



## **Education for Sustainable Development: Challenges for Transformative Education and Research**

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**Abstract** The world is experiencing tremendous challenges entering into the 21st century. The enormous growing global population is expected to use more natural resources to achieve economic growth, while imperiling moral social values and degrading the environment. These gargantuan problems cannot be solved overnight. They have to be tackled collectively by all sectors of society, and the consensus is that Education for Sustainable Development (ESD) is the pathway towards a sustainable future. While there is general consensus that ESD is the way forward, instilling this new educational paradigm into peoples' minds and hearts is a gigantic task. Higher education institutions, as well as research institutions, together with non-formal education institutions, have important roles to play in this defining human endeavor. In response to the United Nations Decade of Education for Sustainable Development (UN DESD 2005-2014), the United Nations University (UNU), collaborates with UNESCO, the lead UN agency for the UN DESD Implementation, and other UN agencies and international organizations, in spearheading the promotion and development of Regional Centres of Expertise (RCEs) on ESD worldwide. An RCE is a network of existing formal, non-formal and informal education organizations, mobilized to deliver ESD to local and regional communities. An RCE builds an innovative platform for multi-sectoral and interdisciplinary information-sharing, dialogue and collaboration for promoting ESD among regional/local stakeholders, including joint efforts by stakeholders in working for transformative education and research on ESD in all levels of education and knowledge creation. It is important that the lessons learned from these RCE activities are shared globally, through the so-called Global Learning Space on ESD, as they provide inspiration and knowledge to others wanting to make contributions for a sustainable future. This paper provides an overview of sustainability, highlights the concept of RCE as a new form of networking, and provides examples of good practices of RCEs in tackling ESD issues.

**Keywords** education for sustainable development, regional centre of expertise, sustainability, transformative education and research

### **INTRODUCTION**

In the last two decades there have been a number of important international commitments strongly suggesting that the traditional development paradigm must change - the UN Conference on Environment and Development or UNCED (1992), the Rio Declaration and Agenda 21 (1992), the World Summit on Sustainable Development or WSSD (2002), and the UN Decade of Education for Sustainable Development or UN DESD 2005-2014, among others. In the Rio Declaration, for example, it was recognized that the current global patterns of consumption and production are not sustainable and if these continue, additional planets will be needed by 2050 and this is not possible. The world is indeed consuming more and more, faster and faster that the entire world population are living on ever decreasing natural capital. The human ecological footprint is now equivalent to consuming annually 30 percent more biological resources than the earth can produce or regenerate

in one year (Global Footprint Network). As the people consume more, more species go extinct. The Living Planet Index of biosphere health fell by about 40 percent from 1970 to 2000, a period of just 30 years, and the question is what will happen in the next 30 years (Worldwatch Institute Report, 2004). The livability of the earth is getting unsustainable, and this situation must be reversed.

As proposed by the Japanese Government and nongovernmental organizations in the Johannesburg Plan of Implementation in 2002, the UN General Assembly in December 2002 adopted the UN Decade of Education for Sustainable Development during 2005-2014. The International Implementation Scheme (IIS) for DESD, with UNESCO as lead UN agency, was approved in September 2005, and Governments of UN Member States are invited to consider measures to implement DESD in their educational strategies and action plans. Sustainable Development - one which meets the needs of the present without compromising the ability of future generations to meet their own needs (WCED, 1987) - must be adopted and integrated into educational context. The vision of the UN DESD is to create a world where everyone has the opportunity to benefit from education and learn the values, behaviors, and lifestyles required for a sustainable future and for positive societal transformation.

## **EDUCATION FOR SUSTAINABLE DEVELOPMENT**

Education for Sustainable Development (ESD) is about learning rather than teaching and therefore requires reforming the structure and nature of basic education, reorienting existing education programs, developing public awareness about what sustainability means, and building capacity within education systems and across all other ESD partners. The three pillars of sustainability are Society, Environment, and Economy, with Culture as an underlying and critical dimension. There is a need to understand the social institutions and their role in change and development. There should be awareness of natural resources and the fragility of the physical environment. There must also be sensitivity to the limits and potential of economic growth and its impact on society and on the environment. All of these must be embedded in ways of behaving, and acting which differ according to context, history and tradition.

ESD is interdisciplinary, holistic and values-driven, promoting the ideals of gender equity, just and peaceful societies, human rights, environmental preservation and restoration, cultural diversity, and poverty alleviation, and focusing on critical thinking and problem-solving, multi-methodological in approach, participatory in decision making, and locally relevant. Sustainability is not only a “what” but it is more a “how”; it is a decision-making framework for continuous improvement for creating a sustainable future. For each and every planned action, it is imperative to ask and answer the big question - How will this action impact people, the environment, and the economy?

ESD research and development deals with longitudinal studies to evaluate the effects of ESD programs implemented. It is designed to advance the conceptual and theoretical development of ESD and identify appropriate ESD pedagogy, as well as research on quality teaching and learning approaches for ESD. Research on and on topics related to Sustainable Development (SD) must be demonstrated and put into education context so that they can be cases of good practices for the education sector - both formal and nonformal - to use and learn from them. Not only that theory must be put to practice, but that also practice - sustainability practice, that is - must be contextualized in educational curricula and programs.

## **DEVELOPMENT PARADIGM SHIFT TOWARDS SUSTAINABILITY**

There is a need to effectuate change in peoples’ living and working styles, in enterprises doing business, and on the whole towards sustainable consumption and production. These changes entail exercise of leadership by all people in all segments of society. The change is everybody’s business, in bringing the present state, which is basically unsustainable, into a desired future state, which is and must be sustainable. The past cannot be undone, but it can be analyzed and lessons learned

from for purposes of designing a sustainable future. The desired future state is undoubtedly to attain the goals of sustainable development - e.g. those articulated in the Millennium Development Goals (MDGs); the Goals of Education for All (EFA); and in the Thrusts of the UN DESD. MDGs aspire for ending poverty and hunger, providing universal education, attaining gender equality, securing child and maternal health, combating HIV/AIDs, creating environmental sustainability, and achieving global partnership. EFA aims at expanding early childhood care and education, providing free compulsory education for all, promoting learning and life skills for young people and adults, increasing adult literacy, achieving gender parity, and improving quality of education.

The major thrusts of ESD under DESD is to improve access to quality basic education, reorienting existing education programs to address SD, developing public understanding, and to provide training programs for all sectors of private and civil society. In response to the UN DESD, the DESD vision of UNU is the creation of the so-called Global Learning Space (GLS) for SD. The GLS for SD encompasses advocacy and dissemination of ESD and DESD, promotion of regional centres of expertise (RCEs) and their networking, strengthening of ESD activities of higher education institutions, further development of on-line learning for ESD, and training of teachers and trainers on ESD. These thrusts constitute the UNU strategy to promote ESD.

## **REGIONAL CENTRES OF EXPERTISE**

A Regional Centre of Expertise (RCE) is a network of existing formal and nonformal education organizations mobilized to deliver ESD in the region or locality where it is situated. It creates a platform for dialogue among regional/local ESD stakeholders and for exchanging information, experience and good practices on ESD. It develops regional/local knowledge base and assists in promoting vertical alignment of curricula from primary through university education and in linking formal and nonformal sectors of the education community. RCEs together and their mutual relations form the Global Learning Space for SD, which is a visible output of DESD. As of November 2009, there are 74 RCEs worldwide that have been acknowledged, 28 of them are located in the Asia-Pacific region, 22 in Europe, 13 in the Middle East & Africa, and 11 in the Americas. RCE Greater Phnom Penh is one of the 8 new RCEs acknowledged in November 2009.

There are three levels of networking under the RCE framework. One is networking among RCE stakeholder organizations, called intra-networking. The next level is the networking of RCEs in the Asia-Pacific region. The widest level is networking among RCEs globally. The inter-networking among RCEs, either continentally or globally, is in the form of thematic groups such as Health and Traditional Medicine, Sustainable Production and Consumption, Youth, Teacher Education, Climate Change, Energy, Biodiversity, among other areas. All of these areas cut across the Conference theme of Environment and Rural Development. Some areas - Climate Change, and Sustainable Production and Consumption - are further considered in the subsequent sections in the context of RCE activities.

## **CLIMATE CHANGE**

Climate change is an issue of concern to all of humanity, and many RCEs around the world have engaged in programs and projects on this issue. Albeit the task is gigantic, it can be tackled with great impact in the long-run in the context of ESD. Climate change has serious impacts on food and water security, on ecosystems and weather conditions. It causes falling crop yields in many areas, particularly developing regions. Small mountain glaciers can disappear, threatening water supplies in several areas. There can be significant decrease in water availability in many areas, and sea level rise threatens major cities. Climate change can cause extensive damage to ecosystems and biodiversity where rising number of species face extinction. It causes extreme weather conditions - rising intensity of storms, forest fires, droughts, flooding and heat waves. There is increasing risk of dangerous feedbacks and abrupt, large-scale shifts in the climate system.

There is a need to have an integrated approach to tackle climate change, both in terms of adaptation and mitigation. Mitigation requires reducing vulnerability and impact possibly through

sustainable production. Adaptation requires changes on where and how people live through sustainable consumption. Another option in combating climate change is through sequestration of greenhouse gases. These responses to climate change can be effective if they are put into education context. In this great endeavor, RCEs can play important roles.

## **SUSTAINABLE PRODUCTION AND COMSUMPTION**

Sustainable Production and Consumption (SPC) is another critical movement in pursuit of a sustainable future and in which RCEs can play important roles. Changing consumption and production patterns towards more sustainable ones require improving policy framework to stimulate sustainable production and consumption. The technologies, or in some cases adopting the local indigenous knowledge, and processes involved in the productive activities need to be addressed as well as on the way basic services are provided, managed and distributed to the population. There is also a need to improve the way communication and information are provided and the way consumers purchase. These changing patterns requires strategies that would change public consumption behavior, increase resource-use efficiency by the production and service sectors, and in changing the way administering and managing sustainable consumption is done in a country.

Changing consumption behavior of the public sector entails several strategic options including advocacy and public awareness on product and service selection, dissemination of information from the government sector concerning sustainable consumption, creating a mechanism to support green product and service marketing, and integrating sustainable consumption concept into academic courses at all education levels. Promoting effective use of resource-base in production and service sectors include strategies like applying the ecological footprint concept, promoting research, development and application of clean and green technologies, promoting green design, strengthening a recycle market for industry, and promoting a product design for recycle, to mention some. Administering and managing for SPC should necessarily develop a strategy to take care and protect the resource-base in the country. It should develop a mechanism to make a balance between the use of renewable resource and restoration of ecological system of the resource that has been used. It should also involve increase efficiency of the use of non-renewable resource and develop other alternative resources, assign sustainable consumption as a national agenda, and accelerate the improvement and development of laws/legislations of the government sector in supporting effective sustainable consumption.

Instruments for SPC constitute a whole range of measures from “soft” to “hard” ones. The hard measures are of regulatory type such as following norms and standards, imposition of environmental liability, and environmental control and enforcement according to laws/legislations. The soft measures are informational instruments such as eco-labeling and sustainability reporting. The so-called in-betweens, from harder to softer in that order, are economic, research, educational, and cooperation instruments, such as environmental taxes, environmental financing, green public procurement, research & development, education & training, technology transfer, and voluntary agreements.

## **SOME RCE GOOD PRACTICES ON ESD IN ASIA-PACIFIC**

What follows are some examples (not exhaustive) of RCE education and research activities on ESD in the region. These were contributed by the respective RCEs for presentation at the 2<sup>nd</sup> ASEAN+3 Leadership Programme on Sustainable Production and Consumption organized by UNU-IAS, the ASEAN Secretariat, and the Ministry of Natural Resources and Environment of Thailand, 8 August 2009, Cha-am, Petchaburi, Thailand.

- *RCE Tongyeong, South Korea:* As an example of a practical approach to ESD, the network introduced values education through “Clean Plate Movement”. In the environmental context, the movement conserves food resource and save cooking energy. It contributes towards reducing carbon emission from cooking and transport; it leads to green consumption, and forest

cultivation. From the economic standpoint, the movement decreases unnecessary food waste, activation of safe organic farming industry, and decreases food price at the international market. From the societal and cultural perspectives, the movement can prevent conflict instigated by food shortage; it enhances safe and healthier food security, respect for various food culture, and healthier eating manner by only eating moderate amount. The movement has impacted a large number of the local population.

- *RCE Anji, China*: The Anji County of Zhejiang Province of China is richly endowed with bamboo resources. About 70 percent of its land area is covered with forest, most of them by bamboo plantations. This is an example of utilizing its indigenous natural resource to propel the local economy through the concept of sustainability from consumption to production. The County has been awarded by the Government of China as an Eco-county, which practices the concepts of sustainability. Bamboo forest is considered as among those with high carbon sequestration capacity. The RCE helps promote ESD through the sustainable bamboo economy as example.
- *RCE Bogor, Indonesia*: The RCE contributes towards tissue culture training, engaging in rice organic farming pilot project, and entrepreneurial training and practices. The target groups are teachers, students and the community. Entrepreneurial practices include fruit chips, aromatic oil distillation, mushroom production, and herbal drink production.
- *RCE Trang, Thailand*: The RCE engages in biodegradable packaging. The process is from sugarcane to bagasse pulp to biodegradable tableware, to compost in landfill, and back to fertilize sugarcane plantation again. Products include common-use things such as bowl, box, plate, tray, and biofoam. Promoting the use of biodegradable packaging is done in traditional festivities including the municipality's vegetarian festival.
- *RCE Cha-am, Thailand*: The Philosophy of Sufficiency Economy of His Majesty, The King of Thailand calls for a balanced and sustainable development at all levels. The theory is to make the agricultural producers or farmers more self-reliant through a holistic management of their land, while living harmoniously and within society. The RCE is engaged in promoting this sustainable philosophy in the locality. Sustainable production includes rice farming, livestock, mushroom culture, organic farming, solid waste disposal technology production, biological fertilizer production, and water bio-fermentation.
- *RCE Kitakyushu, Japan*: The RCE is engaged in demonstrating an example of adopting a circular society through cardboard compost. Domestic garbage from households is put in the compost, the compost is put in the field, then planting, and then harvesting. There were lessons learned from the project including habit-forming behaviors such as - to stop throwing garbage as disuse; getting into the habit of garbage compost; the pleasure of growing vegetables; learning the circular system, etc. For the activity of using compost fertilizer for rice cultivation, lessons learned include the pleasure of youth and adults working together, the fun and difficulties of rice-making, knowing about the animals and plants in the rice fields, and sensing a good taste of rice.
- *RCE Cebu, Philippines*: The RCE adopts corporate social responsibility (CSR) by a cluster of business enterprises working together for a common purpose. Consideration of the environment is addressed through solid waste management which includes activities such as segregation, garbage collection, composting, biodiversity conservation, and watershed management. Entrepreneurship is demonstrated through recyclable collections in the form of cash-from-trash project, product-from-waste project, waste exchange and seed bank project. Education is impacted by the adopt-a-library project, vocational scholarship, and tutorials. The movement also serves as a manpower source for the participating businesses. The movement also contributes to peace and order through emergency preparedness activities. It also impacts health through feeding programs, medical mission, and health center project. All of these are through the initiative of the RCE with the participation of a group of companies working together for ESD.

## **CONCLUDING REMARKS- ROLE OF HIGHER EDUCATION INSTITUTIONS**

It is imperative that education institutions, especially higher education institutions (HEIs), integrate SD philosophy into curricula as well as mainstream the sustainability paradigm in academic programs. Research must be reoriented and new knowledge developed based on SD. There is also a need to develop new technologies, methods, tools and techniques to embrace SD.

There are obviously questions of competencies, however, which are critical. The focus must not only be on teachers and students in formal education but also those in nonformal education organizations engaged in teaching diverse fields. Training must also be in-service, not only pre-service teaching, at the inter- and multi-disciplinary nature of ESD. ESD must be learned as a general concept that allows for its adaptation to national and local needs and priorities.

As part of its Education for Sustainable Development Programme, UNU-IAS has under its auspices, spearheaded the establishment of the Promotion of Sustainability in Postgraduate Education and Research Network (ProSPER.Net) in Asia-Pacific. Members of the alliance, currently 19 reputed higher education institutions, have committed to working together to integrate SD into postgraduate courses and curricula as well as in research programs. The network is a platform of collaboration for members to pursue postgraduate education and research on SD with an emphasis on ESD. The process and content of education must change to be able to reach the goals of sustainability.

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