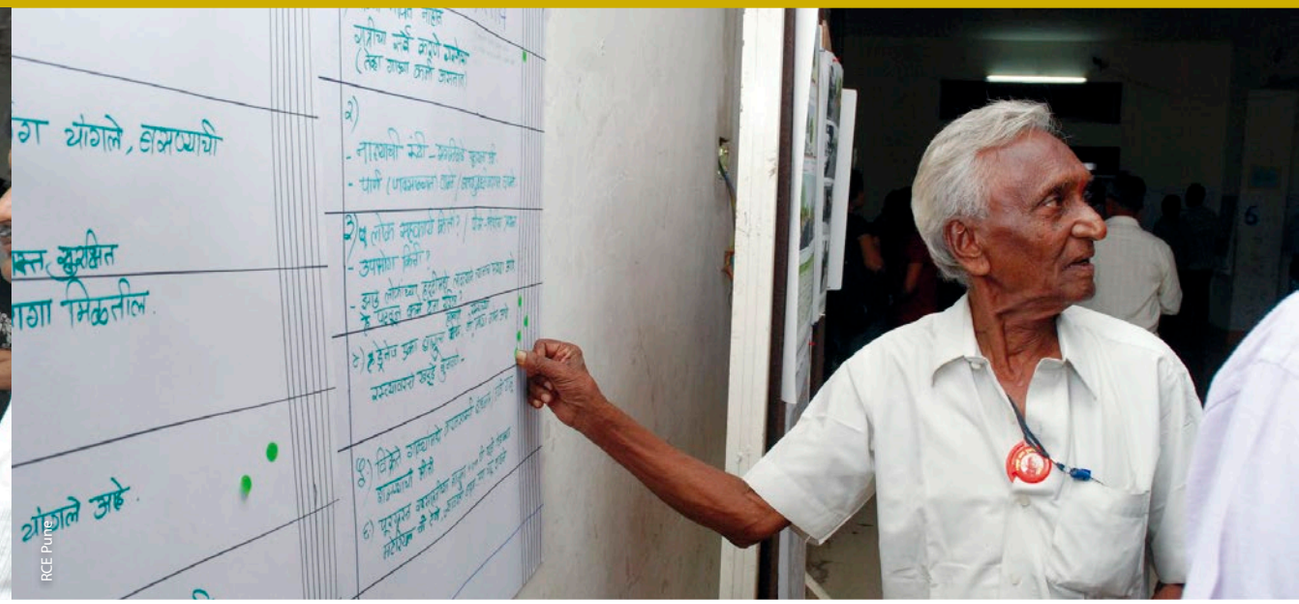
By the end of the session, the Member of Parliament announced that the detailed designs developed by the students and enhanced through the deliberative process would be implemented. Later that evening, the 'technical team' comprising of the college faculty and students developed the scenario options presented during the workshop and incorporated the feedback from the participants. Various options for street design in Dattawadi were developed by the architecture students and faculty, responding to the views of the public, that is, the 'mini-public' assembled at the workshop.

These designs were put forth for a public deliberation on the second day. As the venue on the second day was the local school in Dattawadi, it enabled a larger number of people from the community to review the designs. The previous day's discussions were summarised and presented to the participants on the second day.

Deliberation Using Station Rounds

The deliberation technique used in this instance was Station Rounds. This technique had 'stations', each with a different design option presented on charts, placed for review by the community. Each station had a facilitator and a scribe. Groups of six to eight persons were formed, who visited each station in turn making suggestions and discerning the extent of consensus as they went. This enabled a wider range of community members to comment and contribute to the development of the design. The responses were clustered by topic, while marking the responses of each group separately within the cluster. The attempt was to update each group with the inputs of the previous group, seek their inputs on the same topics as well as add any new topics the group suggested. After all groups had commented upon each design, the entire group was asked to take some time to read through and understand all the views expressed, and then as individuals, identify the top few key elements they would like to see or change in the designs. This technique was structured to enable deliberation in groups, understand the views of others in the room, as well as exercise individual voting on selecting

Community members review the design options and prioritise actions for implementation in Dattawadi.



Community members review the design options and prioritise actions for implementation in Dattawadi.

designs or requesting change of a design to reveal the group's priorities and dissents. As with the previous day, facilitators helped foster dialogue between participants to provide suggestions for refining the designs.

Again, municipal elected representatives were part of the deliberative processes. It was agreed that the designs would be refined based on the inputs from the second day of public deliberation, and submitted to the municipal authorities for implementation.

Evaluation

The deliberation processes should ideally be assessed against the three defining criteria of inclusivity, quality of deliberation, and influence. This could have been achieved by asking each participant to fill a survey form at the end. In Dattawadi, this process was not done formally but through an oral reflection with the assembled group about their experience of the deliberation process. An oversight team also provided its observations on fairness and other qualities of the process.

Post-deliberation

The feedback from the community was incorporated into the designs, which were submitted to the municipal authorities for consideration for implementation. After the public deliberation, CEE and the BNCA faculty continued to interact with the municipal authorities, and visit Dattawadi for explaining and further detailing of the designs. However, the response received from the municipal authorities was not so positive. Firstly, the designs prepared through the deliberative process were conceptual designs and not execution-level drawings. Secondly, the authorities informed the team that they had not dealt with such proposals before, especially as the materials and designs were not included in the schedule of rates, and therefore unclear how they could implement the designs.

The local Corporator made special efforts to present the designs to the municipal administration and secure funds for implementation. Certain unique elements of the designs therefore did get implemented. A later informal discussion with some members of the community revealed that they were satisfied with the design that was implemented.

Discussion on Deliberation Quality

The stated aim of the activity was to bring about a change in the transport planning process in Pune through innovative forms of citizen engagement. The quality of deliberation is evaluated here, using the three critical components of DD as defined by Carson and Hartz-Karp (*2005*) – inclusiveness, deliberation and influence.

1. Inclusiveness

Theorists and practitioners have argued that to be inclusive, participation needs to be large scale and representative of the population. This is to avoid the typical consultation scenario that involves only a small number of the community, overwhelmingly skewed by those who are either 'highly articulate' or those 'with an axe to grind'.

The DD forum for the research aimed to be both large scale and representative. Prior to the large deliberative forum, the aim was to involve as many of the community as possible in understanding and talking about the issues. Invitations in Marathi and English were sent to the stakeholders, local authorities and to community members to be part of the forum. It was ensured the participants from the community were from diverse backgrounds, and included residents, street users, women, old residents, students and members of a hawkers' association of Dattawadi. The organisers arranged transport to the location of the workshop from Dattawadi. The vendors and auto rickshaw drivers who had to forgo their daily wages to participate were compensated for their time.

The second day of the workshop was held at a school premises in Dattawadi on a Sunday afternoon to encourage better participation from the local residents who could not attend the workshop the previous day. The participants were asked to go through each proposal and comment on it. Good responses were received through this process. However, the response for the forum would have been more widespread if the publicity of the event had been better and more widespread.

Other instances of DD, such as the Dialogue with the City Forum in Perth, demonstrate that several strategies can be adopted for enhancing participation and awareness among the community. In Perth, several forms of media were used to publicise the event; websites were created to disseminate information to the public, activities such as painting competitions were organised for

students to re-imagine their city, and online fora were created to allow people to share their views, which were displayed on the day of the workshop.

Many such techniques may be considered for future deliberative events, to keep the public informed and involved in the process on a regular basis.

2. Deliberation

Informed dialogue is an important feature of a successful deliberation. The project teams consisted of Masters students and PhD candidates dedicated to work on this project. They collected and synthesised the information prior to the DD forum. This information was presented to the participants on the day of the workshop to equip them with enough knowledge to get involved in a dialogue. The concepts of sustainable transportation, walkability, and urban design were presented by experts from CUSP, as well as the local sustainable transportation experts, in order to educate and inform the participants.

The forum encouraged open dialogue, respect, access to information, and offered the space to understand and reframe issues, and to move toward consensus. To encourage open and free discussion, small groups were formed with diverse participants. Each group was supported by a trained facilitator, with the task of encouraging in-depth discussion and respect for others' views. A trained scribe in each group input data into a computer that the group deemed to be a fair representation of their discussion. The small group interaction provided a safe environment to express views, learn from others and reach a collective view. Staff from RCE member organisations, students, faculty members and the CUSP team volunteered to facilitate, act as scribes, and take other support roles. This team was given rigorous training prior to the workshop. Not only were commonly-held views fed into the computer, so were strongly-held minority views and views of individuals. The computers on each table were networked, transmitting the data to a 'Theme Team' who analysed the data in real-time and broadcast the common themes back to the entire room via large screens along the breadth of the room. In a short space of time, participants could see the build-up of collective views from the individual tables to the whole forum.

In terms of evaluating the deliberation process, it is important to measure the effectiveness of deliberation to reflect on the process and how people felt about the exercise. However, such a method was not employed during the workshops except for the oral feedback of random participants, which has been documented.

Participant comments included:

- "[The deliberation was] the first time I spoke as a citizen of India."
- "…give people a little chance and they deeply respond. It is a spiritual matter."
- "It is very important to see how much people understand."
- "It made me very excited when we first heard about it and then it came true."
- "A unique way for getting things done."
- "A very different experience, which doesn't usually involve people in this way."
- "Training that reaches into every class."

Comparing the Dattawadi process with the Dialogue with the City Forum in Perth, the procedure adopted in Perth is noteworthy in the sense that extensive information in the form of well-researched discussion papers were provided prior to the workshop through a dedicated website, along with newspaper features and articles which provided background briefing. This process of information dissemination needs to be explored in Pune in future engagement exercises.

3. Influence

The Dattawadi case shows that the deliberation was influential in bringing about a change in the traditional planning process by incorporating feedback from citizens. The deliberative fora gained considerable media attention which could be positively used for future deliberation workshops.

Reflection

A reflection was also completed with the faculty of the architecture college, and other resource persons to understand their views on this method of urban design and public engagement. The students and faculty expressed that this was a completely new method of planning which should be developed further. The Principal of the college suggested that a Department of Deliberative Democracy could be set up at the college, and that CEE could work with CUSP to help develop a curriculum with supportive teaching materials, methods and skill enhancement for participatory planning and DD processes.

Comments from the BNCA Faculty

Indian Streets are not merely for commuting; rather they are part of the local culture, part of life. The workshops with Curtin University, Australia, CEE and SUM Net, hosted by BNCA, were linked with the Second Year Landscape Studio 'Deliberative Democracy model for Cycle and Pedestrian-friendly Street Space Design and Development for the City of Pune'. The Studio focused on safe mobility through the involvement of children, young people, women, elderly people, people with disabilities, street vendors, NGOs, Pune Municipal Corporation and various users of street space.

The students prepared the designs based on the deliberations where concerns of various stakeholders related to Dattawadi and their priorities were articulated. The streets and open spaces of Dattawadi were thus 'Design by All, for All'.

I am glad the project is going ahead with initiative from the local authorities. Success of the project and the workshop lies in implementation of the designs, and safe and sustainable use of the streets by the people.

Shubhada Kamalapurkar
Professor and Head of the Department, Landscape Department, BN College of Architecture, Pune

Longer-Term Outcomes and Future Directions

The introduction and demonstration of the concept of DD to RCE Pune members has set off some sparks. Discussions are unfolding on what participatory democracy means to its members, with discussions also joining up with similar conversations in Pune and elsewhere. An *abhyas gat*, or study circle has started to meet on the topic of participatory governance. Intermittent discussion on deliberation and participation has been continuing with some of the actors who were closely associated with the Dattawadi efforts. These include elected representatives, the facilitators from the RCE Pune member groups, faculty from the BN College of Architecture together with another college, and CEE staff. The Dattawadi work has become a part of the language and shared memory of some of these actors to draw on when discussing participatory processes.

It is realised that instituting DD within the Indian context may require considerable political engagement, and strengthening and consolidating the bottom-up demand for citizens' participation in governance. Media engagement, capacity-building and research are also crucial. Experiments and innovations for deepening democratic processes, and for dialogic approaches to citizens' engagement would help enhance understanding about such processes and develop capacities to conduct them. Furthermore, deliberative democratic forums have much to offer even when not institutionalised. Work

areas have emerged among RCE Pune members. These include using and demonstrating DD tools and techniques in various fora, and using these as part of RCE Pune's dialogues and within its networks. The association of RCE Pune partners such as CEE and Parisar with CUSP has introduced thinking about DD into CEE's and SUM Net's approaches to promoting citizens' engagement in urban governance. Deliberative tools have since been used, deliberative processes have been initiated in various ways, internal discussions have been conducted, and workshops have been designed to be facilitated jointly, discussing the issues of street vendors for example, in attempts to initiate multi-stakeholder processes for shaping the evolution of sustainable mobility in other cities as part of the work of SUM Net.

In 2014 and 2015, CEE facilitated public deliberations to review the participatory budget process that Pune has been running since 2007. These public deliberations have tried to follow the methods that characterise DD: the recruitment of participants represented a 'mini public', the presentation of information was in a clear and understandable way, the design of the deliberative events where discussions were facilitated attempted to embed the outcomes in city decisions, and the quality of deliberation was evaluated.

The review of participatory budgeting in 2015 recommended improved information availability on the levels of infrastructure and services in different wards of Pune. In discussion with the Municipal Commissioner, CEE took forward this recommendation to develop a Ward Infrastructure Services and Environment (WISE) information base and index for Pune. This index was used to provide a more rational basis for budget allocations for different wards, with wards that rank lower getting a higher budget allocation. As it happened, this rationality was not quite accepted by the elected representatives who rejected the idea of using the WISE index for allocation of resources. However, the WISE index and its rationale were well reported in the media, and occasionally still appear in press articles several months later.

Reflection on this experience of 2013 is especially relevant in the context of the Sustainable Development Goals (SDGs) and the UNESCO Global Action Programme (GAP). The experience directly links to SDG 4.7 on education for sustainable development and SDG 11.5 on participatory planning. The UNESCO GAP on ESD identifies 'accelerating sustainable solutions at the local level' as Priority Action Area 5. It suggests that local authorities and leaders need to increase and strengthen learning opportunities for the whole community through formal, non-formal, and informal venues.

One of the activities carried out by CEE with SUM Net in parallel with the DD work has been the development of a 'Streets for People' elective course, and studio or workshop conducted by CEE with two other architecture colleges – the PVP College of Architecture in Pune and in CEPT Ahmedabad. The DD element was synergised with the Streets for People studio at BN College of Architecture in 2013. At CEPT and PVP College of Architecture, the street design course does seem to succeed in helping students to recognise the multiple users of streets, and that a design process should integrate their views. However, it does not yet prepare the students for facilitating public deliberation or public engagement processes. The bachelors level curriculum in architecture does not particularly address the realm of public space design using participatory methods, while the Urban and Regional Planning programmes also do not have substantial course content on participatory planning. CEE hosts the UNESCO Chair on Sustainable Habitats with CEPT Ahmedabad. The Chair programme presents an opportunity to develop a course on the theory and practice of public deliberation, especially for students of urban design, planning, architecture, habitat studies, public administration and social work. This is one of the directions for future work for ESD that would fit in well with UNESCO GAP priority area 5.

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Watch a video about this work:
Taming Streets: Design, Deliberation and Delivery in Indian Cities https://youtu.be/NxXDNtcaMno

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Jen Dollin and Margaret Somerville

Chapter 5

Developing Local Sustainability Initiatives in Western Sydney

Summary

ESD Innovation

'Our Place Western Sydney' represents a research on the meaning of local places in relation to community involvement in environmental sustainability initiatives. The participatory action-research methodology implemented allows the participants to identify places that mattered, raise issues of concern, and to generate possible solutions. Two innovative Education for Sustainable Development (ESD) approaches were undertaken.

The first was the creative use of storytelling and objects to identify local places of importance. Participants were asked to bring an artefact from or representing their favourite place, and tell a story about that place. This approach generated powerful insights into how, why, and where community members connected to their local places. The second innovation involved 'Open Space Technology' (OST) with the aim of bringing together clusters of people with a common interest in taking specific environmental action. Seed funding was made available to collaborative projects developed through this methodology to enable implementation.

Societal Transformation

The research highlighted the unique ways in which local people relate to their local places and also supported small networks of grassroots projects at these sites. The Emu Riparian project is one example of a continuing project that has had a 'ripple effect.' The project included two successful funding applications for riparian zone action along the Hawkesbury Nepean River and engagement with university students for project-based learning. The Our Place Western Sydney project supported new membership to the RCE Greater Western Sydney (GWS) network, which in turn continues to support the individual organisations and associations at the grassroots level. RCE GWS continues to use a form of OST at its annual planning day to further generate collaborative initiatives.

Implications of Development for Knowledge Institutions

Findings by the Our Place Western Sydney project have implications for future study design and how universities can approach working with communities. The chapter demonstrates how higher education knowledge institutions that work in the community space can use ESD innovations that are mindful, respectful and considerate of the local knowledges and expertise that already exist there. Employing these creative methodologies led to a depth and breadth of the initiative that would not otherwise be possible using more traditional study methods such as a survey.

Acknowledgements

With respect for Aboriginal cultural protocol and out of recognition that its campuses occupy their traditional lands, Western Sydney University acknowledges the Darug, Gandangarra, Tharawal (also historically referred to as D'harawal) and Wiradjuri peoples and thanks them for their support of its work in their lands (in Greater Western Sydney and beyond).

University-community Engagement

In Australia the widely accepted definition of the university-community engagement relationship is:

> *"The collaboration between higher education institutions and their larger communities (local, regional/state, national, global) for the mutually beneficial exchange of knowledge and resources in a context of partnership and reciprocity" (Bell, Scott and Holland 2007, 4).*

The emphasis of the core elements distinguishes university-community engagement from non-scholarly forms of service such as 'extension' and 'outreach', which have sometimes been confused with the notion of engagement (*Bell, Scott and Holland 2007*). This definition of the university-community engagement relationship has been adopted by Western Sydney University, where 'engagement' is also seen as a distinctive way of carrying out research, teaching, learning and service, the core business of the university. The university is a young higher education institution established in 1989 from an amalgamation of regional colleges, and maintains a deep association and commitment to the region and to the local communities.

RCE Greater Western Sydney (RCE GWS) was acknowledged by the United Nations University Institute for the Advanced Study of Sustainability (UNU-IAS) in 2011 and is based on a model in which the university's Office of Sustainability provides secretariat services, program support and facilitates relations between communities, researchers and students. RCE GWS has a flat governance structure and facilitates learning, research and community interaction by convening open forums quarterly that generate programs and initiatives under broad themes mutually agreed upon via strategic planning (*See Figure 1*). Partners lead themes, and can join specific projects under each theme as opportunities for connection and collaboration linking to the Sustainable Development Goals (SDGs).

This chapter, facilitated by Western Sydney University, focuses on the creative community engagement methodologies that underpinned a large university-government-community research initiative in Western Sydney, New South Wales, Australia led by Professor Margaret Sommerville of the Centre for Educational Research (*Somerville, Brown and Kasbarian 2013*). Our Place Western Sydney used 'place' as a conceptual framework and employed a participatory-action research design to address the requirement by the NSW State Government to better understand how to activate community engagement in sustainability initiatives at a local level. The study did not commence with a single problem or issue to be addressed but allowed the community participants to generate their own solutions to their own identified challenges in looking after their local places.

The challenge of how to bring local community participants together through recruitment and communication strategies was a key step to the success of the study. Two innovative ESD approaches were employed to identify what local places mattered and how to facilitate environmental action. The first approach was storytelling with an artefact, and the second was Open Space Technology (OST). A total of 67 community educators and residents across three regions participated, leading to the generation of eight seed-funded projects. These projects created a 'ripple effect' and have grown into larger and more challenging intiatives over time. Holistic formal and informal sustainability education was identified as a common abiding need in assisting all levels of a community in looking after their local places. This chapter presents the findings and lessons learned by the research team from this research project, as well as its ripple effects.

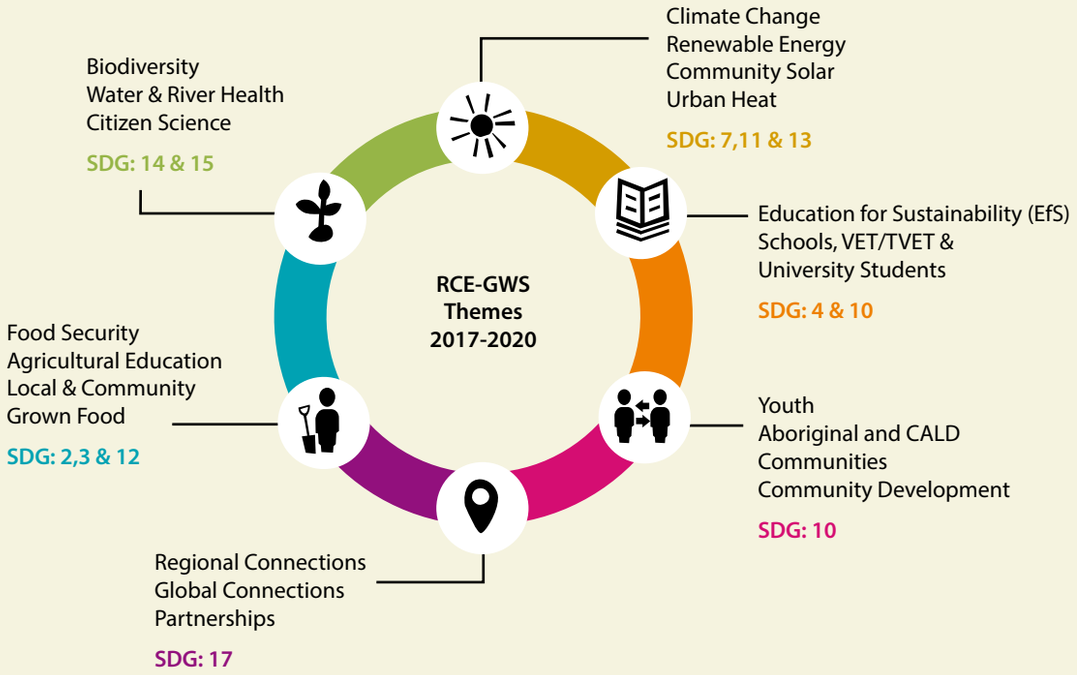

Figure 1: *RCE GWS Thematic Directions 2017-2020.*

Place as a Conceptual Framework for Sustainable Development

> *"Place … foregrounds a narrative of local and regional politics that is attuned to the particularities of where people actually live, and that is connected to global development trends that impact local places" (Gruenewald 2003, 3).*

RCE GWS covers 14 Local Government Areas (LGAs) in Greater Western Sydney, working with 'place' as a conceptual framework for its research programs. Place is productive as a framework because it creates a space between the grounded physical reality of landscapes or terrains and the metaphysical space of language, stories and other representations of place (*Somerville 2008*). This bridging of physical reality and representation has the potential to bring positivist paradigms from the physical sciences into conversation with post-positivist research in arts and social sciences (*ibid.*). Place is thus multi-dimensional, and includes human beings in relationship with non-human others and the material terrain of the environment. As an enlarged concept of place, it provides a link between local concerns and global issues. Place is thus a way to engage community members on an emotional and spiritual level (*Somerville, Brown and Kasbarian 2013*). Such connections are vital to the co-development of new understandings for more sustainable futures. These endeavours support progress at a grassroots level towards achieving the SDGs.

Partnerships for Collaboration

It is important to note that while this project was delivered in 2013, many of the collaborations and methodologies are still in place with RCE GWS, while new and re-developed projects are continuing to emerge as a result of this initiative. This type of approach to university-community engagement with multi-stakeholder partnerships supports the operationalisation of SDG 4 and SDG 17, namely,

Quality Education and Partnerships for the Goals. Below is a summary of the Our Place Western Sydney report submitted to State Government in 2013[1].

Our Place Western Sydney was a collaborative research project between the NSW State Government Office of Environment and Heritage (OEH), the university's Centre for Educational Research, and the RCE GWS network. In a NSW State Government restructure, OEH had moved from a state-based (governance) approach to a place-based (regional) approach in their planning and activities for environmental outcomes and impacts. The overarching issue in such a restructure was the need for the State Government to better understand regional opportunities and the challenges they present. The driving research question for the project therefore was: How can we facilitate members of the communities of Western Sydney to get involved in sustainability activities and in the protection of their natural environments? Funding for the project was provided by OEH over an 18-month period. The project design and methodology was developed and led by Professor Margaret Somerville at Western Sydney University's Centre for Educational Research (CER). The research team developed the action plan with OEH and RCE GWS and organised the consultation/forum processes. Seed funding for potential projects was built into the research design. All Western Sydney University research also adhered to a National Ethics Application Form clearance to ensure ethical conduct, privacy and data protection issues.

In keeping with the conceptual framework of place, defining target communities was based on the landscape or physical attributes of where people lived. This resulted in three clusters of targeted LGAs with similar sustainability challenges:

- Outer Western Sydney cluster (two LGAs) characterised by low population density, large areas of rural land, rivers, and access to national parks and wilderness
- Mid-Western Sydney cluster (three LGAs) characterised by medium population density, peri-urban development and new housing estates
- Inner Western Sydney (three LGAs) characterised by high population density, highly urbanised environments and smaller total land areas

A one-day community forum was planned within each of the clusters for the community members to share their experiences and ideas.

Recruitment and Communication

Recruitment of community members to participate in the community forums was central in engaging them to care for their local places. The recruitment used a collaborative approach between the project partners to identify appropriate organisations, groups and stakeholders in order to involve as many community members as possible. Those contacted included organisations and community groups both affiliated with and not affiliated with local environmental issues, as well as members of the general public. OEH and RCE GWS shared their contacts and mailing lists.

A variety of options was explored for initial recruitment, which differed in the three locations. Initial recruitment methods included social media postings, paid advertisements (local newspapers), email distribution lists, flyers posted on public noticeboards in community halls and shopping centres, and calls to personal/professional contacts.

[1] The full report can be downloaded here: *https://www.westernsydney.edu.au/__data/assets/pdf_file/0019/561403/Our_Place_Stage_2_web.pdf*

A follow-up email or phone call explained further details of the forum. Sixty-seven community educators and community residents participated in the three forums. The Outer West Forum attracted 27 local residents, the Inner West Forum was attended by 25 and the Mid-West Forum hosted 15 local participants. All were adult residents of the local community and 65% nominated an affiliation with an active community group/s or to their workplace within the region, or both. The recruitment process led to some useful generalisations about the recruitment and engagement of community members.

Sample Invitation to the Outer Western Sydney Community Forum.

Lessons Learned: The Importance of Place Specifics

One forum (Mid West) had to be redesigned when the initial recruitment approach garnered only two interested participants. The research team conducted interviews about this failure and learned that amalgamating three LGAs for this purpose was not going to work, as people were not willing to travel outside their local places. Consultation with local government educators in one selected LGA found a traditionally very low level of engagement with environmental sustainability activities, with no spontaneous initiatives outside council support.

The activities that were established were hard to sustain. Specific feedback and recommendations for the timing, duration, venue and possible recruitment strategies included limiting the forum to two hours instead of a whole day, conducting the event on a weeknight in conjunction with late-night shopping, holding the forum in a venue adjacent to the local shopping centre to make it convenient for participants, and personally contacting people from groups individually who were likely to discuss potential outcomes up front. The second recruitment method resulted in a successful community forum, with 15 community participants.

Lessons Learned: Established Networks Work

In all cases tapping into networks of people who are already connected was a crucial element of recruitment. The networks of community sustainability educators, whether paid or volunteers, were an important and vital part of the recruitment strategies. The reach of these networks varied according to population density; community members in the Outer West travelled some 50km to a forum across large LGAs. All other methods of recruitment (email distribution, advertisement in local papers, public flyers) resulted in a very small number of participants.

What Local Places Matter? Storytelling with Artefacts

The first section of each community forum was designed as a session for community members to explore what local places mattered to them, and to discuss in small groups their needs in looking after those places. Based on Somerville's work about place and place attachment, participants were encouraged to bring along an object that best represented their local place and to use this object to introduce themselves and their places. The discussion of identifying places was recorded and transcribed and the discussion about needs was scribed in note form. The strongest identification of places that matter emerged from those community members who brought objects along to tell the story of their places. The objects included a jar of clear river water, a block of Blue Mountains sandstone, pebbles from the Nepean River, bird feathers, autumn leaves from the street and a jar of dried eucalypt leaves painted with miniature Aboriginal symbols – among many others. Participants were highly animated when introducing their places through their objects, producing immediate and intense levels of connection and engagement.

Lessons Learned: Places That Matter

The places community members identified as important to them (some illustrated in the quotations that follow) fell into three broad categories, according to the distance from their home and the nature of the place:

- Local places such as backyards and workplaces
- Regional places such as bird and bush habitats and parks
- Global places and related planetary issues such as global warming and 'country', as understood in the Australian Aboriginal sense

"My mum was Aboriginal ...we try and show kids the understanding of the gum trees, and in this jar, some of the paintings through great Aboriginal people like Ellie [participant]. She paints things like turtles, which is a strong connection all the way back through Kings Tableland, through Woodford and Linden, over country into Faulconbridge. So there's this strong connection in country. So my desire is to see these places regenerated" (Our Place workshop participant).

Artefact: Painted leaves.

Artefact: River Water and Platypus Poster.

"Another thing that I found out recently that the riparian zone is extremely important to, is these little guys, [the] platypus. Now I know there was one caught a couple of years ago in Penrith in the channel that leads up to the sewerage works. I was talking to a guy at the club on Tuesday night and he said he saw one at Devlin's Lane not that long ago, so they are still here but we really need to get their riparian zone sorted, because without a good riparian zone they cannot form their burrows [and will] just keep moving on" (Our Place workshop participant).

"Hawkesbury region's very important for birds, native birds, because it contains their habitats of woodland and swampland. The woodland especially has a couple of endangered species – nationally endangered species – which are the Regent Honeyeater and Swift Parrot" (Our Place workshop participant).

Artefact: Feathers.

Lessons Learned: Needs

Community members interestingly identified which places need to be looked after as well as their personal or group needs for looking after the places that matter to them. The needs highlighted included skills development, capacity building, advocacy and external funding. Holistic, systemic sustainability education at all levels was expressed as a common need. This was seen as the best avenue for getting the message out to young people and to children who will take that message home. Integrating sustainability education in schools, TAFE (technical and further education institutions) and university linked to local history and heritage was viewed as being extremely important. Experiential activities in education were favoured and the need to meet people where they are, and accept slow change, were emphasised.

Leveraging Partnerships Using Open Space Technology

The second stage of the community forums was dedicated to developing collaborative projects using Open Space Technology (OST). OST was founded by Harrison Owen in 1983, and is suited to complex problems requiring engagement, innovation, problem-solving, creativity, and teamwork. The OST format is based on an amalgamation of traditional tribal and village knowledge from West Africa, North America and Asia (*Owen 1993*). The delivery of the OST methodology was provided by a trained OST facilitator employed as a project consultant. OST was appropriate to use in this instance, as there were no predetermined specific outcomes, but rather a need to co-create new collaborative approaches towards sustainable development initiatives.

At a minimum the methodology requires a circle of chairs, wall space for the emerging 'marketplace' of topics raised by participants, and spaces for break-out sessions. The delivery of OST follows the same process each time, and has four stages:

1) State the theme: local places and environmental sustainability.
2) Describe the process: introducing four principles and the law of two feet (explained below).
3) Create the bulletin board: interested participants pitch ideas.
4) Open the market place: consolidate ideas and ask others to join.

The four principles of OST are very clear and simple:

1) Whoever comes are the right people.
2) Whatever happens is the only thing that could have at this time.
3) Whenever it starts is the right time.
4) When it is over, it is over.

The 'Law of Two Feet' frees participants to make decisions about whether to join groups or not, on the grounds that: "If you find yourself in a place where you are neither learning nor contributing – move to a place where you can." (*Owen 1983*).
The process of OST facilitated community members coming together to strengthen already established networks and to form new connections. This was a significant outcome for the participants and the research team. The process of the collaborative project formation was a magic moment of transformation, from individual initiatives to collective and collaborative group projects. Ongoing support was required for collaborative project development after the process at the forum, including assistance for community members to complete the simple project template, develop a budget, and apply for funding. The projects that were funded took longer in their development and implementation than was imagined at the outset.

Participants discussing the ideas posted on the bulletin board.

Particpants in all the forums responded enthusiastically, generating over 40 project ideas (see Box 1).

The research team consolidated these ideas and were able to seed fund a number of place-based projects.

Examples of ideas resulting from the OST forums:

- Develop community groups (landcare) and community days (incorporating the arts)
- Improve the involvement of schoolchildren (e.g. through adventure conservation)
- Build research capacity
- Improve communication
- Create connections within the community
- Educate and inspire residents about sustainable living (through cooking workshops, healthy living, and reducing food waste)
- Identify ways to attract volunteers and building Culturally and Linguistically Diverse (CALD) involvement
- Develop resources and material for early childhood educators

Place-based projects consolidated by the UWS research team on the basis of ideas generated at the forums:

- Maintenance and restoration of the Florabella Pass Track
- Simply Living Demonstration Festival 'Ensuring that the Wisdom is Not Lost'
- From ideas market to marketable ideas: Our Place GWS Grant-Sourcing Project
- Emu Green Riparian Regeneration
- Mamre Farm Seed Bank Project
- Our Community is Connecting: 'You're the Voice'
- Community Gardens: Connecting through Cooking Demonstrations
- Priority Conservation Wetland Monitoring

Box 1: *Examples of ideas resulting from the OST forums and place-based projects consolidated by the UWS research team.*

The Ripple Effect

> *"Place is such a multi-faceted jewel. There's so many aspects to it and there's such a web of interactions around place. So it's never just going to be a simple thing. It's quite rich." (Our Place Community Participant)*

The legacy of this initiative is substantial, generating a 'ripple effect' of ongoing engagements that range from small, single events to large, new, externally funded research projects, to student placements and internships, and in one case, to the creation of a part-time job. The connections with RCE GWS were strengthened because some of the project discussions initiated in the forums have developed into different forms, depending on the availability of people and funding. A 'Love Your Lagoons' proposal initiated at the first forum morphed into a larger project to connect schools with local wetlands in the South-Western Sydney area funded through the Environment Protection Authority (2013–2014: $150,000 AUD). A further Our Place Program with CALD Communities was also funded (2015–2016: $25,000 AUD).

Final Reflections

The Our Place Western Sydney program demonstrated how universities, communities, and government can work together at a local level using 'place' as a framework for engendering local place attachment. This framework was replicated in two other regions in the state: the Murray Darling and Upper Hunter. The applicability of the framework is relevant for situations where an understanding exists that participatory methodologies require researchers and government agencies to allow responses – and sometimes more questions – to originate from community participants. This requires setting aside academic and managerial expertise and management oversight to work with open-ended processes, open-ended questions and uncertainty. The results are rich, rewarding and sometimes unexpected. Critical to the success of the project was the state government's willingness to embrace policy options based on local and regional jurisdictions.

Key recommendations for replicating this initiative include:

- Making local connections to community advocates and activists to engage community
- Using creative strategies such as stories and objects to express place attachment
- Offering everyone the opportunity to speak about their place
- Co-ordinating through a process such as OST with an experienced facilitator
- Offering a specific focused and supported outcome in terms of resources for practical implementation

Our Place Western Sydney identified that systemic, holistic sustainability education for all ages and at all levels was the one common and abiding need in terms of looking after local places. Community members expressed a resounding confidence and faith in young people as well as in the belief that by reaching them and instilling a love of the environment, they will continue this love and care for place into their adult life. This finding highlights the critical role that quality education (SDG 4) and partnerships (SDG 17) play in advancing the SDGs.

Western Sydney University is a signatory to the SDGs and the university support for the Regional Centre for Expertise on Education for Sustainable Development (RCE) is a crucial component of its functioning. However, the example provided in this chapter is only one of the many through which the network and profile of the RCE enhances the curriculum and enriches the student experience in higher education. The Our Place project has demonstrated that sustainability learning works best when there are opportunities for practices of networking, creating connections and collaborations with community members and developing collective responses to local environmental challenges. Sustainability learning offers the possibility of an engaged curriculum and a useful strategy for creating work-ready students in a variety of fields. It is proposed that similar benefits could be gained by other educational institutions, including schools and vocational-education providers, where community engagement becomes not just a buzz word but a powerful way of forming reciprocal processes of learning and caring for local places.


Doug Ford, Flickr

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Lu Wan and Lucy Binfield

Chapter 6

Participatory Approaches in Promoting Sustainable Communities through Education in China

Summary

ESD Innovation

Empowerment, capacity-building and social learning are the key-words in describing core strategy for NGO's ESD activities in China. This chapter provides two examples of the holistic ESD approach, one in the formal education setting and the other at the level of a single community. Schools, community centres and other locally managed units, including the community itself, form the main agents of change. Projects are tailored to the needs of the community, whose members are engaged right from the planning stage. Issues relating to community development or welfare, brought up by the community members, are discussed in participatory meetings. Local culture and traditions are re-discovered and re-packaged, then integrated into learning and action.

Societal Transformation

With continuing capacity-building and the involvement of many community members, new leadership on sustainable development is developed within the community and grows during the projects. The first example has had a wide-ranging impact on national environmental education, affecting hundreds of thousands of students and building the capacity of many schools and teachers to reach out into the community and work to make changes in their environment. In the second example, the impact in the community has been considerable, with community members becoming empowered to stand up for their community, have their voices heard, and make informed decisions to pursue development while protecting their natural resources.

Implications of Development for Knowledge Institutions

The NGO – Shangri-la Institute for Sustainable Communities (SISC) provides support in terms of funding, learning opportunities and also platforms for project participants to present their project and communicate with their counterparts in different regions. An important result is the expanded knowledge transfer between communities, and from communities and project participants to higher-level knowledge institutions, wherein local experiences of ESD learning are disseminated, such as through the Global RCE network and the Waterschool China Program.

Shangri-la Institute's Approach Towards Sustainability in Education

The Shangri-la Institute for Sustainable Communities (SISC) is an independent NGO working towards ESD in China. The goal of SISC is to promote the sustainable development of communities through social learning and empowerment in both formal education (the school system), and informal/non-formal education (community-centred lifelong learning that happens outside the school learning system) (*SISC 2011a*).

In modern China, the industrial development model has led to environmental degradation and inequality, and these issues are becoming larger and more complex as the country develops. Under this threat, Scientific Outlook on Development (*GOC 2003*), one of the guiding principles of the Chinese government that centres on development, calls for putting people first and changing the current development model into one that is more comprehensive, coordinated and sustainable. A great effort is being made towards this goal in all fields of science, policymaking, academia and civil society. Advocacy and campaigns appear regularly in the national and local media, but the negative impacts of development continue to accumulate. Collective learning and action by the whole society is called for in order to make transformative changes in thinking and development practices.

SISC's programmes have been designed to respond to this reality. Although officially registered in 2007, SISC's roots can be traced to Diqing Tibetan Autonomous Prefecture where key staff members started their work on nature conservation and community development projects in 1996. SISC has accumulated 20 years of experience in working to promote ESD in China, in both formal and non-formal educational settings, by supporting projects that empower schools and local communities to engage in sustainable development (*SISC 2011b*).

As Thomas (*1992, 145*) pointed out, "... while NGOs can conduct grass-roots projects aimed at empowerment, they cannot be multiplied to give a simple alternative 'NGO approach' to development. ... [Because] a general model for development needs to go beyond the actions of NGOs alone to include the place of NGOs in public action in relation to other development agents, particularly the state." SISC also realises that programmes targeting only a few specific communities cannot have an impact in the development field overall. To promote learning and action for sustainable development throughout Chinese society, SISC works in equitable partnerships with village communities, schools, enterprises, government departments, monasteries, other NGOs, academics, and professionals in the fields of environment, development and education.

Based on SISC's years of cumulative experience working in China, empowerment, capacity-building and social learning form its three core strategies, which can be found in every SISC initiative in different ways. Empowerment enables people to become effective participants in achieving sustainability through enhancing their knowledge, skills and values for sustainable development at the individual and community level. It applies to primary and secondary school students, in-service schoolteachers, villagers, schools and community organisations as well as the wider community, especially those particularly interested in sustainability and environmental protection, who may become 'pioneers' of ESD through this process. For capacity-building[1] SISC maintains regional

[1] Capacity-building, which is included in empowerment in SISC's narrative, is analysed here separately to identify the processes within the implementation structure that ensure the efficiency and quality of project implementation.

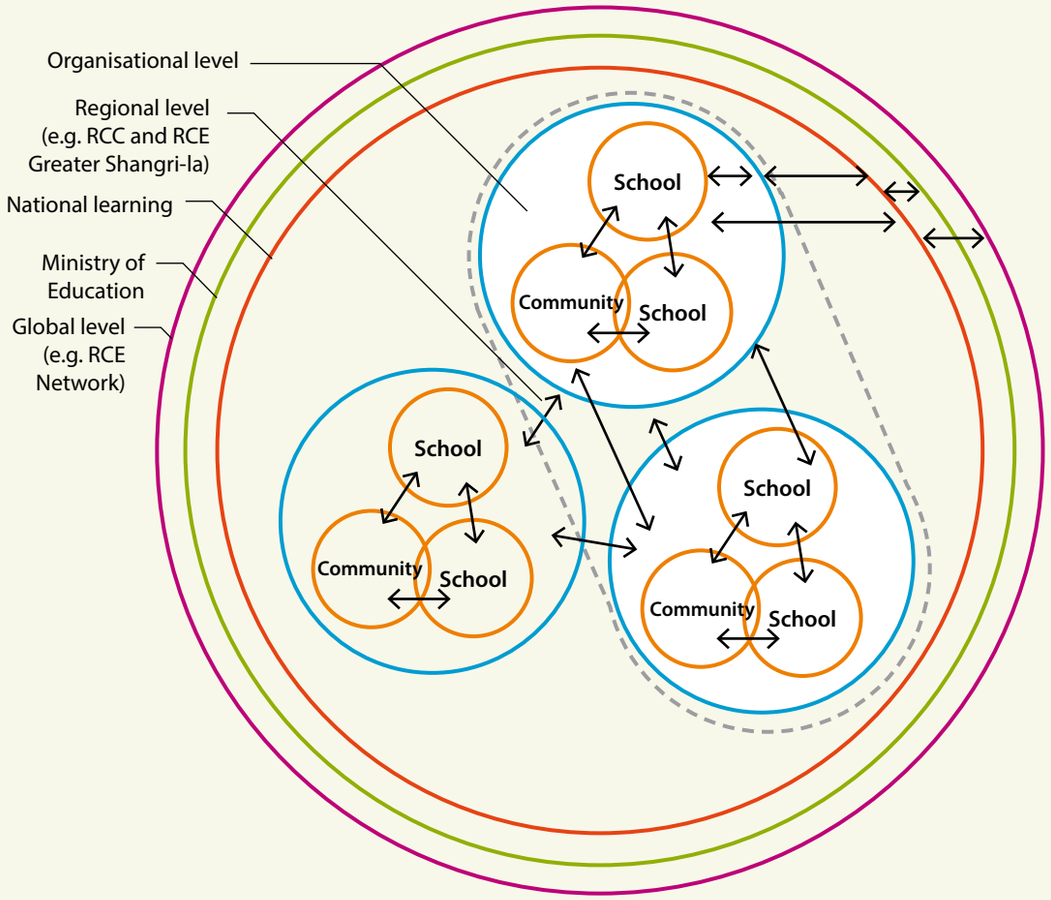

Figure 1: *Levels of social learning and interaction.*

project coordination centres at teacher training universities across China. It also entails training, support and relationship maintenance with school and community leadership teams. Social Learning refers to a mechanism through which: (1) Learning and experiences from practices in diverse contexts and levels are shared and critically reflected upon among broader communities via publicity materials, regional and national training workshops, conferences and regular online and offline experience sharing; (2) Good ESD practices of SISC's empowerment and capacity-building work are captured in reports and media; and (3) Understanding among people of different cultures, beliefs and lifestyles is facilitated through the exchange of ideas and experiences both in person and at regular conferences, workshops, visits and meetings, and through online dialogue between individuals and groups, leading to the development of friendships and working relationships over many years. This also involves recognising, re-discovering and cultivating aspects of indigenous knowledge and culture that contribute to sustainable ways of living, and presenting these in visible ways to share with the community and with outsiders.

These three strategies work in an interdependent way, enhancing each other, and form SISC's innovative approach to promoting ESD. The social learning perspective enables SISC to work within a multi-level action framework (*Figure 1*) where both empowerment and capacity-building have critical roles to play. This framework has established a viable channel for knowledge sharing and dialogue at different levels, from local to global. At the local level, individuals, organisations and communities are the target audience for SISC's work on empowerment. SISC believes that equitable and sustainable development starts at the local level. This development necessarily depends on local people, who have a deep psychological link with their place of residence, an in-depth understanding of its specific development needs and a willingness to actively explore ways of attaining sustainable development.

Capacity-building works at both the local and regional level. It is not only for community leaders, but also for teams at other core institutions that promote change at the local and regional level, such as Regional Coordination Centres (RCCs), schools and grass-roots NGOs. At the national and global levels, facilitating cooperation with national departments and international agencies is a key responsibility of SISC, including cooperation with higher-level organisations such as the People's Education Press (PEP), the Ministry of Education (MoE), the United Nations University Institute for the Advanced Study of Sustainability (UNU-IAS), and the International Union for Conservation of Nature (IUCN).

In 2012, SISC collaborated with community organisations, local government departments, businesses, vocational colleges and teacher training colleges in south-western China to join the United Nations University's global network of Regional Centres of Expertise on Education for Sustainable Development (RCEs). Together they founded RCE Greater Shangri-la, which now acts as a platform to engage key stakeholders in the learning and action process of ESD. The RCE plays an important role in promoting cross-regional cooperation (between Tibet, Yunnan and Northern Sichuan – the dotted circle in *Figure 1*), and also in communicating local ESD experiences to the global community (purple circle in *Figure 1*).

The following case studies introduce the application of SISC's approach with respect to two very different contexts, and outline the successes achieved and challenges faced during this process. The first case provides an example of how the SISC approach has been applied to a programme targeting formal education: how this programme has engaged and motivated universities, schools, grass-roots NGOs and government departments of different regions to work together to explore the theme of sustainable development, and the impact that this programme has had on the formal education sector. The second case recounts a series of gradual changes on a micro-scale that occurred in one particular community with the help of SISC. From this case it is possible to track how the entire community has been empowered to protect their local environment and cultural traditions, embodying the principals of sustainable development.

Reorienting Formal Education on a National Scale: The Waterschool China Programme

SISC's Approach as Applied to the Waterschool China Programme

The Waterschool China Programme seeks to educate young citizens and engage communities throughout China in ways that enable them to become active participants in sustainable water resource management. From its origins in the Yangtze River basin in 2008, the Programme now extends to four river basins across China, and has reached 173,000 students through the formal education system. The Programme engages and supports 100 primary and secondary schools

from 12 regions across China, as well as many communities and organisations in selected watersheds to educate students and community members to be aware of, and concerned about the condition of their local river and its tributaries. It also seeks to empower them to take action to improve the ecological integrity of their watershed and the sustainability of their communities (the photo below shows one such watershed in Sichuan).

The Programme works in five key areas: Teacher training, school activities, community action, resource development, and linking and learning at the national and international levels.

The SISC approach is applied in the management structure of the Programme. Project teams at different levels have been established and developed through individual and institutional capacity-building. At the local level (orange circles in *Figure 1*), school leadership teams in the project schools initiate and implement ESD in the form of in-class activities, fieldwork, publicity and after-school clubs. At the regional level (blue circles in *Figure 1*), schools and communities share and reflect on their learning from local educational practices through regular exchange meetings, and participatory workshops facilitated by the RCC and SISC staff. Through this process, suggestions for local problems to be addressed are collected and submitted to the regional authorities; following this a regional network is built among project sites and other educational agencies. Based on this work at the local and regional levels, a national-level learning platform is created (red circle in *Figure 1*) and nurtured by SISC.

The learning platform is designed to: facilitate information sharing among schools, communities and RCCs through annual seminars; to collate and publish regional educational resources developed by schools with the help of the PEP; to organise knowledge and expertise from local, regional and national levels to influence policies by working with the Ministry of Education on China's Education Reforms (green circle in *Figure 1*); and to collect examples of good practices together with traditional wisdom and lifestyles to contribute to global ESD theory and practice, through international education and conservation networks like the RCE Network, Earth Charter and IUCN (purple circle in *Figure 1*).

Mianyang Waterschool.

Waterschool students interact with the community in Baiyang Primary School.

Collective Actions to Reduce River Pollution

Each participating school in the Programme selected a tributary or stretch of river to explore its social, cultural and environmental context. Through investigation and research, students identified and explored water-related problems in their local communities. Following the research phase, the students of each school carried out community-service activities, aiming to 'solve' the problems. Activities included cleaning the river, tree planting, and information campaigns based on their research (the photo above shows students working on a publicity campaign). In this case, the community acted as a learning resource for the students, and the schools provided research results and service in return.

This approach has resulted in progress across many project sites. One example is the action of rural project schools located along tributaries of the Jianling River in Mianyang, Sichuan Province. The project schools carried out in-community action and information campaigns, successfully changing the community's waste management behaviour – ridding them of their former practice of disposing of household waste into the river, and supported the village administration to establish its first ever garbage disposal system which is still in place without continued input from project teachers or SISC staff.

Students of Baiyang Primary School, a rural school with students hailing from the surrounding villages,

launched this initiative. Under the guidance of SISC, the school first initiated its own water education project, focussing on water resource education both in class and outside through investigations, research and fieldwork. Throughout this process, students found that household garbage was being thrown into the river, because in the absence of a waste management mechanism, the villagers did not have an alternative. Seeing this problem as an opportunity to explore the local context further, teachers designed a series of in-class and fieldwork activities related to this topic. Students were also assigned homework in which they had to work with other family members, such as interviewing their grandparents about their memories of the river, and collating the opinions and suggestions of other family members about the village's waste management problems. In parallel with in-class curriculum changes such as themed classes, various publicity activities were also carried out. Over time, this set of activities caught the attention of the local authorities. A carefully managed relationship eventually allowed meetings to be held between schoolchildren and representatives of the village committee. During these meetings the children presented committee members with the information they had collected and put forward their ideas for changes in the village. As a direct result of this interaction, garbage bins were purchased by the village committee and placed at locations suggested by the villagers. A mechanism to collect and transport the garbage to a waste disposal plant was also developed. As a result, the water in the river passing close to Baiyang Primary School is now a fast-flowing river free of garbage, much to the delight of the school children and their teachers.

Waterschool student shows her art.

The process, which provided both students and community members with opportunities to learn and discuss local issues, proved to be an important tool for local environmental governance. Although the schools mainly initiated the action, community members were involved at many stages, giving them the right to feel proud of their achievement. In later stages, the Waterschool RCC for the area (established at Mianyang Teachers College) used this case with the municipal Environmental Protection Bureau and the Education Bureau of Mianyang to get funding to support a similar project in 18 other villages of Mianyang located in the Jialing River Basin.

A key development in this initiative was the participation of the local government as an active stakeholder. It gave funds and support to this programme thereby making it a true example of multi-stakeholder engagement that is so essential for progress at the local level. The mechanism for garbage management has been taken up by other villages in the area – even communities without a direct link to the Waterschool Programme benefitted from the experience sharing, learning and action of the participating schools.

Although SISC's approach may not directly lead the 'learners' to solve all the problems themselves (for example, when threats to sustainable development are from higher authorities or outside enterprises), it still provides a successful and essential model to reach out to local people, discover local problems and create opportunities for local communities to get involved and learn from the problem-solving process. It could be helpful to bear in mind Fien's (*1993, 2-3*) "social critical approach", under which "school and society reflect one another; school may help in overcoming social inequities and preparing students for participation in social, political, economic and environmental activities, with a stress on socially, morally and politically justifiable conflict resolution."

Reflections on the Programme

Through years of practice in and exploration of ESD, SISC has made great progress but has also experienced challenges as an NGO working to pursue ESD. These challenges have specifically been in the form of:

1) Tension between diverse local knowledge and needs, and global knowledge and actions;
2) Tension between the need to build partnerships with a wide range of development agents, particularly state-owned agencies, and the need to critically understand the power structure that influences development issues and to promote changes so that the existing structure can better support sustainability.

The concept of 'think globally, act locally' could be mistranslated into an over-emphasis on applying global or national knowledge and skills to the local context. This may cause erosion of indigenous knowledge and hide the root causes of local problems, giving rise to the first challenge listed above. This raises the questions: How involved should national or international NGOs be at the local level when attempting to tackle local problems? To what extent can 'outside' expertise be applicable to individual communities?

In the Waterschool China Programme, for example, with 100 project schools located in rural and urban areas in 12 different regions, each local community and school is located in a distinct environmental, societal and cultural context, with their problems varying widely. General information campaigns and 'global thinking' therefore would not necessarily lead to collective local action, for it may tend to make the issue abstract and disconnected from local problems (*Esteva and Prakash 1994*). For this reason, project teachers are encouraged in teacher training events to design activities with their local watershed in mind. Teachers are taught to think creatively about the specific needs of their watershed and about activities that the students and communities would most benefit from.

Requests are often received from school teachers for practical handbooks that they could use directly in their work to develop school implementation programmes. There is tension between the need to support these teachers and the aforementioned need to give them freedom to explore the specific contexts and problems faced by local communities. In response to these requests, however, the programme has developed three kinds of educational resources for school teachers on water education: (1) An Activity Pack – a collection of ESD classroom and outdoor activities; (2) a Regional Locality Pack – a resource book detailing the regional environmental, social, historical and cultural background; and (3) a Technical Book – a resource book providing philosophy, background information, guiding principles and good practices in ESD on water issues.

To avoid the risk of global, national or even regional thinking misdirecting learning and action, leading it away from community reality and needs,

and marginalising indigenous knowledge and traditional practices, the following suggestions were taken into account when developing handbooks and guidelines:

1) Region-specific Locality Books should leave space and allow flexibility for school teachers to create their own curricula focusing on the local context and problems, and should provide best practices on the development of school-based curricula.
2) Activity Packs should be collections of best practices for developing and adapting activities to the local context.
3) Guiding Principles should be open to frequent revision, based on reflection by both users and planners.

Education for Sustainable Development (ESD) needs to be developed to promote changes at the individual, institutional and societal levels. In many cases, the theory behind ESD encourages changes in the existing power structure comprising institutions such as local government authorities and the Ministry of Education. This institutional structure can often be seen as creating obstacles to sustainability and development. In practice, an NGO needs to work in partnership with the public sector in order to be effective, rather than exclusively taking a critical role outside the existing structure. The support and resources from these institutions to promote local and regional actions towards sustainable development are integral to the success of these actions, and direct criticisms of the deficiencies of the institutional structures would thus be counterproductive. NGO activities can however still have positive influences on the structure through working with these institutions. Building relationships through partnerships with individuals and departments within institutions which share some of the values embedded in ESD practice, presenting to them successful cases as examples, and building communication channels between local authorities and local environmental activists to bring in new perspectives, can all be utilised. This 'bottom up' strategy will not always result in structural or policy changes but it will create more opportunities for further and deeper changes.

Another institutional power structure that is crucial to the success of the Waterschool China Programme is that of the participating schools and colleges. Usually, the attitudes of key individuals, such as school headmasters or college presidents, determine the motivation level of the teachers and the level of support from the school, starting of course with whether the project is allowed to proceed at all. Furthermore, the specific agendas of the schools and colleges themselves determine why they participate in the programme. For example, some schools were attracted by the innovative teaching approaches introduced by the programme, while others joined to develop their own curricula under a requirement set by the Ministry of Education. Various agendas create differences between participating schools and colleges; there are also risks that the latent or secondary objectives of each school might clash with the effectiveness or even the basic principles of the programme, thus affecting progress towards the achievement of the programme objectives. Therefore, in order to ensure sustainable ESD learning and action within an institution, project teachers and regional centre coordinators need to act as active agents to facilitate institutional change and create an enabling environment for ESD.

In working towards this goal, the capacity-building of teachers, coordinators and project facilitators is given a central role in regional and national teacher training and experience sharing workshops. Participation skills as well as knowledge and concepts of micro-policy are introduced in the teacher training workshops. Alongside this, successful cases are presented which outline how the attitudes and understanding of managers inside the school have been influenced and changed. These case studies outline the journey from seeing the Waterschool China project as a separate, discrete task to be completed, to understanding that ESD can be integrated into every aspect of the whole school's development, thus creating more opportunities for the school. A wide group of potential and current participants are introduced to resources such as these.

Fieldwork with teachers.

Community Engagement and Knowledge Co-development in Bazhu Village

Context for Stronger Community Engagement in Bazhu Village

SISC staff members started working with Bazhu village in 2003, when most of the villagers earned their entire income from subsistence farming, buying only a few necessities such as rice, which could not grow on the steep, high slopes. As seen in other small villages in China, local culture was in decline as young people left to seek work in larger towns, and globalisation had reached the village boundaries, bringing material luxuries but also leading to the inevitable loss of valuable local traditions and culture. Bazhu Village Primary School, the only school in the village, had a low enrolment rate and some of its objectives were not in line with the community's needs. For example, Tibetan language or culture was not taught in the school – most villagers in Bazhu are ethnically Tibetan and speak a local Tibetan dialect in addition to Mandarin Chinese, although people from other ethnicities have joined the community over the years.

A lack of communication among the village leaders, the village administration and the local and provincial government made the villagers feel helpless in making their ideas or concerns be heard. Environmental problems such as waste management and water pollution were increasing. The villagers were aware of these problems but lacked the skills, resources and a platform to act decisively towards solving them.

SISC had been working in the communities adjacent to Bazhu for several years. Members of the Bazhu community had heard about the training sessions, activities, and that this valuable training

Bazhu villagers and solar water heaters.

Bazhu villagers observe Tibetan customs.

was accessible for free. Information about these sessions travelled orally. What led to the start of a relationship between SISC staff and Bazhu villagers was a bird-watching session that many villagers had attended and enjoyed. As the relationship with the community members grew stronger, SISC staff realised that Bazhu village was an appropriate place to develop projects based on ESD. This was especially due to the passion and activism of the villagers attending the workshops and other factors such as the fact that Bazhu villagers are mainly devout followers of Tibetan Buddhism and follow many traditional practices (in the photo on the opposite page, villagers can be seen observing traditional mourning rites). Despite extensive deforestation in the area, 80% of Bazhu's land remains covered by forest due to the community's strong traditional belief of living in harmony with the land. The villagers had also benefitted from the strong leadership of a village head during the 1990s that revolutionised village opinion on environmental and development issues. When logging companies sponsored the construction of a motorable road up to the village, the village head saw an opportunity to bring positive development to the village without having to succumb to outside control and destructive development resulting from logging companies destroying the local forest. Upon completion of the road, the influential leader led a successful campaign to stop the loggers from taking over forest land in the village. This bold move provided an important precedent for community action. Despite these moves to ensure the village's autonomy, the threat from outside loggers or special interest groups still remained, and the villagers felt their situation was precarious.

Putting the SISC Approach into Participatory Decision-Making and Action

Once partnerships were established between SISC and interested villagers, SISC implemented their three-pronged approach. Each element was tailored towards the local context and sensitive to issues important to the villagers. The process of empowerment, embodied here by the building of a Community Learning Centre (CLC) and by the election of coordinators responsible for the daily operation of the centre and for liaison with the village committee, was essential to give the villagers a voice and build an environment in which they felt able to make changes in the village. Capacity-building, in the form of training workshops, relationship maintenance and funding support, gave the villagers the skills and resources to carry out their own projects. Social Learning in the context of Bazhu refers to the process of collecting examples of ESD good practice and of traditional culture supporting sustainability. These case studies are valuable not just for the Bazhu villagers; they can be translated to other projects carried out by SISC and also inform projects on a global scale.

An open, democratic environment was developed to ensure full participation of community members. The construction of a CLC in the village, with funds and support from SISC, was the key mechanism to involve community members. The Centre was constructed using local materials and labour, just metres away from the village's administrative centre, and is owned and managed by the village community itself. The CLC is the focal point for learning and knowledge transfer at the individual and community level.

The Centre provides a neutral meeting place for local women's groups, senior citizens' groups, computer club, an all-women forest patrol team and children's holiday homework clubs. The CLC is a place for stakeholder engagement, non-formal learning and experience sharing. It is also a place for collecting and collating local contextual knowledge, values and skills including traditional practices and indigenous knowledge. Not only should such valuable information be preserved, documented and passed on as part of the community's cultural heritage, but also used in approaches and practices for sustainable development. Since its

The Bazhu village women's patrol team.

construction, training sessions managed by SISC, the Bazhu Committee and supported by a range of different funding bodies, are conducted on a variety of topics. These include sustainable land use, sustainable water management, organic farming and processing methods, renewable energy use, local language tuition, financial management, project management, eco-tourism, cultural revitalisation, environmental protection, health care and handicrafts training.

Through relationships with a range of schools, universities and community institutions, shared learning is occurring between the formal, non-formal and informal sectors. By linking with formal education, the CLC has also contributed to increased enrolment in the school and engagement with compulsory education. Through raising awareness about the importance of education and joint activities on environment protection, with an emphasis on place-based learning connected to the local culture and indigenous knowledge, the content and style of teaching at the primary school has become more relevant and 'valuable' to the local community. The CLC played a key role in the incorporation of ESD and Tibetan language classes into the school curriculum. The local primary school has been incorporated into the Waterschool China Programme. This gives students access to resources and information to become agents of change by taking on the mission of cleaning the local water systems and creating awareness among their families and the community on why and how to protect waterways and the local environment.

To ensure the participation of villagers in decision-making processes, a Community Management Committee was elected by the community. Villagers, including women and children (who had previously not been involved in decision-making processes) participated in the formation of a five-year development plan for the village. The Community Management Committee, made up of nine elected members from the community of whom three were full-time members, represents the community in decision-making processes at the township, county and prefecture level. Elected members have been able to increasingly support the community as their own capacity has increased. Community decisions shaped the learning process from the very start, from the kind of training the villagers are interested in, to the kind of relationship that the villagers should have with outside entities. Committee members have become 'like brothers' to SISC staff (according to one SISC manager), and a stable relationship enables them to maintain an honest and open dialogue. The selection, training and empowerment process of the committee members is an important part of the mechanism for ensuring effective community knowledge transfer.

Care has been taken to improve the role of women in Bazhu village, who traditionally have been denied a voice in village decision-making. Since 2001, SISC have been providing support to the 21-strong all-women forest patrol team formed in the village in response to the threat of forest destruction from both external and internal forces. The women are elected from each of the 21 groups in the village, ensuring a wide representation. They have been instrumental in improving the ecological state of the Bazhu forest, and have overcome many obstacles such as conflicts between team members, confusion about the complicated boundaries of the Bazhu forest area, poor forest management by the villagers, and threats from logging companies. These women have risen to take a leadership role in the community and act as role models, especially for other women. Significantly, although they have received training in leadership skills, health and other topics, the knowledge they use to protect the forest is drawn mainly from local traditions and experience. They have thus become an inspiring example of the power of local indigenous knowledge and the community in sustainable development. They take full advantage of the CLC as a base to cement social bonds, make decisions and receive training, but do not accept the leadership of any outsiders. The training and empowerment from the ESD projects in the village have given these resolute women the confidence and stability to work closely with local police and village administration to ensure that poachers and loggers do not invade the local forest.

Main Results and Challenges

The Village Committee members, supported by SISC, identify problems through a democratic process and aim to find environmentally and socially just solutions for these problems. Sometimes they enlist the help of local experts and visiting researchers in seeking solutions. Communicating the resolutions to the rest of the villagers is a challenge, but the answer, according to the committee members themselves, is to engage with them, demonstrate the effectiveness or sense of the plans without resorting to punitive or coercive measures. An example of explaining localised solutions through local methods relates to the Matsutake mushroom. An extensive research project had been under way in the nearby Baima Xueshan Nature Reserve, combining local knowledge and input from visiting scientific researchers, on the problems associated with overpicking of a local high-value mushroom found in the forest. The Matsutake mushroom is one of China's most highly valued crops and represents a key source of income for many villagers. The committee members knew the yield of this mushroom had been declining in the Bazhu area for some years. When they heard of the project, they invited the researchers, who had also built up a close partnership with SISC staff, to give a presentation on their research findings. Knowing that this would not be enough to fully convince the community members to alter their foraging habits, the committee set up their own demonstration plot, with support from SISC and input from the staff of the nature reserve. Careful monitoring of the mushrooms growing in the plot would prove definitively the techniques advocated by the nature reserve staff were effective. In this way, local knowledge, expert researchers and good communication were combined to teach the community a wise and sensible course of action to increase income from the mushroom crop and protect the local environment. The Bazhu Committee and SISC staff acted as a bridge between the outside world and the village.

Biologists and environmental experts have worked alongside villagers to survey and document the different plant and animal species in Bazhu forest. A socio-economic survey was also conducted through the joint efforts of outside professionals and local communities. Experts in modern natural and social sciences and technologies provide training to enhance the local community's understanding of their physical, social and economic environment, for example, training in local biodiversity or in the use of renewable energy. This is combined with the community's respect for sacred mountains and lakes, and with indigenous knowledge and traditional practices of preserving local cultural and natural heritage. This amalgamation of traditional local knowledge and modern academic knowledge has led to a range of environmentally-friendly solutions to the problems faced by the community, who are active participants in their own empowerment and social learning. The topics of the training sessions include: organic farming and food processing methods, composting toilets, locally based eco-tourism, energy-saving stove production, solar heating, biogas, and eco-green houses. Where possible, the training is delivered in the local dialect, with translators on hand to ensure each member of the community, even the most vulnerable, can gain access to the resources offered. Collaboration with the local government has resulted in a scheme to provide households, even the poorest, with solar water heaters, at a very low cost. Collaborations such as this increase trust and cooperation between SISC and the local government, and ensure participation in environmental action from every household.

Sometimes, problems arise whereby the village community is not in complete agreement. The committee members are proud of their tradition of allowing open discussion, and employ careful strategies of communication and explanation to find out how best to meet the needs of those who think that the solution is not the best one. For example, road construction in recent years has hindered the movement of garbage trucks to the village. The community has been struggling to reach an agreement on the best course of action to deal with its garbage, with various different factions suggesting a payment system with village members contributing towards a private van to take the garbage down the valley, others suggesting burning the garbage, and still others advocating further pressure to be placed on the local government to find a solution. However, those who have most vehemently disagreed with the chosen waste management plan will generally attend every meeting.

The Community Integrated Nature Reserve is a concept demonstrated in Bazhu Village, of a new type of nature reserve, an area completely owned and managed by the community. The Bazhu Community Nature Reserve development project is a demonstration of how local communities, rooted in their natural environment and cultural traditions, and empowered through a process of collective learning and action, can improve all aspects of their lives and contribute to the development of a sustainable future economically, environmentally and culturally. For this concept to be effective, the whole community needs to be active and engaged in protecting and developing their ecosystem. The capacity for this type of engagement has been increasing over recent years, with stronger bonds between village administrators, local police, higher-level government and village leaders.

The success or failure of the community in the future hangs in a precarious balance, with continued threats from the outside. For example, lack of high school education opportunities in the village mean young people inevitably spend time away from home at key points in their development. It remains to be seen whether these young people will be as invested in the cultural and sustainable development of the village. As with other rural areas in China, economic pressures and sweeping cultural changes associated with globalisation put the sustainable development of the community at high risk.

Conclusions

Sustainable Development is a systematic process requiring transformative change towards a new whole-society paradigm. Developed via SISC's years of exploration in ESD, the approach described here could provide a reliable framework to achieve sustainability through education using three core strategies: empowerment, capacity-building, and social learning. Any attempt at using education to achieve changes towards sustainability could be placed in this framework, whether change has to occur in a community or school, or at the regional or even national level. The two examples described here show how the processes of empowerment and capacity-building have been used to build an environment in which social learning and other processes such as knowledge sharing and activism can take root, expand into the wider community, and have an impact beyond the classroom or learning session.

In the nationwide Waterschool China Programme, which works within the formal education system, the specific approach outlined here refers to balancing the needs of the different stakeholders at different levels. SISC acted as a facilitator and helped provide an experience-sharing platform for stakeholder management. The learning process and the platform offered opportunities and support to students, schools and teacher training institutions (regional coordination centres) to act as agents of change at different levels. A close look at specific schools and communities that have worked with Waterschool China provides many valuable lessons about local schools working with communities to bring transformational changes to a village or even a city using this approach. As in the garbage management project in Mianyang, the key to success is to find common ground for the agendas of the various stakeholders, and work together. Using nature and the environment as a link between schools and local communities has proved very useful in promoting public participation for a common goal. Through the learning process and through their successes and progress, both groups developed a sense of pride in the community. By understanding the challenges inherent in this program, responses to these problems were tailored for different situations and levels.

The same approach is seen on a much smaller scale in the second case study, where through a slow and careful building of key relationships, real change has been achieved. The Bazhu community provides a successful case of environment and development projects in a local community using global concepts from ESD theory and scientific research. The unique characteristics of the Bazhu village community could be preserved in the face of social change driven by urbanisation and globalisation through the successful implementation of ESD. This was possible because of a deep understanding of the internal needs of the community, the close relationship and trust that developed between the project staff and community, the active participation of the community, and the patient and sustained support provided by SISC over a long period of time. The success is also due to the ability of the project, through the local, regional, national and international shared-learning networks established by SISC, to provide resources and capacity-building for the community to develop itself independently and become empowered through this approach. The practical experiences gained in the Bazhu community in utilising indigenous knowledge, beliefs and community traditions to promote sustainable development can also provide a valuable contribution to the global sustainable development knowledge base.

Reflecting on this work, ESD requires participation and commitment from organisations, government agencies and companies, but it cannot be achieved by programs led by these alone. ESD must be based in a people's movement, which occurs at all levels. The slogan 'Think globally, act locally' should be translated into how each institution, whether rooted in non-formal, informal or formal learning at various levels, acts as an agent for transformative change. In doing this, institutions need to be clear of the overall mission and understand their role in the ESD process. They need to develop their own thinking, plans, funding and actions while being aware of what is beyond their control. They also need to take responsibility for achievable institutional changes within the system and the broader society to create an enabling environment for their role in ESD. Communication, constant feedback and close collaboration with stakeholders are key to this process. Knowledge institutions and national networks represent important links in this chain, as do local community organisations and non-formal relationships.

SISC continues in its efforts to promote ESD by engaging individuals and institutions to become active agents of change towards sustainable development through its time-tested, three-pronged approach of empowerment, capacity-building, and social learning. Through this, it too, continues to learn as it moves ahead.

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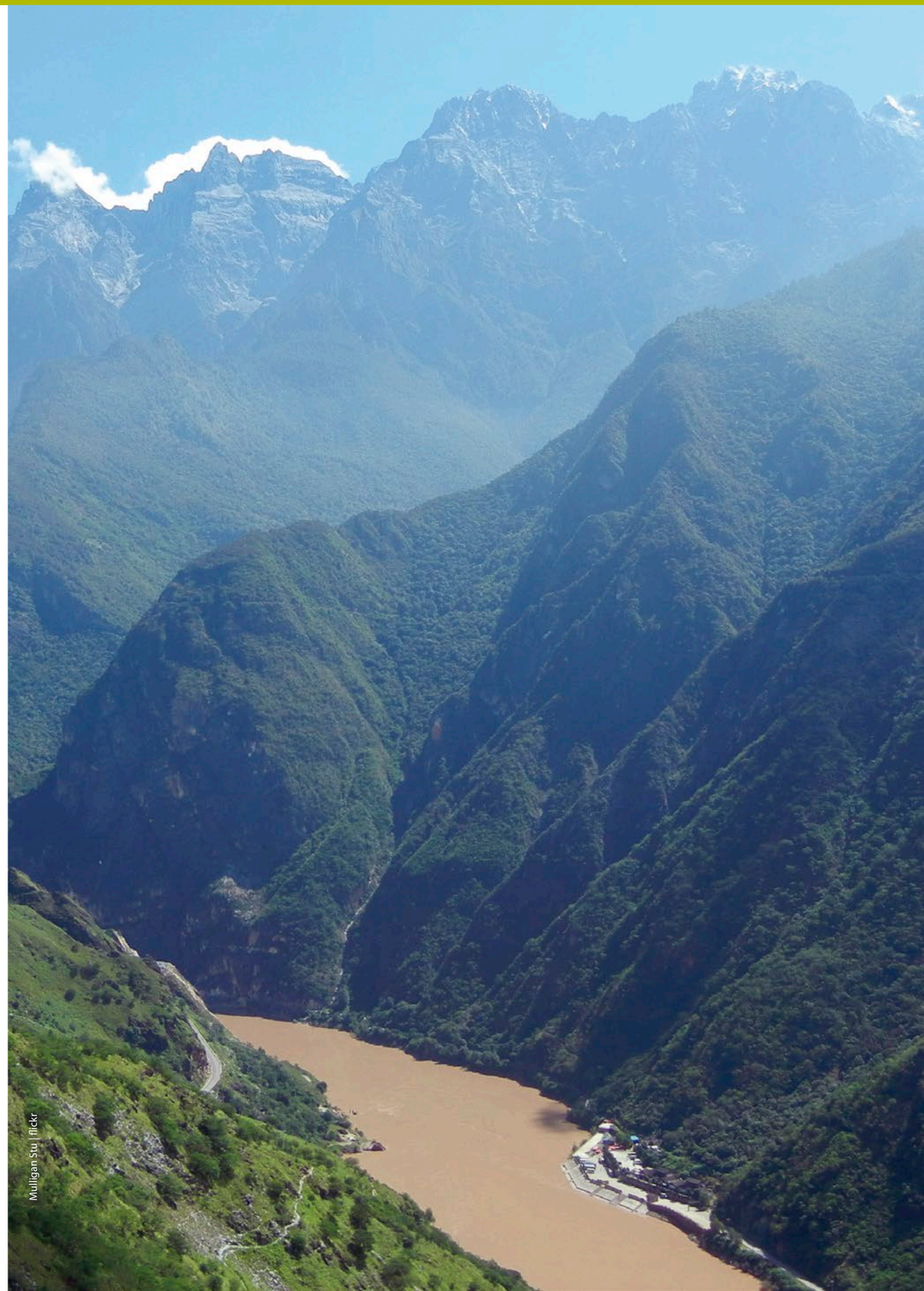

Mulligan Stu | flickr

Gayle DeBruyn

Chapter 7

Engagement between Knowledge Institutions and Communities: Design Process and Wicked Problems

7

Summary

ESD Innovation

This chapter looks at how the practice of design contributes to ESD through two examples: the US Green Building Council's Leadership in Energy and Environmental Design (LEED) protocols and the Wege Prize student design competition. The LEED protocols teach professionals through rigorous protocols, case studies, and peer mentoring. The Wege Prize encourages university students to advance their learning through applied projects that respond to restorative circular economy strategies and triple bottom line sustainability goals.

Societal Transformation

The key to societal transformation lies in a variety of metrics such as healthier living environments and lower utility costs, carbon impacts, and maintenance costs. Healthier environments are validated by tracking health metrics such as reduced student absenteeism and fewer hospital visits for asthma patients, as well as meeting universal design standards for accessibility. Lowered utility costs and carbon impacts are measured and aggregated regionally to show shared reductions across projects through the Battle of the Buildings and District 2030 protocols.

Implications of Development for Knowledge Institutions

Educational institutions will continue to be expected to provide an educated workforce, to stay current with advancing technologies, to support industry, and to participate in the development of continuing education formats. These formats for LEED building projects include peer-reviewed lectures and online courses designed for professionals to keep their licensure and certifications current. The student design competition provides a platform for applied learning, professional mentoring, and engaged jurors who provide ongoing feedback as an integral part of the competition.

Development of Design Concept in Grand Rapids

Grand Rapids is home to a rich collection of designers and manufacturers, led in large part by furniture and automotive industries and their supply chains. Beginning with a migrant workforce expert in furniture manufacturing, by 1870 Grand Rapids had built a reputation of being the 'Furniture City', boasting 444 residential furniture manufacturers using the local and regional forest resources to manufacture fine furniture for the world. This tradition shifted to the contract furniture industry serving professional offices, health care, and hospitality markets, led by Herman Miller, Steelcase, Knoll, Haworth, and Westinghouse, with products made primarily of steel.

Product designers in West Michigan also work in the medical device design (Stryker), houseware (Bissell and Newell Rubbermaid), home appliance (Whirlpool), and commercial lighting (Light Corps) industries, to name a few. The design professions are continuously evolving and include architecture, interior design, fashion, service, graphic and communication design, urban planning, transportation, landscape architecture, and film and animation design. All these designers have expertise in human-centred design and deep knowledge of universal design, human factors, and ergonomics. They use a variety of tools for researching, testing and communicating ideas, including ethnography, computer-aided design, 3-D printing, and life cycle analysis.

Everything is designed. Design practices bring a unique dynamic to how one thinks about problem solving. Working beyond the aesthetic, the *design thinking* process and methodologies serve as a user-centred design tool, useful for solving 'wicked problems.' The idea of labelling problems as wicked is attributed to Horst Rittel, who described wicked problems as "a class of social systems problems which are ill-formulated, where the information is confusing, where there are many clients and decision makers with conflicting values, and where the ramifications in the whole system are thoroughly confusing" (*West Churchman 1967, 141*). These are non-linear problems, tangled and complicated, involving numerous stakeholders and many opinions, the problems often associated with (un)sustainability.

In his book, *The Fifth Discipline*, Peter Senge (*2006*) identifies the importance of understanding the whole. The fifth discipline is systems thinking that brings together personal mastery, mental models, shared vision, and team learning. "Systems thinking… is a conceptual framework, a body of knowledge and tools that has been developed over the past fifty years, to make the full patterns clearer, and to help us see how to change them effectively"(*ibid., 7*). Problems that are best solved through the application of an integrated design-thinking approach guide design practitioners to listen carefully in order to gain a shared understanding of the problem or opportunity, engage all stakeholders, build empathy, research, map, prototype, model, test, iterate, and visually communicate solutions unique to the community, leading to more sustainable living.

The decisions made in the first phase of the design process for new commercial products will impact the environment as "approximately 80% of a product's environmental profile is fixed under the concept creation in product development" (*McAloone and Bey 2009, 5*). Material choices, manufacturing processes, worker safety, transportation, packaging, consumer use, the ability to repair products to extend their life, end of product life plans – all these decisions are impacted in the design process. Design practitioners have been working to reduce environmental impacts through a variety of resources and protocols.

Examples include life cycle assessment tools, International Standards Organization (ISO) 14001, 14040, 14044 (*International Organization of Standardization 2015*), Leadership in Energy and Environmental Design (LEED), and solutions that strive to meet circular economy strategies.

As Grand Rapids manufacturers began to participate in global markets, the adoption of international standards and good practices became evident. Standards included ISO built on regional and federal environmental regulations impacting standard business practices. The birth of the US Environmental Protection Association (in December 1970) consolidated into one agency a variety of federal research, monitoring, standard-setting, and enforcement activities to ensure environmental protection. With these environmental regulations came important shifts in local business culture. Competitors came together and organised trade associations and non-profits in an effort to define industry best practices, including the reduction of environmental impacts and improved social equity while meeting profit expectations. Regional businesses were motivated by an interest in reducing the cost of compliance and by consumer demand. Market demand was the catalyst for change; design was the driver. It led to designing out toxic adhesives and finishes, waste, and materials mined and forested at great environmental peril, and to designing in strategies for durability and longevity, disassembly, and dematerialisation, as well as the reduction of embodied energy impacts in supply chain and distribution channels. These strategies in manufacturing influenced architecture (US Green Building Council and LEED buildings) and urban planning, including storm water management, transportation, community well-being (*Green Grand Rapids Master Plan 2002*), and how to address inevitable climate impacts (*West Michigan Environmental Action Council 2013*).

Methodology of 'Design Thinking'

Design thinking is a methodology and process that inspires deeper creative solutions to problem solving. It dates back to the 1940s and is often attributed to Harold van Doren and his book *Industrial Design: A Practical Guide to Product Design and Development (Van Doren 1940)*. It spread from an exclusively product design and engineering methodology to architecture and urban planning applications, and more recently as a tool for business and social impact practice. Through the inspired work of the Stanford d.school, led by professors David Kelley (*Camacho 2016*) and Rolf Faste (*Faste Foundation. n.d.*) during the late 1980s, and David Kelley's private practice as co-founder of IDEO, a world-renowned design consultancy, the design thinking process became part of the public dialogue. Many authors[1] writing for the popular business press have contributed to robust discussion about the impact of the design process on innovation.

Innovation includes transformative innovation, those leaps in technology moving from incremental improvements to deeply impactful innovations that reshape the way people make and consume products and services, and disruptive innovations that work to reduce environmental impacts and improve quality of life. Design thinking engages integrative, divergent thinking to imagine more inspired solutions. It encourages exploration of the interconnectedness of whole systems and the engagement of radical, diverse cooperation, which leads to innovation.

Through the practice of focused listening and observational skills, combined with keen insight, the design process is a robust tool for identifying opportunities and solving problems. Design teams of persons curious about the world and expert in their field, working cooperatively with others from diverse, often unexpected backgrounds, are likely to be most successful at solving wicked problems. Moving beyond theory and conjecture, they come up with design solutions that are applied, tested, refined, practiced, and enduring.

This process is manifested in the Regional Centre of Expertise on Education for Sustainable Development (RCE) Grand Rapids through the integration of academic learning programmes, with professionals practicing in areas such as urban planning, architecture (*American Institute of Architects Grand Rapids n.d.*), renewable energy technology, green chemistry (*Michigan Green Chemistry Clearinghouse n.d.*), environmental science, and public administration. This work has brought the region national recognition for advanced sustainability initiatives, including city sustainability (*City of Grand Rapids Office of Energy and Sustainabilty 2011*), resilience planning (*Ferguson and Occhipinti 2013*), and Great Lakes watershed management (*Great Lakes and St. Lawrence Cities Initiative n.d.*). Additionally, universities have integrated sustainable development (SD) into degree-granting programmes (*Aquinas College of Sustainable Business n.d.*), the Office of Sustainability Practices (*Grand Valley State University Office of Sustainability Practices n.d.*), and the Centre for Economicology (*Grand Rapids Public Schools Center for Economology n.d.*), to name a few. The following section presents two examples of education for sustainable development (ESD) that involved higher education institutions in design initiatives to address local developmental challenges.

RCE Grand Rapids, designated by the UNU in 2007, celebrated 10 years of ESD practice in 2017 throughout the West Michigan region of 1.3 million people. During a significant economic downturn in 2004, Grand Rapids convened the Grand Rapids Community Sustainability Partnership (GRCSP), a leadership team led by the City of Grand Rapids, 10 regional higher education organisations, and K–12 academicians working together to address regional wicked problems by designing sustainability strategies for the region. Aligning community stakeholders to work collaboratively to "help enrich and secure the future of the Greater Grand Rapids Community" the GRCSP consists of over 270 endorsing business, educational, and municipal partners to preserve natural resources, provide economic viability, and foster social justice. By providing assistance with developing sustainability plans, designing strategies for operational efficiencies, and defining metrics and procedures for mutual accountability, the GRCSP community has lifted the Grand Rapids region to local and national acclaim, including the US Chamber of Commerce, and Siemens 2010 Sustainable Community Award for the most sustainable midsized city.

Box 1: *RCE Grand Rapids.*

[1] See:
Brown, Tim. 2009. *Change by Design*. New York: Harper Collins.
Florida, Richard. 2002. *The Rise of the Creative Class.* Philadelphia: Basic Books.
Gladwell, Malcolm. 2005. *Blink*. New York: Time Warner.
Kelley, Tom, and David Kelley. 2013. *Creative Confidence*. New York: Crown Business.
Pink, Daniel. 2005. *A Whole New Mind*. New York: Riverhead Books.

Design as Driver: Examples of Education for Sustainable Development

> *"Design [is] a cultural activity which provides evidence of how people live."*
> Victor Margolin (*Margolin 2002*)

US Green Building Council, West Michigan Chapter: Looking Through Design Practice and Informal Education for Education for Sustainable Development

The US Green Building Council, West Michigan Chapter (USGBC/WM) provides protocols for sustainable construction in commercial and residential building, developments, neighbourhoods, and districts. LEED is a voluntary, "third-party certification program for buildings and communities that guides their design, construction, operations and maintenance toward sustainability" (*USGBC West Michigan n.d.*). The West Michigan Chapter, founded in 2004, has been deeply committed to supporting the SD goals of the city through the application of LEED protocols in new construction and renovation. Grand Rapids is home to 129 LEED certified buildings totalling 7.2 million square feet, many of which were 'firsts' in LEED construction: the first church, Girl Scout camp, art museum, school, brew pub, and Habitat for Humanity homes, to name a few.

The success of the LEED protocol lies in the ability of the project team and stakeholders to clearly define and prioritise project-specific goals that align with a balance of economic viability, social equity, and environmental stewardship – also known as the Triple Bottom Line (TBL) – as well as corporate social sustainability goals.

The Integrated Design Process (IDP) of the LEED protocol is unique in that it is a requirement, not an option, for the successful completion of a certified building. *All* members of the design and construction team, owners, and property managers must be at the table together from the inception of the project to its completion. Pre-design brings together project stakeholders including end users, community and special interest groups, and government to define the vision, motivation, and metrics of the project, and to clarify the interrelationships of systems and their life cycle performance implications. Stakeholders often include participants from higher education institutions whose scholarship is connected with aspects of the built-environment processes. The faculty serve as consultants and students as volunteers.

U.S. GREEN BUILDING COUNCIL
USGBC
WEST MICHIGAN

Source: U.S. Green Building Council West Michigan.

According to consultants such as Winn (*2017*), preparing a clear statement of the Owner's Project Requirements (OPR) is essential. "Integrative Pre-Design services enable project teams to facilitate the collaboration of multiple design disciplines and stakeholders to set project goals and analyse design opportunities for ecosystem restoration, optimisation of energy, water and mineral resources, and the health and well-being of occupants. These services initiate early analysis of comprehensive measures for the project before the completion for the schematic [conceptual] design where the majority of the decisions associated with environmental impacts are made" (*Winn 2017*). The integrated design process thus provides a clear, shared understanding of the goals of the project, and is imperative in designing buildings that demonstrate best practices in energy efficiency, as well as reduced environmental impact, optimal occupant health, and improved social and economic sustainability.

The voluntary protocol focuses on meeting all regulatory requirements, including Energy Star and ASHRAE (a global society advancing human well-being through sustainable technology for the built environment) standards, site placement for the most effective response to the sun, building performance, thermal envelope design appropriate to climate, considerations for storm water management, access to active commuting infrastructure, reductions of heat island effect and light pollution, and indoor air quality and daylighting.

An exemplar project for West Michigan is the 502 Second Street NW renovation. It holds the highest rating (63 of 69 possible points) from the LEED for New Construction v 2.2 protocol (*Figure 1*). Built in 1917 as a fireproof flour mill, this historic building is home to Catalyst Partners and M Retail Solutions. Beyond the cultural and environmental benefits of restoring a historic structure, this project applied the integrated pre-design process to identify design features that provide the highest efficiencies. The features include strategies for community connectivity, optimised energy performance, geothermal heating and cooling, photovoltaics, onsite storm water management, water-use reduction, repurposed interior finishes, a charging station for electric cars, and native landscape plants rescued by Calvin College students. The design team applied metrics and analysis such as modelling software to design HVAC (heating, ventilation, and air conditioning) mechanical systems appropriate to the building, and life cycle analysis protocols to provide justification for material specifications. Careful research, integrated planning, and aspirational goals contributed to the success of this building, which achieved a platinum rating in 2012. This building continues to perform at an operating cost 60% lower than traditionally built buildings, serving as an 'instructive tool' for Catalyst Partners, who consult on high-performance and restorative design protocols.

Figure 1: *Catalyst Partners atalyst Partners, Grand Rapids, Michigan, LEED Platinum Certification.*

The LEED protocol also requires rigorous professional training and testing to achieve individual accreditation and to assure the design teams comprise knowledgable practitioners. This protocol is introduced to students through formal course work in college, primarily to those studying architecture, interior design, building sciences, and construction.

Grand Rapids's success in achieving high levels of sustainable construction was influenced by aspirational, committed design and engineering professionals, building owners, and most importantly philanthropists who insisted that the projects they were helping to fund meet LEED certification.

Source: Michigan Battle of the Buildings.

Source: Grand Rapids 2030 District.

In addition to supporting the LEED protocol, the USGBC West Michigan Chapter also manages the Battle of the Buildings[2], "an awards and recognition program for energy use reduction open to all Michigan area commercial, industrial and multi-family buildings. The program is a way to encourage energy-efficient practices in buildings across the state and to instil a spirit of friendly competition among the area's building owners and operators" (*Michigan Battle of the Buildings n.d.*).

Another example is Grand Rapids 2030 District, also managed through USGBC/WM. In 2002, architect Ed Mazria established Architecture 2030, a "groundbreaking, private and public led, collaborative high-performance building district focused on fostering a sustainable, efficient, thriving downtown Grand Rapids" (*2030 Districts Grand Rapids n.d.*). Grand Rapids 2030 District was launched in December 2015 with 39 founding members, including 20 building owners representing 61 buildings and 9,975,420 square feet of downtown real estate. In June 2017 the area totalled 10,083,420 square feet.

Continuing to build on the best, designers in West Michigan are taking the next step to an even more rigorous building standard, the Living Building Challenge[3]. This performance standard provides a design framework that is regenerative, creating spaces that give more than they take.

US Green Building Council: Reflections

Problem statements: LEED protocols focus on energy and environmental design. The aim is to reduce environmental impacts and improve human well-being. Educational approaches embrace a sensitivity to context, culture, and place. Stakeholder engagement is essential. Analysis and study for feasibility and defined outcomes, methodologies for metrics, practice, trial and error, maintenance, and ongoing improvement mindsets are all built on an Integrated Design Process framework.

Educational approaches: Education occurs at many levels. Traditional academic instruction providing accredited degrees in architecture, building construction, project management, interior design, and maintenance are examples. Ongoing professional development and licensing are offered through continuing education certifications and accreditations. Owner education happens through the LEED protocol requirements.

The role of research: Building science leads the research, supported primarily by the teaching institutions of Ferris State University's College of Engineering and Technology, School of the Built Environment, HVAC and Construction Management programs, and Grand Valley State University School of Engineering. In partnership with building supply manufacturers, this research is providing more affordable solutions for users.

Community voices: Everyone is invited to the process – from the master planning process through to individual home designs. Specialised support resources include Disability Advocates of Kent County, the Association for the Blind and Visually Impaired, Rapid Transportation, and Downtown Grand Rapids Inc., all working together to provide seamless access between work and play.

Communication methods: Community engagement begins block by block, neighbourhood by neighbourhood, business district by business district. Community organisers connect through schools, cultural and civic organisations, faith-based organisations, and social media. Communication methods are specific to each project and are established during the inquiry phase of the design process.

Lessons learned: The community learns through practice. It learns to build on best practices, push boundaries, and take the lead. The impacts are large and the possibilities endless.

Wege Prize 2016 finalist teams.

Future insights: Materials and technology will continue to improve with increasing speed. Designing with an eye toward adaptable systems will optimise energy reduction and minimise impacts.

The Wege Prize: A Student Design Competition Bridging Formal and Non-formal Education for ESD

Wege Prize Design Competition: Designing Circular Economies

The Wege Prize Design Competition[4], which began in 2014, encourages college and university students to apply their classroom learning by identifying wicked problems and forming teams that collaborate across institutional and disciplinary boundaries to reimagine systems, services, or

[2] See *www.michiganbattleofthebuildings.org*
[3] See *living-future.org/lbc*
[4] See *www.wegeprize.org/rules*

products to improve the quality of life. Recognising the power of diversity in design, the competition requires at least three academic disciplines and two academic institutions be represented on teams of five full-time college students from anywhere in the world.

The design process is the primary tool used to assess the 'whole system' impacted by the problem and to design solutions to meet a circular, restorative, economic model of 'waste equals food' (*Braungart and McDonough 2002*). Student teams are encouraged to seek advice from subject experts and mentors, further embracing the informal educational model of ESD.

Built as a platform for applied learning, the competition shares many resources that provide examples of design process methodologies, research methods, and communication tools, as well as information on how to apply them to the competition project. The website also includes current research on topics of circular economy strategies, biomimicry, green chemistry, industrial ecology, business model development, and the cultural impacts of design.

Team requirements are outlined in the design brief[5], which encourages work that is concise, visually compelling, and research rich. Finalists' teams must send one team member to Grand Rapids, Michigan, to present and defend their work to the panel of judges, who are a diversified team of subject experts. The panel of judges currently includes Colin Webster, Education Programme Manager from the UK-based Ellen MacArthur Foundation; Gretchen Hooker, Biomimicry Specialist at the Biomimicry Institute; Nathan Shedroff, Professor of Design at California College of the Arts; Michael Werner, Environmental Program Manager at Google; and Christopher Carter, educator, sculptor, and board member of the Wege Foundation.

Judges engage with student teams throughout the competition, providing rich critique and feedback over three phases of the competition, encouraging iterations and strengthening submissions. They look for solutions that address the shortcomings of a linear economic model as well as evidence of a deep understanding of whole systems and applied circular economy strategies. A judges' forum held the day following the competition allows the students to ask questions and receive a final critique.

The competition has expanded each year. It began in the first year as a regional undergraduate competition, and became a national competition in the second year. In the third year the competition was extended to international students, and in the fourth year it added graduate students. The fifth year (2018) will introduce a competition designed for high school students.

The organisers of this competition had the audacious goal of providing big incentives: USD 30,000.

Successful teams explore opportunities that either improve existing systems or imagine new ones. Students build on their college research, seek input from experts, and expand their networks to include student team members with diverse expertise and experiences who review concepts critically and bring new perspectives that advance the research. Winning teams have explored a variety of topics, including:

- "Working with food and beverage processing plants to convert their organic waste products into an insect-based protein that can be used in animal feeds as an agricultural fertilizer." (*Austin 2017*)

  The team included students of Environmental Science, Business, Computer Science, and Industrial and Operations Engineering.

- "Creating an onsite waste treatment system for hospitals that minimizes environmental impact while maximizing the ability of the system to recover resources. The solution translates existing proven waste treatment processes into a hospital setting in a way that does not require extensive modification to existing infrastructure." (*Austin 2016*)

  The team was made up of students of Psychobiology, Sustainable Business and Innovation, Urban Systems Engineering, and Urban Environmental Management.

- "This agricultural system is designed to act in symbiosis with its surrounding community, utilizing hot composting, hydroponics, and other innovative technologies to produce fresh, healthy, local, and affordable fish and vegetables while upcycling waste and eliminating many of the negative impacts associated with existing food production and consumption." (*Austin 2015*)

  The team comprised students of Public Relations, *Engineering*, Geography, and Biomedical Sciences.

- "…combin[ed] technological and biological material cycles… keeping the end goal of disassembly and renewal in mind." (*Austin 2014*).

  The team included students of General Business, Public Administration and Sustainability, Collaborative Design, Applied Economics and Urban Planning, and Industrial Design.

The most successful solutions will:

- *Think in systems by demonstrating an understanding of how parts influence one another within a whole, as well as the relationship of the whole to the parts*
- *Consider the economics and viability of the solution within natural, social, and financial systems*
- *Preserve and enhance natural capital by controlling finite resource stocks and balancing renewable resource flows*
- *Optimize resource yields by circulating products, components, and materials at their highest utility at all times in both technical and biological cycles*
- *Foster system effectiveness by designing out waste and negative externalities such as pollution, toxicity, and climate change. (Austin 2017).*

Box 2: *Wege Prize Design Brief 2018.*

Teams apply human-centred design strategies and careful listening skills, build empathy, and engage users in the process, which results in consumer buy-in and more successful solutions. Judges expect an integrated design process that demonstrates an iterative process and evidence of proof of concept. The telling of the story is a critical component. Framing the language to meet the audience in their space is a craft that the teams must refine. The storytelling is written, verbal, and visual. Graphic design and illustration leverages the content value. Presentations are carefully choreographed and practiced, and include the improvisational defence that follows the presentations.

The coordinators of the Wege Prize follow the teams after the competition and document their progress, both academic and professional, in preparation for the publication of case studies.

[5] See *static1.squarespace.com/static/52372ebee4b0281c19761663/t/57c986e6b8a79bd7376947c5/1472825062951/16131+Wege+2017+Design+Brief+Booklet+FINAL.pdf*

Wege Prize: Reflections

Problem statements: Students are challenged to leverage transdisciplinary teams of five to collaboratively design and propose a solution to a wicked problem of their choosing. The solution must meet the economic model of a circular economy, one that is restorative by nature and keeps products, components, and materials at their highest utility and value at all times.

Educational approaches: This competition is an interdisciplinary platform for practicing a radically different approach to problem solving. Student teams are encouraged to engage stakeholders, subject matter experts, and mentors for the duration of the five-phased competition. Judges model the design process by providing critiques and constructive feedback loops to the teams five times over a six-month period. This built-in support system connects students directly with the industry professionals who are evaluating their solution, and empowering them to maximise their collaborative potential.

The role of research: The role of research and research methodologies varies, as it is specific to the student-defined project.

Community voices: Successful student teams must conduct careful stakeholder engagement research, integrating learned insights into the project.

Communication methods: Communication methods for the prize begin in an online format. Proposals are submitted online, as are phased submissions. The jurors submit comments via an online platform. Five finalist teams are invited to send one team member to Grand Rapids, MI, to present and defend their work in a public forum, which is also live-streamed around the world.

Lessons learned: The competition has grown incrementally over the years. Now that it is open to any full-time university student, undergraduate through graduate, projects with greater depth and complexity are emerging, many of which are in early stages of implementation.

Future insights: A high school competition is in the planning stage, building on the success of the Virtual Youth Conference. The intention is to introduce the students to the collegiate competition and the overall process. Students will receive a certificate upon completion of the project, as well as an invitation to include their work in college applications and portfolios.

Reflections on Collaborative Design Practices in Michigan

Importance of Knowledge Institutions

The West Michigan community understands the value of education, life-long learning, exploring, and testing to find new ways to advance the community's sustainability goals.

Home to many global businesses and manufacturers, West Michigan is well poised to build on existing skill sets and move to advanced manufacturing and knowledge economies. Agile and forward-thinking leadership encourages unique public-private partnerships to support ideas that advance social, environmental, and economic development, while philanthropic organisations require collaboration as a condition of grant requirements.

A *systems thinking* approach is encouraged to achieve successful design. According to Winn (*2017*), "New technologies can no longer keep pace with demands for increased efficiency and ecosystem restoration. An integrated understanding of community, cultural and human interface with the built environment is essential." To achieve that, it is necessary for all knowledge institutions – formal and informal – to find connections, build bridges, inspire curiosity, and work toward inclusive community engagement. That is, to be truly committed to a 'stronger together' philosophy.

Elements of sustainable and transformational design featured in this discussion centre on a common theme of radical cooperation. Engaged communities actively seek better solutions to wicked problems, and intentionally bring diverse points of view and unexpected connections together to inspire new thinking. Transformative unproven ideas that are intended to leapfrog over incremental improvements are encouraged and pushed through cynical mindsets to invest in untested ideas.

Buchanan, in his article on wicked problems (*1992, 6*), wrote: "Without integrative disciplines of understanding, communication and action, there is little hope of sensibly extending knowledge beyond the library or laboratory in order to serve the purpose of enriching human life."

ESD and Societal Transformations

The word *innovation* is used in many ways, often describing slight incremental improvements of one product or model over another. Examples of *transformative innovation*, however, include the steam engine that brought on the industrial revolution; modes of transportation that moved from a horse to a car and now toward automated transport; wired to wireless communication platforms; and a shift from non-renewable to renewable energy sources. "True design is the art of invention, not analysis. You cannot analyse your way to invention." (*Tony Golsby-Smith 2009*). Design holds the potential to change mindsets, bringing producers and consumers to demand more sustainable solutions for the world.

Design also drives *societal transformation*. Design is a balance between tension and empathy. Design performs best with constraints, and with clear, shared understandings of how solutions best perform. Design often works on intuition – that gut feeling that the new idea, material, app, or manufacturing process will work. Designers are risk takers, visionaries, and persons with grit. According to Margolin (*2002*): "Design must disengage itself from consumer culture as the primary shaper of its identity and find a terrain where it can begin to rethink its role in the world. The result of this activity, if successful, will be a new power for the designer to participate in projects for the welfare of humankind both inside and outside the market economy."

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Chapter 8

Peer Learning Methods for Transformative Education Towards Achieving Biodiversity and Development Goals on the Ground

Summary

ESD Innovation

The approach introduced here is of facilitating peer learning among multi-stakeholder communities at the level of policy implementation, to enable members from similar yet varying socio-ecological and political contexts to learn from each other's experiences and adapt relevant solutions for sustainability in their contexts. A participatory social learning approach was adopted as the exchanges were specifically planned and situated within community contexts. The exchanges discussed the value systems and current transitions, as well as intergenerational learning approaches in different sociocultural and biogeographical contexts in a comparative framework. They also compared the challenges faced by communities with respect to revitalising traditional knowledge in the contemporary context, and the continuity of intergenerational learning through approaches, such as recognition of prior learning within policy and regulatory processes in different regions.

Societal Transformation

In the long term, communities start building internal and external networks that serve as support groups to their activities. Within the communities too, it allows a better understanding about more efficient and equitable use of resources, sharing of benefits, adoption of policy measures and influencing policymaking. Most importantly, it has built confidence among the communities on the relevance of their socio-ecological worldviews and knowledge practices in contemporary development policies and practices. It has also encouraged self-regulatory networking that is aimed at both protecting and promoting knowledge practices.

Implications of Development for Knowledge Institutions

Drawing on the practices of community exchange, knowledge institutions would find it easier to communicate complex ideas with community gatekeepers and other stakeholders, and further, to gain fresh perspectives from participants of the knowledge exchange on issues affecting sustainability enabling more critical thinking in this direction. Through such close interactions, academic institutions also have an opportunity to create avenues for new knowledge production and evidence generation within a transdisciplinary and multiple evidence-based framework. This can also inculcate socially sensitive and appropriate innovations among students.

Socio-ecological Context and Endogenous Development

In the management of environment and biological resource diversity, there is a clear acknowledgement that more emphasis needs to be given to address the concerns of proximate stakeholders who are dependent on, or are directly responsible for the management of resources, or both. Participatory tools of capacity development have not always translated into desirable actions primarily because they are often limited by an external resource person sharing anecdotes with the local stakeholders. Here it is argued that complementing such approaches with peer learning tools that allow sharing experiences amidst the stakeholders from similar backgrounds but different socio-ecological contexts would inspire endogenous solutions, motivating proactive strategies and a better articulation of capacity and resource needs and ways to achieve them. It is therefore argued that for education to translate into desirable action, especially in multi-stakeholder networks such as the RCEs, more emphasis needs to be given to methods that foster experiential learning amidst peer groups and communities.

The Role of Stakeholder Involvement for Sustainability of Ecosystems

There is increasing realisation that sustainability in the Anthropocene cannot be addressed just by policies, targets and measurable goals. Multi-stakeholder engagement is viewed as a potential means for an iterative process towards addressing sustainability in all its complexity (*Fadeeva et al. 2014*). An important challenge in ensuring the effectiveness of inclusive policy implementation relates to adoption of policies, and action on the policies by the intended stakeholders and actors. Agencies tasked with implementing global and national policies invest heavily in communicating and raising awareness on different dimensions related to the policies among various actors[1]. However, more often than not, their investment rests within the confines of actors affiliated with the focal and formal sector (such as, development, environment and agriculture). Thus raising awareness on biodiversity, for instance, is oriented towards the policymakers involved in the environment sector and modules designed to orient those engaged in environmental education towards developments in the area. Though reasonable, the approach constrains efficiency in ensuring that the policy objectives are mainstreamed and scaled down appropriately to the subnational governance structures. At the same time, a disconnect can be seen between the priorities at the local level (among citizens and local communities) and policy intentions and goals at national and global levels. Thus, for instance, situations where local communities are concerned about their rights to access resources, as well as certainty of tenure are often seen, while the national government agencies are more concerned about conservation of resources and protection of nature (*Suneetha and Pisupati 2009*).

Much has been written about the challenges of joint natural resource management and the conflicts between the official regulatory approaches and the local aspirations. Researchers have shown that merely demarcating protected areas for conservation need not necessarily be successful in the long run, as people living on the fringes could indulge in unsustainable production activities that would eventually leach into the protected area (*Brondizio et al. 2009*). Even where joint or participatory management has been attempted, the efforts have mostly remained anecdotal and

[1] See for instance, documents of the Convention on Biological Diversity (CBD) on Communication, Education, Promotion and Awareness raising (CEPA); Capacity Building Strategy of the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services; UN Declaration on the Rights of Indigenous Peoples.

have not provided significant replicable rigour. In such situations, considerations of both the State and the local population are seemingly met. But as the secondary and tertiary consequences of various responses by the actors on the environment and welfare of population are not comprehensively understood, the solutions fail to be ecologically adequate and socially appropriate. For example, intensive agriculture around protected areas, using abnormal levels of chemical inputs to increase production, is leading to ecosystem degradation impinging into the protected area (*ibid*.).

This is the case even with cross-sectoral policies. A case in point relates to the adoption of sustainable development objectives. Since the discourse on sustainable development emerged, tools to raise awareness and build the capacities of different stakeholders continue to be developed. Ironically, despite the availability and accessibility of several tools, it is an acknowledged fact that the environment continues to be degraded, societies appear to engage in greater conflict and inequity continues to widen across different societal strata (*UNEP 2012*).

Although economic development appears to have progressed through increases in GDP levels, this too has been asymmetric between and within countries. This essentially points to a situation where operational measures relevant for some actors are not sufficiently developed. Given the constraints in human and financial resources within which most agencies operate, such an approach that focuses on the motivations of a few actors, especially those who are vested with decision making authority by law, appears to be the obvious way forward. But it also points to the problem where several policy implementation frameworks are set within certain time and geographical boundaries requiring that the responsibility to implement can only be vested with a few actors – which essentially sets the stage for power hierarchies, and symbolic reporting on various parameters as called for by those who set policy agendas. This hampers a comprehensive, solution-based approach as it precludes, by design, the necessity for engagement with all stakeholders who are likely to influence the effective implementation of any policy or regulation.

A significant number of Regional Centres of Expertise (RCEs) are involved in biodiversity and ecosystems related sustainability initiatives. The experience highlights the importance of informal and non-formal education and action in this regard. This case study on peer learning highlights the need to engage across different stakeholders through a mutual learning process to ensure that priorities and challenges of different groups of actors are sufficiently considered. The examples used are primarily from environment and biodiversity policy implementation to illustrate these points.

The Challenge of 'Ideal' Policies and Insufficient Implementation

The reports of the Millennium Development Goals (MDGs) (*United Nations 2015*), the Global Biodiversity Outlook (*Convention on Biological Diversity 2014*) and others reiterate that while a lot of progress has been made in the development of multilateral and national policies and regulations relating to various sectors, the intended outcomes have not been satisfactory. Such outcomes are indicative of a discord between policy setting processes and the downstream implementation pathways. This is recognised more easily in some spheres than others. For instance, in relation to management of environment and biological resource diversity, there is a clear acknowledgement of the need for greater emphasis on addressing the concerns of stakeholders who are dependent on or are directly responsible for the management of resources. The connection that these actors have with the resources is most often linked to cultural values (*Posey 1999*), and an augmentation of the quality of the environment and resources is often successfully effected by focusing on reinforcing these cultural values and leveraging on their asset value (for example, intangible human capital, namely, the knowledge of use and management of resources) to translate into economic values such as value-added herbal products viz., teas, medicines, cosmetics, tourism, and the like (*ten Kate and Laird 1999*). Substantial evidence exists to indicate that mismanagement of resources and conflicts on the ground arise when laws and policies do not take into consideration the cultural contexts within which they are placed (*Bavikatte et al. 2015*). Participatory resource management efforts in most contexts are frequently portrayed as failed attempts, and hardly any models of scalability exist at subnational or national levels to guide policy implementers.

In addition, when the mainstream education systems alienate this biocultural connection and associated values, it further distances the younger generation from reconciling between traditionally held and modern knowledge systems (*Battiste 2010*). Calls for pluralistic approaches to raising awareness and strengthening capacities to address various development and conservation challenges or those related to human well-being are gaining traction across the world (as expounded in the Aichi Targets, or in the mandate of the IPBES (*2015*). The recent documents of UNESCO on education for sustainable development (ESD) unequivocally call for appropriate and adequate emphasis on different forms of learning that would enable achieving various sustainable development (SD) goals across multiple stakeholders. Forums such as the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services (IPBES) are developing indicators that are interlinked, and represent the worldviews and priorities of different categories of people. Refreshingly, the Sustainable Development Goals (SDGs) are also interlinked, thus enabling more coherent reporting across the goals. Moreover, the SDGs are well aligned to other policy goals implying that achieving the SDG relevant targets complements the achievement of corresponding goals and targets across various sectors such as biodiversity, environment, education, and health. This is a welcome development as it forces implementers to 'speak to' people across different sectors, and streamline and identify synergistic processes for implementation. These goals, however, still need to be made contextually relevant and the process of implementation needs to be designed to motivate different sets of stakeholders to undertake actions that are mutually reinforcing.

Community Involvement and Value Orientation

This calls for respectful listening, social learning and reflexive capacity-building in line with the contextual needs and priorities. *Box 1* and *Table 1* highlights biodiversity and ecosystem-related global targets and identifies areas of inclusive action at a local scale.

Behavioural change of various stakeholders including individuals, communities, organisations and governments, has been aptly highlighted in

- Strategic Goal A: Address the underlying causes of biodiversity loss by mainstreaming biodiversity across government and society
- Strategic Goal B: Reduce the direct pressures on biodiversity and promote sustainable use
- Strategic Goal C: Improve the status of biodiversity by safeguarding ecosystem, species and genetic diversity
- Strategic Goal D: Enhance benefits to all from biodiversity and ecosystem services

Box 1: *Aichi Biodiversity strategic goals*[2].

[2] See *https://www.cbd.int/sp/targets/*

Targets	Action
Target 1 By 2020, **people are aware of the value of biodiversity** and the steps they can take to conserve and use it sustainably.	Involves raising awareness, changing unsustainable attitudes and promoting behaviour change at individual and societal levels.
Target 2 By 2020, **biodiversity values have been integrated into national and local development and poverty reduction strategies** and planning processes and are being incorporated into national accounting and reporting systems.	Involves ensuring that multiple perspectives of different stakeholders regarding biodiversity are incorporated in macro planning processes for development.
Target 4 By 2020, Governments, business and stakeholders at all levels have taken steps **to achieve or have implemented plans for sustainable production and consumption and have kept the impacts of use of natural resources well within safe ecological limits.**	Involves motivating different stakeholders at multiple levels of governance to embrace good practices of production and consumption.
Target 14 By 2020, ecosystems that provide essential services, including those related to water, and **contribute to health, livelihoods and well-being, are restored and safeguarded, taking into account the needs of women, indigenous and local communities, and the poor and vulnerable.**	Involves communicating and deepening understanding amongst multiple stakeholders about direct and indirect linkages/dependencies between biodiversity and ecosystem conservation and different aspects of human wellbeing.
Target 16 By 2015, **the Nagoya Protocol on Access to Genetic Resources and the Fair and Equitable Sharing of Benefits Arising from their Utilization** is operational, consistent with national legislation.	Involves ensuring that respectful and equitable transactions between different stakeholders operating at various scales of a value chain is fostered and encouraged.
Target 17 By 2015, each Party has developed, adopted as a policy instrument, and has commenced implementing **an effective, participatory and updated national biodiversity strategy and action plan.**	Involves raising awareness amongst policymakers the need for inclusive and participatory approaches to envision and plan national policies for biodiversity conservation.
Target 18 By 2020, **the traditional knowledge, innovations and practices of indigenous and local communities relevant for the conservation and sustainable use of biodiversity, and their customary use of biological resources, are respected, subject to national legislation and relevant international obligations, and fully integrated and reflected in the implementation of the Convention with the full and effective participation of indigenous and local communities, at all relevant levels.**	Involves integrating or bridging, as appropriate, different sciences and knowledge systems to allow contextually relevant and more inclusive and effective solutions to sustainability issues.
Target 19 By 2020, knowledge, the science base and technologies relating to **biodiversity, its values, functioning, status and trends, and the consequences of its loss, are improved, widely shared and transferred**, and applied.	Involves ensuring a comprehensive learning among different stakeholders of the different values of biodiversity and ecosystems, and consequences of loss and appropriate actions.

Table 1: *Aichi Biodiversity targets with direct reference to local stakeholders*[3].

the Convention on Biological Diversity as necessary to ensure that awareness and appreciation of the diverse values of biodiversity result in necessary and appropriate actions (*Duraiappah et al. 2013*). Given this, measures taken towards achieving Targets 1 and 2 will greatly facilitate the implementation of the Strategic Plan for Biodiversity and the fulfilment of the other Aichi Biodiversity Targets, particularly Target 2 (*See Table 1*). It is noteworthy that values of biodiversity should be understood in their broadest sense, not only in terms of environmental, social, economic or cultural but also intrinsic values. What is often not well conceived is which specific actions will facilitate conservation and sustainable use. Diverse stakeholders can contribute different actions in line with how they value the outcomes

The following SDG targets refer to multi-stakeholder partnerships:

17.16: Enhance the global partnership for sustainable development complemented by multi-stakeholder partnerships that mobilise and share knowledge, expertise, technologies and financial resources to support the achievement of sustainable development goals in all countries, particularly developing countries

17.17: Encourage and promote effective public, public-private, and civil society partnerships, building on the experience and resourcing strategies of partnerships

Box 2: *SDGs and multi-stakeholder partnerships*[4].

[3] See *https://www.cbd.int/sp/targets/*

[4] See *http://www.un.org/sustainabledevelopment/sustainable-development-goals*

The Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services (IPBES) is the intergovernmental body that assesses the state of biodiversity and the ecosystem services it provides to society. In response to requests from decision makers, the mission of IPBES is to strengthen the science-policy interface for biodiversity and ecosystem services for the conservation and sustainable use of biodiversity, long-term human well-being and sustainable development.

An important guiding principle of the IPBES is to "Recognise and respect the contribution of indigenous and local knowledge to the conservation and sustainable use of biodiversity and ecosystems."

IPBES aims to promote effective engagement with indigenous and local knowledge holders in all relevant aspects of its work. This is to be achieved by facilitation of a roster and network of experts to support the Platform's work, a number of global dialogue workshops of indigenous and local knowledge experts, a review of regional case studies to inform the Platform's procedures for and approaches to working with indigenous and local knowledge, and the delivery of a preliminary and final set of procedures and approaches for working with indigenous and local knowledge systems. IPBES will also set up a participatory mechanism for indigenous and local knowledge systems oriented to facilitate the linkages between indigenous and local communities and scientists, and to strengthen the quality of indigenous peoples' participation in the development of the deliverables of the Platform. Multi-stakeholder engagement is an important dimension of its work programme.

Recognising the importance of indigenous and local knowledge to the conservation and sustainable use of ecosystems as a cross-cutting issue relevant to all of its activities, IPBES established a task force on indigenous and local knowledge systems and agreed on terms of reference guiding its operations to implement this deliverable.

Box 3: *Engaging effectively with indigenous and local knowledge holders (ILK) within the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services (IPBES).*

and process. Learning has to effectively contribute to such actions by stakeholders; it must also initiate a process of alignment of such actions and shared values to motivate multiple interventions. The next question is whether such contextual experiences can be abstracted and scaled up at subnational or national level. This calls for integration of such experiences in formal learning spaces, such as schools and universities, and also in informal contexts, such as community to community learning. Appropriate communication, educational and public awareness based on a bottom-up process is critical, not just at the sectoral level but within the broader context of sustainability. SDGs have amply taken note of this requirement (*Box 2*); however, implementation does not reflect any novel departure from other policy implementation mechanisms.

What is Required for Contextual Adaptation of Policies?

The forms of learning recommended by UNESCO and partners range from mainstream school education to informal and non-formal models of learning including Technical and Vocational Education and Training. These latter forms are important as they enable citizens and lay people to relate in a practical fashion to various

Community to community learning exchange 2015 – discussion sessions at FRLHT, Bangalore.

policy messages. This is especially so as most policy goals and implementation pathways are designed in a top-down fashion resulting in shortcomings that are accentuated by the capacity development programmes that seem relevant only to the initiated, and quite incongruent to sector specificities (*Suneetha and Pisupati 2011*). Despite advances in tools to conserve biodiversity and concurrent progress in meeting educational goals of the MDGs, biodiversity loss and environmental degradation continue, indicating a gap in translating awareness tools to motivations for action, which the education sector is well placed to undertake (*Convention on Biological Diversity 2014*). More recently, the SDGs appear to have a set of goals and indicators that are more interlinked. But even so, attempts to link sectoral peculiarities or uniqueness with appropriate pedagogical tools appear underdeveloped. Taking the example of biodiversity loss again, it would be useful to ascertain how to capture the benefits of non-formal education, whereby being experiential is more relevant to influence attitudes and behaviour of intended stakeholders towards conservation and environmental management.

The 2015 MDG Report identifies that despite progress in achieving the various goals, poverty still persists in most developing regions, societal conflicts are on the rise, vulnerability of poor people to natural and economic risks is on the rise and environmental degradation continues (*United Nations 2015*). Most of these challenges can be addressed together, but this requires specific skill sets and capabilities that build on the interests, strengths, assets and networks of the people. Broadly referred to as endogenous development, it would entail developing and harnessing multi-stakeholder partnerships and identifying the barriers that challenge the achievement of the development objectives. Such an approach would also facilitate an understanding of good practices on the ground that could be upscaled and replicated or adapted, depending on the contexts; of how learning occurs amidst practitioners and how such learning can be aligned to policy goals; and of how it could be better upscaled to support better policy implementation. For example, in biodiversity policy, the Nagoya Protocol on Access to Genetic Resources, and the Fair and Equitable Sharing of Benefits Arising from their Utilization (ABS) recognises bio-cultural community protocols (BCPs – statements by communities about themselves and their resources and potential partnerships they seek to and are willing to enter). The articulation of BCPs emerged from community-led initiatives asserting their rights to resources and territories of which they have been stewards for generations (*Bavikatte et al. 2015*). There are other instances of policy initiatives that are attempting to localise their objectives, such as the IPBES assessment process involving indigenous and local communities and their knowledge and perspectives, and the Brazilian healthy meal schemes which attempt to integrate local foods into school diets to make them healthy and sustainable (*Aliyar et al. 2015*). These interactive policy and practice linkages foster the flourishing of pluralistic and diverse practices relevant to

Community to community learning exchange 2015 – discussion sessions at FRLHT, Bangalore.

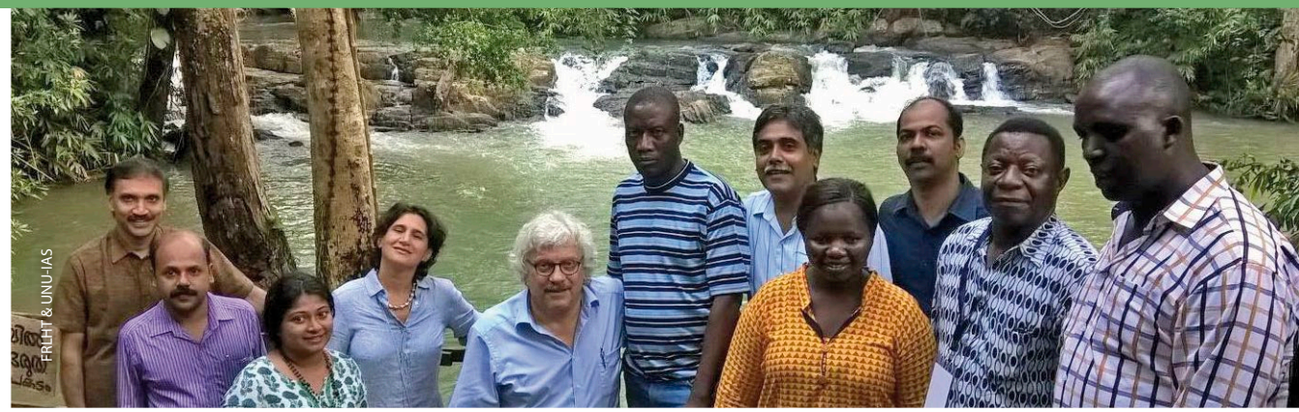
ecological integrity and human well-being. Such examples also point to the importance of developing an appropriate learning approach for science (evidence), policy (regulatory) and society to interface with each other.

Peer Learning Approaches as Tools of Capacity Development and Sharing

Conflicts relating to inequities in access to resources are increasing (*United Nations 2015*), and hence enhancing dialogue among different stakeholders has become an urgent need. This is because solutions cannot be brought on by mere regulations and legal measures, but call for greater understanding of needs and sensitivities of different actors and deriving consensus on fair and just solutions. It is also not a matter to be modelled as an academic exercise, as negotiations on implementation plans relating to management and use of complex bio-cultural diversity (the variety of interdependencies between humans and nature systems) require going beyond the academic setting.

What is required is an engagement among stakeholders involving a combination of participatory methods. These would include participatory surveillance of changes to biocultural resources and welfare outcomes, collaborations between disciplines and different sectors, strengthening notions of citizenship and identity, promoting 'action research' also in the work of academics, integrating and bridging multiple worldviews and epistemes, to bring on board innovative educational methods such as peer learning and social learning. Furthermore, given the various forms of expertise within the stakeholder groups, it is time to refashion several capacity development activities as capacity-sharing activities and promote them between countries and regions. Using the forum of politically supported initiatives such as south-south and triangular cooperation in related areas would assist in securing better outcomes.

Community knowledge experts, with good intergenerational understanding in diverse areas, are the core stakeholders in the process of community knowledge dialogue. As their learning is an experiential process and totally different from learning in an academic setting, engagement of academics and civil society organisations is desirable to ensure sensitivity and rigour in the policy practice dialogue. Academic institutions that engage in this process are expected to be cultural relativists and have sensitivity to the epistemological dimensions of traditional approaches. In most communities, however, erosion of the local governance structures as they get more integrated into mainstream societies, is leading to rapid erosion of not just the knowledge practices but also the epistemological aspects. This calls for the reconstruction of logical integrity in the knowledge systems. Thus, the facilitators require not just sensitivity but also a certain level of expertise to facilitate coherent dialogue. Developing institutional support for this process through creation of self-regulatory organisations, promotion of community learning centres, building capacities of stakeholders, and documenting the process through appropriate creative media and databases are also necessary to assure sustainability. The following example provides an illustration.



Community to community learning exchange 2015 – participants at the Jawaharlal Nehru Tropical Botanical Garden and Research Institute.

Peer Learning on Access and Benefit Sharing: An Illustration of the Utility of the Approach

Securing good health at the community level is a multidimensional process as it involves availability of a diversity of biological resources, knowledge related to their use, sustainable utilisation and capturing value from any actual or potential commercial use. With the adoption of the Nagoya Protocol related to benefit sharing, several issues including sensitive development of new products, managing expectations related to benefit sharing depending on the scale of operation, improving symmetries in information and negotiation skills between community actors and industry and other external actors, need to be addressed.

Identifying local health priorities and supplementing them with ecosystem and community-specific traditional medical knowledge and resources through primary health programmes is critical both to ensure conservation of biodiversity and health security at the local level. Furthermore, it provides a platform to develop more interdisciplinary education and tailored capacity development tools, given that it is easier for people to relate to the above concepts based on their close association with biological resources and search for good health care at a low cost. This is especially important when progressively high out of pocket spending for health, increasing privatisation, over-medicalisation of health care and treatment are becoming important challenges of the health systems. While there are several models at the local level on diverse nodes of interventions, concerted policy attention and integrated frameworks and approaches for bringing together multiple institutions and stakeholders are missing.

In addressing these knowledge and capacity gaps, UNU (IAS and IIGH)[5] in partnership with other leading agencies and initiatives, including the Biodiversity and Community Health (BaCH) initiative, ABS Capacity Development Initiative hosted by GIZ, Bioversity International, UNDP Equator Initiative, The Christensen Fund and the Transdisciplinary University of the Foundation for the Revitalization of Local Health Tradition organised a Community-to-Community Exchange and Capacity Development Workshop for Traditional Knowledge Holders. A key goal of the event was to expand peer-to-peer learning particularly among Indian and African local stakeholders working on key issues of conservation and livelihoods. Representatives from five RCEs from Africa (Greater Nairobi, Lesotho, Buea, Minna, and Kano) and two RCEs in India (Srinagar and Bangalore) participated in the event.

The event, which was held in 2015 in Bangalore, India, covered key issues related to the Nagoya Protocol on Access and Benefit Sharing and

[5] UNU-IAS is the United Nations University for the Advanced Study of Sustainability. UNU-IIGH is the United Nations University – International Institute for Global Health.

traditional knowledge in the framework of the health sector. It brought together community-level participants from 22 countries to interact with Indian counterparts. This involved field visits to sites in three different states in South India (Karnataka, Kerala, and Tamil Nadu) where communities have taken proactive measures relating their well-being to activities that may be considered ABS-compliant. This was followed by a structured workshop involving external experts and community representatives. The workshop enabled better sharing and learning around different aspects of the supply, use and valorisation of biological resources.

The outcomes of the workshop included a joint statement by the African delegates calling for further actions to implement the Nagoya Protocol at the local level, and two cooperation networks being established between communities in Africa and Central Asia, with plans for a larger network to be established. This peer learning event also highlighted that when local communities are exposed to the same policy issues from a context they identify with, it motivates their resolve to plan, collaborate and innovate to achieve multiple benefits[6].

Reflections

Reorienting capacity development activities towards interactive, mutual learning approaches allowed the capture of several benefits for different interest groups. Some learning from the community-to-community learning exchanges, such as the one above and others (*Payyappallimana et al. 2010*), are listed next.

- It helps to unravel conflicting interests and value positions amongst different stakeholders. For example, if training is considered to be related to biodiversity conservation, the various values held by different actors such as indigenous and local communities, businesses, domestic traditional industry, conservationists, civil society organisations and the government could range from spiritual to pecuniary to instrumental (*IPBES 2015*). An interactive session enables identifying where contestations arise and how this may be addressed, either from existing examples or from similar experiences elsewhere.
- Having a single solution to a particular concern takes away the pressure. Instead, diverse and pluralistic ways can be identified and worked on. This also helps to negotiate and bridge intercultural understanding between the different worldviews of different actors regarding pathways to sustainable development.
- Such an approach helps to develop strategies for augmenting and revitalising existing resources while assuring sustainable use and improving livelihoods equitably.
- It helps to further strengthen policy-practice linkages and highlights the importance of peer learning and networking (*Table 1, Box 2 and Box 3*). Lessons from successful models of integration such as self-help groups (for access to credit) and producer company models and cooperatives (that link primary production to markets, alternate economic opportunities, and principles of green economy) can contribute to transformative learning and action at a local level.

Conclusions

Peer learning can be considered a subset of participatory tools. It involves sharing of learning among peers – whether local communities, researchers or policymakers – on various dimensions related to an issue. The sharing of experiences between stakeholders enables them to co-design solutions to problems they encounter. Peer learning is thus a reflexive tool for capacity-building and sharing as it ensures early adoption. The RCEs, as a multi-stakeholder networking platform for co-creating solutions for locally relevant sustainability issues, shows immense potential for accelerating development at the local level. Being a globally linked space the RCE network also poses a good prospect of sharing and replicating good practices across the network as well as among other such platforms.

It has been argued here that complementing conventional capacity development approaches with peer-learning tools that allow experience sharing among stakeholders from similar backgrounds but different socio-ecological contexts would inspire endogenous solutions, and motivate proactive strategies with a better articulation of capacity and resource needs to achieve them. This also implies that for education to translate into desirable action, more emphasis needs to be given to methods that foster experiential learning amidst peer groups and communities.

[6] Adapted from UNU-IIGH *https://iigh.unu.edu/publications/articles/from-practice-to-policy-achieving-core-objectives-of-health-for-all-sustainable-biodiversity-conservation-and-equitable-benefit-sharing.html*

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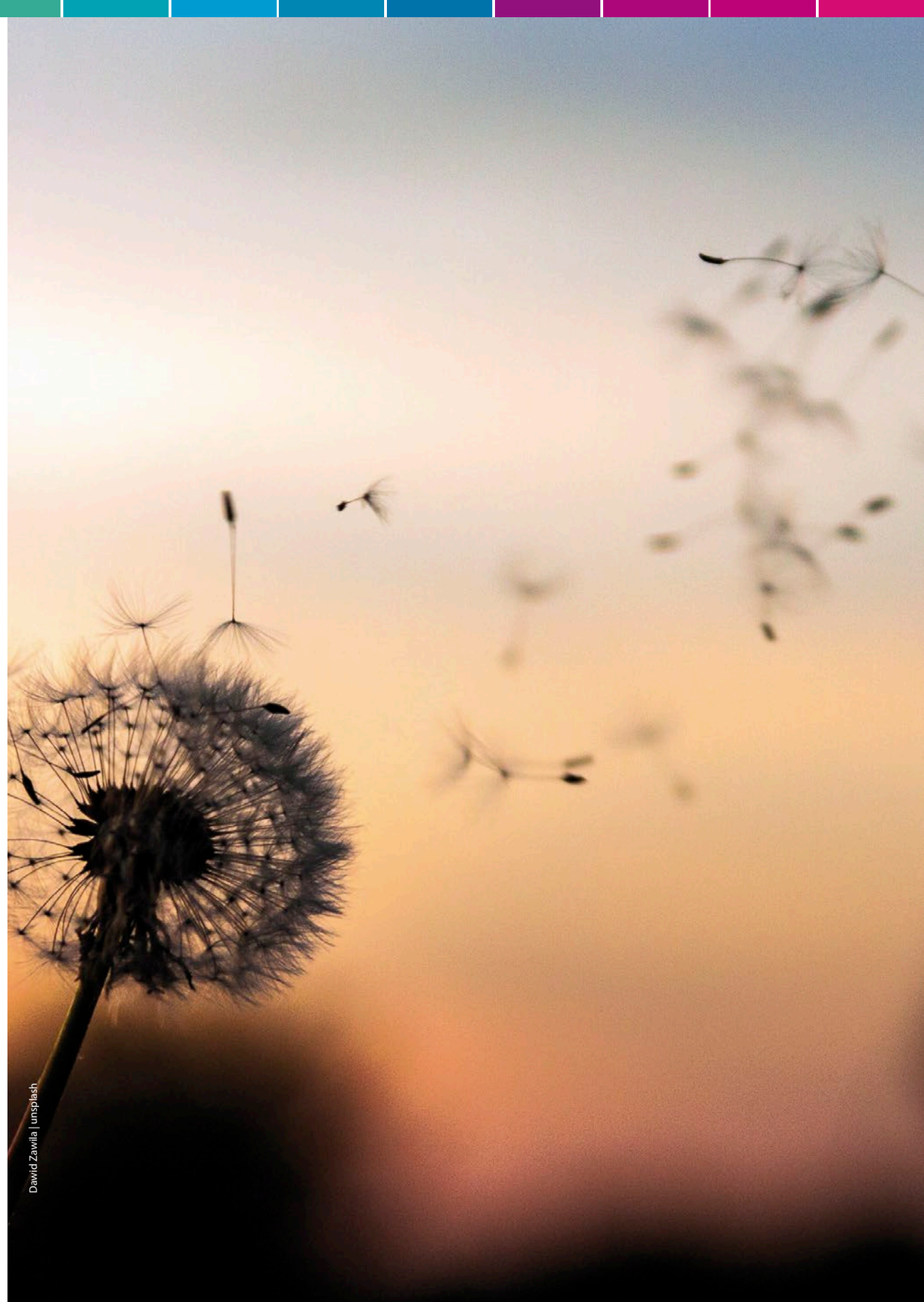
Part II

Education as Transformation

Global Action Programme on Education for Sustainable Development, Objective 1:

"to reorient education and learning so that everyone has the opportunity to acquire the knowledge, skills, values and attitudes that empower them to contribute to sustainable development"



Rob O'Donoghue

Chapter 9

Higher Education and Sustainability: A Review of Some ESD Trajectories of Risk, Learning and Change in a Southern African Curriculum Context

Summary

ESD Innovation

This chapter locates Education for Sustainable Development (ESD) transformations in higher education within the ferment of education as a reflexive modernist project responding to a failing modernity of increasing socio-ecological risk, impending climate change and continuing socio-economic injustice. The review that follows attempts to scope and examine some of the dimensions of contestation and change in higher education practices that are emerging in a twenty-first century post-colonial South Africa. The study is centred on ESD imperatives and an innovation in higher education. Here it examines a subtle reorientation in higher education through a review of a course-activated, social-learning network process to improve food security through water-conservation farming.

Societal Transformation

The collaborative curriculum development process examined juxtaposes endogenous, intergenerational knowledge practices with a scientific manual for water conservation farming. The associated knowledge co-production emerging from the deliberative learning actions enabled participants to initiate change projects in an agricultural college curriculum setting and in local village gardens. A subsequent series of local radio programmes undertaken by participants deepened and expanded the transformative work of an expanding learning network.

Implications of Development for Knowledge Institutions

The course-activated social learning and change approach to ESD that was developed in a southern African university and community learning setting is providing potential solutions to many of the epistemic contradictions in higher education institutions today. The innovation may allow many higher education curricula to stop masquerading as realms of disciplinary knowledge for expert mediated access, and begin to function as a co-engaged nexus for acquiring knowledge and competence with which to shape future sustainability. Competence here refers to the knowledge, dispositions and a capacity to act in ways that enable participants in ESD to recognise, assess and act on emerging concerns so as to address the contradictions confronting them in a globalising modern life.

Trajectories and Drivers Towards Sustainable Development in Higher Education

This chapter explores some of the emerging contours in Education for Sustainable Development (ESD) that are shaping expansive trajectories of change in higher education. At a macro level, it tracks subtle shifts in knowledge and power relations in recent decades that have not been fully grasped as drivers of change. Here, it reviews how imperatives for change are emerging in social movements that are responding to contradictions as drivers of change in modern society. Some notable trajectories of change are towards more co-engaged and collaborative landscapes of ESD and action learning for transitioning to future sustainability (*O'Donoghue, Taylor and Venter, 2018*). Social transformations that appear to be driving these processes of change are a levelling of power gradients that has accompanied new media and an ontological turn that is disrupting the mediating power of disciplinary knowledge fields. These changes have been accompanied by a shift to more participatory curriculum processes within multi-stakeholder approaches for better situated and more co-engaged knowledge creation. The case for this reorientation is developed for ESD, and some encouraging transformations are examined. Finally, a course-activated learning network with a change project is reviewed as a case of expansive innovation in higher education practices.

Higher Education in the Context of Southern Africa

In the southern African globalising context contemplated in this chapter, student movements are currently calling for free higher education and a decolonising of the curriculum. One finds many international and state institutions expanding the scope of their activities to include collaborations to enhance social justice and future sustainability. On the surface, these appear as postcolonial adjustments in the fabric of an oppressed and unequal state in transition, but the deeper and more global drivers of these critical processes are not always readily apparent, and corrective transformations in higher education institutions are not always clearly understood or practically evident. In a review of postcolonial perspectives in research in higher education Andreotti (*2016, 203*) concludes:

> *"Higher education institutions have been part and parcel of the structure of colonialism and imperialism. In this sense, naming these problems and asking these questions can help those involved with research on sustainable development in higher education to work through the doubleness of their positions, to historicise their questions and answers, and to transform unexamined complicity into more subversive forms of praxis that can shed light on and potentially disrupt cognitive and existential injustices in practices of research and education."*

This chapter is written out of Rhodes University as an institution of higher education in transition amidst contested perspectives, competing dispositions and expanding ambivalence. It thus seeks to locate some emerging axes of tension in education practices, and to report and explore some of the perspectives and expansions that are emerging with environment and sustainability education in response to colonial modernity.

Higher Education from the Perspective of Contradictions and Risks in Late Modernity

Contemplating Education as a Response to Globalising Contradictions

Colonial modernity is one of the key drivers of contradictions and calls for reform in higher

education in South Africa. The calls have escalated as postcolonial modernity fails to produce just, inclusive and equitable social conditions. At a global level, prevailing modernist conditions have also escalated socio-ecological risk that has given rise to successive global imperatives, for example, to foster "Education for All" (*UNESCO 2000; UNICEF and UNESCO 2007*) and more recently, "Education for Sustainable Development" (*UNESCO 2014*), among many other global education imperatives emanating from UNESCO/UNICEF and other conservation, environment and sustainability organisations.

A prevailing conventional wisdom of institutional structural functionalism underpins the global education reform imperatives[1] of the last decades. This disposition assumes that the intervention programmes of modern educational institutions should create the awareness for human values, attitudes and socio-ecological behaviours to change. As education interventions have been failing to produce the desired change, the ball has increasingly been passed to civic participants to enact the change and to resolve local issues in order to mitigate risk. A complex succession of tensions confronts higher education, emanating from colonial modernity, failures in the modern state and concerns for sustainability on a global scale.

These broad brushstrokes of tensions in education point to how contradictions have driven expanding calls for change. The drivers of change have not always been visible, have seldom been clearly understood or agreed upon. They remain elusive to be mapped and addressed within an evolving turmoil of transformations and are often only evident with hindsight.

Problems of Knowledge and Change in Higher Education

The position of higher education institutions as repositories of universal knowledge and mediators of disciplinary knowledge fields to bring about learning-led change has become more and more contested. A levelling of power gradients associated with this contestation has, in part, been driven by a proliferation of mass communications and knowledge-mediating media. This change in the fabric of society has been deepened by the advent of digital knowledge networks that are producing new literacies, a further levelling of power gradients and new elites in the twenty-first century. Emerging ESD processes of change in higher education have been accompanied by a proliferation of critical theory and new environmental knowledge that has exposed contradictions in conventional beliefs and patterns of practice in everyday life. These processes have driven a loss of trust in disciplinary knowledge and imperatives for higher education teaching and learning to relate more to the concerns in everyday life. With this has emerged a wish for learners to contribute to and to have more of a say in learning activities.

Within this simplified overview of some emerging contradictions and tensions driving imperatives for change, one finds a proliferation of calls for change in higher education. The calls have developed around almost every conceivable risk and axis of tension that surfaced in the modern project of the late twentieth century. In the early twenty-first century, education imperatives continued to proliferate, escalating to a global scale amidst global economic crises and a realisation that consumptive trajectories of humanity were driving patterns of climate change that needed to be averted through ESD.

[1] This chapter has been centred on globalising trajectories but these should also be read against the education-reform processes and the rationalising changes in higher education that have accompanied the political changes in South Africa since the early 1990s. These are not immediately germane to this study and are comprehensively covered in the South African education literature.

Emerging Tensions Around Curricular Knowledge of and in the World

It is somewhat ironic that the proliferation of the sciences and other disciplinary fields in higher education institutions has uncovered, narrated and driven most of the environment and sustainability education imperatives that emerged in international agency programmes and civic movements. The loss of trust in the sciences and a need to access powerful knowledge to understand many of the complexities of socio-ecological risk is developing as somewhat of a dichotomy in higher education. Here, the fields of higher education are commonly regarded as disciplines, but the learning programmes are constituted as curricular. Popkewitz (*1988, 82*) describes how:

> *"Curriculum generalizes and categorizes in a way that distances objects from their cultural and social context, transforming the experiences and communication patterns of particular cultural groups and refocusing experiences in ways that respond to dominant structures and power relations."*

As tertiary institutions have clung to their curricula and disciplinary fields, there have been increasing rejections of disciplinary knowledge ('knowledge of the world') for the immanence of intergenerational knowing and life experience ('knowledge in the world'). This has led to a concern for transdisciplinary research and learning contributing to the emergence of more intricate bio-cultural-historical epistemological dispositions that are often compelling but are seldom robust or clear (*Osborn 2015*).

Education responses to risk have been slow to realise that programmes based on the object congruence of universal, authoritative knowledge could not simply be implemented to steer change through education interventions emanating from and mediated by academic centres of higher education. For example, African students who have critically tracked the exclusionary trajectories of colonial modernity in the modern cosmopolitan state[2] are currently drawing on the immanence of intergenerational life experience to question the legitimacy of Western universities and the current disciplinary mediation of what counts as relevant knowledge. Here, the debates have been divisive and ambivalent without a clear grasp of how one commonly needs to contemplate intergenerational knowledge practices (immanence) alongside new environmental knowledge and other object congruent disciplinary knowledge (abstraction) to drive the critical learning processes for the co-production of knowledge for future sustainability.

Education Imperatives for More Inclusive, Endogenous Epistemic Processes

The history of colonial and modernist exclusion in Africa points to how African scholars, youth and communities are still being confronted by descriptions of risk and propositions for future sustainability that are difficult to articulate with African experiences and history. O'Donoghue *et al.*, (*2018*) point to a need to address problems of relevance through a concern for situated, intergenerational processes of teaching and learning. They argue that:

> *"A better-situated (intergenerational and contextual) approach will require closer work within African case histories, cultural perspectives, lived experience, metaphor and knowledge practices (endogenous[3]*

[2] See Popkewitz (*2008*) on abjection in the education practices of the modern cosmopolitan state.

[3] Socio-cultural and historical perspectives that arise within life experience and have situated relevance.

onto-ethico-epistemic[4] processes). In this way, African contexts and cultural capital will need to be more central in ESD if we are to have any chance of mediating ethics-led learning to establish socio-ecological and political equilibria on the tiny blue planet that is now shared by an expansive humanity which originated in Africa."

This perspective reflects a shift in the authority of modern institutional knowledge in Africa and a realisation that the situated knowledge/experience of participants needs to be included alongside the disciplinary knowledge fields for a more relevant process of knowledge mediation. The subtle re-focusing on context here is shaping an expansion in the functioning of modern higher education. This is manifest in more collaborative education actions that engage participants in bilateral epistemic processes that have the potential to develop as reflexive critical processes of learning-led change. Here, learning-to-change appears to be rooted in a reflexivity within and across the immanence of an endogenous social capital and the disciplinary fields for a detaching grasp that might support transformative learning[5].

Restoring Ontological Realism with Situated, Bilateral Knowledge Production

A central tenet informing endogenous approaches to knowledge co-production as situated, learning-led change is reflected in the following insight:

> *"The method which people use in acquiring knowledge is functionally interdependent with, and thus inseparable from, the substance of the knowledge they possess, and especially from their basic image of the world. If this image is different, the method they devise for acquiring knowledge is, as a matter of course, different too."*
>
> *(Elias 1987, 64)*

This proposition is evident in the participatory expansion of ESD as situated, co-engaged processes of learning-to-change.

The move towards object-congruence in the scientific disciplines is evident in the constituting of disciplinary knowledge over successive iterations of research and generations of scientists. The problem here is that the institutional representation of knowledge using the scientific methods and positivism, as noted earlier, commonly masks endogenous, realist ontologies in abstract curricula that masquerade as disciplinary fields. What is also commonly lost is a clear pedagogical grasp of the conditions needed for knowledge to be reproduced in meaningful learning and change in response to environmental risk. Bhaskar (*2015*) in his review of scientific knowledge production, points to how ontology is integral to the critical naturalism and dialectical processes (DREIC) that have constituted modern scientific knowledge. His insights also note how what is experienced and known must be part of the situated, investigative reproduction of knowledge (RRREIC)[6]. These process models are useful for contemplating cultural reproduction from generation to generation.

Towards a Changing Landscape of Co-engaged Knowledge Mediation

The central role of situated, learner knowledge and agency (endogenous epistemic actions) have been emerging in participatory approaches to ESD as reflexive critical processes of learning-led change. One can find a mediating balance being maintained between the intergenerational knowledge-experience of participants in a given context and the object-congruent knowledge (abstractions) of conventional disciplinary academic fields constituted in higher education curricula.

Whereas early education conventions required the prior stipulation of cognitive grasp, socio-emotional assessments, and linked behavioural practices (behaviourism), these are now more commonly emergent and co-developed with learners. The recognition of a concern (contradiction) is commonly preceded by a situated critical assessment and knowledge mediation with co-engaged deliberation to activate relevance that might enable a better grasp of how things are and/or ought to be.

Put simply, the attendant foregrounding of situated learner agency, deliberative engagement and an associated activation of learning actions is not yet fully accommodated in the prevailing conventional wisdom driving most educational practices. There are, however, principles that are beginning to emerge to change not only this but the way that institutions of higher education are functioning to help mediate change. This is notable in ESD where learner **recognition** of a concern commonly includes knowledge of an intergenerational experiential context that is deliberated alongside new environmental knowledge. These deliberative approaches can enable learner **assessments** to activate necessary socio-emotional dispositions in relational to learner **action**, with an emerging grasp of complexity and a sense of relevance for driving changing practice.

Recognition of shared concerns, with associated socio-emotional assessments and action, appears to be slowly gaining traction as situated dimensions for the co-engaged mediation of knowledge, to enable greater learner agency and develop the competences to shape sustainable futures together (*UNESCO 2017*[7]).

Making the necessary changes as institutions of higher education to open up bilateral learning practices with multi-stakeholder interest groups appears to have become an expanding ESD frontier of deliberative learning to change in a changing world.

An Experience of Higher Education with Co-engaged, Bilateral Cultural Reproduction

To engage many of the emerging tensions and contradictions in modern society and higher education, the Environmental Learning Research Centre (ELRC) at Rhodes University began to realise that education needed to be approached in more inclusive, collaborative and integrated ways to support situated learning that had greater local relevance and traction. The iterative process involved in critical reflexivity began to clarify ESD as evaluative processes and learning-led-change that can be mediated as situated, quasi-endogenous modalities of change.

The following co-engaged change projects modality reflects trajectories of change in higher education practices in the case of the collaborative development of course-activated social learning networks with these a rainwater harvesting and food security project, Amanzi for Food.

Amanzi for Food: Participatory Course-activated Social Learning

Amanzi for Food (Water for Food) developed around a concern for food security in response to the risk of climate change in the Eastern Cape of

[4] Here 'onto' refers to lived experience, 'ethico' to valued purpose and 'epistemic' to meaning-making that is constitutive of the knowledge to provide orientation in the socio-ecological environments of the world we share.

[5] See the recent work on 'T-Learning', *http://transgressivelearning.org/*

[6] DREIC and RRREIC are critical realist, process models of theoretical explanation and explanatory investigation.

[7] The current state appears to be at a transitionary point as the recognition, assessment and action stipulations have the appearances of being knowledge- and learner-mediated in developing context, but the associated specification of objectives is predominantly instrumental and structural functionalist.

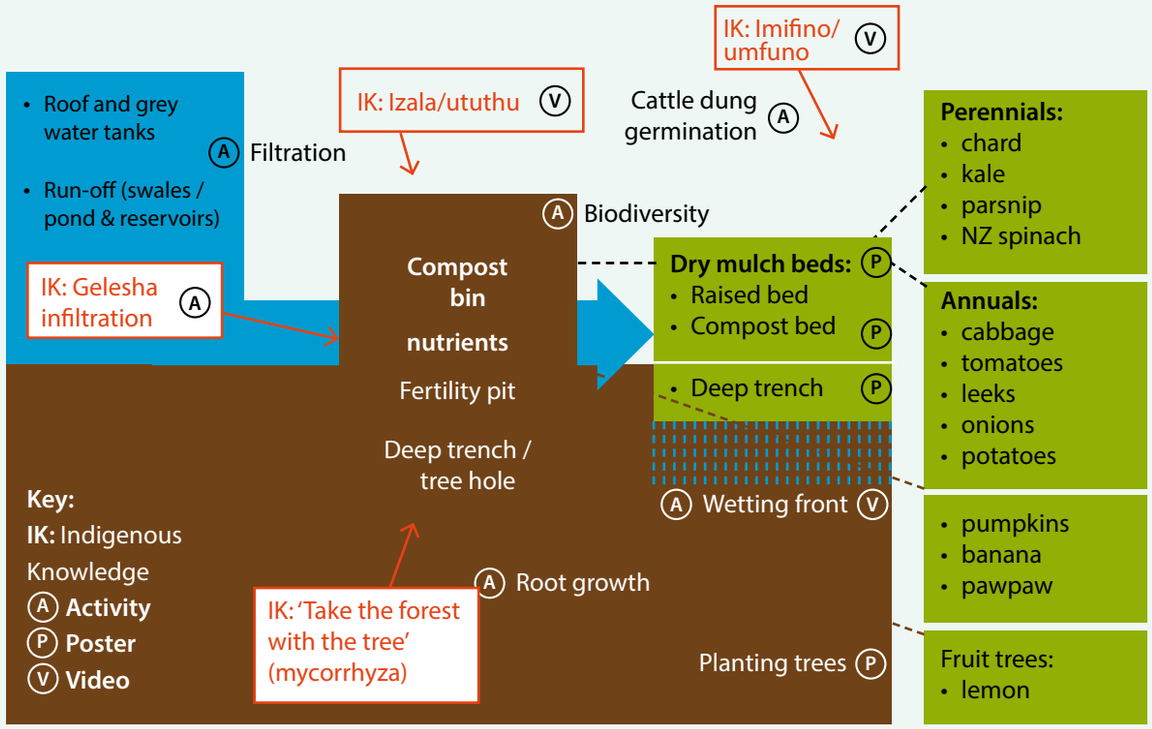


Figure 1: *Knowledge map of practices for the college teaching garden.*

South Africa as a region of high climate variability. The programme was constituted as a multi-stakeholder collaboration in a course-activated process of co-engaged social learning that informed and developed around change projects initiated by course participants (*Lotz-Sisitka et al. 2015; Weaver 2015; Lupele 2017*).

Three phases of expansive learning were explored:

- Course-based activation of a learning network
- Running small-scale social innovation projects
- A radio-programming expansion of the learning network (*Weaver 2015*; *Lupele 2017*)

Amanzi for Food was a project initiated to encourage the practical application of the Water Research Commission (WRC) materials on rainwater harvesting in agriculture. Amanzi for Food was developed to engage agricultural colleges and surrounding communities of food growers in water-conservation farming. A co-engaged, course-activated process was used to include both expert knowledge in the WRC resource books and the local knowledge of participating partners. This inclusive approach to the intended curriculum to support the activation of change was centred on local learning actions to produce food in a region of high climate variability.

Collaborative Mediating of Water-conservation Farming

The curriculum for the proposed participatory course was co-developed with local stakeholders working with local knowledge practices and the WRC materials on rainwater harvesting. An initial 'activating' course was offered over a period of three to four months, with participants undertaking a local change project to introduce rainwater harvesting in either a college curriculum or a local community context. The start-up course was compiled by the participants and accredited by the university. To do this with the ELRC staff, the

Students constructing the teaching garden and trying out water transfer with a hand pump.

participants constituted themselves as the Imvotho Bubomi learning network. The name gave the course-activated social learning process an identity and a structure for continuing their work together as a community of practice. The collaborative learning processes involved in the curriculum development and subsequent expansions led to the inclusion of local knowledge practices in relation to the variable seasonal cycles of the area. The assembled knowledge on water conservation farming practices was thus an emergent amalgam of the WRC handbook and local knowledge practices that resonated with and informed them. All of these dimensions are reflected in *Figure 1* as a synthesis of the assembled knowledge.

The knowledge emerging from bilateral engagement with water-conservation farming produced a mix of intergenerational knowledge practices (*Gelesha; Izala; Imifino*), agricultural science (e.g. use of swales and rainwater tanks) and adaptations of these to the socio-ecological context and the changing seasonal cycles (e.g. mulching, raised beds and deep trench). The crops and practices were mapped onto *Figure 1* for developing a teaching garden at the agricultural college. The blue reflects rainwater capture, the brown compost and soil, and the green, cultivation practices and crops. Foundational indigenous knowledge practices have been mapped in red. Associated learning activities, posters and video materials are overlaid to create a mind map that captured all the dimensions of water conservation farming practices that came out of the knowledge-sharing of all involved. The teaching garden developed as a curriculum innovation and a springboard for the students to acquire the foundational knowledge for visits to local field study sites where they would learn from farmers and gardeners.

The collaborative learning process on the course and in the emerging learning network was centred on action learning sessions that informed the practical-change projects undertaken by the course participants. This approach enabled each participant to use their existing knowledge and emerging knowledge of water-harvesting practices to develop local water-conservation farming projects that had relevance to their teaching and farming contexts. The change projects led to the development of practical-learning sites for the local agricultural college (teaching garden) and for community members to learn in local food gardens. A series of radio programmes followed to further expand the emerging networked learning community of water-harvesting farmers in the area.

The participatory course-activated learning network process reflects the changing role of the ELRC as a higher education institution responding to the need for learning-led change for future sustainability in a changing world. The process developed around:

- The course materials that were constituted as a collaboration with multi-stakeholder groups interacting with the WRC handbooks
- Small-scale demonstration sites which emerged as change projects using small amounts of seed funding support
- The co-engaged roles of participants that changed as the project was expanded through the local radio programming

Three co-engaged research projects flowed from the participatory start-up process of course-activated learning:

- An expansion of the learning network into local radio programming:
  - Using the communities of practice (*Wenger, McDermott and Snyder 2002*) approach, Lupele (*2017*) reports how, in the sharing of their stories on the radio, participants took up an identity as water-conservation farmers. Participants exhibited the agency to both enact and narrate local food production practices. The associated study also tracked how the learning network was formalised and expanded to include many more local farmers and food growers.
- The development of a teaching garden:
  - A demonstration garden was constructed in the agricultural college as part of a process of localising curriculum expansion. This site for practical learning illustrated both intergenerational water-conservation practices and modern drip irrigation.
- A collaborative research project to include climate-smart agriculture in the curriculum of agricultural colleges in other regions:
  - An activity systems approach was used with agricultural college lecturers to identify tensions and contradictions in the prevailing curriculum. This enabled them to work together on curriculum change to better meet the needs of students, and to begin to conceptualise a climate-smart curriculum and teaching practices for the bioregions in their area.

Some Preliminary Insights from the Project

The initial participatory course-activated learning process, the change projects, and the expanding collaborative research that followed, provided a grasp of how and why co-engaged approaches to ESD have the inclusive potential to foster learning-led-change with an associated agency to reimagine and transition to more sustainable futures.

Concluding Insights to Contemplate Expansions in Higher Education

Despite higher education currently being in ferment in South Africa and elsewhere, and with many transformations difficult to track and sustain, some encouraging evidence exists of expansive trajectories of change that are becoming more collaborative. These collaborative practices are begging to arise in higher education practices that are emerging with a concern for learning to transition to future sustainability.

Against the background of the contradictions and risk erupting in late modernity, the expanding scope and changing focus in key aspects of higher education appear to be becoming more inclusive, collaborative and reflexive. It is notable that the knowledge project and pedagogy are undergoing inclusionary change, where knowledge to inform change is being constituted in bilateral, dialectic processes that challenge many of the assumptions and practices that have characterised higher education in modernity.

The complex fluidity and pluralism here have confronted the authority of prevailing knowledge fields to constitute these as capital for collaborative learning to detour sustainability dilemmas in the present era. This has made the terrain of higher education both complex and contested as never before. However, the slow advent of more co-engaged and collaborative practice, briefly examined in the case study of Amanzi for Food, points to the emergence of increasing clarity and the prospect of learning-led change.

The changes noted must be read as modest in both significance and scope. After a little experience of the heated passions and the rigidity of contesting dispositions in the current ferment in South African contexts of higher education, it is sobering to note that some of them may be difficult to sustain amidst the contested political sociologies of turbulent times in higher education. Conscious of this, and erring on the side of exploring transgressive practices in curriculum and pedagogy in ESD as reflexive critical processes, this review frames a more open and deliberative pluralism for transitioning to future sustainability[8] in Higher Education. These approaches developing in Higher Education will need to be deliberative and learning-centred. They will also need to be responsive to the risk of the times if they are to come and be constituted in ways that include the endogenous knowledge in the world and the prevailing disciplinary knowledge of the world. Following Andreotti, what is probably necessary here is the honesty to name complex problems that might enable the difficult questions needed for transformative praxis at the level of humanity as a whole to be confronted.

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[8] Following the critical realism of Roy Bhaskar, sustainability is contemplated as an 'ability to sustain' that is framed by an ethic of being 'for the common good', where this resides on a landscape of futures that can only remain open to being realised by humanity.

Teresa Salinas

Chapter 10

Sustainability Learning Based on an Andean Amazonian Worldview

Summary

ESD Innovation

Three aspects constitute the starting points: (i) changes in philosophical, epistemological and didactic frameworks of education, (ii) the questioning of higher education's new functions, and (iii) the appraisal and inclusion of an Andean Amazonian worldview and rationality into university environments.

In order to start the Diploma Course on Biodiversity and Dialogue of Knowledge Systems, it was required that Ricardo Palma University validate Andean Amazonian knowledge. This sparked an intense debate. Eventually, a Regional Academic Council was appointed to validate both the indigenous leaders who would participate as teachers and those who would attend as students.

Indigenous youth who attended the diploma course were educated in the use of ICT and a virtual classroom in order to be able to communicate both locally and nationally; although this required a 30% increase in the diploma course programme time, students were later able to attend and present their proposals in regional conferences and debates.

Societal Transformation

At the local level, it validated traditional knowledge and strengthened leaders of the Quechua Lamas communities who attended this course. Indigenous community leaders, teachers, technicians, and professionals from private and public institutions, as well as local governments, strengthened their intercultural vision and established the need to develop shared visions and actions that value academic knowledge and ancestral knowledge related to biodiversity regeneration and its sustainable use.

Implications of Development for Knowledge Institutions

One of the transformative outcomes of this experience was to put into practice complex, transdisciplinary, phenomenological, and hermeneutic educational research which promotes a dialogue between knowledge, social agents, and levels of reality. This has been strengthened in the university and escalated to other projects. At the national level, a working group for educational innovation was consolidated at Ricardo Palma University. At the global level, networking was promoted, and contributions and good practices were shared at events organised by GIZ GmbH, UNEP and UNU.

Dehumanisation of 'Scientific' Knowledge

In the mid-1970s, a new global 'scientific-technical revolution' was evident. It was characterised by a synergy among quantum mechanics, informatics, and molecular biology, and by unprecedented developments in world affairs. These transformations have permeated all human activities and increased the complexity of knowledge and of life on the planet.

Influenced by Descartes's and Newton's ideas, Western culture built knowledge by seeking order, ruling out contradictions, fragmenting wholes, and reducing and rejecting uncertainty in emergent processes; in short, it built knowledge by means of the simplification paradigm. While this form of knowledge has brought some positive aspects (in medicine and technology, for example) its consequences have been harmful to mental models of humanity. In fact, the actions that followed eventually endangered life on Earth. Positivist and reductionist thinking, reinforced by considerations of profit, may well be held responsible for the predatory action of humans over nature and the blindness to understand and address the serious problems of humankind.

This narrow understanding of the world accepted only one method of creating scientific knowledge, and at the same time it invalidated other knowledge systems. Historically, with the conquest of the Americas, this way of thinking about the world was imposed on the conquered lands; concurrently, indigenous forms of building knowledge as well as social and spiritual indigenous practices were brutally repressed. According to Ramos: "Loss of cultural references of their own makes people enter into that arbitrary system of categories by which 'developed' are those who consume more energy and 'savages' who [consume] least. This type of cultural matrix, in which we are captive, creates a circuit of alienated values regarding the types of knowledge as well as changes the order, essence and characteristics (by the small size of our market and its dependent relationship) of contents and ways of knowledge" (*Ramos 1992, 33*).

Further development of sciences made it evident that some of the emergent properties of life and nature cannot necessarily be addressed by deterministic and reversible science. For example, according to classical science, mass and energy are the sources of change and transformation. The development of biology led to a better appreciation of how life organises itself and how certain processes (such as human consciousness or climate change) emerge. Information shows up as another source of change and transformation. Such evolving understandings lead to changes in ways of thinking and living in the world, knowledge structures, and the way of doing science. It encourages the rise of Sciences of Complexity and Complex Thought (*Morin 1995*) and Dissipative Structures of Non-Equilibrium Thermodynamics (*Prigogine and Stengers 1983*), which have integrated real-world irreversibility into science.

This global 'scientific-technical revolution' opened up new epistemic frameworks for understanding natural and social phenomena that underlie human existence. In the new epistemic and social order inhabitants of the Central Andes of Peru still lose their culture. There is a hope that research on new epistemological frameworks of science which might support new ways of thinking, understanding the human condition, taking care of biodiversity, and preserving life on Earth will lead to a change in university practices, making it more accommodating to other knowledge systems. Briefly, what is needed is a contextualised and relevant education to achieve sustainable development.

According to Morin: "It is essential, in unison, to globalize and de-globalize, to grow and to diminish, to develop and to involve, to conserve and to transform. Globalization and de-globalization as it is oriented means if we were to multiply cultural processes of communication and globalization, if we were to create an Earth-Motherland consciousness, a community of destiny consciousness, it is also necessary to encourage local development within the global one" (*Morin 2011, 35*).

Four Challenges for Higher Education in Peru

The tertiary education system in Peru was created by conquerors with the objective of maintaining the colonial state, imposing its culture, and destroying the indigenous culture. Although the university has been a democratising force since the end of the Colonial Era, it still maintains its colonial character in relation to the production and application of knowledge. The work of the university is based on repeating knowledge developed in other countries and other contexts, a knowledge that does not address the basic needs of the multicultural and multiethnic population of Peru.

For instance, engineers and technologists in charge of the preservation of ecosystems in the Central Andes of Peru have a tendency to underestimate or ignore ancestral knowledge and prioritise lessons they learned in university classrooms, even though most of the time these lessons may not be well contextualised. This is a significant hurdle to better understand local and cultural realities and thus to creatively and productively integrate knowledge to advance biodiversity protection and sustainable development.

Education in Peru has for the most part forgotten the essence of being, the human condition, and reflection on who Peruvians are.

Tensions and contradictions of local and national life are also echoed in the challenges of the knowledge systems as a root cause of the educational crisis, contradictions that determine the irrelevance and lack of quality of education, but these are not addressed. Even when some efforts have been made to do so, deficiencies still remain. Most challenges are multidimensional and recursive; however, some of these challenges, because of their significant impacts, should not be overlooked.

The first challenge has to do with structures of knowledge, that is, how people build knowledge, how knowledge builds people, and how knowledge builds mind patterns; that is, whether these processes help people to understand the world, the dynamics of life, biosphere, and human nature and, most importantly, whether these processes help to develop relevant knowledge.

The second challenge has to do with the reductionist and fragmented view of the educational system. Education should not be reduced to formal areas; real and systematic non-formal and informal education support is essential, along with sound public policies, to ensure private and public sector (especially mass media) and civil society compliance with social responsibility. It is also essential to ensure implementation of public learning spaces and interactive knowledge centres as effective means of lifelong learning through Education for Sustainable Development (ESD).

A third challenge is the commodification of education. By allowing education to serve the market, its essence as a right inherent to the human condition has been distorted. Massive privatisation of education has not improved its quality, nor ethical and moral values. An assessment of private education in Peru is pending.

A fourth challenge is the irrelevance of education, which does not prepare citizens to face life's uncertainties and to address the serious problems of humankind (poverty, violence, delinquency, hunger, climate change, etc.).

Establishing Sustainability Studies

Rethinking the University in Light of a Different Thinking Tradition

The serious challenges humanity faces lead us to question the role education plays in the construction of the world. How does education contribute to shaping mental structures of humanity? Why is the creation of relevant knowledge in universities so precarious? What philosophical or epistemological frameworks could sustain ESD? From what epistemological framework could the university understand and validate an indigenous community's knowledge? How have the Central Andes' indigenous communities cared for biodiversity for thousands of years? What topics are of mutual interest to both universities and indigenous communities?

The fundamental challenge for ESD lies in the way of thinking and being in the world, at the level of consciousness to understand how humans are destroying the world in the commitment to transform it. This requires rethinking the role of humans as individuals and social beings, as well as humanity's relationship with nature. This means rethinking education, transforming the foundations of education and learning processes, and thereby to 're-enchant' the meaning of life on the planet. People need to transform linear and fragmented mental models based on instrumental reason into an ethical and humanist reason, i.e., an education that helps to regenerate life and to make humanity happier.

From a higher education system perspective and the ideas of Morin, Prigogine, Maturana, Nicolescu, and some others, the Ayni proposal of thinking (*Box 1*, *Figure 1*, and *Figure 2*) presents a logic for exploring the transformation of learning from linear to systemic in all its complexity. Also, the Ayni proposal validates other ways of building knowledge and relevant and contextualised curricula.

The Ayni proposal constitutes the ongoing quest to encourage change of the linear and fragmented view of educational systems (based on *Salinas 2009*). This proposal presents a higher education system dynamic informed by complexity, transdisciplinarity, hermeneutics, and phenomenology. Only important variables and interactions are included in the proposal; hence, this can be considered to be a kind of reductionism. However, it might play a key role to create shared views of the processes.

Ayni conceptualises education as a feedback loop of social and natural systems. In a process of auto-eco-organisation[1], feedback transforms the mental structures and regulates ways of translating reality and intersubjectivity, both individually and collectively, as well as relations with the environment. All these processes take place simultaneously, carrying out local and global functions. Emergencies arise and provide feedback to this same system, to humans (individually and collectively), and to ecosystems. This dynamic determines the quality of life and of education, and also the relevance and contextualisation of the latter.

Box 1: *The Ayni proposal.*

[1] Auto-eco-organisation allows one to consider a creative evolution that integrates and transforms the capacities of order, disorder, and organisation (ecological, biophysical, and cosmic) into psycho-cerebral capacities that organise knowledge.

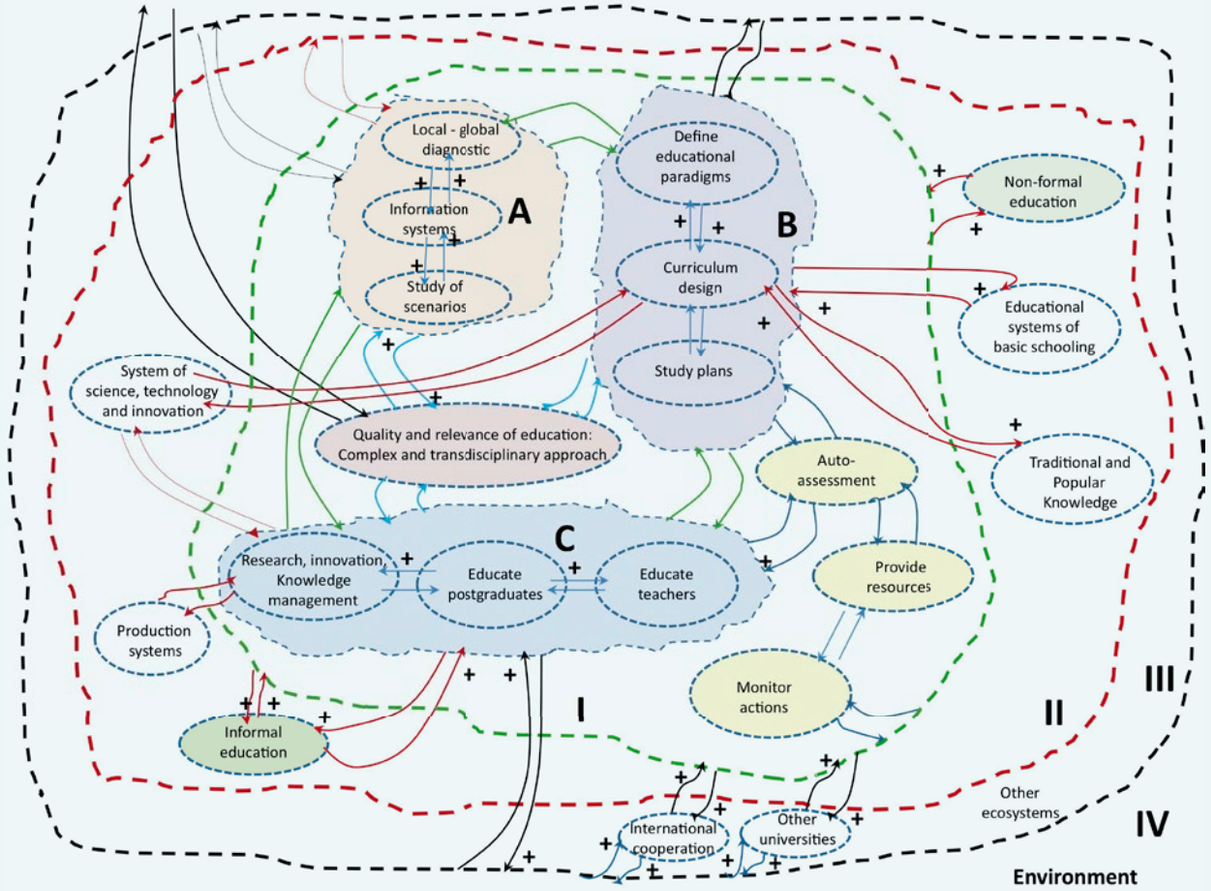


Figure 1: *Ayni proposal for higher education. Level I: University; Level II: National; Level III: Global (See Appendix A).*

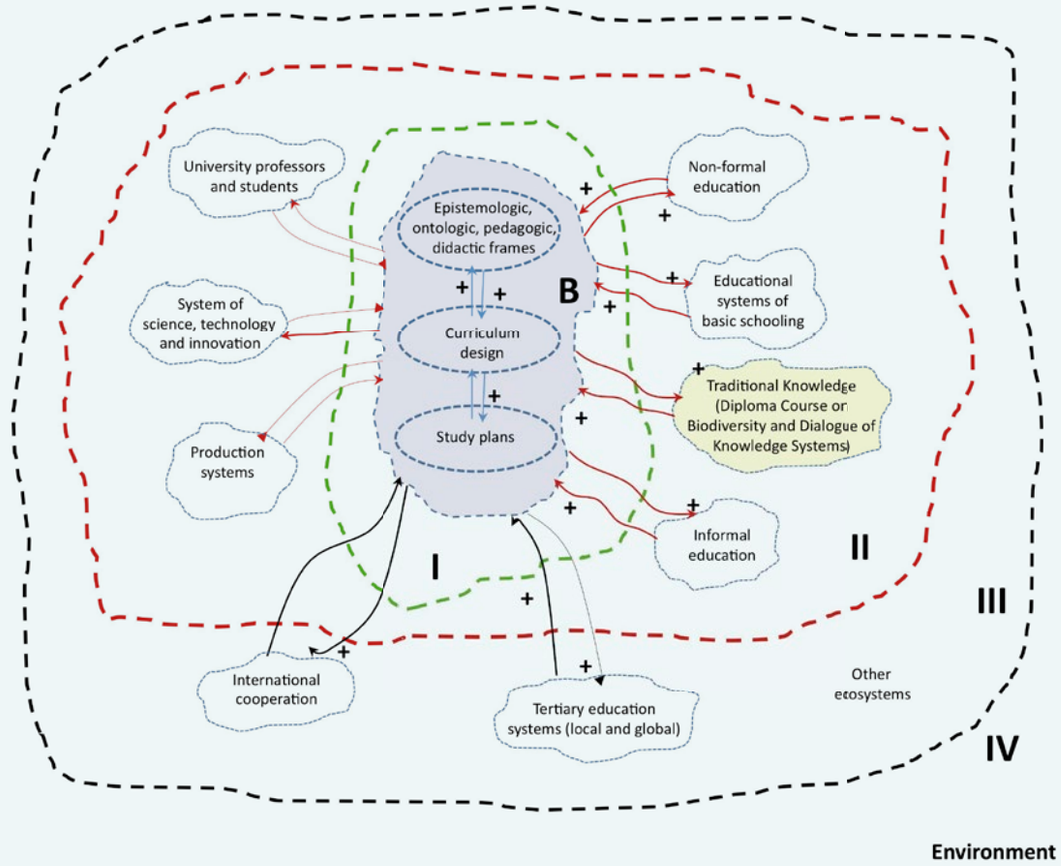


Figure 2: *Ayni proposal for higher education. Node B: Interactions for a relevant and contextualised curriculum (See Appendix A).*

According to Maturana (*2014*): "To educate is to create, to realize, and to validate in the coexistence, a particular way of coexisting. This is always done in a network of talks which coordinates the doing and the excitement of the participants… this means giving each citizen elements for an autonomous, social and ecologically responsible task" (*Maturana 2014, 147*). To make this possible, education must be centred on love, mutual respect, and trust. Maturana also pointed out that "knowledge acquired should make some sense in the vital environment in which students live" (*ibid., 148*). The intercultural approach to education is fundamental here. It supports the impossibility of comprehending the whole human experience from a single perspective. Peru needs an education whose curricular plans are relevant and contextualised, and which is able to answer local and global challenges, and contributes to solving basic needs of the population, namely to overcome economic, cultural, and spiritual misery. It is insufficient to follow the logic of one culture alone. Other complementary methods can help to reorient education. In this regard, Prigogine and Stengers (*1983, 279*) said: "The metamorphosis of the contemporary sciences is not a rupture. We believe, on the contrary, that it leads us to understand the meaning and intelligence of ancient knowledge and practices that modern science oriented towards the model of an automated technical fabrication had believed to leave aside."

The Central Andes of South America is home to a thousand-year-old heritage of knowledge and social practices (*Box 2*) that have taken care of the complex and fragile Andean ecosystems. Different phrases characterise the way of being and living in the indigenous communities. Quechua-speaking Andean Amazonian communities call it *Sumak Kausay* (*Buen vivir* or *Vivir bonito* in Spanish, 'the good way of living' in English).

Peru is rich in biological and cultural diversity. The Peruvian Amazon represents 60% of the Peruvian territory. Although San Martín represents only 6.6% of the Amazon territory, it is the most densely populated region of the Amazon, home to approximately 800,000 indigenous and non-indigenous people, who comprise 30% of the total Amazonian population. This reality, caused largely by the Andean immigration, puts pressure on nature to the extent that some regions, such as the Alto Mayo, are among the most degraded in the country.

Peru has 42 Amazonian ethnic groups with a population of 340,000. Three are in the San Martín region: Awajún or Aguaruna, Quechua-Lamas, and Chayahuitas. Awajún and Quechua-Lamas are the second and third largest ethnic groups in the Amazon after the Ashaninka. These people have a deep knowledge of their territory and have kept and preserved, until now, not only their knowledge but also their values and practices for taking care of nature.

The Andean Amazonian worldview has a systemic understanding of people and nature. Evidenced in the people's day-to-day life and in indigenous education, this worldview conceives of the fundamental interrelationship to the point that its recursive thinking is obvious. In this worldview, one makes connections and has an incessant dialogue with oneself and with everything that exists in nature. The 'reciprocity' principle governs any activity and all human-nature interaction.

Antonio Peña Cabrera highlighted some Andean Amazonian rationality features thus: "The Andean Amazonian person… leans towards diversification and variety, not only respects existing plurality but also enriches it… The Andean Amazonian people had an ecological conscience, based on a sense of collective responsibility and a cosmic order perception. There has not been any significant agriculture anywhere on Earth over 3000 meters high, except in the Andes. The rationality that made life and diversity possible on such a high altitude was the Andean Amazonian one" (*Peña Cabrera 1998, 16–19*).

In order to survive, Andean people needed the collective. As a Quechua-Lamas indigenous community leader (*Apu* in Quechua language) explained, they practice *Choba-choba* (mutual assistance). In his words: "What you can do in a week, it may take a day to do it together; our community and family in full would contribute; furthermore, we all together would eat, dance and thank Mother Nature."

Box 2: *The Andean Amazonian worldview.*

How to recover these knowledges for an intercultural education? What do indigenous people think about it? To enter an indigenous community one has to comply with a series of established protocols; for them, mutual trust is paramount. Indigenous people suffered many deceptions, which impacted negatively on their worldview and customs and encouraged their youth to migrate to cities. In this case, through the 'Academic Council' of the region some work has been undertaken with them to strengthen mutual trust.

In order to recover traditional indigenous knowledge and community values, it is necessary to strengthen them, to make them visible, and to equip school teachers, authorities, students, and society as a whole with an intercultural vision for

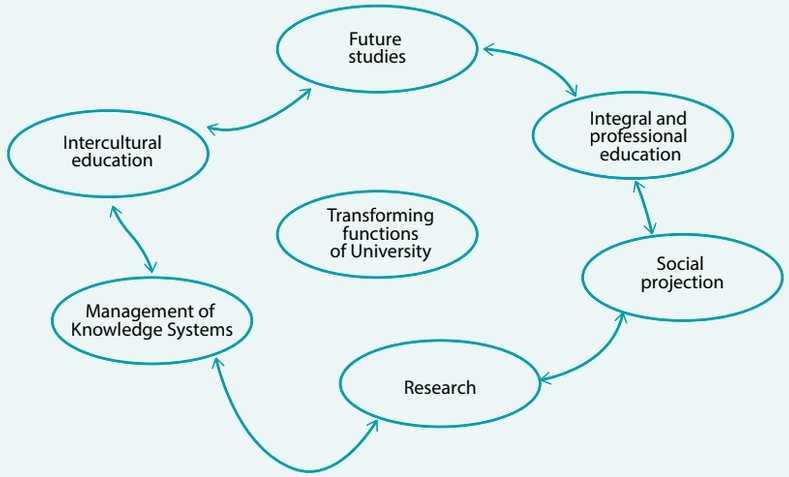


Figure 3: *New university functions for enabling sustainable development.*

knowledge decolonisation. This would allow the validation and incorporation of relevant Andean Amazonian knowledge at all levels of educational curricula and at all places in Peruvian territory.

Furthermore, challenges of rethinking education are functions universities typically fulfil. According to the current legislative framework, Peruvian universities usually have three functions: academic training, social projection (university extension to society), and research. In the author's view, these functions are insufficient to achieve sustainable development. *Figure 3* shows some new functions that should be incorporated into higher education, namely managing different knowledge systems, encouraging the creation of relevant knowledge, and promoting intercultural education. Knowledge production should be one of the main functions of universities.

Aware of its social responsibility toward Peruvian biological and cultural diversity preservation, Instituto Peruano del Pensamiento Complejo Edgar Morin (IPCEM) of Ricardo Palma University, undertook the Diploma Course on Biodiversity and Dialogue of Knowledge Systems. The purpose was to connect technoscience and traditional knowledge for the mutual transfer of knowledge and good practices, thereby contributing to ESD that is capable of providing solutions to both local and global challenges. It is pertinent to point out here that this course, combining scholarly work with the development of the Quechua-Lamas indigenous communities of the San Martín Region, was developed as a part of the activities of RCE Lima-Callao. The Ricardo Palma University (URP), in partnership with other public and civil society organisations, had set up this Regional Centre of Expertise (RCE) on Education for Sustainable Development, which was acknowledged by the United Nations University in 2011 as a part of the RCE global network (*Fadeeva et al. 2014*). Instituto Peruano del Pensamiento Complejo Edgar Morin coordinates RCE Lima-Callao.

Epistemic Foundations of the Project Concept

Peruvian universities only recognise the Western knowledge system as valid. Yet, for ESD to be possible, all social sectors are to be considered, which makes it essential to research new epistemological approaches that may support an education able to integrate all worldviews coexisting in a given territory.

The epistemological approach debate going on at RCE Lima-Callao Research Group is based on the proposals of Morin, Prigogyne, Maturana, and

Nicolescu, among others. Morin's theory questions fragmented, reductive thinking, based on absolute truths, blind to understanding the dynamics of life. He proposes a thinking capable of understanding natural and social phenomena's complexity based on the following principles: the Dialogical Principle, the Principle of Organisational Recursivity, and the Hologramatic Principle (*Morin 1981*). The Dialogical Principle allows us to rationally assume the inseparability of contradictory notions to conceive the same complex phenomenon, for example, antagonistic notions of life and death or good and bad that coexist in the same reality. Recursivity is the process in which the effects or products are cause and effect of the process itself. This notion requires one to consider the processes of self-organisation and self-production which characterise the complexity of natural and social phenomena, especially education. The Hologrammatic Principle claims that not only is the part in the whole, but the whole is in the part; it ultimately transcends both the reductionism that sees the part only and holism that sees the whole only.

If education takes place in a network of exchanges that coordinates the actions and the emotions of the people involved, there is a need to foster reflections in education that make us aware of the limitations humans have of comprehending the complex dynamics of the universe, Earth, body, mind, and spirit, as well as of the meaning of culture.

In this project, Edgar Morin's Seven Complex Lessons in Education for the Future is the starting point for the inquiry. The seven lessons are: 1) Blindness of knowledge: Error and illusion ("to prepare the mind to confront the constant threat of error and illusion"); 2) Principles of pertinent knowledge (the need to place partial knowledge within the complexity of its reality and the totality of its context); 3) Teach human condition (key for education, humans are simultaneously physical, biological, psychological, cultural, social, and historical beings); 4) Teach Earth identity (awareness of complexity of global crises, acknowledgement of the shared fate of humanity); 5) Confront uncertainties ("education should include the study of uncertainties that have emerged in the physical sciences (microphysics, thermodynamics, and cosmology), the sciences of biological evolution, the historical sciences"); 6) Understanding each other (which is absent from education, despite the fact that it is vital to human relationships and "which is a vital necessity to carry human relations past their barbarian stage of misunderstanding"); and 7) The ethics of humankind (a human being is at the same time an individual, a member of a society, and a member of a species (*Morin 1999, 1–4*).

According to Morin, from this point on, one can note the two great ethical-political goals of this new millennium: First, to establish through democracy a mutually controlled relationship between society and individuals. Second, to think of humanity as a planetary community and thus to work for a planetary citizenship.

The transdisciplinary perspective proposed by Nicolescu[2] is based on a multidimensional and multireferential openness of education, which "revalues intuition's, imaginary's, sensibility's and body's role in knowledge transmission" (*Nicolescu 1996*). This would allow movement through different levels of reality of the Object (micro, meso, and macro cosmos) and different levels of perception of the Subject (individual, society, etc.). It entails apprehending (in another way and with another strategy) scientific disciplines, and traditional and popular knowledge of different cultures through a transdisciplinary dialogue of knowledge systems, which requires new approaches and attitudes (rigour, respect, tolerance), allowing the emergence of new knowledge that cannot be obtained from linearity, simplification, and reduction of knowledge.

"Epistemology is an examination of origins, nature, methods, and limits of knowledge… however, any epistemology is based on the western intellectual tradition." In this view: "We therefore propose a broader understanding of epistemology, one which does not reduce it to a theory of scientific knowledge but rather one which embraces the spectrum of access paths to knowledge and facilitates the flow of life. In this context epistemology might be understood as the reflection on the conditions of possibility of a rigorous knowledge that supports the accompaniment of a culturally distinguishable group by somebody who accompanies mutual learning" (*Ishizawa 2009, 9*).

From the Andean Amazonian communities' community education approach, the native wisdom of values, practices, and knowledge hold the potential to propose a transdisciplinary dialogue of knowledge systems. The 'Good Living' of these indigenous communities is not a recipe, it is a constant intercultural unfolding. According to Lajo, it is the balance between feeling good (*Allin Munay* in Quechua Language) and thinking well (*Allin Yachay*) that results in doing well (*Allin Ruay*) to ultimately achieve harmony (*Lajo 2005*). Good Living is based on the principles of (a) interconnection, or the interwoven dynamics of life, which are not only things related to human heritage but also those produced by a dialogue with all that exists: rivers, animals, *Chacra*, mountain, moon, deities; (b) reciprocity, (*Ayni* in Quechua language) members of all communities have something to give and need something to exist; and (c) complementarity, all fulfil a function for harmony, balance, living in peace, and community. Life is born in that interaction of protection, mutual respect, love, affection, trust, joy, and the dance with nature. From these interactions emerge some community practices such as *Choba-choba* (Quechua language for 'mutual aid') or *Mikunas* (a type of food ritual).

According to Aníbal Quijano: "We are witness to the emergence of a new historical identity… whose development could produce a new social existence liberated from domination, exploitation and violence… In this perspective the proposal of 'living well' is necessarily an open historical question which needs to be continuously researched, debated and practiced" (*Quijano 2015, 859*).

These epistemological approaches supported the proposal to validate the Andean Amazonian knowledge holders in a university context and to execute the Diploma Course on Biodiversity and Dialogue of Knowledge Systems. The course was conceived as a 'semi-attendance' or blended learning (part online, part contact) program, aimed at the transdisciplinary practice of the dialogue of knowledge systems related to biological and cultural diversity.

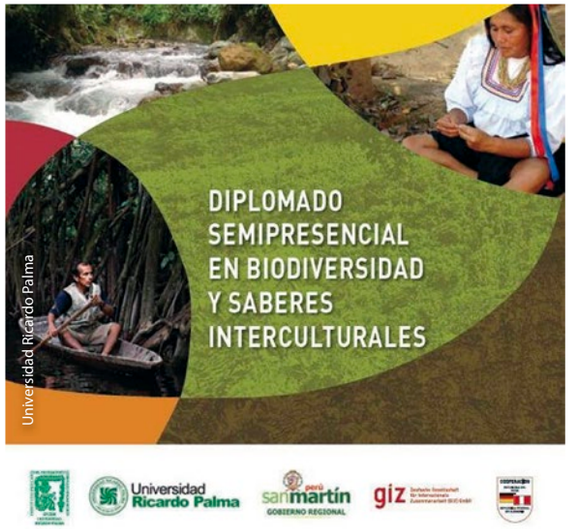
One of the main aims was to put into practice a complex, transdisciplinary, phenomenological and hermeneutic research of education that links different social actors and levels of reality (local, national, and global) to build an epistemic community that would contribute to a communal and intercultural education at both urban and rural levels. At the local level, it seeks to strengthen

[2] Transdisciplinarity principles: 1) The ontological axiom: There are, in nature and society and in the knowledge of nature and society, different levels of reality of the Object and, correspondingly, different levels of reality of the Subject; 2) The logical axiom: The passage from one level of Reality to another is ensured by the logic of the included middle; 3) The complexity axiom: The structure of the totality of levels of Reality or perception is a complex structure; every level is what it is because all the levels exist at the same time (*Nicolescu 1994*). Yet, comprehension can be enhanced through other 'knowledges' such as technoscience knowledge, traditional and popular knowledge, and life experiences.

the indigenous communities and the 'Communal Groups of Cultural Affirmation' that exist in the area to make indigenous knowledge visible. It validated traditional knowledge and strengthened the Quechua Lamas indigenous community leaders who attended the diploma course and, in general, all diploma course participants, who were given an intercultural vision. At the national level, beyond the diploma course experience, a working group on the subject of educational innovation was consolidated at Ricardo Palma University. At the global level, networking and the exchange of best practices were encouraged. For instance, some events organised by Deutsche Gesellschaft für Internationale Zusammenarbeit (*GIZ* GmbH), United Nations Environment Programme (UNEP), and United Nations University (UNU), among others contributed to debates.

The diploma course helped indigenous leaders to move from oral-based to text-based knowledge transmission of experiences. Furthermore, based on their experience and systematic reflection throughout the diploma course, indigenous community leaders drafted some proposals for solving local challenges and thus empowering their community.

To evaluate both indigenous people who could potentially contribute as instructors and the young leaders who may attend as students, an Academic Council was set up. This was composed of Andean Amazonian culture and San Martín region specialists with university degrees and previous work with the Communal Groups of Cultural Affirmation in the area. Within two years, from among the indigenous communities visited, leaders and bearers of traditional knowledge (recognised as such by their communities) were identified. Those evaluated and found acceptable were included in the diploma course. This was the first such initiative in Peru.



Diploma Course presentation.

The Diploma Course on Biodiversity and Dialogue of Knowledge Systems

In Peru, efforts have been on improving intercultural community education. As mentioned earlier, in most cases these efforts are aimed at rural areas, and education is still geared toward Western customs and knowledge. Many courses directed at indigenous communities take them out of their environment, bring them to the city to be trained in the Western worldview, and certify them as participants in courses not appropriate for them. This project differs in essence. As a starting point it considers the Amazonian worldview as significant as the Western worldview. Within a scholarly program framework it offers a dialogue of knowledge systems developed in Andean Amazonian communities. It aims to communicate to the new generation the relevance of traditional knowledge, the importance of urban and rural relinking, and better social integration for biodiversity care and sustainability. The blended learning Diploma Course on Biodiversity and Dialogue of Knowledge Systems arises from the recognition of the great biological and cultural diversity of the Andean Amazon region and the crucial role that regional institutions and local communities play in their preservation and development. The diversity shows the millenary cultural tradition of the upbringing in indigenous and local communities, and motivates the interest of the Peruvian State and regional governments to promote the interests enshrined in the Convention on Biological Diversity (CBD), in the General Education Law of Peru and in the various biological diversity conservation programs and policies.

The diploma course combines theoretical reflections with the cultural and biological diversity management methodologies associated with regional natural and cultural asset regeneration. This diploma course was led by Ricardo Palma University professors with equal contributions from holders of local knowledge, i.e., indigenous wise men and women and leaders who would share with diploma course students their knowledge of some aspects of forest, water, agriculture, and medicine.

Theories of Metamorphosis: Intervention Hypothesis

The dimensions of the interventions offered by the diploma course are: conceptual (philosophical and epistemological), cultural (relevance and contextualisation), technological, and economic. The first includes the reason for the intervention and educational paradigms that lay the foundation of metamorphosis theories (extension, change, and transformation) that underlie all educational interventions. The cultural dimension considers matters relating to the relevance of the intervention, in particular its effects and impacts on different actors and cultural groups and their perception of the intervention goals. The technological dimension refers to the practice of the approach, strategy, and procedures, as well as the organisation of resources available for intervention. The economic dimension deals with the management mechanisms and financial resources planning that make this intervention feasible (*Salinas, Ishizawa and Tréllez 2014*).

IPCEM and RCE Lima-Callao conceived of their intervention based on a vision of the metamorphosis of the regional 'field'. This favoured the participation of indigenous communities, teachers of the diploma course as well as participants and teachers from other institutions, who were not necessarily local.

Combining the two traditions of knowledge has been embraced by the CBD since 1993. Global initiatives that followed, such as the Millennium Ecosystem Assessment (MEA) and the most recent International Assessment of Agricultural Science and Technology for Development (IAASTD) recognised the value of indigenous, local, and traditional knowledge. Rather than a complete, explicit or implicit theory of change, which could be expected from an intervention such as the diploma course, IPCEM's intervention was based on the conviction of the relevance of the complex thinking of Edgar Morin for the San Martín region. The viability of the diploma course as designed lay in the existence of: (a) a detailed documentation of knowledge about the rich biodiversity of indigenous communities in the region (especially of the Quechua Lamas) due to the work of institutions of civil society and international cooperation such as the GIZ, (b) local teachers able to encourage dialogue of knowledge systems, and (c) consensus about the need of a platform for the regional epistemic community that would make the dialogue of knowledge systems a reality – to meet, discuss, and design the training of new members. Based on these regional strengths, the Diploma Course on Biodiversity and Dialogue of Knowledge Systems was implemented (*Salinas, Ishizawa and Tréllez 2014*).

Design of the Course

The objective of the diploma course has been to equip community leaders, school teachers and professors, technologists, and professionals from public and private institutions, regional governments, and Andean states and regions with an intercultural vision that understands and values the academic and ancestral knowledge related to regeneration and sustainable use of biodiversity (*IPCEM , GIZ GmbH 2012*).

Upon the completion of the diploma course, the graduates are expected to have:

a) achieved a greater awareness of biodiversity care both locally and globally, taking into account the different views on addressing this issue
b) developed skills of listening, understanding, and articulating views and positions of various development actors
c) acquired competence for intercultural conversation and exchange
d) developed the capacity to elaborate intercultural approaches to local issues
e) applied learning from the course to work on a relevant local issue and present a proposed solution in the form of a monograph

The design and implementation of the diploma course was an interactive and evolving process. It was started by an advisory council that worked for two years with different regional stakeholders (among them the Quechua Lamas indigenous communities) to develop the course proposal and to validate its indigenous participants either as instructors or students.

This diploma course included exchanges with scientists and field work with Quechua Lamas from indigenous communities who had some background in cultural affirmation. Virtual modules provided space for self-learning with team support of virtual instructors/teachers/tutors. E-learning technology was used in distance-learning modules and adapted to the specific situation of each student.

Implementation was a 'learning by doing' process that was indeed validated in students' day-to-day life. In a scenario highly related to regional challenges, two worldviews (two ways of building knowledge) were set at play. On one side were students with a strong Western worldview who like to use linear language and a logical framework for research. On the other side were Indigenous students and leaders whose knowledge largely comes from conversations with nature, which start from their community experiences on how to raise the field (*Chacra* in Quechua language), and deal with the forest, or water, in relation to the moon.

The students' monograph, a written proposal to solve a local issue based on students' experience and systematic reflection throughout the program, is the tangible result of the diploma course.

Learning Process

Didactic methodology is based upon the reflection of one's experience. Within an environment of trust, tolerance, and mutual respect, one is encouraged to have a dialogue with others on their worldview, perception of life, and way of constructing knowledge. As Gaston Pineaud put it: "What we want is to change the choice of knowledge from a programmed didactic towards a reflexive didactic and towards an organization of reflexivity based on one's experience and on concrete challenges. Because reflexivity on one's experiences puts us from the start inside the complexity of life" (*Pineaud 2014, 40*).

Participants' work was continuously evaluated through the process. In the on-site phases, it consisted of the evaluation of each item by reading the summaries and the subsequent development of each topic. In the distance-learning phases,

Diploma Course Students in a 'Mikuna'.

Indigenous Leader Misael Salas Tapullima, diploma course student.

reports of lectures and participation in forums and discussions were graded. All these ratings together have a weight equivalent to that of the rating of the monograph.

Results and Discussion

Stakeholders went from words to action. Eventually, technologists, professionals, sages from the indigenous communities, and some organisations and international cooperation agencies connected locally, nationally, and globally. This contributed to multicultural networking and strengthened the diploma course.

IPCEM and Ricardo Palma University pioneered the approach of facilitating people without academic qualifications to interact with the academically qualified. It was a great challenge to change and open new horizons to the higher education–society relationship to build relevant knowledge.

Indigenous participants at the 2nd Americas Regional Centres of Expertise (RCE) Conference held in Lima.

While abundant literature exists on biodiversity from an academic perspective, there is little from an indigenous perspective. For this reason, special effort had to be made in devising both the curricular plan and methodological frameworks.

Traditional knowledge bearers selected by the Academic Council were recognised by Ricardo Palma University either as teachers or as students in the diploma course. Indigenous participants who successfully completed their monographs were certified. This was the first such initiative in Peru.

A major challenge of the course was to overcome the gap between orality and textuality of the indigenous participants as revealed by their difficulty in writing the monograph the diploma course required.

While in this first experience, it was difficult to achieve the full potential of the dialogue of knowledge systems, the foundation for the course was set with regard to engagement between the academic community and the Quechua Lamas indigenous community.

GIZ GmbH, UNEP, and Ricardo Palma University funded the diploma course and offered a few scholarships for indigenous students. As the participants were very poor and came from far away, the program had to provide housing, food, and education.

Engagement with other institutions in the area where the diploma course was developed encouraged the emergence of work based on solidarity and mutual trust.

Young indigenous participants from the region were introduced to the use of ICT and the virtual classroom. This, however, increased the scheduled duration of the course by 30%. Their achievement of ICT competence became evident when several students of the diploma course participated in the Ibero-American Conference on Environmental Education held in Lima in September 2014, where they presented their monographs or final papers. The participants appreciated this opportunity to communicate locally, nationally, and globally.

The knowledge parity of indigenous students and teachers was recognised and appreciated when they participated in the 2nd Americas Regional RCE Conference held in Lima in February 2013, which was an opportunity for the incorporation of their work at the global level.

Conclusion

This project explored new horizons in Higher Education epistemological frameworks. The conclusions reached call us to look towards our origins to find our history, our ecosystems to find its aspects, and in the Andean Amazonian worldview, as the bases to contribute to ESD to develop practices to support dignified lives.

1) New ways of thinking, which question the very foundations of dominant knowledge are emerging, and are opening new epistemic frameworks for knowledge construction and understanding of the dynamic, complex, natural and social phenomena that underlie human existence. These new ways of thinking and knowledge creation have the potential to address, with relevance, the challenges faced by education and humanity to build more sustainable societies.

Kwechua-Lamas Indigenous Community at the closing ceremony of the diploma course.

2) ESD faces the fundamental challenge of transforming consciousness – the way people think and feel about the world. It is necessary to replace an instrumental and mercantilist reasoning for an ethical and humanistic one that allows us to recover the meaning of life, the human condition, and the fact of being in the world. Humans need to understand that they live on a planet that is not unlimited, and whose dynamics obey complex and irreversible processes that they cannot control.

3) At a minimum, education for a sustainable life requires taking into account formative and deforming challenges of everyday life – locally, nationally, and globally. This is a basic condition for transforming education and getting it out of its abstraction. In the process of education, formal, informal and non-formal, one must question how knowledge is built and how knowledge builds mental structures.

4) It is necessary to change the philosophical, epistemological, and didactic frameworks of education in order to change the reductionist, fragmented, and deterministic vision of the educational system and to expand university functions. This could be done by scrutinising different future scenarios; by providing the university with an intercultural vision; and by managing various knowledge systems, including the local one.

5) A local-global epistemic community was built to foster a transdisciplinary dialogue of knowledge systems in order to create spaces of peace, cooperation, and trust and to generate shared visions that might solve major local challenges, including those in the area of biodiversity.

6) To be sustainable, all initiatives need time to mature. One needs to understand the region where the hands-on experience takes place, to look for opportunities for its insertion in the academic field and in national ecological debates, and to appreciate its local and global anchoring. Such initiatives need to be rooted in institutional life, in indigenous and popular organisations, and in civil society.

7) Development of this practice generated a debate on the relevance and value of the Andean Amazonian knowledge system. An important precedent was established for its valuation in the Peruvian higher education system. Synergies were generated with other educational activities, notably a Hydraulic Engineering course that is now being taught at Ricardo Palma University's Engineering School.

8) A complex, transdisciplinary, phenomenological and hermeneutic inquiry with good interaction among different levels of reality took place. At the local level, traditional knowledge was strengthened and indigenous communities' leadership was provided with an intercultural vision. At the national level, a workgroup on the subject of education and innovation was consolidated at Ricardo Palma University, and the Ayni proposal was developed. At the global level, exchange and networking was encouraged by contributing to debates and the sharing of best practices at conferences.

9) The Ayni proposal explores a dynamic, complex, and transdisciplinary vision of education. It is based on multidimensional, multireferential circular thinking that considers processes, agents, organisations, and social and natural system interactions that play a part in the education process. It promotes an intercultural approach and includes other knowledge systems, especially the Andean Amazonian system. It seeks to bond art and science and so to humanise knowledge. It is about creating a shared vision of positive feedback to develop transdisciplinary curricula from local, national, and global perspectives to provide quality and relevance to ESD.

10) Indigenous children and indigenous young people's education should begin with recognising the validity of their way of thinking and being in the world. It should become a space to learn their traditional knowledge, their wisdom and to strengthen their mother languages and peasant practices that raise local biodiversity, which may serve them well as a source of employment, and so to guarantee their food and to be healthy as well as preserve their culture. Education should also be a space to access Western knowledge through reading and writing Spanish and other languages, as well as using information technologies. It should be a meeting of two cultures, which respect each other and which continuously have a dialogue of knowledge.

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Appendix A
Legend to understand 'Ayni' proposal

LEVEL I (Local) University level	
Node A	**Links:** Information systems team, diagnostics and future studies at local, national and global level. **Interactions:** With Level I, Level II, Level III, and nodes B and C and creates shared views. **Provides:** Relevant and up-to-date information for curricula development and adjustment and for relevant generation of shared views. Positive signs imply a growing feedback from processes. Negative signs imply the decline in quality of higher education.
Node B	**Links:** Epistemological, didactical, psychological frames, curriculum design. **Interactions:** With Node A, Node C, Level II and Level III and creates shared views. **Provides:** Curriculum, study plans, syllabus, execution of undergraduate program and creates shared views.
Node C	**Links:** Research, innovation, patents, post-graduate programs and knowledge management. **Interactions:** With Node A, Node B, Level II and Level III and creates shared views. **Provides:** Research lines for innovation, post-graduate courses, research teams, systems of knowledge management, patents and shared views for Education for Sustainable Development (ESD).
LEVEL II (National)	
Links: Links university and basic education levels to understand and solve the deficiencies of students who are about to begin university programs. Links university and different knowledge systems (especially Traditional and Popular Knowledge). Links university and National System of Science and Technology, production systems (private and public) with policies for studies, research and knowledge management. Links university and formal and informal education systems for Sustainable Development (SD). **Interactions:** Transdisciplinary spaces of dialogue, a greater understanding of natural and social issues and phenomena. **Provides:** Context information to improve quality and relevance of education, shared views of the country.	
LEVEL III (Global)	
Links: Networking with other universities within the region and around the world. **Interactions:** Experts from other universities, international cooperation agencies; UNU, UNESCO, GIZ GmbH, among others. **Provides:** Information to guide scholars and research work in order to advance global knowledge. Works on a planetary citizenship basis to achieve Sustainable Development Goals (SDGs).	

Appendix B
Modules of the diploma course

Module I	Biodiversity and Management of Dialogue of Knowledge Systems	This module introduces the diploma course, establishes conceptual foundations for addressing the biological and cultural diversity and the transdisciplinary dialogue of knowledge systems, as well as its operating base through training in information technology and communication. It includes a visit to local Quechua Lamas indigenous communities to see traditional knowledge in practice.
Module II	Ecology and Ecologies	Building on Module I, Module II introduces ecology as a conceptual framework for a dialogue of knowledge systems. It is about understanding the whole ecosystem and each of its stages – farm, forest, and water – from the technoscientific vision and from local knowledge in an integrated manner.
Module III	Intercultural Approaches, Gender, Health, and Food Sovereignty	The use of the category 'gender' in policies and practices of food and health in the scientific approach as well as in the vision of indigenous communities is analysed.
Module IV	Biodiversity and Climate Change	The central theme of Module IV is the local response directed at the regeneration of biodiversity in the context of climate change. Both adaptation and mitigation are considered.
Module V	Sustainable Development and Biocommerce	Module V is aimed at discussing ways to improve the living conditions and livelihoods of the communities, and promotes a dialogue of knowledge systems and worldviews promoting peaceful coexistence. The module also focuses on the locally situated responses of communities.
Module VI	Indigenous Peoples, Biodiversity Conservation, and Environmental Legislation	The central theme is the view of indigenous peoples and local communities on the regeneration of biodiversity in a global context.
Module VII	Research Seminar	Prepares students to develop their monographs, which are written as a proposal to solve a local issue based on students' experience and systematic reflection throughout the program. It is the tangible result of the diploma course.

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Chapter 11

Putting Sustainability Theory into Practice in Nizhny Novgorod, Russia

Summary

ESD Innovation

The two cases – cognitive modelling methodology for sustainable thinking training and a public socioeducational program, 'The Academy of New Faces', introduce some new public education methods developed in Russia's sociocultural environment. These methods are now used in local collaboration for societal projects. Cognitive modelling supports a new framework to bring together expert contributions, public strategy discussions, and educational seminars for graduate and postgraduate students. A new training framework for team building for regional business start-up projects is also planned.

'The Academy of New Faces' is about practices and strategies to support and develop citizens' public initiatives in the city of Nizhny Novgorod. These were in the form of an 'incubator' where creative groups of youth, students, and citizens can have different resources, such as human resources and funding, for the development of their projects. This societal education program aims to shape and promote a new generation of local social moderators, public leaders, and NGO managers, and to support an associated project-making network.

Societal Transformation

The cognitive modelling methodology, first developed at the university, became a tool for engagement with professional experts and contributed to the formulation of a regional vision and strategy of sustainability. The long-term results of the cognitive modelling methodology include (a) the development of an educational and training network based on cognitive methodology and the methodology behind the creation of digital simulators of social and economic regional development in Russia, and (b) the creation of a network of regional experts for regional strategy discussions and for identifying scenarios of sustainable regional development.

RCE Nizhny Novgorod's second strategy (The Academy of New Faces) has evolved from a students' network into a multi-stakeholder network of students, businesses, state institutions, and the municipality working for development of the city. Its long-term outcomes include (a) a working infrastructure for sustainability (public project offices, public-art incubators, etc., which can be organised in The Academy of New Faces framework), and (b) the building of local human capacities (social moderators, public leaders, NGO managers, etc.).

Implications of Development for Knowledge Institutions

To become 'transformative', knowledge institutions have to introduce new practices of 'sustainable thinking' and 'sustainable partnerships'. Sustainable thinking assumes a holistic vision of regional development based on social, economic, cultural, and environmental considerations. This work has demonstrated the ability to develop such thinking through the cognitive modelling method. Sustainable partnerships require a basic knowledge of societal communication and engagement, partnerships, and social competitions toward common regional goals. 'The Academy of New Faces' process described in the article demonstrates the application of actions leading to a lasting collective engagement between universities and communities. Among other things, the methodologies lead to the development of a framework for a new research project with the participation of experts from the cities of Nizhny Novgorod, Samara, and Saransk.

Socio-political Development in Russia

Public policy transformations in Russia basically include two dimensions. On the one hand, the State order started to move from the Soviet principle of *"one state, one actor of politics and public policy"* (the Soviet State was understood to be a single actor) to the principle of "*one state, many actors of politics and public policy.*" The latter principle produces an environment in which different political parties, NGOs, and other public institutions act as policy makers. On the other hand, the self-understanding of the State institutions and the State political class changed from the principle of *"to do on behalf of the people and for the people"* to *"to do from itself and according to its own competence and jurisdiction" (Dakhin 2008)*. The latter principle reflects the well-known idea of flexible interdependence of relations between 'the State' and the 'civil society' in Russia. It leads to progress in public practices of collaboration between different participants of public policy activity. This is the essence of the mental sociopolitical transition in Russia.

Describing institutional, structural, and practical aspects of these transitional processes, it is necessary to identify several stages at which different elements of independence and cooperation in the relationship between the State and civil society were established.

The first stage (1985–1991), 'perestroika' in the framework of the USSR, marked a move from an authoritarian state toward a system of 'the State and the civil society.' In this framework, a diversity of political parties (more than 60 in 1991) appeared, and a new order of competitiveness in political elections was established. A feature of the new Soviet institution was that not only formal political parties but also representatives of non-formal civil movements could be candidates in elections.[1]

The second stage (1991–1999), was characterised by the main trend 'diversification of political and social-economic institutions' within the framework of independent Russia. National Russian structures and institutions of 'State–civil society' cooperation developed exceptionally well as a result of citizens' participation in the activities of political parties. The popular official and non-official vision was that citizens' political activity must be formalised to become activities of political parties or their institutions. Therefore the aim of the transition toward democracy was related to the idea of a representative political democracy. At the same time, social research and other such civil society activities and projects were often developed and supported by international foundations (such as the Open Society Institute, the MacArthur Foundation, or the Friedrich Ebert Foundation). At this stage, the two sociopolitical arenas developed separately: (a) the political parties' arena was managed and regulated by the State institution of elections; and (b) the NGO–civil society arena was managed by different international foundations. Although these two trends appear to be positive sociopolitical developments, the management features of the two imply contradictions in their coexistence.

The third stage (2000–2012) was marked by the process of centralisation of the power of political parties in Russia and the creation of a new 'party of State power'. The main goal was to involve most citizens as electoral followers of the party *Edinaia Rossia* (United Russia); yet, the electoral arena was limited *(Dakhin 2006)*. Other forms of citizens' movement were not a priority, but the activities of international foundations were converted, under an

[1] For example, Boris Nemtsov was approved as the representative of a local non-formal city movement for the elections in 1998, when his political career began. Nemtsov was governor of Nizhny Novgorod Oblast' from 1991 to 1997, a leader of the political party *Sous Pravych Sil* [The Union of Right Forces] from 1997 to 2000, and leader of the political opposition in the early years of the twenty-first century. He was killed in Moscow on 27 February, 2015 *(Dakhin 2012)*.

order, to become a part of newly assembled Russian foundations.

The fourth stage of 'State and civil society' development started in 2012 when State politics started to facilitate, support, and help develop active social projects, the non-commercial activities of NGOs, and citizens' public art groups.[2] The main emerging trend is that along with processes and institutions of representative democracy, some practices, structures, and institutions for participatory democracy are in a stage of progressive development *(Dakhin et al. 2013)*.

Education and Knowledge to Transform Society

In the context of the long-term socio-political process, different institutions and communities are changing. Among these are universities and citizens who are partners of RCE Nizhny Novgorod. RCE Nizhny Novgorod focuses on two areas of work: transforming universities (changing practices of teaching, learning, and research) and transforming the urban society (linking actions and knowledge). Russia's sociopolitical 'climate' facilitates the needed development; for example, creating new links between formal and non-formal education, between teaching and research, between thinking and action competencies, creating value-based foundations, and creating a culture of sustainable development. The main trends that have opened new fields for collaboration among the RCE stakeholders are:

a) digitalisation in social sciences and the humanities as well as in the sciences
b) engaging experts from the relevant fields in public discussions and activities
c) citizens' demand for creative participation in the city's public projects, programs, and events
d) informational and partnership transparency of the city municipal institutions and officials

The following cases show how RCE Nizhny Novgorod capitalises on these trends and what the new features of the sociopolitical environment are for promoting sustainable development in Nizhny Novgorod through ESD activities. The presented practices were organised on the basis of the educational programs of Nizhny Novgorod State University of Architecture and Civil Engineering (NNGASU) and Volgo-Vyatsty Public Administration Academy (VVAGS), with participation of the Nizhny Novgorod Centre of Socio-Economic Expertise.

RCE (Regional Centre of Expertise) Nizhny Novgorod was acknowledged in 2009. The key members of RCE Nizhny Novgorod are Nizhny Novgorod State University of Architecture and Civil Engineering, Volgo-Vyatsty Public Administration Academy[3], the NGO Social Rehabilitation, the Nizhny Novgorod Centre of Socio-Economic Expertise (NIC SENEX), MEGA-IKEA Nizhny Novgorod, and Secondary School No. 47.

Nizhniy Novgorod is growing and will become a megapolis within the next 15 years. This transformation will affect all aspects of city planning and policy. Aspects of sustainable development will need extra attention to ensure that the megapolis will be a better place to live, work, and study. RCE Nizhny Novgorod's long-term goal is to develop a strong scientific and educational network that uses the best scientific and other expertise in the region and good international sustainable development (SD) and education for sustainable development (ESD) practices. The RCE aspires to work toward transforming the educational system, facilitating the application of innovative approaches, conducting research, and enabling the exchange of knowledge and good practices among all organisations in the Nizhny Novgorod region. The special role of RCE Nizhny Novgorod in local ESD activities has thus been to provide a platform for engagement, both locally and internationally.

Two streams of the project activities that have proven to be most successful since the inception of RCE Nizhny Novgorod are those associated with methods and technologies of facilitation and incubation of social projects and those based on cognitive modelling methodologies. By pursuing participatory local societal development in the city, RCE Nizhny Novgorod has developed project frameworks based on principles and methodologies from several critical fields. These fields include cognitive modelling, which focuses on communications with experts groups, and 'richly populated' social technologies that aim at producing creative, socially-oriented art projects and teams (i.e. social projects) in the city. The following sections demonstrate how this was done.

Box 1: *RCE Nizhny Novgorod.*

Methods and Technologies for Facilitation and Incubation of Social Projects

Students' Innovation and Research for the City's Sustainability Practices

In 2009–2010, RCE Nizhny Novgorod organised a public competition of students' 'social adaptation projects for Nizhny Novgorod's sustainable development.' In 2010–2011 the topic for the competition was 'innovative projects for sustainable development of Nizhny Novgorod agglomeration'. During the first cycle, seven groups presented their ideas and the jury selected the four best projects that continued to the final stage of the competition, where the jury selected the best project. The first prize was granted to two projects: 'Marketing of services for disabled persons' and 'Technology incubator for disabled persons: training, job placement and career.' Annotations of these two projects were published in the NIC SENEX Bulletin[4]. In the second cycle, 10 projects were submitted. All the projects were concerned with problems of the location of a new stadium for the hosting of World Cup football (in 2018), new centres for tourists, etc.

To promote educational activity within the framework of sustainable development for Nizhny Novgorod agglomeration, in 2011 RCE Nizhny Novgorod created the public city club 'New Nizhny Novgorod'. Its aim was to promote public discussion on topics related to the strategy for sustainable development of Nizhny Novgorod agglomeration. The key themes of the students' competition were included in the main topics of the public discussions.

In the 2009–2010 phase of RCE Nizhny Novgorod's activity, a target group of 50 students was

[2] Public art groups are engaged in creating legal graffiti, open air art exhibitions, and other art projects accessible to the public.

[3] Currently it is Nizhny Novgorod Institute of Management, a branch of the Russia Academy of National Economics and Public Administration under President of Russian Federation (NIM RANEPA).

[4] *Prizëry konkursa proektov "Social'naia reabilitatcia dlia ustoichivogo rasvitia Nizhnego Novgoroda"*. Soctbal'no-politicheskie resursy ustoichivogo rasvitia v situactii economicheskogo spade [*Summaries of the prize-winning students' projects 'Social rehabilitation projects for Nizhny Novgorod sustainable development.'* Socio-political sources for sustainable development in the context of economic crisis]. NIC SENEX. 2010. *Information bulletin NIC SENEX*. June-November, 199-208. N.Novgorod: VVAGS.

involved in a project with the NGO Social Rehabilitation, which works to improve the lives of the disabled. Nehem International, Heemstede (of the Netherlands), provided financial support to the project. It is a concrete example of how students and experts on disabilities participated in developing a public education program. This was the first experience of RCE Nizhny Novgorod in working to bring the disabled into the mainstream of the city's public activities. It was also a discrete step toward *informational transparency* in public activities, which was borne out by the participation of some of the otherwise uninterested municipal officials in the project's events. The case shows that social demands are realised by 'small steps,' where a small, specific target group and a main collaborator are selected to work together.

Students' Engagement in Hi-tech Innovations

Sustainable development ideas for architecture and building construction were realised in the 'Wyksa District of Tomorrow' project, a sister project of the 'District of Tomorrow', which had been launched in the Netherlands and where the first 'test house' was ready. It was the first experience of discussions on zero-energy house renovation ideas in Russia. The District of Tomorrow was run by Zuyd University in the Netherlands. In 2012, the program attracted the attention of RCE Nizhny Novgorod and the Nizhny Novgorod government. J. Spaubeck, a Professor of Zuyd University and member of the Steering Committee of RCE Nizhny Novgorod, supported this initiative. He and Prof. J. Hermans discussed with the governor of Nizhegorodskaia Oblast', Valery Schantcev, the prospect of the District of Tomorrow project in the region. Later in the year, the Russian District of Tomorrow was launched in the city of Wyksa (Nizhegorodskaia Oblast').

The target group of this project were 60 students of architecture and building construction, regional

Student participants of RCE Nizhny Novgorod's project 'District of Tomorrow' during their visit to the construction site of zero-energy buildings in Holland.

management and local government/governance education programs. The Design Studio at the Zyud University welcomes international students and has changed its language of communication and instruction to English. Russian researchers and students worked with students from Finland, China, Spain, and Nepal as interns and researchers on the district project.

Students from Nizhny Novgorod State University of Architecture and Civil Engineering designed the first 'zero-energy' apartment houses as well as a temple for the Russian Orthodox Church.

This case shows that the stated needs were realised by another 'small step' in which students and experts from the local builders' community

An architectural decision for a zero-energy building, elaborated in the framework of the RCE Nizhny Novgorod project 'District of Tomorrow'.

participated in the public experience of building zero-energy housing. The main collaborators in this case were Zuyd University, which provided support for the students to visit the 'District of Tomorrow' in the Netherlands, and the association for low-space flat housing. This was one more experience of RCE Nizhny Novgorod in 'translating' a new, technically-sophisticated experience into the consciousness of the public and experts of the region, and one more step toward *informational transparency* in the public activity of Vykca and Nizhny Novgorod cities, as indicated by the participation of municipal officials to some extent in the project's events.

Both cases – the social adaptation project and The District of Tomorrow – had to be developed so as to link them to the line of RCE Nizhny Novgorod's activities. Currently, the RCE works with students as a priority target group.

Each project involved new participants from the local student community. Both projects contain practices of business communication between students and different expert communities, where some informal education was achieved. At the same time, some methods for inculcating new social or technologically complex ideas among the public were employed. Another common element was the participation, though limited, of municipal officials. This list of common elements of the two

During a workshop of the public socio-educational program 'The Academy of New Faces' in 2016 .

During a public lecture of the public socio-educational program 'The Academy of New Faces' in 2016.

The 'Second life of plastic' project in a secondary school, part of 'The Academy of New Faces' program, taken in 2017.

RCE Nizhny Novgorod

Poster of the city competitiveness exposition of social projects, titled 'Generator', part of 'The Academy of New Faces' program, taken in 2016.

cases indicates that they could be successfully tried in other projects. With all of the achievements, the challenge was to retain the participants within the projects and thereby to sustain RCE processes. This challenge was addressed in the next generation of projects described in the next section.

'The Academy of New Faces': New Phase of Development in Addressing the City's Development

Since 2015, RCE Nizhny Novgorod has made efforts to develop an incubator for facilitating and supporting the social initiatives of active groups of citizens. RCE Nizhny Novgorod's main partners in this venture are the Nizhny Novgorod city administration and the Nizhny Novgorod regional branch of Russia's association of municipal communities. The project called 'The Academy of New Faces' aims to generate new social project groups, volunteers, project moderators, project leaders, and front persons in the city's civil society activism. The project has a one-year cycle that supports some ongoing events and activities including public lectures, a competition for project teams called 'City's Generator', the activities of public project offices, platforms for presentations and discussions of public projects, 'Social Projects for Living Areas Development' (for collaboration in developing business activities in the city), and 'Social Projects for Public City Strategy' (for collaboration with the city strategy planning committee). In any one year, about 100 participants take part in the permanent events, and about 1,500 participants are connected with the program through an internet group called 'V Kontakte'. Every May, close to 60 project teams share their results, project experiences, and aspirations for the future.

As a next step, there are plans to develop a regional incubator for pursuing citizen initiatives with branches located in different areas of the city and with a diverse network of partners. The 2017–2018 season will be started in cooperation with the new City Public Chamber established in August 2017.

Developing Research, Educational and Training Networks Based on Cognitive Methodology

Since 2010, the university and its partners have looked for ways to continue ESD in the region. A permanent students' colloquium was started, with Prof. Andrey Dakhin as the head, on scientific and educational projects based on the methodology of cognitive modelling of sustainability for sociopolitical processes. Several topics on advancing sustainable development in the city have been addressed so far with the participation of the Nizhny Novgorod Institute of Management, a branch of RANEPA (formerly VVAGS). These included 'Cognitive modelling of sustainability of sociopolitical processes and a factor of collective memory' (in 2009), 'Cognitive modelling of sustainability for regional business space' (in 2010), 'Cognitive modelling of sustainability for regional NGO activity' (in 2011), and 'Cognitive modelling of sustainability for regional governance space' (in 2012) (*Dakhin et al. 2011; Dakhin et al. 2013*). The goal of these events is to draw students into modelling complex social processes related to the sustainable development of the region. The targets of this project were the students of regional management, local government/governance, public policy, and regional policy education programs.

Based on the research experience, a training module was created. The training rests on the premise that the practice of producing sustainable objects such as 'green bags,' 'green pencils,' or 'green houses' is the result of a special culture of thinking. The first point here is that a 'green bag' looks like a *usual bag*, until we *think* of it as an element in the complex environmental system with different links between the bag and some other environmental elements. In other words, if we look at 'this thing' as an object by itself, not as a part of a complex interrelated whole, we can see only a 'usual thing.' This emphasised the relations between 'how we think' and 'what we see,' where 'what we see' depends on 'how we think.'

The second point that leads to a sustainable activity rests on the correlation between 'what we see' and 'what we do.' If we see an object as a 'green one,' it sets us thinking about what we actually mean by 'green' in that context. It also provides us with an opportunity to elaborate what we mean by a 'usual thing.' Sustainable action thus is the result of a particular vision, which in turn is caused by a particular culture of thinking. In other words, if a person uses sustainable thinking, underlined by a set of values, he or she is efficiently motivated to sustainable practices and actions, such as producing 'green things.' So, if teachers teach people to act in ways that are sustainable, the educational task should be to train people in the culture of *sustainable thinking*.

What is this culture? As explained earlier, it is necessary to think of a single object as an element in a complex environmental system, where it has special interactions and relations with other elements of the environment. Some critical elements in these interactions and relations can provide sustainability to the system, but others can produce only unsustainability and cause the system to collapse. The culture of sustainable thinking consists of the capacity of the consciousness to look for agents and subjects of interactions, which can provide sustainability to the environmental system.

How to train people to develop these capabilities to act? A method of education using a cognitive math model of the environmental system seems to be reasonable, usable, and effective. A student collides with sustainable tasks on the imitative math model, which consists of several interactions between subjects (factors). The training is focused on solving a typical task: what factors are necessary to activate for the sustainable development of the environmental system? What is needed here is the culture of thinking of any one element in its own environmental system.

The training includes three main levels of activity with practical tasks characterised by an increasing degree of difficulty.

On the first (or 'elementary') level, students work with the fully 'completed' model. It requires them to create optimal scenarios of activation of separate factors for achieving the sustainable development effect for the environmental system as a whole.
On the second (or 'free user's') level, students also work with the completed model but they are now required to (a) rethink and correct the main interactions between factors according to their own understanding and experience, and (b) create optimal scenarios of activation of separate factors for achieving the sustainable development effect for the environmental system as a whole.

On the third (or Master's) level, students work with a partly completed model. This level demands that students (a) change or correct the list of factors to give their definitions of the factors and to describe them, (b) rethink and correct the main interactions between factors according to their own understanding and experience, and (c) create optimal scenarios of activation of separate factors for achieving the sustainable development effect for the environmental system as a whole.

Each level of assignment is completed with a handbook and certified software with a usable interface. The first level requires 12 hours, the second 24 hours, and the third 32 hours of learning. In 2017, in cooperation with Zuyd University (with Prof. Spaubeck as the head) RCE Nizhny Novgorod started a new research project: 'The impact of start-ups on regional development,' which rests on

the methodology of cognitive modelling. Together with participants from Samarskaia Oblast' (Samara Region) and the Republic of Mordovia, RCE Nizhny Novgorod makes contact and converses with regional experts of start-up activities, businessmen, sociologists, and economists, discussing issues such as reasons for successful and failed start-ups related to sustainability, the role of budgeting, and the factors leading to the success of private financial support to start-up projects. The RCE Nizhny Novgorod project team plans to convert this research experience into a new training program for business communities in Russia and abroad. This case shows how bringing together research and education to the societal platforms works to achieve the aims of sustainability.

Reflections

The cases described here represent the RCE's experience of creating a growing but sustainable community involved in its project activities.
The RCE's target group is the local community, including students, experts, and city activists. The projects undertaken since 2012 include an element of infrastructure for business communications serving the community of participants, where informal education gives deeper meaning to the learning by relating it to the local context. The learning and action community is expanded and strengthened through the procedure of inculcation of the new cognitive modelling methodology in various public settings. Further strengthening the sustainable actions and its communities of practice are partnerships with the municipality through the project The Academy of New Faces. These latter elements – through methodological development and critical partnerships – can be reproduced and developed in future projects.
The innovative feature of the first project relates to the inculcation of cognitive modelling methodology, which was previously used only in closed professional circles, in public practices of expert communications, and for developing a culture of 'sustainable thinking.' The distinctiveness of RCE Nizhny Novgorod's second project is that the new structure of The Academy of New Faces not only supports some existing NGOs, but also facilitates the education of new public project teams working toward sustainable development of the city, helping activists to form NGOs and to develop partnerships. Contrary to 'thinly populated' technologies[5] of industrial economics, the structure of The Academy of New Faces inculcates 'richly populated' social technologies, where people help each other to develop individual and collective capacities.

Reflecting on all these experiences and looking ahead, it is possible to conclude that:

a) RCE Nizhny Novgorod and its stakeholders identify and implement solutions for local environmental challenges

b) For greater effectiveness, RCE Nizhny Novgorod recognises the need to change target groups and the framework of activity, and to look for new sources for communities of social networks

c) The present priority projects of RCE Nizhny Novgorod are aimed at producing and promoting public knowledge, including 'sustainable thinking' and 'sustainable partnerships'

d) The priority projects of RCE Nizhny Novgorod have proven to be successful in developing and supporting practices and infrastructure for participatory democracy

[5] 'Thinly populated' technology refers to production places dominated by technology or robots with no or minimum engagement of people. 'Richly populated' social technologies refer to working places with no or minimum technology or robotics.


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Chapter 12

The Value of Service-learning in Addressing Community Problems

Summary

ESD Innovation

In exploring the complexities of regional sustainable development (SD) problems, it is not enough to study social trends and research data. Students need to look in the eyes of a homeless person and serve them a meal or remove nails from reused wood to truly understand the tangible reality of why social, economic, and environmental issues exist, while providing pathways for how to transform their knowledge into empowerment and engagement.

As a pedagogical method, service-learning provides greater efficacy for education for sustainable development (ESD) by establishing community partnerships and offering applied learning and problem-solving opportunities in schools and higher education institutions. The integration of learning objectives with service projects and reflection exercises thereby appear to offer four key benefits: active learning, empowerment, community building, and citizenship.

Societal Transformation

The greater Portland region has a long tradition of service, with collaborative relationships built between schools, higher education institutions, and non-profit organisations in the community. These evolving networks address regional challenges and offer the power of collective impact.

The ability to engage students in real-world activities, while reflecting on course concepts and theories, expands classrooms into the community. This deepens the potential for learning about sustainability and discovering ways to make a difference through ESD.

Implications of Development for Knowledge Institutions

Partnerships between higher education institutions and community organisations offer an innovative co-teaching model based on identifying community needs, building collaborative relationships over time, developing meaningful course curricula, and empowering students to learn in new ways. The service-learning programme established with community partners allows for deeper relationships and advancements in ways to contribute as citizens to community problem-solving.

However, such programmes require support. Cuts in funding and staff and growth in online courses lead to fewer opportunities for service and lower levels of engagement. ESD could infuse more life into these efforts.

Promoting Community-based Learning in Greater Portland

Understanding real-world problems requires the deconstruction of their cultural and structural foundations - but such knowledge can also be challenging to absorb and translate into effective problem-solving. This is particularly the case when facing the core issues of sustainable development: equity, economy, and the environment. It is necessary to identify educational tools that allow students to uncover the sources of global and regional problems, tangibly engage in their communities, and feel that they can make a difference.

The greater Portland region, which includes three counties in Oregon and one in Washington, has made strides in overcoming this daunting task thanks in part to its long tradition of service and collaborative relationships between schools, higher education institutions, and non-profit organisations. As documented by Robert Putnam, in *Bowling Alone (2000)* and *Better Together (2003)*, while the trajectory of engagement in the United States has declined, Portland is an exception. The abundance of sustainability-focused organisations in the region, along with service requirements in schools and the valuable networking tools offered by Hands On Greater Portland allow service-learning programmes and the TeamWorks model to build on existing strengths and contribute to real sustainability needs.

RCE Greater Portland, also known as the Greater Portland Sustainability Education Network (GPSEN)[1], has adopted the TeamWorks model as a component of its community service and engagement programme. As a multi-sector network, GPSEN encourages collaboration across sectors and institutions. Educators, students, non-profits, political and industry leaders, organisations, and community members develop and promote formal and non-formal education and training opportunities and public awareness campaigns to help create a sustainable future for the greater Portland region. Community-based learning is a critical piece of their work as it facilitates such partnerships and helps address regional needs.

Portland Community College (PCC) plays a key role in these relationships, serving as a leader in community-based learning and as a founding institution of RCE Greater Portland. As a community college, PCC is part of "an American invention that put publicly funded higher education at close-to-home facilities, beginning nearly 100 years ago. Since then, community colleges have been inclusive institutions that welcome all who desire to learn, regardless of wealth, heritage, or previous academic experience" (*American Association of Community Colleges 2017*). PCC is the largest post-secondary institution in Oregon, serving nearly 78,000 full-time and part-time students. The college strives to "strengthen our region's economy by educating a skilled workforce, prepare students to successfully transfer to four-year colleges and universities, enrich the community through lifelong learning, build a greener workforce while shrinking our carbon footprint, and maintain our responsibility to be a sound financial steward of public dollars" (*Portland Community College 2017*).

GPSEN Director Kim Smith first started teaching sociology at PCC in 1996. Over the years, she witnessed how education could have deleterious effects on students. Fellow professors found Social Problems courses to be particularly challenging, as students had to face topics ranging from poverty and racism to crime and domestic violence. Daunting issues related to the environment increased the risk of students falling into cynicism,

[1] See Greater Portland Sustainability Education Network, last modified 2018. *http://gpsen.org/*

apathy, and fatalism. The questionable ethics of these consequences and the destruction of students' faith in their ability to enact social change inspired the sociology department to turn to service-learning, a valuable programme established at Portland Community College in the mid-1990s. That programme, now titled community-based learning (CBL), is still going strong, offering instructors, students, and community partners a transformative world of applied learning and collective impact.

Service-learning, also known as CBL, is different than volunteerism because it combines community service with curricular and co-curricular learning objectives and reflection activities that identify the value of student engagement in communities (*Eyler and Giles 1999*). While difficult topics are still examined deeply, they also are balanced with critical thinking and problem-solving. By integrating community engagement, the academic lessons take on greater levels of real-world significance and individual efficacy, thus having great applicability to ESD. Whereas before, students might have left class disheartened by the weighty topics they were grappling with, overwhelmed and paralysed by a sense of inaction, the addition of service to their studies gives them a sense of direction, with added focus and intention to their exploration of community issues.

The Power of Partnerships

The value of integrating active community engagement into students' coursework became integral to many PCC instructors' teaching, but it took significant time and intention to juggle the extra layers of project planning, relationship-building, and ethical engagement considerations. For an overworked professor, these details may present a barrier to service-learning. Regional networks such as GPSEN and Hands On Greater Portland, a volunteer organisation with whom many of GPSEN's partners and stakeholders (including PCC's Community-Based Learning Programme[2]) have already worked, can offer a promising opportunity to pool partnership efforts and support educators as they explore how to integrate service-learning into their curriculum. With the adoption of the motto 'Educate ~ Empower ~ Engage', the leaders of GPSEN chose to scale up their actions to increase education, training, and public awareness campaigns. By seeking opportunities to increase civic engagement and encourage diverse partners, they strive to contribute to knowledge-sharing and community problemsolving.

Hands On Greater Portland

TeamWorks Logo.

Hands On Greater Portland

Hands On Greater Portland is the volunteer programme of the United Way of the Columbia-Willamette region, with a mission "to improve lives, strengthen communities and advance equity by mobilising the caring power of people across our metro area".[3] The United Way has depended on Hands On Greater Portland to connect individuals and groups with volunteer opportunities across the greater Portland region since 1996. Hands On Greater Portland is a powerful organisation in helping the region achieve high levels of civic engagement. More than 300 non-profit partners, over 150 longer-term volunteer postings, and close to 100 done-in-a-day service projects scheduled each month on their project calendar offer countless ways to engage. From one-time commitments for a few hours or individual projects to corporate team programmes or a theme-based series of projects, volunteers are invited to deepen their understanding of community issues and contribute to solutions.

Much as the PCC instructors saw a need to provide students with an avenue to act on the lessons they were learning in their Social Problems courses, the staff at Hands On Greater Portland saw the value in weaving learning opportunities and reflection into the service projects they helped promote. The goal is to provide volunteers with meaningful opportunities to do more than simply go through the motions of service, whether motivated by school, work, community service, passion, or leisure. Individuals come to service through many avenues and for many reasons, and not all of them are rooted in an understanding of the larger cultural and structural issues addressed when serving a meal at a shelter, painting a classroom at a school, or pulling invasive weeds at a park. While volunteers can still bring helpful skills and support to such service projects, instances of 'thoughtless engagement' can sometimes reinforce stereotypes and deepen misunderstandings or assumptions about why the issues addressed by volunteering exist in the first place. As the local volunteer centre, Hands On Greater Portland is committed to providing avenues for entry into service for individuals of all types and motivations. Thus, the identification of the opportunity to raise awareness about social and environmental issues and inspire learning in their projects led to the creation of the TeamWorks programme.

The Portland TeamWorks Model

The Portland TeamWorks model grew out of a programme created by the larger Hands On Network to deepen the engagement of community members in service projects and offer opportunities to build awareness and understanding of the issues underlying their service. Designed for small groups of people, each TeamWorks team brings together 10 to15 volunteers who "commit to working together on a series of projects and learning sessions over the course of three to six weeks, during which they get to know one another, gain a deeper understanding of community issues, and make a positive impact along the way" (H*ands On Greater Portland 2017*).

In exploring ways to partner with Hands On Greater Portland and its wealth of connections in the local non-profit and community engagement world, Smith utilised both individual and group service projects for her students as well as the TeamWorks model over two decades. Expanding the sustainability theme, she developed a pilot TeamWorks project focused on climate change in 2008, based on the Northwest Earth Institute's[4] *Global Warming: Changing CO_2urse* discussion book (*2007*). Upon the formation of RCE Greater Portland in 2013, GPSEN chose to advance its partnerships by leveraging the TeamWorks model, through which volunteers would be introduced to the structural and cultural foundations of *why* they should address social, economic, and environmental issues and *how* they can make a tangible difference.

Smith worked in collaboration with TeamWorks Programme Manager Melia Tichenor to build GPSEN-sponsored teams focused on ESD, where participants learned about the pillars of environmental, economic, and social sustainability. In 2014 and 2015, GPSEN engaged 23 students and community members in their 'E6' TeamWorks teams, exploring the four 'Es' of sustainability – education, environment, economy, and equity – while expanding their mission to include two more 'Es' in recognising the importance of empowering and engaging individuals in service. Team members participated in a series of lectures, readings, and service projects focused on the following learning objectives:

[2] For more details on the programme, see Portland Community College Community-Based Learning, last modified 2017. *https://www.pcc.edu/community-based-learning/*

[3] See Hands On Greater Portland, last modified 2017. *https://www.handsonportland.org/*

[4] See Northwest Earth Institute, last modified 2018. *https://www.nwei.org/*

- Explore local E4 sustainability challenges
- Identify existing sustainability education initiatives
- Empower participants to recognise the contributions they can make in their communities
- Engage participants in meaningful service projects
- Foster civic responsibility and social sustainability through community-based learning
- Facilitate reflection on the quality and impact of their service

Over the two years, Smith, as the instructor and team leader, organised the TeamWorks learning objectives, while Tichenor scheduled the service projects with established partners based on the E6 themes.

Team members were made up of both Smith's students in her Introduction to Environmental Sociology course at PCC and community volunteers who expressed interest in the sustainability-focused TeamWorks topic through GPSEN and Hands On Greater Portland. Participants shared interests, life experiences, educational backgrounds, and perspectives while working side-by-side throughout the duration of the TeamWorks programme. Together, team members served meals to hungry community members at Potluck in the Park, constructed raised beds in a low-income housing complex with Growing Gardens, attended a film release on indigenous knowledge with Wisdom of the Elders, listened to a guest lecture by indigenous leader Ilarion Merculieff for Earth Day, beautified two elementary schools as part of a community day of service, and reclaimed building materials at the Rebuilding Center for future reuse. Guided discussions and evaluation forms were embedded into the service projects in order to help participants recognise the benefits of their actions and explore how the projects could be improved. Those participating in Smith's course at PCC elaborated further on their experience and explored connections between the projects and course themes through assigned reflection papers and in-class discussions, including presentations to other students in the class who did their own service projects or research.

Applied Learning Outcomes

To assess the effectiveness of the learning objectives, applied learning experiences, service projects, relationships with community partners, and impact on students, various responses from students and community members over the years were examined. Based on longitudinal studies of course-based service-learning assignments at PCC and reviews of the TeamWorks' evaluations, a variety of themes emerged. There appear to be four key educational benefits of participating in service-learning: active learning, empowerment, community building, and citizenship. These trends suggest that service-learning is a valuable pedagogical tool and applied learning exercise, as well as a powerful source of social change, thereby having great applicability to community problem-solving and ESD.

Active Learning

According to sociological research, service-learning "releases students from the passive role of simply reading and taking notes. Students discover for themselves many of the linkages between subject matter and lived experiences and they tend to take the findings more seriously" (*Everett 1998, 306*). By reviewing PCC student reflection assignments, it is evident that active learning makes a difference in achieving learning course objectives. As engaged learners, students wrote that service-learning helped them better understand course material. For example, a student who worked with homeless teens wrote, "After all the meals were prepared, I joined the kids at their tables and ate with them. I got to hear them talk to each other, where I learned more than any book or statistical data could have offered." Another student, who did habitat restoration on campus, shared:

> *"Through my volunteer experience in the forest of PCC, I have made inevitable 'hands-on' connections with several of the social and environmental concepts that have surfaced in our class dialogue. Foremost being the ideal of environmental stewardship and the bottom-up approach to affecting social change. Although the protection of a few acres of forest within the city seems meager in light of the greater environmental issues facing our global community, it is obvious that if each individual becomes a steward of the land in their immediate community, then collectively this can have great and far-reach-ing effects globally."*

The recognition of such valuable learning outcomes suggests that professors should consider service-learning or community-based learning as a pedagogical tool to support their courses and help achieve learning objectives.

Empowerment

As noted earlier, a common outcome of learning can be the struggle to absorb the weight, severity, and scale of societal problems. Gaining knowledge can be disheartening and disempowering if it lacks pathways for change. With lessons from *The Better World Handbook* (*Jones, Haenfler, and Johnson 2007*), service-learning and TeamWorks were utilised to empower students to have hope for the future and become change agents.

The service-learning projects were designed to give students the opportunity to learn how to be active citizens, thus contributing to a decrease in apathy and an increase in self-empowerment. Based on quotes from student reflection papers, this outcome appears to have been achieved. A woman who volunteered with a food delivery service called Store to Door shared:

> *"Volunteering empowered me in a way that I have never been empowered before. When I was driving home from my volunteer work, I felt this overwhelming need to help my community. I began to think about when I have children; I would like to instill the value of giving back to your community in them. I can't believe that I am twenty-six and I have never even helped a volunteer organisation until this project. It almost embarrasses me! Great things can come from a small amount of volunteer work."*

Another student wrote:

> *"Not until I volunteered at the Boys and Girls Club did I realize that I could help counteract the negative forces that face the youth in my community. Community service is an excellent way to combat social deterioration. Through volunteering in a youth program, I have gained hope for the children in my community. Some negative interaction is inevitable for these children, but positive influences can prevail."*

Such outcomes are inspiring for students as well as instructors, as they enhance a sense of efficacy.

The TeamWorks programme was particularly valuable in addressing the psychological struggles that so many people face in light of sustainable development. As one team member shared on an evaluation form, "It was fun and educational. I had a great time doing all of the different types of activities. Talking to like-minded individuals has a great effect on one's attitude on being positive about such heavy topics." Rather than feeling overwhelmed by the scale of environmental and social problems in the world, teams focused on how to become educated, empowered, and engaged, by balancing the analysis of the core foundations of social problems with methods to combat thought traps, create cycles of hope, and identify ways to participate in sustainable solutions.

Community Building

An additional question that many students face is how to get involved in their communities. Whether they are attending a residential or a commuter college, the commonly inward focus of higher

education institutions and academic disciplines can have an isolating effect. To combat this, PCC administrators like to say, "Community is our middle name." In addition to increasing learning opportunities and creating 'living laboratories', civic engagement demonstrates the value of colleges to their communities. A student exemplified these lessons when she worked with an eldercare facility:

> *"The insight that I gathered from this project was how important community involvement is. It is really cool to have younger people be given assignments in school that would force them to be involved in the community. A lot of students become so involved in their own lives and challenges that they forget about what is really important and take things for granted. This project is empowering because it shows people that they really can make a difference."*

One of the greatest benefits of service-learning is that students can become engaged citizens, thereby establishing social connections and rebuilding communities.

This was particularly evident in the TeamWorks projects, as the partners were all committed to rebuilding their communities. From constructing raised garden beds to sharing indigenous wisdom to the Rebuilding Center itself, Hands On Greater Portland facilitates collective impact by supporting engagement in community projects and, thus, in community building.

Continued Service

On a longitudinal scale, the question arises whether volunteer projects translate into long-term service. One would hope this would be the case. After having the chance to learn about social issues, participate in community action, and reflect on their experiences, the majority of PCC students said they would continue to participate in some form of community service. As a woman who volunteered with Habitat for Humanity wrote in her final class reflection paper, "This sociology project helped me in two ways: (1) It helped me to realize that I was a bit more narrow-minded about the situation of many low-income families, and (2) It helped me feel that I can make a change in the problems our society faces... So, I have only one question, 'When can I volunteer again?'"

Of those who participated in the 'E6' TeamWorks teams, 20 participants completed the TeamWorks programme, logging a total of 277 volunteer hours and citing the experience as positive, educational, and inspiring:

- 100% of participants rated their experience on the team as 'Very Good' or 'Excellent'
- 100% felt that the experience deepened their understanding of the issue(s)
- 100% reported that the team helped them feel connected to other people who care about the well-being of the larger community
- 88% felt that their team engaged in meaningful discussion related to the E6 TeamWorks topic
- 88% reported feeling confident that they would know where to go for connections, resources, and support if they wanted to further impact the topic addressed by the E6 TeamWorks teams
- 88% said they were inspired to be a more active volunteer or community member now because of their experience with the TeamWorks team
- Two students went on to join additional TeamWorks teams and one became a TeamWorks Leader

Overall, when Hands On Greater Portland surveys TeamWorks participants three to six months after their engagement, the majority report that they have been active in the community in a new way (or ways) because of their TeamWorks experiences. These numbers illustrate how students and community members can move beyond classroom lessons and make a commitment to continue to serve their communities. When partners share quantitative results with their volunteers,

TeamWorks students building garden beds.

the impact of their efforts becomes even more meaningful, as such knowledge allows them to recognise that they can contribute far and wide in their communities. As one participant remarked in her evaluation:

> *"My favorite thing about participating in the TeamWorks experience was being exposed to the positive efforts that are currently happening. It was very nice to be able to see and be a part of the activities that are helping rather than hurting our current situation. It has given me hope for the future and has motivated me to continue in efforts like this."*

Conclusion on TeamWorks Results

The long-lasting ripple effects of the impact the participants were able to make are unknown, but serving meals, offering joy to children in their schools, building gardens for low-income communities, and helping people save money with reused wood all demonstrate the kindness of the human spirit and reinforce the community benefits of service projects such as these. On a practical level, our two TeamWorks teams achieved the following:

- Twelve local sustainability organisations benefitted from service projects
- Over 1,100 meals were served to those in need in Portland, at Potluck in the Park
- Seventy-five students and community members screened the Wisdom of the Elders films and 65 students and community members attended Ilarion Merculieff's presentation. Each class participated in group discussions about Native cultures and climate change
- Eighteen TeamWorks participants and over 800 Comcast employees engaged in the Centennial Beautification and Glenfair Elementary School Projects. They planted 155 trees, spread four tonnes of mulch, and scrubbed and painted 27 schoolrooms and hallways
- Twelve wooden raised beds and five sheet-mulched raised beds were built
- Over 160 pieces of recycled lumber were de-nailed and made ready for resale at the Rebuilding Center
- Close to 1,200 community members were engaged in the events, interacting with the TeamWorks members and working collaboratively on a variety of projects

As demonstrated by these service projects, civic engagement offers a variety of multi-level beneficial outcomes to ESD, for students, instructors, college programmes and communities. Working with Hands On Greater Portland helped Smith teach her courses, GPSEN reach its community engagement goals, and volunteers increase their collective impact by deepening learning experiences, building networks, and facilitating greater levels of service. These benefits advanced the psychological well-being of the students and the betterment of the community.

Moreover, these efforts helped GPSEN address critical sustainability challenges in the region as well as core priority action areas of the Global Action Programme (GAP) on ESD[5]. For example, instructors, students, and GPSEN were able to utilise Hands On Greater Portland's existing tools and relationships to develop and enhance projects and

[5] See Global Action Programme on Education for Sustainable Development, last modified 2018. *https://en.unesco.org/gap*

partnerships focused on ESD that build capacity, empower youth, and strengthen local communities. Specifically, participating in TeamWorks allowed GPSEN and PCC to:

1) Expand classrooms into the community through integration of sustainability practices into a 'whole institution approach'. By addressing the challenges that citizens face, the formal and non-formal education efforts offered applied learning opportunities that were interdependent with the needs defined by partners, in addition to contributing to their solutions.
2) Support educators and trainers by increasing their capacity through existing relationships with partners, leadership development, enhanced civic engagement skills and a higher understanding of current events.
3) Empower and mobilise students by both helping youth engage in service and developing projects that serve youth, including offering leadership training opportunities through its growing youth network.
4) Tap into existing resources by partnering with programmes and organisations that share education and service as a core mission (such as the United Way, Hands On Greater Portland, the Northwest Earth Institute, and individual service sites), thereby "accelerating sustainable solutions at the local level."

Such sustainable solutions and community development are benefits that have high value and are worthy of further research.

In addition, Hands On Greater Portland benefitted from the partnership with GPSEN and PCC. Hands On Greater Portland received educational expertise in the 'E6' topics, value-added services through curriculum development, and an experienced professor in the team leadership role. As partners of GPSEN, PCC and Hands On Greater Portland

TeamWorks students refurbishing a school.

exemplified how it is possible to work together to increase collective impact by encouraging local communities and educational institutions to collaborate on ESD programmes that embrace sustainability and reward community service while advancing education, training, and public awareness campaigns. The interdependent nature of the programmes has strengthened learning opportunities and advanced PCC's service-learning programme and community engagement awards, thus inspiring more instructors and students to participate and adopt service-learning as a teaching and learning tool.

Opportunities and Challenges for the Future

After completing many years of service-learning projects, often with a sustainability focus, and developing the collaboration with Hands On Greater Portland, it is clear that teachers, students, and communities benefit from clear learning objectives, strong partnerships, and community engagement. The TeamWorks model, in particular, is a worthwhile educational process, allowing for applied learning by transforming communities into living laboratories focused on a series of issues and projects. As hopefully demonstrated in this review, civic engagement can be a powerful way to make education come alive through illustrating course concepts with real life examples and offering opportunities to critically evaluate social and environmental problems while striving to solve them. Given GPSEN's motto: 'Educate ~ Empower ~ Engage', such an active and intentional mission is demonstrated well in this project. The TeamWorks model helps students and community members learn about the educational, environmental, economic, and social issues embedded in the communities, recognising the causes and consequences of these issues, while also helping them find the power to make a difference and facilitate pathways for more engagement.

The success of such partnerships, as seen between GPSEN, PCC and Hands On Greater Portland, however, is predicated on relationship-building – and one of the biggest challenges for organisations and institutions in partnership is how to maintain their collaborative momentum when individuals move on. Relationships, after all, are built between the people at organisations, not the organisations themselves. When one person leaves a job, it can cause a shift in the dynamics, institutional memory, and commitment to continued partnership. Without effective succession plans, valuable programmes can be put at risk.

In the case of the 'E6' TeamWorks programme, the initial collaborators have since moved on from their positions and some of the structures supporting the collaboration have changed. While PCC's Community-Based Learning Programme remains strong, classes which guided students into the 'E6' TeamWorks teams have become online courses, with less ability to require or encourage student participation in such in-person, team-based experiences. The Hands On Greater Portland TeamWorks programme itself has ebbed and flowed in its funding and capacity, therefore at times having to pull back from collaborations. The value in sharing the responsibility of TeamWorks co-creation – which paired the logistical and programmatic strengths of Hands On Greater Portland with the educational and curriculum development strengths of PCC – comes with the shared challenge that when one side of that equation sees a shift in resources, staffing, or priorities, the other side of the equation is simultaneously affected.

As instructors and organisations work to teach and engage others in the important work of sustainability, they sometimes find themselves struggling to sustain their organisations and partnerships, as well as themselves, through these changing times. Such challenges, however, are not insurmountable, and adequate investments and advocacy can help maintain valuable programmes such as these. The TeamWorks model itself is especially worthwhile and replicable and is worth exploring further. Hopefully, this overview will inspire others to develop similar educational and civic engagement tools with the capacity and resources needed to ensure that they are robust and long-lasting. For the sake of a sustainable future, ESD would benefit from further advancements in community-based learning, with a focus on regional challenges, engaged problem-solving, and meaningful reflection.

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Yasushi Iwabuchi

Chapter 13

University and Community Partnerships for Sustainable Urban Development in Okayama, Japan

Summary

ESD Innovation

This article presents a new method of Education for Sustainable Development (ESD) in which the university provides the community with scientific analysis, while the community gives the university opportunities to engage with citizens and to enrich the students' emotions and minds. Citizens learn how they are needed by society, and students experience the challenge and satisfaction of trying to solve real-life issues.

Given that the current contact between universities and citizens is limited, this approach is relevant to achieve the aim of educating the next generations of citizens, as it makes students realise that they are actually a part of civic society.

Societal Transformation

Local democracy is an engine for societal transformation. Sustainability could be realised by citizens' efforts to make community rules that conserve local resources and self-regulate responsible behaviour. Over a long period, such an effort can be called self-governance. If citizens carry their experience of transforming society over generations, a civic sense of local democracy will be constantly revitalised. ESD essentially involves a diversity of actors. Therefore, encouraging various partnerships will produce the most innovative solutions for sustainable development (SD) of a city.

Implications of Development for Knowledge Institutions

The most significant result expected from this strategy of student engagement in civic activities is that it would create a circulation of knowledge between formal education (universities) and non-formal education (NPOs and citizens' groups). This circulation would constantly vitalise the ideas and activities of both the university and the community, thereby leading to a new type of ESD.

It is expected that facilitating student participation in citizen activities will lead to a new synergy with different views of youth, ensuring inter-generational learning for societal transformation.

Introduction

Okayama, a city with a population of 700 000, is located in western Japan and is known for its mild climate and lack of natural disasters. In recognition of its community hall (公民館: kominkan) civic engagements, the city was selected to co-host, with Nagoya, the UNESCO ESD World Conference in 2014, which was a great success thanks to the commitment of the citizen groups of Okayama (*Usami 2017*).

Nishigawa Canal Park was established along the Nishigawa Canal in 1974 in the city's downtown area. The park extends for 2.4km along the 16km-long canal, which was constructed for irrigation by the feudal lord Ikeda in the 17th century. The park has become a place for recreation, where more than 40 events are held annually under the Nishigawa Performers Project to support citizen activities in the park.

This chapter discusses the development of the civic engagement by students and community members to make Okayama City walkable, environmentally friendly, and healthy. The partnership between the university and the community started in 2012 when Okayama University professors and students participated in social research near Nishigawa Canal Park through the involvement of citizens and citizen groups. An unexpected result was that the university was found to play an important role in the development of civic engagement. From this example, the chapter discusses how sustainable development (SD) can be realised through collaboration between a university and the community. Three questions are examined. First, why is a partnership between the university and community necessary? Second, why is the Okayama case unique? Third, what kind of changes did the partnership between Okayama University and the community generate? From the answers to these questions, it is hoped that the changes that universities need to make when collaborating with the community can be elucidated, as well as the identification of the civic-engagement responsibilities universities have as members of the local community.

Previous studies on partnerships between universities and communities have focused on urban development, industrial innovation, urban economies, and service learning (*Perry and Wiewel 2005; Goddard and Puukka 2008*). As the competition between cities intensifies due to globalisation, universities are now being seen as the base for industrial innovation and economic urban knowledge development (*European Union Regional Policy 2011*). Therefore, this chapter is also interested in the CBL (Community Based Learning) approach as it influences local development through student learning to enhance the development of the younger generations (*Cress, Collier and Reitenauer 2013*). For example, a CBL approach by Portland State University called 'Capstone Courses' has attracted the attention of Japanese scholars. Students are taken out of the classroom and into the field to work on a community project. They work in collaboration with faculty, local residents and community leaders to find solutions for local issues to ensure SD.

This chapter has four main sections. The first section discusses why universities and communities should partner, the second section clarifies the historical background of Okayama University's civic engagement with Nishigawa Canal Park, the third section discusses the civic engagement activities at Nishikawa AGORA, Okayama University's satellite space in the city centre, and the final section concludes by outlining the lessons learnt from the collaborative experiences.

Why Should Universities and Communities Partner?

Need for Partnership for Academic Education and Community Development

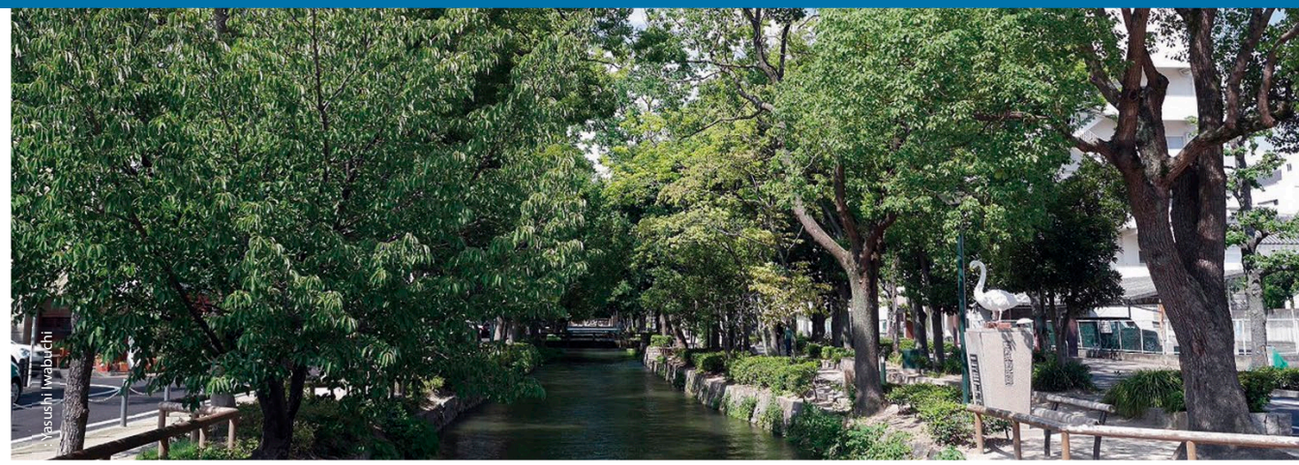
Why did a partnership between the university and the community develop? The Japanese Central Education Committee stated in its 2005 report, "The Future of Higher Education," that besides research and education, social service was the third mission of a university (*Monbu Kagaku Sho Chuo Kyoiku Shingikai 2005*). Further, as the central government looks to universities as the industrial innovation base, they are expected to engage with local enterprises to develop possible collaborations. Third, universities need to engage with the community to enhance their attractiveness and improve their rankings. Finally, universities need to support citizen engagement or *machizukuri*, the revitalisation of community, using the CBL approach.

Communities also need partnerships with universities (*Hagiwara 2016*). Because of public service devolution and the need to improve efficiency, local administrations are looking for new knowledge and information partnerships with local universities. Further, universities and the community need to work together to encourage youth engagement in civic life through community development. There are many articles about CBL; for example, geographic studies that highlight the importance of hearing students' voices and preparing them to become independent thinkers (*Burke, Greene and McKenna 2016*), the necessity of interconnections for local development between university and community (*Mbah 2016*), and making new service-learning models through social work education and research (*Gerstenblatt and Dorie 2014*).

Challenges in Developing University-Community Partnerships

Developing partnerships is not easy (*Strier 2013*). For example, universities need to verify whether their teaching theories can be adapted to the actual situation in the community. Universities generally focus on academic studies in areas such as philosophy, geometry, chemistry and urban design, while local administrations focus on practical solutions to problems such as protecting the forests or preparing river construction. The community might find it difficult to understand academic references. Further, some citizens do not have a good impression of the local administration despite their stated purpose of solving local problems, and other citizens have little time or interest in community activities. Typical responses of researchers, local administrators and local citizens respectively are: "I use communities as my research sample. I don't care for the future of this community"; "residents who agree with us say nothing, but those who oppose us say 'no' loudly"; and, "nothing ever changes, so please leave me alone." As each group has different opinions, it is important to take time to find common ground. There are many different people with many different opinions in any community. Therefore, to start a partnership, a common purpose needs to be identified, with all people involved maintaining polite civic engagement. A community activist stated that, "As we cannot leave our community, we should maintain confidence even if we have conflicts" (*Nakaya 2001*)[1]. In addition, not only should mutual confidence be sought between groups, but also close communication to coordinate the approach, process and goals for a partnership. In university-community partnerships, there can be disputes about priorities; for example, while the university deliberates which tasks are most important to prepare a good educational or engagement experience for students, the community wonders, "The purpose of civic engagement is to solve community problems and ease our life. Why can't they keep to a schedule? The students are taking too much time." Therefore, in order to maintain an effective partnership, it is also necessary to focus on pragmatic negotiation.

[1] Kentaro Nakaya wrote on the story of civic engagement in Yufuin town. This article especially refers to "confliction but confidence," which Nakaya mentions in one of his books (*Nakaya 2001*).



Nishigawa Canal Park is an oasis in Okayama.

Co-education by University and Community: The Key to Starting Partnerships

University-community partnerships must avoid becoming interdependent. While universities need to gain community confidence by focusing on their problems, and also by understanding their needs when providing volunteers for community projects, communities must avoid making unreasonable demands such as using students as cheap labour in the revitalisation of shopping streets.

The CBL approach could solve such societal problems through an educational process. Universities could consult community members when designing a curriculum, and the community could generate new civic engagements using student expertise. The CBL approach has the following advantages: First, students get to engage with the community and apply their formal technical knowledge. Second, students have the opportunity to fulfil their potential by being helpful members of the community while improving their communication skills. In this way, the students' academic knowledge can be applied to a local situation to provide a solid, real-life basis to their knowledge.

The most important thing is that this co-education can lead to the development of strong civic engagement networks that involve students, university academics and researchers, citizens, local government, and local businesses. For example, after Okayama University's small workshop and field survey in Okayama City, the university opened Nishigawa AGORA. The Okayama City administration began supporting student activities in its civic engagement budgets in 2017. How did the partnership start? It is essential for universities and communities to exchange opinions through periodic meetings and symposiums so as to broaden social networks and increase confidence. In the following section, the history of the civic engagement at Nishigawa Canal Park is examined.

Civic Engagement in Nishigawa Canal Park: How the University Participated

Citizens' Activities and Support by the City Government

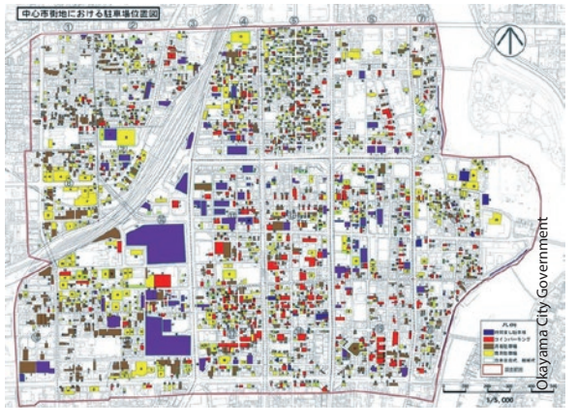
The history of citizen group activities in Nishigawa Canal Park goes back to the 1970s when neighbourhood associations started regularly cleaning the canal and the business community began holding events in the park (*Iwabuchi 2016; Ono 2004*). A young architects' group held flea markets in the park in the 1980s and 1990s, and young women's groups have been holding events

there since the 2000s. Since 2012, Okayama University has participated in these activities as the provider of a research and education forum (*Nishigawa Flea Market Jikko Iinkai 2000; Tabula Rasa 2014; Okayama University Centre AGORA 2013; Okayama University Centre AGORA 2014; Okayama University Centre AGORA 2015*).

As Nishigawa Canal Park is a pleasant place to walk and relax, the Okayama City government has nominated it as a symbol of a sustainable city. However, as the amount of traffic and the number of parking areas near the park have increased, citizen groups have been repeatedly proposing plans to make the area more walkable and sustainable. As a result of these demands, a unique civic engagement program was developed for Nishigawa Canal Park through Nishigawa AGORA, a satellite Okayama University office used as a public platform for the park.

Involvement of the University

Since the start of the 21st century, the Okayama City government has supported citizen activities that seek to increase the number of events in Nishigawa Canal Park (*Okayama-shi Toshi-seibi-kyoku 2011*). For example, the city government stopped charging official performers in the city's Nishigawa Performers Project for the electricity and water they used in Nishigawa Canal Park, and simplified procedures for such groups that wanted to hold events in the park. However, even though many young people regularly came to the city centre to work part-time, they rarely visited Nishigawa Canal Park. To address this problem, the city government came up with the notion that university students would visit the Nishigawa area if they participated in social surveys in the city centre. At the same time, Okayama University started academic reforms in 2011 under the slogan of "Learning City Okayama



Increase in car-parking spaces in the city centre. The colours refer to the varieties of car-parking spaces.

(学都岡山 · Gakuto Okayama)", and in November 2011 established a new institution, the Centre AGORA, to strengthen relationships between the university and the community. This centre is defined as one of the 'University-wide Centres', institutions commonly used by faculty members for the purpose of their research and education. Centre AGORA has two missions: (1) To coordinate between the university and the community, serving as a think-tank for the community, and (2) To provide CBL courses. Centre AGORA has its own governing board consisting of representatives of faculties, with a vision of working together[2].

In 2012, Centre AGORA was granted a contract by the city for research activities such as surveys on buildings, traffic, pedestrians, events in the city centre, proposals on the revitalisation of the city, and the holding of workshops, which required that at least 150 students participate each year. These research activities, especially the interviews on the history of Nishigawa Canal Park in which nearly 30 informants participated, expanded the network between students, teachers, clerical staff at the university, and residents.

[2] Students who engage in community activities with or through Centre AGORA are given an orientation and induction class by researchers of AGORA, although faculty members cooperate when special expertise is required. In Nishigawa's case, students join civic engagement after taking lectures by community partners.

When the city administration and the community asked Centre AGORA for advice on desirable activities in the park, the students suggested that if they could have a base in the city centre, it would be much easier for them to meet up regularly. In addition, during social research, it was found that a non-profit organisation (NPO) working near Nishigawa Canal was looking for a space for meetings and to stock materials. Responding to these demands, the city administration and the university started to look for an office while conducting interviews on the history of the canal.

The year 2014 opened a new epoch of civic engagement in the Okayama city centre. The new mayor declared a policy of a 'compact city', decided to reduce the number of cars, and prioritised public transport and pedestrian areas. He also decided that Nishigawa Canal Park should be the core area for this ideal city. In accordance with this policy, the city government and Okayama University signed an agreement concerning civic engagement in the city centre. Immediately after this agreement, Nishigawa AGORA was opened as a space for city, university, and citizen activities. Located on the second floor of a building near the canal, the space formerly hosted an art gallery, the owner of which lived on the top floor of the building and kindly agreed to let out the unused space at an affordable rent. Centre AGORA of Okayama University, which is in charge of the management of Nishigawa AGORA, allows the space to be used free of charge as the research funds from the city government cover the rent.

In November 2014, Okayama City hosted a stakeholder meeting for the UNESCO World Conference on Education for Sustainable Development, for which citizen groups played an active role. In December, a mega-shopping mall was opened next to the Japan Rail Okayama station, which dramatically changed the landscape of the city and the flow of people.

University Activities Inspire the City Government

Since Nishigawa AGORA opened in 2014, a series of symposiums on the growth of the city has been held regularly, with participant lecturers from Portland State University in the United States who presented research on urban design, civic engagement, and community organisers from across Japan. The space has also been used for events such as a mini-conference on young people's participation in politics and orientation meetings for volunteers. Through these events, Nishigawa AGORA has become a space for public forums where citizens, researchers, and students can associate with each other.

At the same time, Okayama University encouraged all its faculties to develop CBL courses. As some of these courses focused on the Okayama city centre, the link between the university and the local community has been enhanced even further. In parallel with these grassroots collaborative efforts, the mayor, the city government, and university representatives started discussions on how the city should strategically develop. They decided to model it on Portland and on Strasbourg in France, both of which they thought were leading examples of university towns as learning cities. The representatives visited Portland in 2015, and invited Catherine Trautmann, ex-mayor of Strasbourg, to Okayama in 2016 as a guest speaker at a symposium on the Learning City. Inspired by the Strasbourg City government's project of supporting students, Okayama City started its 'Student Challenge' project in 2017, in which the city certifies groups of university students and gives each group a grant of JPY 300,000 for civic engagement activities. Each of the three cities, namely, Portland, Strasbourg and Okayama, has different strategies for engagement with the community. The strategies could be driven from within the university or influenced by an outside agency, or both. In the

case of the Portland State University it is driven from within, and taking a CBL course is a graduation requirement for students. Besides, Portland's active culture of community volunteerism also influences and supports the university strategy. Meanwhile, France's University of Strasbourg received a massive research budget based on the state government's future investment plan in order to bring innovative new industries into the city. The French university's strategy was therefore designed to match the state's priority. After studying these examples, Okayama University conceived their CBL strategy as a way to improve their global strategy while also supporting local activities to advance the university's attractiveness and reputation. Interestingly, there are two common points among these three places: first, the universities are situated in or near the city centre, making it easy to work with community members through a research and education network; and secondly, their CBL material is inherently shaped by the local community's history and environment.

In January 2017, the Nishigawa Car-Free Street Executive Committee was established. This committee, comprised of shop owners, NPOs, citizens, and the university, carried out car-free events five times in 2017, in which the students of Okayama University participated as volunteers and promoted the idea of the 'walkable city'.

Even though collaborations between the industry, government, and university started on a series of small-scale social research projects, this network has become stronger through the activities around Nishigawa Canal Park, resulting in various forms of civic engagement.

Civic Engagement in Nishigawa AGORA: Connecting Formal and Non-Formal Education

Significance of Learning in the City Centre

The previous section showed that research and education by the university are vital to civic engagement. In other words, both formal education on campus and non-formal education in the community are beneficial and indispensable for the students. The university and the community, therefore, need to determine suitable approaches that would link these two types of education (*Maruyama and Ota 2013*). Students need reality-based experiences, while citizens need academic knowledge. According to an Okayama City government administrator, Naoaki Ishida, the students can grow in the community and influence policy-making processes[3]. Ishida stated:

"Honestly, we hope that many of the young visit the city centre. For a long time, professors have just been members of committees or commissions. In addition, although we hear the student ideas for community development through events and workshops, we have rarely adopted these into public policy. It is very useful for the administration to make superficial partnerships, but as community problems are more complicated, we need their unique ideas for a breakthrough. We are looking for ways to have regular contact with students.

I conceive that students will visit the city centre for university field research, and after that, we need them to visit our office for discussion. Nishigawa Canal Park has developed through a lot of support and participation; however, we should change some points. Our network is not stable because of the slender personal relationships between the professors and administrators. In addition, to realise student ideas as public policy, the students need to feel more than clients to show their eagerness. The young can do many unique actions as the adults have done."

Ishida strongly believed that a sustainable city was not possible without developing the next generation of human resources and instilling the desire for life-long learning among the citizenry. The distinctiveness of learning in Nishigawa Canal Park is that local residents, administrative officers, and other specialists interested in civic engagement or the growth of cities are now coming together. In this section, three typical examples of non-formal education opportunities that link the university and community are introduced: (1) The cleanup of Nishigawa canal by the citizens, (2) Making the most of Nishigawa AGORA, and (3) CBL by Okayama University.

In the list of citizen activities below, professors and students played an active role.

Cleanup of Nishigawa Canal

Nishigawa Canal is an agricultural waterway known for its biodiversity. Since 2011, many people participate in a canal cleanup event every summer. On the day of the event, the water inflow to the canal is temporarily stopped, and about 100 people, including citizen volunteers, city staff, university students, and NPO staff, go into the canal and dredge the junk and weeds in a one-kilometre stretch. The partnership between the university and the community in Okayama helped those involved to learn about their role within a sustainable city, a consciousness that has been fostered by the shared experiences of the cleanups, in addition to learning about the importance of environmental conservation.

Role of Nishigawa AGORA

Nishigawa AGORA is a small space of about 90m^2, with a capacity of up to 30 people. The space is managed by Okayama University, and used by the citizens and NPOs free of charge as a base for their activities. In 2016, the space was used for 120 days and was visited by 1,750 people.

The purpose of activities at Nishigawa AGORA and numbers of total participants were:

Citizen Activities	Relationship with University
Nishigawa Performers Project Farmers' Market, Full Moon Bar, Harmony Festival, Ocarina, Bar-Hopping Events, Jazz Festival	Students participated as volunteers and conducted field surveys with professors
Nishigawa Car-Free Street Executive Committee The committee organises different events on the street	Professors joined the committee and students supported the community volunteers
Nishigawa Summer Cleanup Day Mainly by residents, NPOs, and administrators	Students and professors joined as volunteers

Table 1: *Relationship between citizen and university activities in Nishigawa Canal Park.*

[3] Interview with Naoaki Ishida on 20 July, 2017 at Okayama University. Ishida has coordinated with university, community and administration to improve civic engagement in park policy.

Nishigawa Cleanup Day in August 2015.

conferences/meetings (866), work space (421), seminars (240), classes (94), research (80), visits (32), and others (15). The breakdown by attribution was: those related to Centre AGORA (351), those related to Okayama University (222), Okayama City staff (91), citizen groups (416), and others (668), which indicates clearly that the users were not limited to people related to the university.

Conferences and seminars at AGORA have featured topics on Okayama City development policies in reference to forward-thinking policies from the cities of Portland and Strasbourg. For the symposium on youth participation in politics, young people and members of the city parliament discussed local policies. Nishigawa AGORA is also used for training seminars for city staff.

In addition to the educational uses, the space is also used as an office or stockroom by NPOs. For example, Tabula Rasa, an NPO operating near the canal and organised by people in their 20s and 30s focusing on ecology and revitalisation of the community, has used Nishigawa AGORA for regular meetings and as a stockroom for park-event materials. (*Tabula Rasa 2014*).

As the above examples show, Nishigawa AGORA functions as a forum for discussion and networking. In addition, the students have the opportunity to experience civic engagement outside the campus. On the whole, the activities at Nishigawa AGORA have been based on people's pleasures and delight in discovery. A recent trend among universities in Japan is to construct satellite offices and campuses in city centres to show their contribution to the community, and to allow students to have reality-based experiences outside the campus. In contrast, Nishigawa AGORA was born out of direct interactions between the university and the citizens, and shows the close relationship of their engagement in the city centre to carry out not only educational activities, but also to revitalise the area.

Role of Citizens in Community-Based Learning Courses

Okayama University has developed and delivered a series of CBL courses such as 'University and NPO', 'Mastering Fieldwork Skills', and 'Civic Engagement in Okayama' in Nishigawa Canal Park, all of which included coordinators who connected the university and the community. This section briefly introduces the content and outcome of the course 'Civic Engagement in Okayama'. The purpose of this course was to investigate the characteristics of Nishigawa Canal Park, using 170 pictures taken by Kunie Ito (1924-2016), the architect who designed the park. Students and the lecturer walked through the park with a map in hand to observe how the designer's concepts had been materialised. After the walk, they developed a leaflet to highlight the attractiveness of the Ito-designed park.

Purpose	Activities
Rest place for investigators during social research under a contract with the city	Research on traffic and landscape as well as event monitoring
Conferences and seminars	Sports promotion, workshop of civic engagement after the trip to Portland, symposium on young people's participation in politics
Student-group activities	Work experience, meeting for the supporters of earthquake victims, seminar on life ethics
City government activities	Workshops, advisory board meetings, internships, meetings to exchange opinions
Citizen activities	'Full Moon Bar', 'Nishigawa Candle Night', seminars by NPOs, Executive Committee meeting for a Car-Free Street
Storing equipment	Equipment for 'Farmers' Market', musical instruments, etc.

Table 2: *Purposes of Nishigawa AGORA and activities of its users.*

For this course, the lecturer, students and community members each had to prepare. The lecturer made a trip to Tokyo and visited the Tokyo Metropolitan Park Association to borrow the blueprint of the park and the pictures taken by Ito in the 1970s. The lecturer also invited Ito's daughter to Nishigawa AGORA to deliver a lecture on Ito's personality and thoughts. The students were required to study the history of Nishigawa Canal Park and other parks designed by Ito. The community members were asked to join as guides to explain the names of woods and bridges, relate the history of Nishigawa Canal Park and recount their childhood experiences and memories of the park as the students walked through it.

The fieldwork in the park took about two hours, after which the students went back to the university and started pasting copies of Mr. Ito's pictures on the map, identifying the spots where they had been. Even though the park was already well known as an 'oasis of water and green', the students discovered that Ito had paid special attention to the arrangement of rocks in the park.

Neither the university nor the citizens are aware of all of the resources in the community. What the students learned through this CBL course brought to light one of the community's hidden resources.

Towards Sustainable Civic Engagement

Intending to revitalise the city centre, Okayama City experimented with car-free events four times in 2016 on the car lanes on the west side of Nishigawa canal. During the event, parasols, stalls, chairs from open cafes, hammocks and deck chairs were

Social survey seminar.

Young people at the Full Moon Bar.

arranged along the canal, and university students conducted a questionnaire survey among the visitors. It was during these events that the city government came up with the idea of establishing an executive committee for the operation of a 'pedestrians' paradise' in Nishigawa as a collaboration between the university and the community. Following up on this idea, Okayama University gave presentations at Nishigawa AGORA on examples of car-free events in foreign countries, while the community members continued to hold workshops on the future of the city's development.

After discussions with the people concerned, the Nishigawa Pedestrian Paradise Committee was established in January 2017 as a network of shop owners, NPOs, park performers and Okayama University. This was a significant step towards the enhancement of civic engagement in Okayama. The committee has held several unique events; for example, on Pedestrian Paradise Day, the university students participated in the operations for the whole event, and high school students set up a mini-aquarium exhibit to display the fish they had caught in the Nishigawa canal.

As the university and community strengthen their partnership and begin to share their knowledge and learning, there have been several changes in Okayama's city centre, with a new public space being born. This collaboration has proved that a university is not only capable of solving community problems, but also of discovering resources in the community and mobilising the community towards the development of a sustainable city.

Conclusion

Using the example of Nishigawa Canal Park in Okayama City, this chapter describes how partnerships between universities and communities can strengthen civic engagement. Okayama City is remarkable because the citizens have innovated civic engagement by connecting the university's expertise with the community's reality. The essence of the creation of sustainable cities is that even if the local administration has developed modern infrastructure such as roads and parks, the most important consideration is the way citizens can use these facilities to improve their daily lives and discuss future ecological designs to create a more liveable community.

Of course, neither the university nor the community can solve all the problems in a city centre. Three problems continue to be noted. First, it is necessary to analyse whether the partnership has the potential to grow. Second, civic engagement must evolve as the membership evolves. Third, even though students studied the community and its problems and proposed some community development plans, the car-parking areas and traffic problems have not been resolved.

This chapter emphasises that partnerships can improve the quality of a university's research and education efforts through their engagement in community development. Okayama University has learned a lot from the partnership in Nishigawa Canal Park. However, strengthening university and community partnerships takes time, and without mutual confidence and pragmatic negotiation, it could be difficult for the university to understand the reality of the community. Therefore, communication is key for civic engagement. To start successful partnerships, it is necessary to find a community symbol that can attract sustained community engagement to ensure that the university and the community are moving in the same direction.

To conclude, the following key questions will be answered: Why is university-community partnership necessary? What impacts has the partnership generated? And, why is the Okayama case unique? The partnership between university and community is intended to make the most of their collective potential power, which consists of both human and local resources, in accordance with social changes in the context of global competition. CBL presents a new approach for solving community problems by researchers and students. However, in addition, the university must consider what kind of citizens their students will become, and how they will contribute to society. Although it is hoped that the students will survive economic competition with a confident spirit and strong will, there is also the intention and hope that they will develop strong relationships and care for their families and community members, contributing to a sustainable society. To maintain the balance between private and public life, it is of great benefit to develop stronger civic-mindedness and to recognise community experiences as the best material for democratic learning.

Next, how can educational policy strengthen the partnership between university and community? Though this is not a simple proposition, it might be necessary for the central government to transfer their financial resources to and build competence at the local level (such as the city and university) as part of their decentralisation process. Through this, the university and city can start to formulate a local development strategy, especially in terms of education and research towards fostering a creative city. This also gives local institutions greater responsibility for future successes or failures.

The uniqueness of the Okayama model is that as Okayama City already has a reputation for ESD activities on the basis of the Community Hall program, Nishigawa Canal Park represents a source of civic engagement history, and has included varieties of participants such as women, NPOs and youth.

Before the political and educational initiatives of the city government and the university, community members had already paved the way for partnerships by showing their vision and

problem-solving abilities. The Okayama, especially Nishigawa, model shows the interaction of talent and respect between university and community through civic engagement and CBL. An important recommendation resulting from this model is that members of the community should not be seen by the university actors as mere informants or respondents to their research and outreach activities, but rather as co-owners of the university's civic engagements. In other words, universities are no longer ivory towers. The partnership in Nishigawa Canal Park has shown that as universities are part of the community, their sustainability is closely related to that of the local community.

Lastly, it must be noted that the Regional Centre of Expertise on Education for Sustainable Development (RCE) Okayama, with its lead member, Okayama University, has been the major driver of the initiative. This initiative required many stakeholders to work together, a key aspect of the RCE model. RCE Okayama has more than 200 partners comprising educational institutions, NPOs, commercial enterprises, international organisations, and has the active participation of community members who represent the Community Hall, UNESCO Schools, and others. Nishigawa, too, is a part of RCE Okayama and offers opportunities to invite new participants such as young people, women, researchers, and families with small children, into civic engagement. The university has an especially important role linking the community and local administration in order to coordinate their opinions and activities, so as to create and instil new values for sustainable urban development among the next generation. This is the time for RCEs, not only in Okayama but worldwide, to develop strong partnerships with universities and the community to walk the same road to the future, learning together and solving problems as they go in order to create a sustainable society.

Acknowledgements

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Part III

Multi-stakeholder Learning Networks

Global Action Programme on Education for Sustainable Development, Priority Action Area 5 – Accelerating sustainable solutions at local level:

"…to improve the quality of local platforms for learning and cooperation and strengthening multi-stakeholder networks at [a] local level…"

Sam Erwin | unsplash

Dzulkifli Abdul Razak, Nasha Rodziadi Khaw, Zulkifly Baharom, Mahazan Abdul Mutalib and Hood Mohd Salleh

Chapter 14

Decolonising the Paradigm of Sustainable Development through the Traditional Concept of *Sejahtera*

Summary

ESD Innovation

Delving into aspects of etymology-anthropology (in this case, on the concept of *Sejahtera*) and connecting them to the network of cultures provides a better strategy for making ESD a 'living' concept beyond the prescriptive technical and bureaucratic aspects for implementation. Putting the subject in its relevant historical and cultural context creates a deeper appreciation and understanding, which results in ease of acceptance and quicker adoption. The approach used here is a departure from that widely used today, where sustainable development is presented as a 'foreign' concept arising from the 1987 Brundtland Report, ignoring similar and powerful, culturally endorsed ideas that were in existence well before the twentieth century.

Societal Transformation

The strategy described here rests on positive attitudes and understanding of sustainability issues, with respect to the use of resources, conservation of the environment, and the maintenance of balance and harmony as outlined by the 'SPICES' approach, which goes beyond the 3Ps (People, Planet, and Profit) of sustainability. Periodic reinforcement of the internalisation process as part of the 'learning by doing' towards sustainability ensures the success of the strategy.

Implications of Development for Knowledge Institutions

The strategy of raising awareness among the students and the community about the preexisting concept of sustainability in their culture allows them to feel a cultural connectedness to the idea and philosophy, as something that has been part of their culture and lifestyle (albeit forgotten) since time immemorial. Co-creation and co-learning of the concept through interaction with the community would give all parties a sense of ownership and make the changes easier to implement.

In this sense, knowledge institutions must be open to broadening the knowledge system by embracing relevant traditions or even indigenising the knowledge base as part of the process of the decolonisation of knowledge.

The Growing Recognition of Relevance of Indigenous Knowledge and Wisdom

Three decades ago, in 1987, the Brundtland Report, entitled 'Our Common Future', known officially as the Report of the World Commission on Environment and Development (*WCED 1987*), was launched. The Report became a game changer in that it called for a 'new' way of thinking that would ensure better quality of life in generational terms. Sustainable development (SD) soon became a part of the global conversation and the foundation of the 'Education for Sustainable Development' (ESD) framework.

By 2014, when the UN Decade of Education for Sustainable Development (DESD) drew to a close, SD had gained global acceptance, with a number of higher education institutions playing key roles in embedding ESD into their curricula and carrying out collaborative activities with the community to create greater awareness and demand for ESD. Also in 2014, the International Association of Universities (IAU) decided to focus more attention on indigenous knowledge and the need to better understand the ancestral perspectives as the 'forgotten' part of ESD. Following the *IAU 2014 International Conference on Blending Higher Education and Traditional Knowledge for Sustainable Development*, held in Iquitos, Peru, in March 2014, a normative instrument known as the IAU Iquitos statement on Higher Education for Sustainable Development was adopted (*IAU 2014*). It was then presented at the International Conference on Higher Education for Sustainable Development: Higher Education Beyond 2014, on 9 November, 2014 at Nagoya University, Japan.

Succinctly, the Declaration recognises that indigenous knowledge and wisdom that well-preceded the Brundtland Report have a significant role to play in contextualising ESD as the 'new' platform influencing the purpose of education, and how education is being reoriented toward a more sustainable future. In a manner of speaking, SD and ESD could be traced back to the many facets practised by the ancestors, especially focused on positive values and ethics. Anthropocentrism was not a major issue then, unlike how it is being categorically singled out today (*Montague 2013*). This became apparent over the DESD when indigenous knowledge and wisdom found their way into, and became firmly anchored in, the ESD framework. This further widened the relevance of ESD beyond the scope envisaged in 1987. It set up a new focus on ESD by broadening and enriching it as a living educational approach that engages and collaborates with real-life communities; contextualises sustainable livelihood as real-life experiences beyond the limits of living labs; and invites an even greater involvement of the global community in promoting and preserving relevant indigenous norms, values, and practices. More importantly, it blends indigenous knowledge and wisdom with the existing 'modern' knowledge in articulating newer ideas that have been cast aside by the excesses of colonisation.

Sejahtera: A Philosophy of Sustainable Living and Balanced Coexistence

A case in point is the word *sejahtera* in the Malay language, which carries a positive connotation referring to abundance, happiness, prosperity, peace, and tranquillity.

Sejahtera is not easily rendered into other languages because of its comprehensive and multi-layered meaning and nuances. It underscores

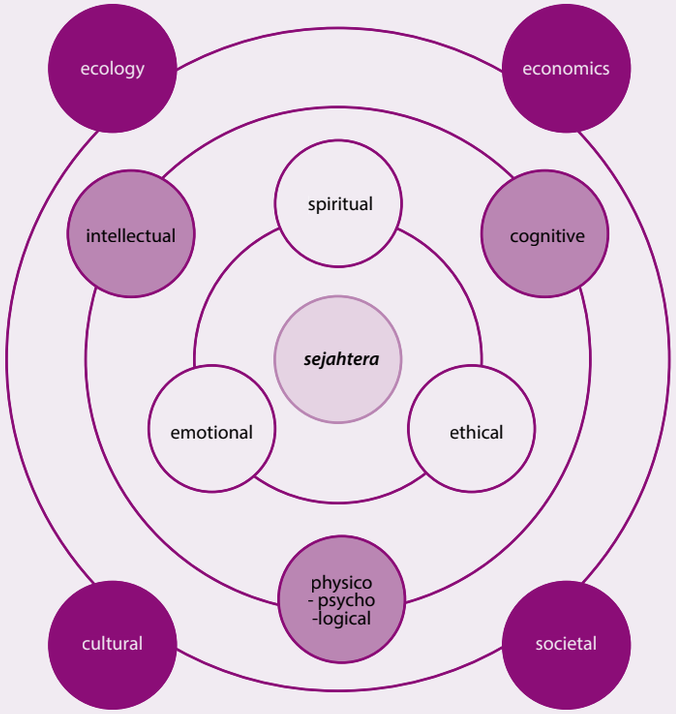

Figure 1: *Sejahtera Circle.*

that indigenous knowledge and wisdom have had their own uniqueness, strength, and relevance for the local community over the years. Although it is often translated as 'well-being' or even 'prosperity,' its inherent meaning is much more than that. In fact, it is 'beyond well-being.' It is human-centric in that it spans the macrocosmic-microcosmic nexus. It is macrocosmic because it relates humans to the external environment – nature and fellow beings, including other species. It is microcosmic because it embraces the 'self' and the inner (esoteric) dimensions, including spiritual consciousness. Taken together the status of *sejahtera* can be described as a balanced lifestyle summarised by at least ten different elements neatly woven into the acronym SPICES, namely spiritual, physico-psychological, intellectual, cognitive, cultural, ethical, emotional, ecological, economic, and societal dimensions (*Figure 1*). Not only must each aspect be in balance in itself, but each must be in balance with all the rest to achieve an overall state of well-being that is lasting (sustainable) over generations.

The last point is pertinent because it implies that sustainability is not a new concept that emerged in the 1980s following the well-acknowledged Brundtland Report. Arguably, sustainability is an ancient concept in many indigenous traditions that has been overtaken and lost in the drive toward modern unsustainable development. The result is that development becomes purely a physical venture and no longer focuses on building 'collaborative relationships' between humans, the community, the environment, and the 'creator' as an enduring lifestyle. In so doing, the fine state of balance is severely offset by a hefty price tag for future generations. In short, the embodiment of *sejahtera* goes beyond the conventional three Ps of Planet, People, and Profit. Although each aspect can be individually targeted and developed, for example *sejahtera ekonomi* (economic well-being), it is only when expanded into the 'socio-ecological' dimension within SPICES that all elements are harmoniously blended and nurtured. That makes it a holistic endpoint for a sustainable future.

Without doubt, 'relationship' (or coexistence) is an important concept in making *sejahtera* work in a balanced way with an in-depth meaning, taking the cultural context and nuances into account. Collaborative relationship in particular embraces compassion, empathy, and the uncompromising spirit of oneness transcending differences and bitterness, bringing about the much-needed close relationship, coexistence, and interdependency. Similarly, within the context of sustainable development, the same traits are needed to cater to the millions who are under urgent threat of global warming and climate change. The unprecedented occurrence of crisis after crisis cannot be handled effectively without nurturing the relationship that binds people via a set of common values and ethics. In reality, the world is highly complex, dynamic, and interdependent; therefore isolated, compartmentalised, independent, and conventional linear approaches are most likely to fail (because they are unsustainable). Instead, constructive relationships and networks are essential to allow for self-reliance and steadfastness in mitigating any form of crisis that is happening at an ever increasing rate. This means that relationships must be nurtured early in life as a part of *sejahtera*; they must be cherished, protected, and lived by.

Etymology and the Cultural Context of *Sejahtera* Philosophy

Ideas regarding a sustainable and balanced relationship between humans and nature have been a part of the sociocultural makeup of all ancient societies. *Sejahtera* is an indigenous concept in the Malay Archipelago. Today, it is more often associated with the idea of 'balanced well-being' or even 'coexisting with common shared values and prosperity,' but its essential meaning is 'beyond well-being of individuals, institutions, organisations and society.' However, the origin of the word is probably not local. When and how it started to be used in the Malay language is unclear, but its etymology can be traced to the Sanskrit language. The possible words from which *sejahtera* was derived include *sadhya* (celestial being), *sudatra* (granting gifts), and sucitra (distinguished). Although the meanings of these Sanskrit words only narrowly imply the meaning of *sejahtera* as it is understood today, all of them have a strong positive connotation.

Regardless of the etymology of the word, the very core of the *sejahtera* concept as understood by the early society moulded the concept of statehood in the Malay Peninsula (*Braddell 1980*). This concept led to the economic and political importance of the port-polities, which developed under very special circumstances, in contrast to many great kingdoms of Southeast Asia (*Coedes 1968; Paludan 1998*). Ethnographic studies, archaeological data, and historical records also offer important insights into the culture of the ancient societies of the Malay Peninsula. Records show a cultural continuity from antiquity until today, suggesting a sustainable lifestyle through the centuries. In terms of their internal political organisation, polities of the Malay Peninsula had distinct structures as compared to the agrarian kingdoms in Southeast Asia (*Wheatley 1961*). The kingdoms, such as Angkor, Campa, Majapahit, Medang, and Dvaravati consolidated their power based on control of land and territory. In the Malay Peninsula, riverine and coastal settlements evolved into kingdoms and port-polities. These settlements often had extremely small populations and lacked agriculture, but their populations possessed important skills: they were great seafarers or

Evidences of Sanskrit Inscription found in Bujang Valley, Kedah.

skilled rainforest foragers. These small societies were fully adapted to their rainforest and coastal environments in a sustainable way.

The stimulus which triggered the change from a prehistoric society in the Malay Peninsula toward the formation of port-polities was trade and the demand for rainforest products. While they were still living as hunter-gatherers, contact with foreign traders had led to an exchange of commodities and ideas, which led to social stratification and eventually to forms of statehood. However, while their social structures changed, unlike in agrarian societies, their lifestyle as rainforest dwellers and foragers remained. Thus, these kingdoms possessed several characteristics that were in line with the *sejahtera* concept, which later led to their success.

From Philosophy to Practice: *Sejahtera* in the Practices of RCEs and Beyond

Bringing the Concept of *Sejahtera* to University

The concept of *sejahtera* was first introduced in Universiti Sains Malaysia (USM) as a way to empower and entice the students to contribute positively to the university. It embraces the five principles of the *sejahtera* program, realigning the USM campus with a global agenda and providing it with a platform that helped it gain a global presence and prominence. This happened in 2005 when USM became one of seven pioneering Regional Centres of Expertise (RCEs) globally, which then led to the APEX (Accelerated Programme for Excellence) agenda when USM declared its vision as a sustainability-led university.

This concept was introduced as a mere campus-bound idea in 2002, but has since evolved into a regional and international concept with the establishment in 2011 of the Sejahtera Centre and Sejahtera Forest by RCE Tongyeong in the southern part of the Republic of Korea. The forest is particularly meaningful not only because it is next to a national park, but more so because it is also a 'living laboratory' that embellishes 'the unique traditional culture of the Asia-Pacific region with an emphasis on coexistence.' Indeed, this is well summed up by the vision of the Sejahtera Project: "Coexistence between human beings, man and nature, present and future generations." There is no doubt that the bold initiative of 'collaborative relationship' rooted in the deeper meaning and philosophy of *sejahtera* will enlighten future generations. It will also help to reclaim the traditional wisdom and cultural values that have faded or gone astray. As stressed by UNESCO (*2014*), "Sustainable development cannot be achieved by technological solutions, political regulation or financial instruments alone. We need to change the way we think and act. This requires quality education and learning for sustainable development at all levels and in all social contexts." In this case, it naturally blends in the RCE vision of 'coexistence' between humans and nature in a balanced way.

The Sejahtera Project, the USD 20 million initiative funded by the Ministry of Environment of the Republic of Korea, covers an area of 200,000m^2 and comprises the eco-park and the Sejahtera Centre, a creative research and teaching centre. It opened on 23 May, 2015. RCEs from the Asia-Pacific region interested in participating in the organisation of the joint platform for sustainable development in the region comprise the Sejahtera Network Committee (*Dzulkifli 2015, 2016*). 2017 saw the launch of the third Sejahtera Fellowship Programme for researchers from Asia-Pacific RCEs.

Every year, one researcher is invited to stay at the Tongyeong Sejahtera Centre for three to five months to conduct research of interest to the awardee, and to produce a research report. The overarching objective of the initiative is to develop a Sejahtera Project discussed among Asia-Pacific RCEs in search of an Asian approach for ESD (*Piquero-Ballescas 2015*). In this way, it can strengthen the regional network, create a new global learning space for ESD, and further assist in the practice and implementation of the SDGs. Won J. Byun (*2016*), the founding Director of RCE Tongyeong, outlined three Sejahtera Forest strategies, namely (a) a need-based design process involving stakeholders, (b) building on existing networks that include the school ESD network, a non-formal network with the Sejahtera Centre as the Local Education Hub, linking to local education groups and their programs offered for visitors to the Sejahtera Centre, and (c) a common platform for partnership, adding value created via the existence of the Sejahtera Centre as a physical platform, as well as the synergy among programs and organisations.

More recently, Malaysia has initiated a Sejahtera Leadership Initiative (SLI) to address the issues of ESD from a leadership position. Malaysia has introduced human-centric dimensions of leadership focused on balance and trusteeship, in addition to justice, as a continuum of leadership evolution into the twenty-first century. SLI is a citizens' initiative that enshrines more than one decade of aspirations and efforts to hold up to the community and institutions in Malaysia and elsewhere. The initiative is a contemporary adaptation from the corpus of universal psycho-philosophical wisdom, both ancient and modern, which seeks to serve the dire need for values-driven leadership at all levels of life. This is encapsulated in the SLI vision of "nurturing a holistic human-centric and balanced well-being leadership towards living in a harmoniously peaceful society", which embraces the three core values of humility, mutual respect, and balanced coexistence. As such, it directly addresses the 'anthropocentric' factor that is the major cause of the global crises of today. This chapter argues that the concept of *sejahtera*, with its conscious or unconscious etymology, was practised by the early historic societies in the Malay Peninsula. In practical terms, it brought to life the practices of trusteeship, responsibility, harmony, and balance beyond that of ownership and growth in constructing 'better' ESD that is more naturally inclined without much imposition from the outside.

Sejahtera: Bringing sustainability and livelihood 'home'

Further reflections on SLI open the door wider into the historical evolution of the global study of sustainability and all that it signifies today. There is no question that indigenous (traditional) knowledge had been the great hallmark of living

communities, representing the collective 'science' and special expertise of leaders and community heads through much of human history. This knowledge has played a critical part in the very survival of the community as an integral entity. At the same time, exchange of knowledge took place on a wide scale, through trade, wars, and peaceful means. When nations or groups of nations eventually began to behave expansively, a culture of dominance based on unbridled material greed and power became the order of the day. The function of knowledge came to sustain and perpetuate the needs of the powerful over the poor or less powerful (*Campbell 2015*). Some nations were quick to grasp how to learn and transfer the science and technology of their advanced counterparts with 'superior knowledge.' 'Modern' universities played a large part in this process. As all this happened, it was also observed that the opportunity to record the traditional knowledge that existed in the less 'modern' societies came to be seen as desirable and important (refer to the growth of detailed cultural studies and monographs from the 1960s until today).

For example, a study of the evolution of the RCE Kitakyushu ESD Council in Japan provides inspiring ideas and motivation. A shared vision, a sense of mission, and a systematic cultural approach were the underlying features that infused dedication and success to the collective social endeavour. At least seven outstanding achievements are worth noting: the formation of the ESD Action Plan for 2015–2019, sharing of information through social media, building of a strong foundation with civil society, networking with the city government and local politicians, working with women's advocacy groups, introducing ESD curricula in elementary schools, and sharing of concepts and success stories with other cities. Malaysia, on the other hand, is focusing on 'balanced' (traditional) villages through the Mizan Research Centre located at Universiti Sains Islam Malaysia (USIM). In particular, the projects in Kampong Bharu (one of the oldest villages in the capital city of Malaysia), and among various indigenous communities in other states (e.g., Negeri Sembilan), deserve mention with respect to nation-building and the philosophy of sejahtera. These projects include support from the private sector and the Office of Malay Agricultural Settlement (MAS), which share common ideals in the cause of service to the community – particularly important as part of the wider, underlying philosophy. For example, Kampong Bharu, that has stood the test of time for more than 110 years, with 2,600 villagers being housed there in 1928 (when the first census was done), comprises a diverse group of descendants maintaining their own identity, traditions, and ways of sustainable livelihood (*The Star Online 2014*). So much so, it is now regarded as the focal point of the local indigenous people that withstood the challenges of an increasingly urban village with a population of 17,000 today. It has managed to escape the long arm of (unsustainable) development because it was duly protected to remain as a living testament of sustainability. A quotation below from Roff (*1965, 299*) explains the history, evolution, original activities, and existence of Kampong Bharu despite many external influences, including those of the colonial government.

"The 'Malay Agricultural Settlement', better known later as Kampong Bahru, was established in 1899, on some 224 acres of land lying at what was then the north-eastern edge of Kuala Lumpur. Its aim was to create, close to the town, a sort of model village, in which traditional Malay agriculture and crafts might be pursued and developed, while children of the settlement were given literary or technical education to enable them to find Government employment. Half-acre lots of land were leased to settlers on what was effectively a permanent tenancy, a school and other facilities were built, and a committee composed of British officials and leading Malays was formed to run the settlement. From the start it seems to have suffered from a superfluity of ideals insufficiently attached to reality. A scheme to grow padi, undertaken against the advice of the Malay members, failed utterly, and plans for co-operative live-stock rearing did little better. Craft instruction in wood-carving, silversmithing, tailoring, mat-making and the like was poorly attended by youths who drifted off to take other jobs in the town. In some respects, however, the settlement was a notable success, enabling, as the Annual Report on Selangor for 1902 said (p.28), 'many families of respectable Malays of the Peninsula to live their natural village life almost within the precincts of a large town'. By 1924, Kampong Bahru, which had been absorbed completely within the town area, had 544 houses and a population of 2,600."

In this regard, the notion of indigenous knowledge that stresses the importance of development and future planning should be determined mostly from the insiders' or the communities' perspectives. One good example of this is the understanding of 'home', which originally connotes the fundamental interpretation of 'community well-being' owing to societal changes and transformation.

The concept of 'home' is now more oriented to indicate 'economic well-being'. This is evident from both empirical and theoretical perspectives as well as cultural reasoning based on multiple observations from urban villages locally and around the globe. The 'economic well-being' and 'community well-being' of home are two highly contested scenarios globally. 'Economic well-being' means that human lifestyle and the place of living are determined mostly from economic demands or patterns, and that community has limited power to influence it. This contradicts the original understanding of the 'community well-being' of 'home' that carries the essence of communal will and freedom to decide what is best and most suited

An original house in Kampong Bharu in a rapidly developing urban area, showing a resident doing his routine job to dry fish.

to the needs and preferences of the community without compromising lifestyles and the place of living that is often balanced and sustainable. This raises an important issue in the context of ESD and the indigenous concept of *sejahtera*, namely: which is the preferred pattern of a 'home'? Even though the 'economic well-being' idea provides the community with material needs and other forms of wealth and luxuries ranging from systematic water system to a hi-tech community lifestyle, the situation is deemed unsustainable because it limits the power and freedom of community members to decide for themselves. 'Community well-being' as it relates to the concept of 'home' recognises the total freedom and power of the community to suggest, promote, preserve, and evolve community traditions and indigenous knowledge as the foundation of the rights to a sustainable or *sejahtera* lifestyle. Arguably, this lends a more powerful understanding of 'life' that matches the present needs of the people without compromising their future needs, and the needs of the generations to come, beyond mere 'economic well-being'.

Transit home, on the other hand, is a phenomena that portrays a new style of living influenced mostly

An interview session with a group of land owners of houses in Kampong Bharu, 17 July, 2017, organised by Malay Agricultural Settlement.

by external economic factors. The original concept of 'home' as analysed by some scholars, notably Shelley Mallet (*2004*), highlighting the elements of community protection and serenity, is absent in the concept of a transit home. The study at Kampong Bharu and studies from various other locations clearly demonstrate how a 'community well-being' 'home' is gradually being reduced to one concerned with 'economic well-being'. As a result, the entire community is rendered unsustainable and precariously exposed to continuous external threats of extinction, as witnessed throughout Malaysia's historical and colonial period, and even well into its independence six decades ago in 1957. Similar experiences are also noted in other Asian communities and beyond, including Africa.

In other words, indigenous community knowledge and wisdom is imperative in defining lifestyles and the corresponding idea of 'home', and must not be overshadowed and sidelined by external influences and domination. Concepts like *sejahtera*, in tandem with ESD, should again be mainstreamed in order to revitalise and enable balanced, harmonious, and sustainable lives and livelihoods in an effort to nurture part of the global drive to meet the goals within the 2030 Agenda for Sustainable Development.

Conclusion

In contrast to most other ancient kingdoms in Southeast Asia, which built their civilisations upon mobilising their large populations either for labour or to man their military force, the coastal and riverine polities of the Malay Peninsula were characterised by small populations, economic subsistence based on tropical rainforest adaptation, lack of agriculture, simple social structure, and material culture based on rainforest products. Yet, with such austerity in their culture and lifestyle, these city-states managed to assert their relevance in the economic and political landscape of the region. This was due to their sustainable relations with their environment, and the ability to optimise the usage of their meagre resources. This indirectly implies that the conscious behaviour of these ancient societies was in line with the concept of *sejahtera* as it is known today.

Now the growing uptake of ESD requires enabling co-learning to coexist in a balanced way taking into account a deeper understanding of indigenous knowledge, its pristine concept and etymology within the local historical and cultural context. The processes of decolonising SD becomes vital in this sense if ESD is to have greater meaning and impact by making the diverse cultural context more organically rooted and intact for generations to come. As it stands today, ESD implementation is somewhat 'artificially' imposed by the limits of Eurocentric reports and thinking (e.g., the Brundtland Report) that does not give sufficient latitude to indigenous knowledge and wisdom that hearken back to ancient times. Colonisation wasted them for many centuries, but now the time has come to reinstate them as a living heritage. Sustainability is indeed a collective heritage, and should be recognised as such before it becomes fashionable only within a limited scope, as is happening currently.

Sustainability is not just a target to be achieved by attaining a certain set of numbers and figures over a period of time (as with the Millennium Development Goals that ended in 2014); it is also vital to the attainment of higher purposes in life that may have nothing to do with the amassing of material wealth. Yet, unless there are attempts to consider and build equally robust, intangible foundations, taking into consideration indigenous knowledge and wisdom that can ensure sincere, equitable, and cohesive partnerships, *sejahtera* cannot be sustained in the long run.

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Chapter 15

Affirmation of Cultural Diversity through Participatory Education and Research

15

Summary

ESD Innovation

The purpose of participatory action research is to build a knowledge base that combines 'modern' knowledge with that of indigenous and ethnic communities. It helps to develop respect and value for the country's rich cultural diversity in working toward achieving peaceful and healthy cultural growth. The research has been guided by the ethnographical method, as it is the most appropriate for working with indigenous cultures whose knowledge is based on oral tradition.

As a methodological resource, the Guide or 'Baquiano' was applied in including research team members considered inexperienced in the academy but who have practical experience and deep knowledge of the cultural context under consideration. They are involved not as informants but as research team 'guides' in understanding cultural and environmental peculiarities that the uninformed researcher might skip or find only much later.

Societal Transformation

The action research approach provides the opportunity to involve people of the indigenous communities in the entire process, from the beginning until the end. Through participation in the research team together with scientists they acquire understanding about the origin of their environmental problems and develop the ability to seek and manage the most appropriate solutions. The engagement experiences have contributed to the creation of the Environmental Forums Program, which brings together teachers, students, and community members interested in promoting ESD through non-formal education.

Implications of Development for Knowledge Institutions

The results of the research with the indigenous communities, emphasised that mainstream society can refine and transform behaviours and attitudes toward cooperation, collaboration, and respect for nature.

The research has also contributed to the approval of the National Environmental Research Policy in Colombia, promulgated by the Ministry of Environment and Territorial Development in 2002, which recognises a second mode of research in which "the parameters of classical science are not necessarily followed and, consequently, it is necessary to refer to it in broader terms… the final result transcends the field of contributing disciplines, being thus interdisciplinary."

Cultural Diversity of Colombia

With a population of 48 million, Colombia is the third most populous country in Latin America, after Brazil and México. Seventy-five per cent of this population is urban. About 75% of the population inhabits the Andean region, between 1,000 and 3,000 metres above sea level along the axis of the Magdalena and Cauca rivers, up to the coast. This region has the best natural conditions, both climatic and agricultural.

The ethnic diversity in Colombia is the result of the mix of American Indians, Spanish colonists, and African slaves, leading to a mestizo[1] majority (64.09%), with a significant minority of whites (22%), and blacks (10.5%). The indigenous peoples are comprised of more than 80 ethnic groups, and together account for 3.4% of the total population (*DANE 2005*). They live in all parts of the country, but are concentrated in La Guajira, Cauca, Narino, Cordoba, Sucre, and Tolima.

Characteristics of Bogotá

The city of Bogotá, the capital of the Republic of Colombia, is located in the centre of the country, 2,600m above sea level on the eastern branch of the Andes Mountains. Bogotá houses 17% of the national population.

The city is one of the most important cultural centres of South America. It has a large number of museums, theatres, and libraries. In addition, Bogotá hosts a wide range of major festivals recognised nationally and internationally. It is also important for academic activity, as some of the most important Colombian universities are located in the city.

[1] Descendants of mixed European and Native American ancestry.

The National University of Colombia and Knowledge on Cultural Diversity

Universidad Nacional de Colombia (National University of Colombia), located in Bogotá, is the largest public university in the country with more than 50,000 students. It hosts 49 undergraduate programmes and 350 postgraduate programmes.

The University recognises cultural diversity and admits indigenous and provincial students through quotas allocated to them. The University is thus open to the diversity of races, ethnicities, and cultures in Colombia. In 1991 the Political Constitution of Colombia recognised this diversity and stressed that respect for diversity implies not only tolerance but also understanding and acceptance of different worldviews and forms of knowledge.

Research on Cultural Diversity

One of the research projects from the Master's in Environment and Development offered by the Instituto De Estudios Ambientales was on 'Interculturality and Traditional Knowledge'. Indigenous students and indigenous alumni, as researchers, contributed to the research through the various steps required by the ethnographic method.

The participatory research was carried out with the participating communities in their indigenous territories, such as the departments of Guajira, where the Wayuu Indians live, in a desert territory in northern Colombia on the border with Venezuela; in the south of Colombia bordering Ecuador, where

Inga cuisine at a meeting place around the fire.

the indigenous Inga are located; in the Sierra Nevada of Santa Martha in the north, near the Caribbean Sea, where the Iku live; and in Caquetá in the Colombian Amazon, where the Uitoto live. In all these places, the researchers carried out fieldwork, wrote detailed field journals, and conducted long and in-depth interviews that revealed the life histories of the traditional sages, such as the Mamu, the Piache, and the Taita among the indigenous Iku, Wayuu, and Inga respectively.

The Network of RCE Bogotá

The Institute of Environmental Studies (Instituto De Estudios Ambientales, or IDEA) of the National University of Colombia, is the coordinating entity of RCE (Regional Centre of Expertise on Education for Sustainable Development) Bogotá. It is dedicated to research, teaching, and extension in environmental issues. IDEA is an interdisciplinary institute where professors from the different faculties and areas of knowledge participate in programs and projects of environmental interest for the country.

The network of RCE Bogotá is constituted by 12 public and private universities, schools, environmental NGOs, the Environmental Ministry of Colombia, and the Environmental Secretary of the Capital City.

This network has been coordinating efforts by various Colombian universities to incorporate the environmental dimension into their curricula, courses, and research. Some of them already include the environmental topics in their master's programmes.

Research on Cultural Diversity

Visions of the Environment through Three Colombian Ethnicities

The process and results of the first stage of research, which included students from the Inga ethnic group of Putumayo, the Wayuu ethnic group of Guajira, and the Uitoto ethnic group of Caquetá, were first published by the IDEA in 1996 in the book Visions of the *Environment through Three Colombian Ethnicities* (*Bermúdez et al. 1998*), the second edition of the book was published in 1998 with the support of the FEN Colombia Fund. In this book the indigenous researchers spoke with their own voices, breaking the traditional research scheme in which they would be included only as informants.

In selecting students for the research team, their interest in going back to their communities after graduation was taken into account. What was also given importance was that they were 'real' representatives of their respective communities, spoke the community language, were in regular communication with their indigenous families, visited their community regularly during university breaks, and seemed to have the ability to help carry out fieldwork in their communities.

The first stage of the research covered the revival of the environmental philosophy of three Colombian ethnic groups, namely the Wayuu, Inga, and Uitoto, through documenting their worldviews related to the environment. These groups are located in places far from the national capital.

Besides a permanent intercultural dialogue, the research involved the placement of the research team in the indigenous communities, where they worked together with community members to compile and record their oral tradition.

The participatory research and the ethnographic method allowed for the advancement of the work and the formulation of some conclusions, which in turn helped with the development of educational proposals in the field of the environment.

It is worth noting that indigenous knowledge is the collective wisdom accumulated and transmitted through the generations in oral and attitudinal form (*Estermann 1998*). It is based on:

- The authority of the elderly and the wise in the community
- Antiquity, i.e., the passage of customs and traditions over time
- A coherent system of beliefs

Therefore, it can be said that this knowledge is the product of a lived experience. It is the transgenerational transfer of knowledge through practice, which can be summarised as 'learning by doing' and in which the wisdom of the elderly is of great importance.

The authority of elders and wise people is the result of a wisdom accumulated over time, which gives them the knowledge and ability to continuously interpret the happenings in the community. That is why they are the possessors of 'strength and life', and the repositories of the history of the culture and the traditions of the ethnic group.

Knowledge for the Iku people of the Sierra Nevada of Santa Marta is universal and printed in nature. To be wise is to be able to comprehend and interpret it, an ability which the Mamus[2] have. For example, the Mamus consider the thawing of the snowy peaks of the Sierra to be a sign that the earth is sick and is bleeding, because the rivers and the sea are the blood of Mother Earth.

This stage highlighted the valuable exchange of knowledge between academia and the indigenous oral tradition in their approaches to the environment. Benjamín Jacanamijoy, an indigenous artist participating in the research group, affirmed that it had allowed a valuable exchange between "indigenous researchers and Western shamans." The formal learning process of the university helped students from the indigenous communities to learn to write more fluently in Spanish, and to use recorders and other equipment during research. They also gained greater self-confidence and self-respect from the recognition and appreciation of their knowledge that they received from the professors and students of the university once the research was complete.

Knowledge of the Place

Current and graduated indigenous students from three Iku communities, namely the Arhuacos of the Sierra Nevada of Santa Marta, the Wayuu of Guajira, and the Inga of Putumayo, participated in the second stage of the research. The book *The Dialogue of Knowledge and Environmental Education*, published in 2005 by IDEA, includes a description of the process, contributions, and conclusions of the second stage.

The words of Iku researcher Ati Quigua bring the discussion closer to what this stage meant: "By the indigenous peoples of the Sierra Nevada of Santa Marta, the territory is seen as a sacred book, where are written the laws of life. Every mountain that is destroyed is like a page that is torn from the book. It is a message from our gods that is forgotten." He

[2] The term *Mamu* refers to the knower or elder of the community of the Iku, who acts as a counsellor and doctor in his community.

The Dialogue of Knowledge, an old Inga and a woman Wayuu with their traditional dresses.

also pointed out: "The world that Iku fight for, the one we want to build, is not a cultural product that is on offer. Our world, which we pretend to be, is a way of life that, among other things, allows a way of cultivating healthy food, without our Mother Earth being exhausted" (*Bermúdez, et al. 2005, 84-85*).

In the indigenous communities studied here, knowledge of the place where one was born and has lived is fundamental, because this affects the construction of one's own history. The Iku, when they are to get married, travel with the Mamu to all the places they have inhabited since they were conceived, especially the place where the placenta was buried at birth, which holds a special place for them. The Ingas of the Putumayo, too, bury the umbilical cord of the newborn as a symbol of its union with Mother Earth.

The power of the word for the Inga is in the hearts of the elders and from there comes what it is known as *samai* – breath or spirit – the word of knowledge or wisdom that guides the history of future generations. The ability to listen to the elderly is the attribute of the young. In the words of Benjamín Jacanamijoy, "Because of this, in the exchange of knowledge and in the construction of coexistence, the word is paramount".

The native peoples 'hear' the land, 'hear' the trees, the wind, and the sounds of the forest. The *samai* for the Ingas refers to maintaining the breath of life of the other in one's heart.

In the indigenous communities studied here, dance and music are united and part of the world of work. In the 'Mingas'[3] still present in the daily life of the Ingas of the Putumayo, joint efforts to carry out collective community work is accompanied by music, partying, and food prepared for the occasion. For the Iku, their songs are mantras that reflect the emotional or spiritual state of the participants.

Addressing Climate Change

The third stage of the research, 'Climate Change in the Panan-Nariño Shelter', was conducted with the indigenous community of Los Pasto, in the Panam Resguardo, Cumbal Municipality, in the Department of Nariño, in the south of Colombia.[4]

The fundamental objective has been to work with indigenous families to recover the ancestral *Chagra*[5] and the knowledge associated with it as a strategy or a form of adaptation to the climate change that has now affected their territory.

According to Zonia Puenayán, an indigenous researcher who collaborated in the field work, "the word *Chagra* comes from *Chakra*, which alludes to the heart, because the *Chagra* is the heart of its territory, which provides food for life".

[3] The *Minga* is the term used by Colombian indigenous communities to refer to community work performed without any economic return, as when they collaborate to build the school or the cultural house or any other work for the good of the community.
[4] Panam-Nariño is the name of the municipality and department of Colombia where the indigenous community of the Pasto live.
[5] The *Chagra* is a term used by Colombian indigenous communities to refer to the plot or land where they plant and grow their food.

Collecting food on the Chagra of the indigenous Pasto.

The ancestral *Chagra*'s traditional crops, such as quinoa, chochos, and chuguas, contribute to biodiversity and also guarantee the food security of the community. To carry out the third stage of the research work, workshops and Mingas have occurred within the community to socialise their knowledge about the ancestral *Chagra*.

Additionally, the children have sown the seeds of the crops that originated in their territory, such as quinoa, chochos and chuguas, and have organised a seed bank to be used by the community. For Taita Gilberto Puenayán: "To be indigenous is to feel like a son of the earth and caretaker of life and nature. To be indigenous Pasto, is to defend the territory and stay around our own culture."

Contributions from Intercultural Research

Indigenous researchers are very important for carrying out and recording long and in-depth interviews with the knowledge holders of their respective communities.

The communities were aware of the research and gave their support to the researchers in bringing their traditional knowledge to the community and society. It was also a matter of pride for them that their own young people had the opportunity to study at the prestigious National University of Colombia.

This kind of research, where indigenous students and graduates are placed on an equal footing with the professors of the university made it possible to open a space in the university to make interculturality a reality, linking indigenous students and graduates as researchers who contribute to scientific knowledge from their knowledge of their own culture and area of origin.

This work has also made possible the recognition of cultural diversity, which implies not only respect but also the understanding and appreciation of other cultures and their forms of knowledge and logic, and their relationship with reality, all of which may be different but no less valuable than those of society. As Leff pointed out: "Environmental complexity occurs in the intertwining of knowledge and it is rooted in new identities" (*Leff 2000, 1*).

The work carried out in this line of research has also contributed to the recognition of other knowledge economies in Colombia, a recognition that was made concrete in the Environmental Research Policy of 2002, which included the second mode of research, according to which: "The parameters of classical science are not necessarily followed and, consequently, it is necessary to refer to it in broader terms... the final result transcends the field of contributing disciplines, being thus interdisciplinary" (*Ministerio de Ambiente 2002, 9*).

This policy recognises the role of traditional knowledge provided by indigenous communities, as well as the 'dialogue of knowledge', which promotes a new perspective that opens forms of research different from those considered conventional by mainstream academia steeped in Western thinking. It points out important tools based on citizen participation, such as those provided by participatory action research.

In this line of research, indigenous peoples' visions are taken on board not for their romantic value, but

as a bridge between the past and the present, to propose innovative proposals that could be made viable through the environmental education of children, youth, and all inhabitants of the country. The purpose is to disseminate this indigenous knowledge by including it in the educational curricula so that young Colombians in the twenty-first century know and value their cultural roots. The three pillars of this form of research are cultural diversity, environment, and education, fundamental elements in the construction of cultural identity and nationality.

Continuation of Work: Environmental Forums

Although the research began a few years ago, and the third stage with the indigenous community of Los Pasto ended in 2014, it has been given continuity by RCE Bogotá through its program of environmental forums. These forums spread and socialise the lessons learned on the importance of interculturality and the revival of traditional knowledge, and apply them in the different educational contexts as a way to implement Education for Sustainable Development (ESD). This Environmental Forums Program, which received special recognition at the RCE meeting held in Nairobi in 2013, aims to build an environmental culture in Bogotá. It is a free program, open to civic participation – to teachers and students from different levels of formal education, and to individuals and communities interested in promoting ESD through non-formal education.

To promote environmental culture based on the principles of ESD, it is very important to know and appreciate cultural roots through the knowledge of Colombian indigenous communities. This is fundamental to fostering, through education, a sense of belonging to the country and a sense of identity as a Colombian. It is particularly important as many citizens not only lack that knowledge but also the opportunity to acquire it. That is why the forums are free of charge and open to ordinary people who have little chance of approaching universities, so as to draw them into a dialogue about environmental issues between academia and communities.

In order to continue this work, environmental forums have been organised to promote ESD since 2010. The most recent was held on 9 August, 2017 by RCE Bogotá in collaboration with IDEA and the Colombian Geographic Society. The forum centred on 'Interculturality and Traditional Knowledge' and included the participation of members of the Inga from Putumayo and researchers from universities, thereby fostering a valuable dialogue between the academic world and the indigenous community.

The questions in the forums are proposed by the participants, who include students, teachers, researchers, and ordinary citizens, some of whom do not have academic knowledge of the environmental problem being discussed but have interesting experiences to share about the issues. The forums have been proposed as a form of teaching and learning in which universities bring their scientific knowledge on an environmental issue and communities bring their experience on the same subject. In this dialogue of knowledge, both universities and ordinary people and communities enrich each other's learning.

Reflections

RCE Bogotá believes it is contributing to the construction of a civic culture in the capital. The fundamental contribution of RCE Bogotá to the Environmental Forums Program is that it reaches a range of the population that is generally not a part of formal education. In this sense, the members of RCE Bogotá's 12 partner universities who participate in the forums have been able to establish a dialogue of knowledge between the academy and ordinary people, who build new learning and knowledge about the environment together.

The researchers from indigenous communities learned many lessons from the research process and the difficulties they encountered. With this learning and their academic knowledge, many of them have returned to work after graduating as doctors, nurses, therapists, teachers, and other professionals to contribute to the development and well-being of their people.

The results of the research have also been disseminated through environmental chairs at universities and schools, where students have learned the traditions and worldviews of the various Colombian ethnic groups and the life histories of indigenous communities. Students have also been involved in research as a pedagogical resource for the transmission of ethical values on the care and protection of nature and ecosystem services.

"Storytelling is an effective pedagogy of ESD as the values reflected in traditional stories often contain the wisdom of the elders or stem from stories about creation, which helps to impart respect for cultural heritage as well as the environment" (*UNESCO 2012*). Such was the case with the life histories of the elders of the indigenous communities which participated in the research.

This research also contributed to the issuance of the Environmental Research Policy by the Ministry of the Environment of Colombia in 2002, which recognises the two modes of research – research in 'formal academic settings' and participatory action research by students from indigenous and other communities among their respective peoples. The second form of research opens the door to the traditional knowledge of the indigenous, peasant, and Afro-Colombian communities in Colombia, and has contributed to the implementation of ESD in different educational institutions, in the city and in the country. This is especially relevant considering that Colombia is currently at a decisive moment at which the doors to peace are finally open after 50 years of internal conflict (*Bermúdez 2016*). In this context, ESD has an important role to play, with its inclusive perspective of respect for differences and its stress on values such as solidarity, cooperation, and understanding in a world marked by intolerance and war. "Sustainable development means valuing biodiversity and conservation, along with human diversity, inclusion and participation" (*UNESCO 2012*).

Finally, the need to disseminate intercultural recognition, respect, and appreciation as contributions to peace and coexistence in a world in permanent conflict is a fundamental task for ESD in shaping tomorrow's citizens. This is one of the foremost intended contributions of this work.

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Michel Ricard

Chapter 16
Co-engaged Multi-stakeholder Learning within RCE Bordeaux Aquitaine, France

Summary

ESD Innovation

Innovation in ESD, in this case, was used in both the approach and in the method. In terms of the approach, it was necessary to redefine the role of academic actors, considered to be the holders of knowledge, but who often have difficulty entering into a balanced partnership with other actors in society. The Regional Centre of Expertise on Education for Sustainable Development (RCE) has therefore taken the approach that each of the constituent actors plays an equally important role at the societal level. The strategy presented in the article naturally flowed from this assumption, emphasising social networks and digital-social networks to develop an approach that is both global and part of an open and balanced partnership. Meanwhile, the digitally facilitated access to academic and non-academic knowledge enables everyone in the network to have the necessary prerequisites for the implementation of projects selected within the framework of the RCE.

Societal Transformation

ESD must provide everyone with the knowledge and skills to contribute to important societal change. These changes cannot happen unless every person, regardless of their status, voluntarily and knowingly brings principles of interdisciplinarity and complexity into personal and professional decisions and acts in a thoughtful and responsible way. RCE Bordeaux Aquitaine has encouraged its partners to set aside strategies that too often have two components: a strand of initiators who propose or even impose a given sustainable development (SD) approach, and a public that is confined to a passive role. The new approach adopted by the RCE is part of a global, shared framework that seeks to bring in each of the target audiences as fully participating actors capable of responding to each initiative. The purpose of this framework is to foster an ongoing dialogue that makes actors heard and understood, and they can thus contribute to the transformation of society.

Implications of Development for Knowledge Institutions

The implementation of the RCE's strategy has two implications:

1) The institution (most often higher education institutions) that hosts the secretariat for a given RCE and its various components is called upon to reconsider the role of the academic institution, which is forced to open up to the outside world by changing its relations with its non-academic partners and also by taking into account the different realities of (including socio-economic and political realities) of other actors in the RCE;
2) Members of the RCE (both academic and non-academic) are aware that any action towards a third party involves reactions of the parties concerned, but also, reactions of parties peripheral to third party actors, who may also be impacted in a variable manner. The results obtained from RCE actions must be analysed and reported not only to the members of the RCE but also to the target audiences, including periphery target audiences when possible.

The approach initiated by RCE Bordeaux Aquitaine has allowed the development of new types of cooperation with traditional partners who see in this approach a university more in tune with society than conventional academic structures.

The Aquitaine Region

The Aquitaine region, one of the largest in France, is a vast sedimentary plain bordered on its eastern side by two mountain ranges, the Pyrenees and the Massif Central. On its western border is the Atlantic Ocean and 750km of sandy coastline. Aquitaine also has the largest cultivated forest in Europe, and a world-famous wine-growing area. This region currently faces two major societal and environmental challenges: a growing population of almost 6 million, and a position at the transit crossroads between northern and southern Europe, which generates multiple environmental pressures, such as the worrying increase in trucks in transit. These challenges require new forms of governance and strategies for development in a variety of fields such as energy, municipal planning, transportation, education and employment. In addition, climate change is causing worsening coastal erosion, drought with a corresponding decline in agricultural production, loss of biodiversity, and displacement of populations. All these issues are the subject of in-depth studies in which RCE Bordeaux Aquitaine takes part.

RCE Bordeaux Aquitaine was created in December 2016, with the Polytechnic University of Bordeaux (Bordeaux INP) as its secretariat. This RCE covers one of the largest regions in France and its members include prestigious higher education institutions (HEIs) and a multiplicity of other actors who, over the years, have carried out recognised initiatives in the area of education for sustainable development (ESD) at the local, regional, and international levels. The construction of RCE Bordeaux Aquitaine draws lessons from numerous actions carried out by the various partners on SD and ESD themes. This experience led to the development of a strategy that takes advantage of the large number of actors present in the territory of the RCE. The many successful previous partnerships developed in the context of UNESCO ESD Chair activities served as a reference for RCE Bordeaux Aquitaine to mobilise partners from various fields of both SD and ESD. In addition to the traditional institutional approaches developed at the academic level, the effort devoted to the partnership dimension aims to open up the academic world to SD issues faced by our society, to strengthen cooperation between institutional and non-institutional actors in Aquitaine, and to improve the dialogue among the various SD actors and the public.

ESD for RCE Bordeaux Aquitaine

At the launch of the United Nations Decade of Education for Sustainable Development (DESD), the United Nations University introduced the idea of the establishment of regional networks to promote ESD. The RCEs contribute to developing formal, non-formal and informal education at various local and regional levels through partnerships among SD stakeholders.

The RCEs adopt ESD principles in their broadest sense, through a process of long-term education, training, and raising awareness, aimed at a society confronted by increasingly complex interdependent challenges. Although the scientific understanding of the problems raised by the impact of human activities on our planet has improved considerably, the nature and complexity of the questions asked have changed and can only be resolved through partnership, as exemplified by the RCEs.

RCEs aim to reach out equally to those involved in formal schooling and university education, local communities, associations and NGOs, researchers, companies, and the many other institutions disseminating knowledge of all kinds within the region. More generally, RCEs seek to engage and

strategise with any entity or individual using education as a tool for addressing environmental, socio-economic, and cultural fields of sustainable development. In the same way, the education advocated by RCE Bordeaux Aquitaine is part of a lifelong educational continuum that begins in the context of the school and then the university, is complemented in the professional and associative framework of the workforce, and continues through the various initiatives carried out within the framework of non-formal, lifelong learning – the 'university of free time' and the 'university of life'.

The improvement of knowledge and skills, in order to improve understanding of modern challenges, requires the implementation of appropriate educational approaches, from formal schooling in primary and secondary school, whose function remains irreplaceable, to knowledge and skills that become more complex in higher education. The advanced learner gradually learns to develop individual and shared initiatives that contribute to the implementation of new societal practices in line with SD. The RCEs contribute significantly to this process by bringing together a wide range of HEIs and societal stakeholders.

In order for education to lead to new behaviours, it is essential not only that the problems be clearly presented, but also that potential solutions are illustrated by concrete cases leading to individual or shared initiatives led by members of the RCE. The importance of the lessons learned from the many joint actions developed by the various SD actors in Aquitaine confirms that changes in behaviour resulting from ESD are based not on the work of a small number of actors but concern all citizens who must exercise their responsibilities at all levels of society. This dynamic educational approach involves many modalities and is aimed at a wide range of audiences. It therefore cannot be carried out in an empirical or compartmental way but is constructed progressively through communication and negotiation between the various actors.

The set of elements outlined above constitute the action plan of RCE Bordeaux Aquitaine. The plan has been developed within a multi-stakeholder partnership approach designed to reflect the diversity of actors in the Aquitaine territory, and mobilised around the theme of education, training, and information sharing for SD, underpinned by associated research activities.

The Role of Higher Education in RCE Bordeaux Aquitaine

In this vast panorama of lifelong education for all, the RCEs have a privileged role because of the strong support they receive from HEIs. In light of the lessons learned by the various RCEs, questions arise about the relationship between the academic world and local communities in terms of the nature, level of commitment, and the adequacy of their understanding of the reality of the society in which they interact.

The state of relations and practices that will be developed between the Aquitaine academic world and the RCE partners cannot yet be precisely described, as RCE Bordeaux Aquitaine is still young and partnerships are still being forged. However, lessons can be drawn after reviewing initial results. The members of RCE Bordeaux Aquitaine have participated in several partnership programs in various fields of SD and ESD (in particular in the context of the UNESCO Chair on ESD and the Digital University on SD. These programs were rich in lessons that have contributed to the establishment of the RCE and will guide its operation. A combination of the results obtained in previous actions and the preparatory exchanges between the future members of RCE Bordeaux Aquitaine have led to the global partnership approach in order to better meet the expectations of society.

Based on these experiences and on the debates that led to the drafting of the RCE application, two important issues have to be addressed:

1) The first relates to the recurring debate within the university between those who remain strongly attached to the traditional academic approach of a university as a 'knowledge sanctuary', and those who think that a university must be open to the outside world by being constantly attentive to the challenges faced by the society in order to provide it with appropriate answers. This debate is exacerbated by the development of free digital educational resources and social networks that make it necessary to think about the future of the university;

2) The second is the legitimacy of the action of HEIs to intervene directly in society by developing partnerships for which the university represents the point of reference and support. In the case of most RCEs, the university also functions as the RCE's Secretariat. This question is particularly acute as the academic world is currently only a small agent in the promotion of ESD, especially with the development of social networks and the media, whatever the quality of their approaches.

In this context, and considering the missions of the RCEs, two other questions were asked during the creation of RCE Bordeaux Aquitaine:

1) How can we create, implement, and exploit the network of partners that makes up the RCE for the common purpose of bringing individuals, politicians, local authorities, companies, associations, and NGOs to work for the construction of a new society whose values are not only material but also ethical, and are in harmony with the principles of sustainable development?

Although a strong commitment is needed from the political authorities to provide a clear framework capable of inducing the changes needed for SD, as well as the HEIs to initiate or contribute to implementing a regional education policy, it is ultimately the citizens , through individual initiatives and actions, who will bring about changes in the consumption and investment patterns necessary to make SD possible. The complexity and uncertainty of situations require effective educational consideration in terms of individual and collective changes that can be brought about by the concerted and synergistic action of all the actors gathered within a common entity, in this case the RCEs implanted in universities.

In these complex situations, Aquitaine HEIs that develop multi-faceted partnerships with socio-economic, cultural, and political actors, and in particular the secretariat of RCE Bordeaux Aquitaine (Bordeaux INP), must be able to play the roles of referent, facilitator, and intermediary with the various partners of the RCE.

2) How can an RCE that is relatively free and flexible in its initiatives and actions be in agreement with and complementary to the different components and expectations of the region in which it is situated while being subjected to regular evaluations and being obliged to comply with the recommendations of the United Nations programmes on ESD (UNDESD, GAP, Agenda 2030, and the the 17 SDGs)?

RCE Bordeaux Aquitaine considered that the simplest way to respond to this question was to follow the approach of the Agenda 2030 and its

SDGs. The SDGs amalgamate all the steps initiated by the United Nations since the 1950s to "ensure quality and inclusive education and promote opportunities for lifelong learning for all". All sectors of society are concerned that education must not be limited to its academic dimension, but that it be anchored in visible and concrete actions developed at local and regional levels in a global context. This is why the question of tools and practices remains essential to be able to evaluate the needs of the community in order for appropriate information to be transmitted, regardless of their personal and professional status, to help them undertake the actions needed to address the challenges.

Before the creation of RCE Bordeaux Aquitaine, the question of research and its link with ESD was asked. Research must enable innovation in education and training, but also identify specific actions or programs chosen according to the target audience and the resources needed to achieve intended learning outcomes.

Research, however, is not only the prerogative of HEIs. They must also work closely with industry and benefit from its many advances, particularly in action research as well as research leading to transfer of technology. Moreover, applied research carried out by associations and NGOs must be better linked to university research. On this point, a number of RCE partners including associations and NGOs have developed applied research programs that can make important contributions through their different approaches, purposes and implementation processes.

Establishing Partnerships of RCE Bordeaux Aquitaine

Characteristics of the Partnership

The Aquitaine region, with the Bordeaux metropolis, represents one of the most important socio-economic territories in France. For the creation of RCE Bordeaux Aquitaine, the choice of appropriate partners was crucial in order to respond to the region's expectations and needs in terms of SD and ESD. This could be dealt with satisfactorily only if representatives of the potential partners from the region were present at the roundtable discussion held for this purpose, and committed to contribute to the development and implementation of a common strategy. Previous work carried out at the local, regional, and international levels on ESD and SD by the project coordinator in the framework of various partnerships made it possible to solicit partners from the region for the RCE.

One of the key partners thus involved is the Regional Council, which provides funding support for the development of education and training programs to universities, associations, and NGOs. The membership of this major partner made it possible to bring in other partners from the region, namely various associations and NGOs, the department of Gironde, the metropolis of Bordeaux, and other various municipalities. The Aquitaine Rectorate, in charge of primary and secondary school education, is also an important partner, working in close collaboration with the academic world on an educational continuum. At the other end are the municipalities and departments contributing to the implementation of the various ESD programs, in particular with regard to global ESD approaches.

The presence of representatives of the three levels of territorial administration – region, department and commune – is particularly important in the RCE, as they have a decisive role in the development and implementation of policies to support action for education and training for SD. Such levels of engagement are also important because of the diversity and complementarity of these levels of intervention and their proximity to citizens. Through a participatory process, the partners work to develop material for their target audiences, so these audiences can adopt behaviour consistent with SD.

Implementation of the Partnership

Partnership arrangements differ according to the actors, but whatever their specificity, the commitment of the various partners is to contribute, according to their missions and to their capabilities (scientific, technical, financial, programmatic, etc.), to the implementation and monitoring of selected projects. According to the projects selected by the RCE Board, the participatory development process is based on the drafting of terms of reference specifying the objectives, the contents, and the responsibilities and role of each partner at each stage of the project.

In actions on SD and ESD carried out in previous years in various multi-partner programs, it was found that partnership approaches were not always easy to implement due to the prior adoption of the principle of 'agreed by all'. In the case of RCE Bordeaux Aquitaine, three essential principles were chosen to formalise the selected partnerships:

1) Projects will be adopted on the basis of the consensus of all partners involved in the project and each partner will be represented on the Monitoring and Evaluation Committee;

2) The project will not only be fully in line with the definition of the RCE, but also in line with the strategy of the partners involved in the project so as to take account of the specific tasks of each of them;

3) The pooling of the resources of the partners involved in any selected project will be carried out beforehand according to the protocols adopted during the preparation and implementation of each project.

Given the diversity of situations as well as the different levels of participation, the Board wished to avoid overly constraining procedures and advocated adopting mechanisms that had already proved their relevance and effectiveness in other RCEs.

Partnership and Public Involvement

Regardless of their status, the members of the RCE unanimously highlighted the importance of improving public participation in ESD. The false but often widespread belief is that the public has very little capacity to change or that it is unwilling to engage in work towards change. However, what is seen as public apathy could be because the information they are provided is often based on unreliable data resulting from poorly constructed research, such as opinion polls conducted by the media. Besides, the information is rarely explained to the public, as a result of which they do not know what to believe and may therefore be cynical. On the other hand, they may not have any meaningful opportunity or process available to engage with.

RCE Bordeaux Aquitaine wishes to encourage public participation in its various projects through procedures that respond to new governance modalities that put the public at the heart of the SD approach. This includes closer proximity between decision-makers and the public, more involvement of the public in decision-making, more trust between social actors and, ultimately, more efficiency by implementing a 'direct local democracy' to:

- Organise and encourage active public participation in sustainable development issues
- Enable all generations, including young people, to understand and participate in initiatives related to SD
- Organise and encourage the active participation of consumers and employees in public debates

The RCE also recommends the adoption of a set of joint actions aimed at clarifying the respective roles of the citizens and the institutions within the RCE's sphere of influence, the nature of the shared challenges and the common objectives in order to ensure that everyone is informed about the purpose of the action, the actors and the results obtained.

The common objectives are aimed at all categories of the population, especially youth, but also focus on specific initiatives directed at marginalised members of the public (school drop-outs, the socially isolated, or those in other precarious situations) whose opinions and involvement are rarely solicited during public consultations. The non-engagement of these audiences deprives us of crucial information and opportunities for meaningful change. The RCE, however, is well equipped to deal with this gap through its network of partners who work at multiple levels, with different audiences and in various ways.

Public Information on SD

Members of RCE Bordeaux Aquitaine decided that one of the activities they would like to focus on was to provide the public with transparent and reliable information on SD. The information provided by the media too often consists of data that ignore the complex and multi-faceted processes that characterise SD. Their reports, articles, broadcasts and messages are either oriented at a particular audience, and the information is thus difficult for the uninformed public to decipher; or it is intended for a wide audience and lacks depth. Moreover, the information frequently expresses values and practices that are antagonistic to those needed for SD, and rarely offers audiences the opportunity to react.

To address this major concern, the RCE intends to take part in addressing the public directly through dedicated events and by developing, across Aquitaine, initiatives of all types and for all sections of the public. The implementation of this component of the RCE's work will be a complex process because, in order to be effective, it must assist in the dissemination of diverse, exhaustive, and pluralistic information, and offer the possibility of a constructive, even if contradictory, debate between the informants and the informed.

These actions for the improvement of SD information will be initiated through the contributions of the RCE partners, who will disseminate information that is sometimes oriented to a particular view and lacks the impartiality one expects. The question of what is 'reliable information' directly affects the problems of education and the pedagogy associated with it, and therefore requires the participation of researchers in these various actions to make sense of differing narratives.

Future Perspective

Of the principles adopted by RCE Bordeaux Aquitaine the following are particularly relevant in guiding its future work:

- HEIs, particularly universities, are the anchors of the RCE insofar as they prove their legitimacy by developing partnerships with other actors in society, encouraging initiatives to help change behaviour while evolving at the pace of changes in society, or even anticipating them

- The projects developed by RCE Bordeaux Aquitaine will emanate essentially from proposals made by the various partners, with a better knowledge of the immediate and future needs of each, and ensuring that they fulfil their various SD and ESD missions. The role of the RCE Secretariat located in Bordeaux INP is to coordinate, monitor, and evaluate projects with the assistance of the respective project managers

- Local and regional authorities, and in particular the Regional Council, play a major role in setting up and implementing partnerships for new projects because of the diversity of their levels of intervention and proximity to citizens, and also because of their funding capacity

- RCE Bordeaux Aquitaine, in particular through associations and other non-institutional actors, will consider the public and also make citizens an active interlocutor. Upstream consultations with the public will identify recurring and new problems, particularly among young people and the marginalised sections of society that are generally left behind. In addition, the public will be informed of the conclusions and recommendations that will be issued following the various actions concerning them

RCE Bordeaux Aquitaine intends to develop exchanges and cooperation with other RCEs beyond its immediate territory in order to feed on their progress and be part of a positive dynamic by entering a 'Global Learning Space'.

Won Jung Byun

Chapter 17

Lessons Learned from the Co-creative Process of Developing an RCE in Tongyeong, Republic of Korea

Summary

ESD Innovation

Connecting people with different sets of information, identifying sustainability challenges and sharing ideas for change have been part of the movement as RCE Tongyeong tried to recognise and build on the assets in the area. Sustainable development of a community cannot be achieved by some projects or champions – it can only be made possible by continuously enriching a shared vision through learning and instilling a method of democratic partnership through ongoing practice. Once the level of common understanding reaches a threshold, a culture of sustainable development is formed. From then on, the community will have the power to replicate its practices under different circumstances.

Societal Transformation

A strongly bonded community of partners with a sense of trust and shared vision for sustainable development of the region is the long-term result of the networking and communication strategies of RCE Tongyeong. Efforts to define and strengthen a healthy, knowledgeable and trustworthy core group through regular, in-depth communication with partners should be at the heart of the community-based transformation strategy. Even if the project labels change over the years, empowered and connected community leaders will continue to make sustainability changes in the region.

Implications of Development for Knowledge Institutions

Knowledge institutions should recognise the importance of balancing the voice of the researchers with the experience of the local partners to effectively produce successful outcomes. While researchers are well-equipped with knowledge and expertise in their field, they often lack understanding of the local community. The community groups are well versed in the contextual specificities of the region but could benefit from more long-term and generalised analysis of their challenges. A well-balanced mix of both groups can be the key to successful community development.

Context

With the start of local elections in 1991, a result of democratic movement and the constitutional referendum of 1987, more and more local governments in Korea autonomously began to initiate policies to design prosperous cities with character. The city of Tongyeong, a small southern coastal town in Korea, had been well-known for its fine crafts until the 19th century. From the late 19th century to the 1970s, the city prospered through its fisheries industry that still holds its title for the freshest fish in the country. Even today, people talk of how cash flowed into the town at this prosperous time, and based on this wealth, many renowned modern artists of Korea were born in Tongyeong in the 1920s and '30s. With the development of heavy industry from the 1970s until early 2000, the city enjoyed an influx of young people coming to work at its shipbuilding yards.

With the emerging competition from foreign shipbuilding companies, this small city of 140,000 people yet again faced an economic challenge. Young people aspired to leave the old town as soon as possible in search of better education, jobs and living conditions, leaving a rapidly ageing population behind. The older generation were proud of their cultural, historical and environmental heritage that included the largest intangible cultural heritage in a single city, the best-known names in modern Korean art, the legacy of the historic victory of Korean forces over the Japanese at the 16th century naval Battle of Hansan Island, and the breathtaking beauty of 500 islands. However, little was preserved and developed by the locals.

To address these economic, cultural and environmental issues, after Mr Jin Eui-jang was elected to the Mayor's office in 2004, the policymakers in the city were searching for an alternative way forward. Many experts were invited to Tongyeong for this brainstorming exercise, and one of the invitees, Dr. Eunkyung Park from Yonsei University, introduced the concept of sustainable development and recommended establishing a Regional Centre of Expertise (RCE) on Education for Sustainable Development (ESD) to the Mayor. This was a part of an initiative of the United Nations University Institute for the Advanced Study of Sustainability (UNU-IAS) to launch the first ten pilot RCEs worldwide at the beginning of the UN Decade on ESD in 2005. The idea of an RCE in Tongyeong appealed to the city government. Yonsei University then partnered with a local higher education institution, GyeongSang National University (GSNU) College of Marine Sciences in Tongyeong, to draft a proposal to set up an RCE in Tongyeong.

Since the acknowledgement of RCE Tongyeong in November 2005, the two universities have been the key stakeholders in creating and strengthening the knowledge hub in the region. The GSNU College of Marine Sciences has been the leading knowledge hub and educational institution to support both the fisheries industry and the shipbuilding industry, thus being a well-situated stakeholder to address the new challenges in the area. Yonsei University, one of the top ranking higher education institutions in Korea, had expertise and an international network in the field of sustainable development.

Establishing an Education Partnership for Change

RCE Tongyeong was made possible through a strategic division of roles among the key stakeholders. The experts at Yonsei University from the Sustainable Development research team at the Institute of East and West Studies provided overall guidance in developing the long-term strategy and the organisational structure. With its research links globally, Yonsei was able to continuously provide cutting-edge information, tools and good practices to facilitate ESD activities in this small

Partners of RCE Tongyeong gathering for an Annual General Meeting, hand-in-hand to create the green ribbon, a symbol of ESD.

town. GyeongSang National University had the advantage of local linkages and understanding of local sustainability challenges. The experts at the University from departments of fisheries, environmental engineering, energy and business management provided direct interaction and leadership on a daily basis, especially as the members of the steering bodies[1] of RCE Tongyeong. While the RCE benefitted from the devoted contribution of these experts, the College of Marine Sciences also gained further recognition through engaging in local community-related activities through the RCE.

The local Government of Tongyeong and the local council provided funding and political support for the initiative. However, as the people in the elected seats of government change over time, the funding and support also became a cause for concern and a potential challenge. Therefore, maintaining a healthy level of engagement with and sense of ownership among the local government was vital to the very existence of RCE Tongyeong.

The partners related to formal education included the local education offices of Tongyeong, the provincial education office of Gyeongnam, ESD focal point teachers designated in each school in the region from preschool to high school, and volunteer retired teachers dedicated to ESD. The schools are the key to changing the learning content and culture in the region. It took six years before RCE Tongyeong was able to convince the local education office to fully engage in the reorientation of school curriculum towards ESD, and include it as one of the institution's six vision goals. After seven years of ESD model school projects at all levels of schools, an annual appointment system of ESD focal point teachers was established to disseminate the key findings of the model schools to all schools in the region. Although the teachers are more centred on the sphere of school life, their impact in promoting change in the area has been proven to be powerful and long-lasting.

The citizen's education committee, as explained in more detail in the following paragraph, is designed as a network of non-formal and informal education partners in the region. Unlike the teachers who often move between cities according to their assigned posts, the practitioners in the non-formal education groups are mostly locals who have dedicated their careers in their respective fields, addressing social and environmental issues in the area. They are knowledgeable about the key assets and challenges in the region, and more open to change compared to other groups of partners. In the case of RCE Tongyeong, the partners from the non-formal education sector eventually became leaders in dealing with local sustainability issues.

The lessons learned from the experience of establishing partnerships among the key stakeholders of education in a local community include: (1) The importance of division of roles among the key organisers of the initiative based on mutual trust. In the case of Tongyeong, the mutual trust and respect among the municipality, and Yonsei and GyeongSang universities that start from the highest level, enabled RCE Tongyeong to overcome hurdles over the years; and (2) The significance of laying the first stones correctly, with a long-term vision. In establishing each committee, the strategy was always to start small with trustworthy members and slowly expand, without resorting to short-term incentives such as funding. A network built on trust and shared vision can have resilience.

Building Trust with the Community

At the start, it was a challenge to define the main actors who, together, would address local sustainability issues. Since Yonsei University is based in Seoul and the researchers at GyeongSang National University previously had few connections with local groups, the main partners had to be identified from scratch. Most people in the area at the time were unfamiliar with the concepts of sustainable development and ESD, and despite their potential, not many ESD-related activities existed before the establishment of the RCE in Tongyeong.

When assigned to the post of the RCE coordinator in Tongyeong, one of the first things one had to do was to locate the key partners, especially those related to the fields of cultural, social and environmental sustainability. With little information at hand, it seemed that the best way was to convene a series of open forums for discussion, inviting everyone interested to the table. A series of 'RCE forums' on key local sustainability issues were held regularly to raise awareness and map the stakeholders. Once some of the key stakeholders were identified, they were visited individually to listen to their interests and needs, and to explain the vision of the RCE. The members of the core group, mostly in their forties, included primary and secondary teachers, professors in disciplines of environment and fisheries, practitioners in culture, youth, and women's organisations, and a journalist from the local media. Through these personal interactions, trust was built among ten opinion leaders of the community who shared a similar vision and a passion for a sustainable future. With this group of partners, more stakeholders were linked, and all successfully convened preparatory meetings for committees on non-formal education, formal education, and research and development. In retrospect, the selection criteria for the main

[1] Board of Directors, Steering Committee, Non-formal Education Committee, School Education Committee, and Research and Development Committee.

Informal networking party among key partners, a so-called 'lightening meeting'.

partners were (1) a shared vision, (2) a belief in change, (3) a strong sense of belonging to the community, and (4) mutual trust. Looking back after 12 years, the partners that are still strongly engaged are those who have these four qualities. In terms of the means of communication with the core group, this was mainly through personal interaction. RCE Tongyeong was known for its spontaneous social gatherings over a drink, where core members from different areas of work were able to meet, share ideas for sustainable development, and build alliances and trust.

Defining other community groups and representatives to be engaged was the next step, because by this time there was some anxiety among local groups who either felt threatened, neglected or forced to compete with this new initiative backed by the local government. Finding these groups was simpler – the opinion leaders who had influence over policymakers were already sitting on various committees and quite visible in the local media.

It was not a matter of 'selection' of these more traditional local leaders – they were already there, and if the RCE did not engage them in the process, it would be damaging to the sustainability of the project. Throughout its development, RCE Tongyeong had to deal with the question of how to engage these local opinion leaders. They already had their own relational dynamics and in order to address the sustainability issues such as revitalising the old town slum area that involved diverse groups, the core group of the RCE had to skilfully manoeuvre its way around the town without siding with a particular organisation or person. In the process, it was very important that the key messages of the RCE and the good intentions of the participants were publicly communicated in a favourable light. Local media and large public events helped to raise awareness among the public. Moreover, communication tactics with the traditional community representatives became refined over the years depending on their key characteristics - some elderly leaders preferred to be visited on a regular basis, as a sign of respect, whereas some were given a chance to speak at public events to build mutual understanding. Creating a foundation of trust was at the core of the work, and in this light, engaging educators from knowledge institutions was helpful to initiate this interaction. The Confucian tradition bestows a high level of respect for teachers and professors in Korea. Thus, engagement of professors at the inception of the RCE provided credibility and a certain level of respect to the work. In addition to the knowledge and expertise of the professors, their social status facilitated access to local leaders' groups. They were also able to address the concerns of specific groups, such as teachers, with their knowledge and understanding of the field. Because the professors provided adequate information and training to help the teachers with their work, this also helped to win their confidence.

However, the professors were not used to dealing with outspoken local representatives who are often insistent on a certain point of view or interested in protecting their place in the community. Sometimes the vocal criticism from the locals baffled them. From experience, the only solution to this problem was an eye-level communication approach. It was important to openly discuss the thorny issues with partners both in formal and informal settings, and humbly listen to their stories, ideas and negative feedback with respect. In a small town where everyone knows everyone else, people tend to remain reserved in formal discussion settings. Therefore, to truly reach the hearts of the partners and build trust, speaking in small groups in an informal setting was much more important.

In summary, the lessons learned from the experience related to community include: (a) defining a healthy, knowledgeable and trustworthy core group is key to the success of a local project; (b) the rest of the groups need to be addressed according to their characteristics – proportionately and diplomatically; and (c) regular, in-depth communication with partners to build trust should be at the heart of the operation.

Tackling Local ESD Issues: An Example

The mandate of RCE Tongyeong was to reorient education to incorporate the values and methodologies of ESD. While the formal education curriculum is mostly decided by the National Education Policy, non-formal education is rooted in the community. Therefore, one of the key areas of the work of RCE Tongyeong was to reorient non-formal education towards ESD.

In order to locate the problems and needs, a 'Citizens Education Committee' was formed among interested non-formal and informal education groups. The committee began in 2006 with 17 members and developed into a group of 39 within ten years, a number which covered 95 non-formal education groups in the region at the time. The committee regularly held monthly meetings to share their ideas and information.

The goal of the committee's work was to 'reorient existing education programmes to ESD'. To reach the goal, earlier discussions were focused on identifying the needs and challenges each organisation faced at the time. During this process, many practitioners said they were frustrated by overlaps among often-competing neighbouring organisations in terms of the content, method of delivery and the target audience. Although many were interested in ESD, there were few additional resources to implement new educational programmes. Although this was an expression of a sense of stagnation, it led to a willingness to implement a new strategy towards sustainable development.

The steering group of the committee that included research professors discussed a sustainable way to address the challenge. The professors were able to provide information and overall assessment of

the situation in a more objective manner, whereas the local partners were able to perform reality-checks on the suggestions made by the professors. It was interesting to see how the professors and practitioners saw the problem from different angles – the former in a long-term, big picture, more idealistic way, and the latter in a more specific, multi-faceted and realistic way. From this process, the committee drafted the project called the 'Saeng Saeng Citizen Education Contest' in which non-formal education groups from within and outside the committee could apply for small grants to collaborate and merge their programmes with other education partners to create synergy and promote sustainable development. The applications were reviewed through a public presentation of the proposals and selected by secret voting by all members of the committee. This platform facilitated closer partnership among educators to create a win-win situation for both parties. Instead of competing with each other, the groups were able to bring to the table what they could do best to create a high quality ESD programme for more people that reflected multiple facets of sustainability challenges in the region. Moreover, based on the experience from the pilot project, more and more voluntary cases of partnership were sparked that brought a change to the culture among local non-formal educators, which in turn benefitted citizens.

Among many lessons learned in the process, one lesson relevant to the issue of the engagement of higher education institutions was the importance of balancing the voice of the research professors with the experience of the local partners. If such a balance is broken, the project is likely to face difficulties either at the stage of short-term implementation or at the stage of long-term continuation.

Communication with Knowledge Institutions

Within the higher education institutions involved, the key researchers and students were approached through existing channels of activities on sustainable development (SD). Since only a small number of people were engaged in the fields of SD or ESD at the time, it was straightforward to locate potential partners. The professors and students who joined the project had motives such as: (1) a genuine personal interest in sustainable development issues; (2) relevance to their research topics and opportunities to work on field studies; (3) possibilities to locate funding for their research; (4) improving their connections with other partners in the network; and (5) personal development and networking.

Among the researchers involved were five scientists. It was difficult to involve and motivate scientists because they found ESD only remotely relevant to their work. Some were able to link ESD to their teaching, but because the demand on the scientists from the institution is focused on research output rather than on teaching, they mostly participated as a part of their social contribution or personal interest.

However, in cases where the sustainability issue of the community involved analysis of the physical environment – for example, the issue of water pollution in the harbour area, the community problem became a scientific problem. These cases allowed a more prominent role for scientists to collect data and share their expertise to devise solutions. The communication between researchers and the community on such sensitive issues that can affect local livelihoods had to be carefully designed. Local partners were involved in the planning stage to give their thoughts on what kinds of reactions one could anticipate when

'Training of trainers' session by Citizens Education Committee.

approaching local residents on the issue. For the issue of monitoring water quality in the harbour area, the researchers engaged local primary and secondary schools to build the project as a part of their learning activities. Young students participated in the monitoring, together with the researchers, and shared their findings through public campaigns with the local shop owners nearby who were identified as one of the polluters.

It is important to understand the interest and needs of the researchers, especially scientists, to draw them out of their isolated, compartmentalised labs and make use of their expertise for sustainable community development. Because the researchers are often placed under great pressure from the institution to produce results and attract funding, there is the need to further develop a win-win strategy to link higher education institutions to global sustainability efforts. It is also important to acknowledge the strengths and weaknesses of the researchers in dealing with community sustainability issues. While they are well-equipped with knowledge and expertise in their field, they often lack understanding of the local community and the sensitivities and reactions they might provoke. Therefore, partnership and collaboration between researchers and local groups can create synergies and bring better results.

At the beginning of the development of RCE Tongyeong, the educators from outside, namely Yonsei University and the coordinator were the deliverers of new information. The educators introduced the concept of SD, thematic knowledge relevant to individual organisations, and stories of best practices. Training of trainers took place in the form of formal programmes such as the 'RCE Forum', regular meetings, special courses for targeted audiences, international exchanges and global RCE meetings. The policy and financial support from the city government played a key role in legitimising the work of participating knowledge institutions.

After a certain period, the partners themselves began to recognise and reflect on their challenges and opportunities from a different perspective. Although the abstract term 'sustainable development' is not easy to grasp, the key stakeholders began to recognise the value of their cultural, historical and environmental heritage. The knowledge brought the familiar heritage of the region, which was previously considered as outdated and useless, into a new light as a valuable asset. It became a process of mutual learning, as the context always was the key to the issues. When outside stories of sustainable change were introduced, people instantly recognised similarities and differences with their circumstances. Sparks of excitement and new ideas flowed from these sessions. This motivated the partners to continuously gather together, move forward to make changes in their own spheres, spread the message of SD and persuade others around them.

Joint programme between RCE Tongyeong and RCE Greater Western Sydney. Students from University of Western Sydney and GyeongSang National University help plant rice in the rice paddies of Sejahtera Forest.

A Global Network of Support

The benefits of being a member of the global network of RCEs, supported by the United Nations University, has been visible especially in terms of communicating the significance of the ESD programme to the local people. This international UN affiliation was what attracted the key partners to join the initiative and brought legitimacy to the work. The concept of ESD and RCE arrived in Tongyeong with the UNU-IAS publication 'Mobilising for Education for Sustainable Development: Towards a Global Learning Space based on Regional Centres of Expertise', which was translated in Korean by the city government and distributed as the conceptual guideline on developing an RCE. Being a part of a global network of practitioners had helped to understand, contextualise and gain new ideas throughout the planning and development of RCE Tongyeong. The Asia-Pacific regional launch of the UN Decade on Education for Sustainable Development opened the eyes of key stakeholders, and annual meetings among RCEs helped them to learn from others. At the beginning of the fiscal year, RCE Tongyeong allocates a budget to allow the representatives of its key stakeholder groups such as teachers, local government officers, NGO activists and youth to have a chance to attend these international gatherings of RCEs and gain fresh perspectives and strengthen membership.

RCE Tongyeong has played a leadership role with RCEs in Asia-Pacific as a regional coordinator since 2009, which led to the establishment of the 'Sejahtera Centre for RCEs in Asia-Pacific' in 2015. Such interaction with other RCEs in Korea, Asia-Pacific and worldwide allowed a chance for local people to realise the similarities in challenges and inter-connectedness of the efforts to make a better world. For example, since 2007, RCE Kitakyushu members have been making an annual study visit to Tongyeong, and the local citizens participating in the exchanges have learned that the sustainability challenges and citizen actions on both sides of the sea have commonalities far greater than the differences. Hosting an international event such as the 7th Global RCE Conference in 2012 helped to summon a wider public involvement and create a local, national and regional alliance for change.

Staying Accountable and Trustworthy

The accountability for the envisioned transformation in the community was always under scrutiny by key stakeholders and donors. Regular internal and external review meetings were held, and annual reporting was made available to the general public. In the ESD projects, efforts were made to involve and include diverse members of the community as much as possible, although often this was not realised to its full potential. However, the doors were left wide open and efforts were made to reach out. Also, providing equal opportunities for all was one of the most important principles for the work of RCE Tongyeong. Extra measures were taken to avoid any discrimination or undue preference to anyone, especially in the youth programmes. After every programme was completed, an internal review provided additional feedback and points for improvement, which were subsequently reflected in the next round. Because Tongyeong Education Foundation, the legal entity for the secretariat of RCE Tongyeong, was supported by the local government, all privacy and data protection laws were applied according to government standards.

In addressing issues that involved various, often conflicting, groups of stakeholders, it was also crucial that as facilitators, RCE Tongyeong and the professors involved had balanced views and an open-minded attitude. For example, in the case of revitalisation of a slum area in the old town district, Dongpirang, different groups of residents had different perspectives on how to deal with sustainability issues of their village. Once the village became a tourist attraction, outsiders who opened shops in the village also voiced their opinions because they had an economic interest in the area. Therefore, the facilitators had to design a clear and transparent process of participatory decision-making and educate the villagers about the process. To create a sense of trust and ownership, facilitators try to constantly communicate and make sure people understand that there is no hidden agenda or preference other than finding an optimum solution to the issue or issues for the benefit of all.

Annual event at Sejahtera Forest.

Lessons Learned

From the 12 years of experience with RCE Tongyeong, the following can be considered as essential competences in community engagement for ESD: applying learning in a variety of contexts of livelihood and lifestyle; developing decision-making for situations of uncertainty; dealing with crises and risks; acting with responsibility; understanding complexity and systems thinking; overcoming obstacles through problem-solving; managing change and problem setting; and creative thinking and future-oriented thinking.

Through its ESD programmes and activities, RCE Tongyeong has been trying to build social competencies of acting with responsibility (locally and globally); acting with respect for others; identifying stakeholders and their interests; collaborating and team work; participating in democratic decision-making; negotiating and consensus building; and distributing responsibilities (subsidiarity).

The participants also learned that personal competencies of self-management and communication, and social competencies dealing with understanding and communicating with others to overcome problems and uncertainties are keys to community engagement.

From the process of co-creating RCE Tongyeong, the participants learned that it is critical for the success of a local community project for key partners to have a strong shared vision and shared values. Respect for the local way of life and acknowledgement of the sustainability wisdom embedded in the local traditions are the foundations for trust with local partners. Listening to their stories with an open heart and genuine interest opens access to the generosity and goodwill of the local community. This can only be made possible through regular, in-depth communication starting from the highest level of the institutions to the practitioners. Clear divisions of roles among key partners have proven to be effective in this regard. In addition, laying the solid ground of trust among a small group of well-informed key members and gradually building the network has been a useful strategy in the long run as it built resilience within the core group. The wider range of local stakeholders should be approached in a timely and well-planned manner so that everyone can share a sense of ownership and participation.

Since everything from the sustainability problem to one's local partners is uncertain, continuously changing and linked with others in a complex manner, it is important to understand the complexities and carefully approach issues in a holistic way. Without understanding the full picture, a partial remedy may cause more problems. In this regard, the engagement of researchers and experts from higher education institutions was especially valuable because they bring in the impartial perspective that can serve to create balance with the experience of the local partners.

Engaging higher education institutions with local community sustainability initiatives such as RCEs is also beneficial for the researchers themselves because they can gain a good source of evidence-based research with a holistic perspective and possible funding to support future research relevant for the project. The partnership and collaboration between researchers and local groups can create a win-win synergy for both parties and bring better results. In return, the outcome of such engagement and research should feed back into everyday activities for a sustainable local community. Especially in ageing societies like Korea where the number of higher education institutions are likely to decrease because of a low birth rate, community engagement linked with lifelong learning can become one of the major services an institution can offer.

As can be seen, there are still ways to further promote engagement of higher education institutions in community sustainability initiatives. The researchers of the ivory tower should make more efforts to take interest and participate in community-based action, starting with the local community in which they live and work. This will make it easier for community members to reach out to higher education institutions and open new opportunities for the researchers in the local area. Community engagement of researchers should be acknowledged and encouraged as a part of their academic duties by management and recognised as a criterion of institutional performance assessment by the government. Furthermore, good practice examples should be highlighted and shared with community leaders and the general public to encourage more in-depth engagement of higher education institutions in community action.

List of Abbreviations

ABS	Access and Benefit Sharing
APEX	Accelerated Programme for Excellence
BaCH	Biodiversity and Community Health Initiative
BCP	Bio-cultural Community Protocol
BMU	Borderlands México-USA
BNCA	Dr. Bhanuben Nanavati College of Architecture for Women
CALD	Culturally and Linguistically Diverse
CBD	Convention on Biological Diversity
CBL	Community-based Learning
CEAA	Canadian Environmental Assessment Act
CEE	Centre for Environment Education
CEPA	Communication, Education, Promotion and Awareness Raising
CER	Centre for Educational Research
CLC	Community Learning Centre
CLEM	Calling Lakes Ecomuseum
COPH	Centre for Oral and Public History
CUSP	Curtin University Sustainability Policy Institute
DD	Deliberative Democracy
DESD	Decade of Education for Sustainable Development
EfS	Education for Sustainability
EIA	Environmental Impact Assessment
EIS	Environmental Impact Statement
ELRC	Environmental Learning Research Centre
ESD	Education for Sustainable Development
ESENeL	Environmental and Sustainability Education Network of Lesotho
FAO	Food and Agriculture Organization of the United Nations
FGD	Focus Group Discussion
FGI	Focus Group Interview
GAP	Global Action Programme (on ESD)
GDP	Gross Domestic Product
GEF	Global Environment Facility
GIZ GmbH	Deutsche Gesellschaft für Internationale Zusammenarbeit
GMO	Genetically Modified Organisms
GPSEN	Greater Portland Sustainability Education Network
GRCSP	Grand Rapids Community Sustainability Partnership
GSNU	GyeongSang National University
GWS	Greater Western Sydney
HE	Higher Education
HEI	Higher Education Institution
HSPC	Havelock Special Projects Committee
IAASTD	International Assessment of Agricultural Science and Technology for Development
IAU	International Association of Universities
ICT	Information and Communication Technology
IDEA	Instituto de Estudios Ambientales
IDP	Integrated Design Process
ILK	Indigenous and Local Knowledge
INAH	National Institute for Anthropology and History
IPBES	Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services
IPCEM	Instituto Peruano del Pensamiento Complejo Edgar Morin
IUCN	International Union for Conservation of Nature
KI	Knowledge Institution
LEED	Leadership in Energy and Environmental Design
LGA	Local Government Area
LL/CDT	Living Lab/Centro de Diálogo y Transformación Inc.
MAS	Malay Agricultural Settlement
MDGs	Millennium Development Goals
MEA	Millennium Ecosystem Assessment
mini-SASS	mini-Streams Assessment and Scoring System
MLA	Member of the Legislative Assembly
MoE	Ministry of Education
MP	Member of Parliament
MRI	Magnetic Resonance Imaging
MSP	Multi-stakeholder Partnership
NGO	Non-Governmental Organisation
NIC SENEX	Nizhny Novgorod Centre of Socio-Economic Expertise
NIM RANEPA	Nizhny Novgorod Institute of Management of the Russian Academy of National Economics and Public Administration
NLSRD	National Law for Sustainable Rural Development
NNGASU	Nizhny Novgorod State University of Architecture and Civil Engineering
NORM	Normally Occurring Radioactive Material
NPO	Non-Profit Organisations
NSW	New South Wales
NUL	National University of Lesotho
OEH	Office of Environment and Heritage (New South Wales)
OPR	Owner's Project Requirements
OST	Open Space Technology
PCC	Portland Community College
PEP	People's Education Press
PRA	Participatory Rural Appraisal
RCC	Regional Coordination Centre
RCDFS	Rural Community Development and Food Sovereignty
RCE	Regional Centres of Expertise on Education for Sustainable Development
RM	Rural Municipality
RRA	Rapid Rural Appraisal
SD	Sustainable Development
SDGs	Sustainable Development Goals
SEI	Saskatchewan Ecomuseum Initiative
SGP	Small Grants Programme
SISC	Shangri-la Institute for Sustainable Communities
SLI	Sejahtera Leadership Initiative
SUM Net	Sustainable Urban Mobility Network
TAFE	Technical and Further Education
TBL	Triple Bottom Line
UACH	Autonomous University of Chihuahua
UN	United Nations
UNDP	United Nations Development Programme
UNEP	United Nations Environment Programme
UNESCO	United Nations Educational, Scientific and Cultural Organization
UNICEF	United Nations Children's Fund
UNU	United Nations University
UNU-IAS	United Nations University Institute for the Advanced Study of Sustainability
URP	Ricardo Palma University
USGBC/ WM	US Green Building Council, West Michigan Chapter
USIM	Universiti Sains Islam Malaysia
USM	Universiti Sains Malaysia
VVAGS	Volgo-Vyatsty Public Administration Academy
WCED	World Commission on Environment and Development
WESSA	Wildlife and Environment Society of South Africa
WISE	Ward Infrastructure Services and Environment
WRC	Water Research Commission
WSA	Water Security Agency
WWF	World Wildlife Fund
YA	Young Authors
3P	People, Planet and Profit

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