

Capacity Building for Sustainable Living Through ESD-Based Learning in a Regional Centre of Expertise (RCE)

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Abstract : This paper attempts a brief ‘update’ on the Regional Centre of Expertise (RCE) and discusses particularly RCE Greater Sendai in light of its relevance to the Decade of Education for Sustainable Development (DESD, 2005-2014) strategies set for the second phase to achieve the DESD goals in the region. The discussion focuses on capacity building activities for sustainable living in the context of ESD-based learning.

Keywords : Capacity building, ESD, RCE

1. Introduction

There is a broad consensus that education - including all its components - must be the driving force (Hansmann, 2010) in search of effective strategies for addressing today’s sustainability challenges from the local to global levels. As a result, human resources are considered key agents to achieving sustainable development (SD) through appropriate development of capacity using a broad range of educational means such as formal and non-formal education, training and public awareness raising (IGES, 2005) and also value and behavioral changes (IGES, 2005). Human capital/resources are furthermore crucial to developing tools to measure the progress towards sustainability. In that regard, the realization of a shortfall in human capacity for sustainable development by many governmental, non-governmental and international institutions led to the call for the development and enhancement of Education for Sustainable Development (ESD).

ESD is known to indicate a complex of concepts, theoretical constructs, policy prescripts and practical methods and tools that convert education and learning to the socio-economic and ecological dimensions of

sustainable development (Lenglet et al., 2010). ESD aims to “develop the knowledge, skills, perspectives and values that will empower learners of all ages to assume responsibility for creating and enjoying a sustainable future” (Richmond, 2010). UNESCO describes the overarching goals (thrusts) of ESD as striving to promote sustainable development through its four identified thrusts namely “(1) improving basic education, (2) reorienting existing education programs, (3) developing public awareness and understanding sustainability and (4) training” (UNESCO, 2003). The contribution of education through ESD could result in improvement in the quality of life of the people, help create resilient individuals, group or society who are capable of thinking holistically, systemically and integratively, and able to adapt to adverse environmental conditions using their acquired knowledge, values and skills. However, because real-life issues and complexities that occur in everyday living are not categorized, compartmentalized or resolved through discipline-based approaches (Sanusi, 2010), in order to achieve this, it is imperative that society undergoes a certain competence developing stage in their lives whereby the conventional discipline-based learning

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process based on standardized assessment through testing is discontinued or significantly curtailed for a new, more holistic and relevant knowledge, skills and values taught through a new learning framework.

To enhance the effective implementation of ESD, a proposal for the Decade of Education for Sustainable Development (DESD) spearheaded by the Japanese Government and NGOs was included in the Johannesburg Plan of Implementation, and was agreed at the World Summit on Sustainable Development in 2002 to integrate the principles, practices and values inherent in SD into all facets of learning to encourage changes in behavior, organizational and institutional practices that allow for a more sustainable and just society for all (UNESCO, 2007) from 2005 to 2014.

The UN DESD which serves as a platform for learning for SD has already entered its third and final phase ending 2014. Consequently, identification of more capacity building measures aimed at the individual, group or community in addition to evaluation of the progress of ESD, of how learning and education have led to improved learning outcomes, and hence contributed to sustainability by implementing effective and relevant monitoring and evaluation mechanism(s) are important.

2. Importance of education and learning during the second half of the UN DESD

A couple of reports (UNESCO, 2009a,b) have shown that much was achieved during the first half of the Decade and that progress was made increase in awareness of the significance of ESD, establishment of national ESD coordination bodies and incorporation of ESD into formal education. Obstacles were also “encountered during the first five years in establishing provisions, strategies, mechanisms and contexts that support the development and implementation of ESD” (UNESCO, 2010). The report(s) also outlined in the UNESCO Strategy for the second half of the UN DESD the ways forward for the remaining five years and, furthermore supports Member States and key stakeholders in addressing global

sustainability challenges through education.

The four key areas of action of the Strategy were set out as:

- 1) Enhancing synergies with different education and development initiatives from mid-DESD onwards and harnessing the expertise existing within United Nations agencies, funds and programmes through coordination and cooperation for the implementation of the DESD as well as strengthening partnerships among ESD stakeholders
- 2) Developing and strengthening capacities for [national] ESD implementation through capacity development and policy advice.
- 3) Building, sharing and applying ESD-related knowledge since “knowledge is an essential component of ESD, promoting research, supporting the development of scientific understanding, and sharing and disseminating the vast amount of available knowledge, including traditional and indigenous knowledge, are central activities within the DESD.”
- 4) Advocating for ESD, and increasing awareness and understanding of sustainability with the expectation that the knowledge will translate into action (UNESCO, 2010).

The Japanese Government’s UN DESD Report on goals for the second half of the UN DESD, (UNDESD Japan Report, 2009) places strong emphasis on three initiatives (a) The urgent need for finding an appropriate evaluation system to monitor the progress of ESD; (b) ESD dissemination where a register system will be set up to improve the visibility of ESD, hence encouraging its dissemination; and (c) fostering of closer alliances through the revision of the National Course of Study for Primary and Secondary Schools towards including ESD while at the same time, taking steps to promote joint community school ESD initiatives.

Pointing to the importance of learning as a capacity-building component towards realizing the goals of (D)

ESD at the regional/local level, ESD learning features prominently in the recently released draft of the Vision of the RCE Community:

“1. In today’s world where uncertainties and risks are the most prominent feature, education has to enable learning that contributes to resilience of communities and of nature. 2. The development calls for rapid learning and continuous evolution of values, skills and knowledge associated with new challenges and aspirations. The learning processes that support development, characterized by uncertainty and complexity, have to be grounded on the requirement of long-term perspective, flexibility, innovativeness, diversity and cross-sector engagement in transformations towards just, low-carbon resilient development” (UNU, 2011).

All three reports which are relevant to all RCEs and for that matter RCE Greater Sendai, stress the importance of education and learning in building capacity to achieve sustainability.

3. Regional Centres of Expertise

In a search for a strategy that would facilitate translation of the ESD agenda at the local level especially during the Decade, the United Nations University (UNU) has championed the RCE concept and has supported its establishment around the globe to serve as a framework for harnessing, exchange and facilitation of vertical, horizontal and lateral integration of knowledge and information through close co-operation among the constituent regional and local actors in a region or local area and also a joint development of innovative programs towards ESD (Fadeeva et al., 2005; Mochizuki et. al., 2005; Ofei-Manu and Skerratt, 2009a; Sanusi, 2009). The RCE concept has been enthusiastically embraced by a diverse array of actors since it was first introduced by the United Nations University (UNU) in 2004. An ideal regional centre of expertise (RCE) acting as a microcosm of the region/area RCEs could vary in size, affiliations and functions, etc. should be able to identify

local concerns and address them in an integrated manner. In fact, the RCE is a regional initiative that contribute to the local implementation of the UN DESD (Fadeeva and Mochizuki, 2010). “An RCE is not a physical centre but an institutional mechanism to facilitate capacity development” for SD (Mochizuki and Fadeeva, 2008).

In addition to redefining existing environmental activities in alignment with the principles of ESD at the regional and local levels, RCEs can facilitate the duplication and dissemination of good ESD practices (Ofei-Manu and Shimano, 2010). The RCE has also evolved as a concept. Originally, it was supposed to serve “the purposes of knowledge management, knowledge transfer and delivery of ESD to the community” (Mochizuki and Fadeeva, 2008). Recently, at one end of the spectrum is the representation of RCE as a “hub”, a meeting point, a clearing house and “a platform for information exchange and sharing. At the other end of the spectrum is the interpretation of an RCE as a “community of practice”, an institutional mechanism for “social learning” and a learning network” (Mochizuki and Fadeeva, 2008). An RCE is unique in its transdisciplinary nature of nurturing and encouraging learning processes while simultaneously enabling a multi-stakeholder engagement platform. Such distinctive traits enable an RCE to function as the best platform through which to address common problems in current human resource development approaches that are more often than not segmented and incomprehensive (Sanusi, 2010).

4. RCE Global

The RCE Community, being referred to here as RCE Global is increasing in size as it is evolving and currently has 89 centres worldwide as of November, 2011 at the last Global RCE Conference in Kerkrade, the Netherlands. Reflecting back on the original vision of bringing together the educators within a community with experts who knew about the sustainability challenges that communities faced, the new vision and strategies seek to dwell on themes that had arisen on issues such

as capacity-development, communication, research, influencing policy and engagement with international organizations and processes (UNU, 2011). There are also plans to further develop RCE Global with a goal to upscale action research and transformative learning projects. Elements to be considered for the capacity development strategy include a re-visitation of the RCE vision governance, ESD competencies and capabilities, principles of transformative learning, action research, thematic actions, marketing, fundraising and communication (UNU, 2011).

In a bid to increasing visibility of ESD projects worldwide, RCE Global is involved in collaboration with international processes and organizations. In particular, RCE Global has formed international partnerships with UN agencies namely UNDP, UNESCO, UNICEF and these were represented and invited to make contribution into the RCE Global Conference. Currently, RCE Global is exploring collaboration with UNICEF and UNDP around the issue of climate change; with CBD secretariat around the issues of biodiversity; with the Equator Initiative around issues of traditional knowledge; with IAU around issues concerning higher education; with UNEP around issues of sustainable production and consumption and sustainable livelihood; with UNECE on the issue of ESD assessment and with Copernicus alliance network of European universities on the issue of higher education appraisal.

RCE Global also offers support to member RCEs through the RCE Global Service Centre located in UNU-IAS. The support services are as follows:

- a) Encouragement/enhancement of communication,
- b) Facilitation of links with international processes,
- c) Acting as stewards of the RCE road map,
- d) Provision of thought leadership to policymakers, and
- e) Facilitation of collaborative research projects (UNU-IAS, 2011).

5. RCEs in Asia Pacific (APRCEs)

The Asia-Pacific RCEs (APRCEs) have been organizing a regional meeting every six months and participating in the annual global meeting. Other means of promoting themselves so far has been direct contact with the Global RCE Service Centre, based at the United Nations University-Institute of Advance Studies, UNU-IAS (UNU-IAS, 2010). Some of the issues, initiatives and projects being addressed include i) community-based discussions on thematic areas of biodiversity conservation, schools and the youth, energy, teacher training, disaster mitigation, natural resources management, climate change, school curriculum reorientation, promotion of model schools; ii) sustainable waste management and environmental education; iii) adapting appropriate technologies to implement at community level with the youth involved; writing of factsheets on the current status of the RCEs, iv) awareness creation of recent events in the region e.g. disaster and resilience and ESD Sendai experience; v) organization of sub-regional group meetings vi) formation of APRCEs network to serve as a platform for collaborative work; and vii) publication of a white paper on APRCEs network (2007-2011). A recent highlight of the APRCE is the development of the 2011 Yogyakarta Action Plan on Community-based ESD Action Plan by RCEs in the Asia Pacific Region.

As of March 2010, there are 28 RCEs in the Asia-Pacific region. Five of the first seven RCEs acknowledged globally in 2005 are located in the Asia-Pacific region. Twelve RCEs, representing over 40 per cent of the network in the region, are led by higher education institutions; about a quarter (eight RCEs) are led by local governments; and the rest are led either by a nongovernmental organisations (six RCEs) or research institutes (two RCEs) (UNU-IAS, 2010).

APRCEs are currently providing cases of good ESD practice towards a collaborative project between UNU-IAS and the Institute of Global Environmental Strategies (IGES) in cooperation with UNESCO Bangkok as input for the development of regional indicators for ESD.

The indicators will be utilized in the monitoring and evaluation of the implementation of the DESD in Asia-Pacific, and also contribute to formulation new efforts and initiatives on ESD towards 2014 and beyond.

The RCE Community is not without its challenges. They include the following: i) up scaling the local level work to continental and global level; ii) making the concept of ESD understood by a larger audience; iii) limited inter-RCE collaboration; iv) lack of funding; v) the challenge of diversity – cultural, language, etc. within and across scales; vi) inability to use the RCE portal effectively vii) promotion of flow of information and knowledge between RCEs; and, viii) how to communicate effectively the work of the RCEs outside of the RCE network.

6. Regional Centres of Expertise in Japan

Japan is home to six RCEs, including two of the seven ‘pioneer’ RCEs launched at the UNU-UNESCO Conference on Globalisation and ESD in Nagoya, Japan in 2005: RCE Greater Sendai and RCE Okayama. In RCE Greater Sendai and RCE Okayama, what was five years ago a localised good practice at one school, Kesenuma Omose Elementary School, and one community learning centre (kominkan), Kyoyama Kominkan, is now being institutionalised and scaled up through the UNESCO Associated Schools Project Network (ASPnet) in the City of Kesenuma and in kominkans across the City of Okayama (UNU-IAS, 2010).

The six RCEs in Japan vary tremendously in their sustainability challenges, thematic focus, educational and learning needs, etc., as well as in their governance and management structures. Japanese RCEs demonstrate that RCEs are shaped by local needs and priorities, offering a delightful testimony to the power of RCEs as a facilitative mechanism to translate a global DESD vision into local contexts within which RCEs operate. RCEs individually and collectively aspire to contribute to the goals of the DESD by embracing diversity within and across them (UNU-IAS, 2010). The coordinators

of the Japanese RCEs also meet once a year to discuss challenges they are facing and ways to overcome them. These annual meetings are coordinated by the Japanese RCEs themselves, with input from the Global RCE Service Centre, and the hosting responsibility rotates among the RCEs (UNU-IAS, 2010). The work of the Japanese RCEs demonstrates that the Japanese RCE initiative is also promoting international cooperation in ESD. For example, RCE Greater Sendai organised the ESD Asian RCE Leaders Youth (EARLY) meetings in 2008 and 2009, that brought together youth representatives from various Asian RCEs (Ofei-Manu and Shimano, 2010; UNI-IAS, 2010). Japanese RCEs often receive visitors from candidate and existing RCEs abroad, especially those from Korea due to their proximity to Japan (UNU-IAS, 2010). Since this paper is focused on RCE Greater Sendai, for further introductory information about the other Japanese RCEs, the reader should refer to UNU-IAS (2010).

RCE Greater Sendai covers four sub-regions which are all connected by the central theme of sustainable food production and consumption. They are 1) metropolitan Sendai, aiming at a recycling-based city; 2) Kesenuma, a coastal city focusing on promoting school-based ESD; 3) rural Osaki-Tajiri which focuses on rice paddy ecosystems and biodiversity; and 4) Shiroishi-Shichikashuku region, focusing on reservoir area conservation. The RCE secretariat is hosted by Miyagi University of Education (MUE), a teacher education institution which produces the majority of school teachers and superintendents for the region (MUE, 2009; UNU-IAS, 2010).

7. ESD-based learning in RCE Greater Sendai

Learning refers to the process by which actors assimilate information and update their cognitions and behavior accordingly (Henry, 2009). Thought of as the way in which information is absorbed, processed, and retained, it is also seen as a collaborative and reflective process that could be extended into an inter-generational dimension at the backdrop of environmental limits

(Foster, 2010). Furthermore, learning is a way by which individuals or a group acquire capacity actionable knowledge, skills values, etc. (Ofei-Manu and Skerratt, 2009a) for adapting to unfavorable conditions. Capacity development is a process in which individuals and partners work together towards a shared vision that could then be carried forward to develop a wide community of practice. It has been noted that RCEs could benefit from capacity assessment, as well as identification of tools and methodologies if appropriate appraisals are carried out. Developing capacity building initiatives are hence necessary to foster transformative learning processes in an RCE. And this is at the backdrop that education (and learning) is considered one of the primary tools for capacity building in most national policy strategies, and for that matter RCEs to achieve sustainability. ESD-based learning therefore could be denoted as a learning process that is realised in the context of the principles of ESD and whose outcome(s) improve what are considered as essential for sustainability.

RCE Greater Sendai in Miyagi, Japan has been coordinating its ESD practices and initiatives through learning collaboration and partnerships among many stakeholders in the formal, non-formal and (to a lesser extent) informal education contexts in the region. Although overseen by a number of institutions, its major promoters are MUE and Sendai City Environmental Bureau (Mochizuki, 2006). It was expanded from three areas and one university to four areas and one university in October 2008 and is in limited cooperation with Tohoku University Graduate School of Environmental Studies. MUE serves to connect these four areas, and has also been promoting the research and development of education, teacher training, and the development of human resources to create a new sustainable society (MUE, 2009). The RCE's ESD objectives and focal points of learning activities have been location-specific with each focal point comprising several stakeholder and actors.

1) Sendai City: With the aim to raise the awareness of

over one million residents that leads to environmentally-friendly behaviors for achieving a sustainable society, the Forum for Environmental Education and Learning in Sendai, City of Trees (FEEL Sendai) serves as a platform for a consortium of NGO and programs that included "Citizens' Forum", "Sendai Eco-challenge", "Social Experiment on the Environment" and "Mori Mori Environment Rescue Team Program" to bring about the objective through collaboration and partnerships between and among NGOs, schools, universities, public administration (Mochizuki et al., 2005), and to some extent, businesses and other stakeholders. An aspect of this project granted particularly students at all levels, teachers and other citizens to actually learn through hands-on experience the City's rich natural environment and other local resources. The reader may access Mochizuki et al. (2005) for details. Attempts have been made to introduce the concepts of enhanced community participation (school-community partnerships) and community development grassroots movement or the use of a community based approach to social change ('machi zukuri,' i.e., 'town building') (Mochizuki, 2006).

There are efforts by the higher education institutions, particularly MUE Environmental Education Centre using education, research and outreach activities to assist in the development, dissemination, implementation and evaluation of sustainability education and learning programs with a focus on elementary and secondary school teachers and students in the city, and also in Kessenuma City (MUE, 2009). Student teachers in MUE are currently receiving ESD training both on campus (Koganezawa, 2010) and on the field (Ofei-Manu and Shimano, 2010). MUE has introduced content on sustainability/ESD into its curriculum with the aim that the student will graduate from the university with ESD as a "sub-major" to go out and use their profession "to tackle the many tasks facing modern society today" (MUE, 2009). MUE has also been fostering ESD among qualified teachers and promoting UNESCO Associated Schools. Several local and international symposia on

ESD have been held under the auspices of RCE Greater Sendai, a significant number of which have focused on ESD and teacher training and/or education. Among them are: 1) Education for International Understanding Symposium in Miyagi held in December 2007 in MUE to spread ESD and international understanding through teachers and also, the expansion of the UNESCO Associated Schools Project (ASP) Network; 2) ESD International Symposium held in Kessennuma and Sendai Cities on February 2009 and was focused on teacher training in ESD.

An efficient and effective dissemination of environmental/sustainability information using the “Tohoku Consortium for Environmental Education” mailing lists exists in MUE. Through mailing, relevant environmental/sustainability information is shared particularly on impending educational and other program activities in the region. Furthermore, Tohoku University Graduate School of Environmental Studies in cooperation with MUE has been disseminating its appropriate research results to the wider society through MUE’s network of first and second cycle schools and municipalities and also, promoting energy education among students and the general public by organizing educational activities both on and off campus for residents’ participation. Mostly driven by enthusiastic teachers and/or school principals, a number of elementary schools, junior high schools and a few high schools within and without the areas currently covered by RCEGS have become involved in an array of ESD-related activities both on and outside the school premises.

Several non-formal educational and learning activities are organized between the universities, research institutions and the municipal/local environmental and education departments, particularly in Sendai. Typical examples are a) “Kankyo Forum 2007” and “The Environmental Forum, Sendai 2008” during which there were panel discussions by foreign resource persons living in the region about the environmental situations in their respective countries among other environmental learning

activities that were organized; b) “Naturare 2009” which was held in Sendai Mediatheque and involved the universities, research institutions, businesses, NGOs, students and the general public. Organization of a fair to showcase and sell pro-sustainability products, a symposium followed by discussions, environmental learning activities for children, and conduction of a research survey were among the activities held; c) “Saponin 2010” which involved a learning forum (including brainstorming on solutions to local problems) and during which individuals and groups in the region gave presentations on sustainability-related innovative solutions to local problems they had come up with, etc. Several other bi-lateral learning promotion activities have been held between RCE Greater Sendai and domestic and/or international entities (MUE, 2009).

2) Kessennuma City, which is slowly recovering from the Tohoku triple disaster has been active in ESD-based learning activities in both formal and non-formal education sectors for a relatively long time. It has developed ESD partnerships, particularly in the city schools. It also has a partnership in sustainable community development with respect to promotion of fresh, locally produced food especially fish. MUE has been providing significant collaborative support to especially the formal sector ESD in this city.

3) The Osaki-Tajiri “socio-ecological system” provides a typical example of how to equip the local community with competencies to adopt ways in which the natural environment can coexist with their human needs. This is done through (a) conservation and wise use of the wetlands in the area, (b) enhancing the conservation value of rice paddies as replacement habitat for wetland flora and fauna, and strengthening the linkages between the winter-flooded rice fields and conservation movements and formal education actors in the locality, (c) recovering the socio-ecological integrity and enhancement of human well-being in the region (Ofei-Manu and Shimano, 2010). In their paper, Ofei-Manu and Shimano (2010), describe social learning processes in a socio-ecological

system that occurs in Osaki-Tajiri in Miyagi, Japan. Using ecological/thematic topics of biodiversity, ecosystems and natural resource management, they showed how in Ramsar wetland-rice paddies, school-based education and a great variety of non-formal and informal learning facilitated the underlying processes of discovery and action. They included how a variety of local stakeholders found methods to improve biodiversity and water quantity and quality while eliminating pesticides and revitalizing the regional economy through tourism and highly-priced organically grown agricultural produce.

With the main objective being capacity building through learning for sustainable/wise use of the wetlands-paddies goods and services, the stakeholders' ESD-linked social learning processes were underpinned by their interrelations with each other through knowledge transfer, co-production and exchange, adaptive learning and awareness creation, etc., their interactions with the biophysical/ecological components and as a consequence, production of outcomes including value and attitudinal change such as "sense of place and belonging" toward the natural environment, effective governance to maintain the integrity of the wetland-paddies agro-ecosystem, reoriented method of agriculture toward sustainability, and co-benefits with over-wintering birds regarding the wetland-paddies (Ofei-Manu and Shimano, 2010).

4) Shiroishi/Shichikashuku area where there is preservation of satoyama as a water resource, and a place for nature experiential learning (Koganezawa, 2010).

Similar to the the satoyama concept, (Ofei-Manu and Satoshi, 2010), the igune concept is a model for sustainable living and plays an important role as windbreak forests in protecting the residences against storm, fire, and crimes. At the same time, the residents utilize igune as fuel, livestock feed, fertilizer, construction materials, and food to sustain their daily lives. Igune not only provides a scenic landscape throughout the year but can be utilized as a tool for educating about sustainability. Igune exploration tours are organised by NGOs to teach children about the

importance of planting trees and preserving them and encourage children as well as adults to become aware of this life-supporting infrastructure. These igune-related activities aim to pass on the traditional knowledge about igune household woods as well as offering a place where children can experience nature and a site of relaxation for local residents (Mochizuki et al., 2005). Also, the concept of "omoiyari", "to imagine another's feelings" or "to be thoughtful" is closely linked to the concept of harmony, one of the most valued principles still alive in Japanese society and relates to the sense of empathy and compassion (Mochizuki et al., 2005).

It is noteworthy that sustainability-related educational activities are also conducted 'independently' by other cities and towns through their city or town offices with the environmental departments mostly in charge. Individuals have also been independently engaged in some sustainability initiatives. For example the first author of this paper conducted independent research (both 'conventional' and action research) on sustainability in the non-formal education sector covering companies and the formal education sector covering several elementary schools, junior high schools, high schools and a university in particularly, South of Miyagi (part of which was officially covered by RCE Greater Sendai in October 2008), Natori City and Sendai City. Part of the work covered i) evaluation of the level of sustainability knowledge in the education and business sectors, ii) gender and environment in the workplace, iii) evaluation of the sustainability of companies and schools in the sampled areas, and iv) comparative study to elucidate whether the knowledge of environmental impact(s) of meat production on production systems and its link to climate change, deforestation and biodiversity loss will affect students attitudes and/or behaviors towards meat consumption. In some of the studies, learning to acquire co-produced knowledge (and values) through knowledge exchange and value transfer in the form of "question and answer time" occurred.

RCE Greater Sendai's ESD learning initiatives have

not only been at the regional level but also at the international level. For example, in 2008 and 2009, RCE Greater Sendai organised the ESD Asian RCE Leaders Youth (EARLY) meetings bringing together youth representatives from various Asian RCEs for [educational/learning] exchange through participation, collaboration and networking (Ofei-Manu and Shimano, 2010). Commencing in 2002, Omose Elementary School implemented a Japan-America collaborative “Inquiry-Based Environmental Education Program” that utilized the abundant shoreline environment in a theme about humans and their livelihoods (AGEPP, 2007). Part of the aim was to foster global communication and understanding with other schools especially in USA.

In summary, identifiable social and individual learning processes in RCE Greater Sendai include co-production of actionable knowledge through knowledge transfer/exchange, experiential (and cognitive) learning, community learning, cooperative learning, adaptive learning and co-management (Ofei-Manu and Shimano, 2010), service learning and ‘nature’ learning based on traditional knowledge. The ESD-based learning ‘concept’ on the other hand is fraught with challenges, particularly 1) the challenge of understanding complexity as it relates to the planet; 2) the challenge of moderating normative belief and value conflict; 3) the challenge of linking knowledge with action; and 4) the challenge of producing new values for sustainability (Henry, 2009). However, the importance of grassroots capacity building towards sustainability using these learning processes in an RCE cannot be overemphasized.

8. Some points to consider looking ahead

As already stated, the goals of UNESCO, the Japanese Government and the RCE Community for the second half of the UN DESD strongly emphasize capacity building through education and learning and also the urgent need to put monitoring and evaluation systems in place to measure both the effectiveness of specific capacity development strategies (outputs) as well as changes in

capacity (outcomes). As the Decade draws to a close, the focus will be on how the types, strategies and methods of education and learning processes of the initiatives are aligned to ESD, how they have contributed to building capacity of the locals and consequently, promoted SD. In that vein, appropriate indicators must be identified and baselines set during the capacity assessment phase of the capacity development process, and incorporated into the capacity assessment tool. It should be noted however, that the variety of activities that RCEs undertake might make it difficult to create a common framework for assessment (UNU, 2011).

There is the need for further improvement regarding identifying more teaching and learning methods and also, other levers for capacity building in RCE Greater Sendai. Some targets and levers for improvements are discussed below.

1) Effective pedagogy and curriculum should include 1) sustainability (“progressive”) pedagogy and integrative curriculum with participatory and inclusive processes (Cotton and Winter, 2010); 2) a student-centred and interactive enquiry-based pedagogy and content that use the environment and community as learning resources; 3) a pedagogy and curriculum that emphasize social learning particularly experiential and interdisciplinary learning at the individual and group levels and produce skills like critical thinking, complex, systems and holistic thinking, trans disciplinary thinking and cooperation, adaptability to change, etc. With respect to the recent Tohoku triple disaster, hereafter, disaster risk reduction education should be central regarding ESD in the region.

Since sustainability literate teachers would play a crucial role in the eventual success of ESD and particularly building capacity of the students, and even though this has begun in MUE, more capacity building efforts through provision of in-service ESD training for teachers is also important as a report indicated that 67.0% of teachers within RCE Greater Sendai just over three years ago did not even know that the Center for Environmental Education in MUE served as teachers’ resource center

for environmental education (Ofei-Manu and Skerratt, 2009a).

2) On participation, there has been less than satisfactory involvement of the media in general which is no wonder the level of knowledge of the existence of RCE Greater Sendai and other sustainability terms was still low three years after the first survey (Ofei-Manu and Skerratt 2009 a, b) about the same subject had been done (Ofei-Manu, P. unpublished data). A more effective engagement with the media by RCE Greater Sendai at its governance level might serve as an incentive in enhancing their involvement. Also, increased participation of the general public in sustainability/ESD activities in the region could be enhanced if more of the media get involved and increase their coverage on sustainability/ESD issues (Ofei-Manu and Skerratt, 2009a).

3) Regarding collaboration and partnerships, one aspect of RCE Greater Sendai (and this is true with other RCEs) that has been least examined is capacity building of the youth (particularly students) in collaboration and partnership with the business sector. Bridging the business and education sectors using ESD-based social/experiential learning/service learning could be done with respect to the practical use of the government-mandated 'Period of Integrated Studies' (PIS) in the Japanese primary and secondary school curriculum. Effectively linking PIS to company visits by schools and reverse visits to schools by competent company personnel (Ofei-Manu and Shimano, 2011), to promote sustainable production and consumption and responsible lifestyles will be a step in the right direction.

Although the business and education sectors are crucial in helping RCE Greater Sendai attain its DESD goals, it could be said based on past evaluation that sustainability or ESD as a concept has not been wholly incorporated into the mainstream activities and programs of most organizations in these two sectors (Ofei-Manu and Skerratt, 2009a, b; Ofei-Manu and Shimano, 2012). As a result, the effort by RCE Greater Sendai to bring business into the core of its activities has more room

for improvement. Also, corporate support for RCEs, particularly funding has generally been weak. For a start, the business-education sector collaboration, if successful is capable of being self-sustaining as the firms can provide the necessary funds to support the learning activities. Generally, business could contribute to advancing ESD activities in RCE Greater Sendai by using its ample financial and other resources, technologies and members of their workforce who are knowledgeable in sustainability issues.

4) There is the need to incorporate other ESD related activities not necessarily sanctioned by RCE Greater Sendai into what is 'officially' acknowledged. A mechanism should be put in place where all ESD/sustainability activities could be integrated to avoid repetition and to increase resource use efficiency among actors/stakeholders. In addition, since the current sustainability/ESD capacity is generally low, a process to attract available but 'hidden' resource persons to assume various roles in the region will be good. The "Forum of Persons in Charge of Domestic RCE" held in 2009 (MUE, 2009) is a step in the right direction.

5) With respect to research, the need for a collaborative sustainability research and learning that involves the active participation of the "researcher" and the "researched" cannot be overemphasized. In this vein, RCE Greater Sendai could team up with UNU-IAS since they are showing significant interest in this aspect to use the Osaki-Tajiri "socio-ecological system" as a flagship social learning case in addition to other cases (Ofei-Manu and Shimano, 2010).

6) In terms of influencing policy, the governance structure of the Steering Committee should have a strong influence on the nature of multiparty/stakeholder cooperation and ESD-based learning processes in the RCE. For example, its role as the governing authority and therefore taking local ownership of the ESD concept as well as its implementation in consultation with the local/municipal authorities is important (Ofei-Manu and Shimano, 2011). It should try and do away with invisible

competition/power struggle between the education and the environmental ministries that moves down through the environmental bureaus of cities and towns and the corresponding boards of education when it comes to ESD implementation especially in schools. By encouraging interagency collaboration, this could be a major entry point for capacity development. The currently existing methods of assessment encourage and reward rote learning based on knowledge competence testing. They fail to measure the affective aspects of learning like values, perception, attitudes, etc. of students and hence result in the waning of interests of students in ESD up the education ladder. This will require a major policy shift from the government and higher education institutions to make any impact. Also, the local school board of education is a major entry point for the failure and success of ESD implementation in schools. The current communication between the boards of education and school teachers need improvement in addition to some level of flexibility from the former. Overall, influence of bureaucratic systems, and poor public access to information which can impede social learning (Ofei-Manu and Shimano, 2011), are some of things that should be discouraged. The list above is not exhaustive but is to serve as representation of several issues that have to be addressed and/or improved.

9. Conclusion

Recently, the idea that governments only are the decision-making authority has been replaced by multiscale, polycentric style of governance that acknowledges that a large number of stakeholders in different institutional settings contribute to the overall management of a resource or a situation that affects them directly (Pahl-Wostl et al., 2007). The RCE fit quite well into this structure of governance. The sustainability transition could be realized by blending the grassroots, bottom-up approach to capacity building with the mostly policy-oriented, top-down approach by government.

Most of the RCE's subcomponents of its core elements

are capable of serving as levers for capacity building (i.e. institutional mandates, visions and goals, management structure, involvement of leadership, engagement of actors, R&D, knowledge sharing, strategies for collaboration, etc. (Fadeeva et al., 2005). RCE Greater Sendai can use these elements to facilitate capacity development through partnerships between the formal and non-formal and informal education settings across all sectors and provide research, learning and other opportunities for all existing components of society.

As the Government of Japan looks forward to host, jointly with UNESCO, the end-of-decade world conference on ESD in 2014 in Aichi/Nagoya which will be preceded by the hosting of the 9th Global RCE Conference by RCE Okayama, it is expected that Japanese RCEs will enhance collaboration among themselves as well as with RCEs in the rest of the world. As RCE Greater Sendai looks to the future and what lay beyond 2014, it is expected that using appropriate and measurable indicators based on 'tested' elements of learning performance, it would become the main identifier and purveyor of the local best practices, success stories and data around the impact of education on sustainability.

* The overall discussion is in light of the deliberations that took place at the just ended 6th Global RCE Conference in Kerkrade in Europe.

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