

Institutions of Higher Education and Partnerships in Education for Sustainable Development: Case Study of the Regional Center of Expertise (RCE) Penang, Malaysia

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Abstract

Sustainable development has become a central focal area in the global strategy for the development of the education sector's future. The ultimate goal of this endeavor is to enable the recognition of Institutions of Higher Education (IHEs) as major contributors to society's efforts at achieving sustainability.

Achieving sustainable development requires collaboration between different sectors and institutions, as well as the participation of all relevant stakeholders and individuals. That being said, there are many different ways through which people and organizations can work together to share knowledge, advocate causes and take action. As Willard and Creech (2008) argue, these may include campaign networks, communities of practice, knowledge networks, public-private partnerships, multi-stakeholder partnerships and strategic alliances. These have all become important mechanisms for identifying priorities, undertaking joint research and for engaging other stakeholders in developing workable solutions. By combining their efforts, members of networks and partnerships are able to have greater impacts on policies and practices than they would have been able to achieve on their own.

This paper seeks to highlight the reasons as to why Institutions of Higher Education serve as appropriate candidates in championing the cause of Education for Sustainable Development (EfSD) and why the success of this leadership by IHEs must occur with appropriate linkages between the government, communities, NGOs and the private sector. This paper also examines the different issues that arise as a result of such linkages by looking at a specific example, namely the Regional Center of Expertise (RCE) Penang on Education for Sustainable Development at Universiti Sains Malaysia.

Keywords: education for sustainable development, partnership, regional centre of expertise

1. Introduction

It can be said that today, sustainable development is no longer considered a novel idea. According to Dzulkifli (2006), “the concept of sustainable development appeared in the 1980s arising out of global concerns on the need to balance economic and social developments, both of which affect the natural environment and natural resources.” For years, extensive and exhaustive discussions and explanations on the concept of sustainable development have been carried out in both academic and non-academic environments. After the creation of the “United Nations’ Decade of Education for Sustainable Development (UNDESD),” the focus point of the campaign on sustainable development has since shifted to the ways and mechanisms through which this concept can be achieved.

A much-emphasized and well-notified area mentioned in the UNDESD’s main objectives is the concept of partnerships. This is seen in the setting of its prime objective, namely to “facilitate networking, linkages, exchange and interaction among stakeholders in ESD.” In addition to this, Chapter 8.7 of Agenda 21 states that the National Strategy for Sustainable Development “should build upon and harmonize the various sectoral economic, social, and environmental policies and plans that are operating in the country.”

The definitions above reflect both the holistic nature of sustainable development and the necessity for collaborative efforts among different sectors toward accomplishing the holistic goals of sustainability. This subsequently leads us to one of the fundamental concepts of sustainable development, namely, the matter of partnerships.

As UNDESA (2001b), paragraph 3 points out, accomplishing development in a sustainable manner requires “a coordinated, participatory, iterative and cyclical process of thoughts and actions to achieve economic, environmental and social objectives in a balanced and integrated manner.”

Recognizing the world’s current state of affairs and the nature of the problems that confront us as a community of nations, we are now more than ever bounded to each other by a common destiny. This common destiny and its mechanisms of action can be well-defined primarily at the local and national levels and then further developed to international scale.

That being said, combining the key role played by education in UNDESD with the concept of partnerships can ensure that we achieve the designated objectives of sustainable development.

This paper argues the reasons as to why IHEs are appropriate candidates to lead the concept of Education for Sustainable Development (EfSD) and the importance of appropriate linkages with the government, communities, NGOs, individuals and the private sector.

2. Education for Sustainable Development (EfSD)

Recognizing the role education plays in the development of societies toward becoming more equitable and sustainable, the United Nations launched the “Decade of Education for Sustainable Development” in 2005. According to UNESCO’s definition, “The goal of the United Nations Decade of Education for Sustainable Development (2005-2014, DESD), is to integrate the principles, values, and practices of sustainable development into all aspects of education and learning.”

This concept was later emphasized in Section 6 of the Bonn Declaration (2009) where it was stated that, “Education for sustainable development is setting a new direction for education and learning for all. It promotes quality education, and is inclusive of all people. It is based on values, principles and practices necessary to respond effectively to current and future challenges.” It is hoped therefore, that this educational effort will encourage changes in behavior that will create a more sustainable future in terms of environmental integrity, economic viability, and a just society for present and future generations.

At the Rio Summit, the role of education in promoting sustainable development was made explicit by Agenda 21 - the global action plan for the 21st century, whereby it was declared that “Education should be recognized as a process by which human beings and societies can reach their fullest potential. Education is critical for promoting sustainable development and improving the capacity of the people to address the environment and development issues.”

Furthermore, EfSD motivates people to expand their awareness, morals and skills toward partaking in decisions about the way things can be done, individually and collectively as well as locally and globally, that will improve the present quality of life while bearing in mind the needs of future generations. It is important therefore to realize that EfSD should be considered an essential component of sustainable development. According to

Sterling (2004), EfSD “implies a change of fundamental epistemology in our culture and our educational thinking and practices; it does not simply require an ‘add-on’ to existing structures and curricula.

That being said, a crucial point that must be considered with regard to this definition is that the education in question is *for* sustainable development and not *about* sustainable development. This key feature alone is an indication that EfSD’s approach is a holistic one which encompasses the many different aspects of life. As of such, collaborations between different sectors are essential in moving this concept forward.

3. Institutions of Higher Education and EfSD

The role of Institutions of Higher Education within the concept of EfSD is a crucial one, as they educate a large number of society’s future professionals and leaders. ESD&GC (2008) self-reflected on the large role there was to play within the sustainable management of their institutions and procurement policies to ensure that globally aware, ethically sound and environmentally balanced processes are introduced. There also exists the potential for influencing others outside the university sphere through professional development and training opportunities.

Most universities around the world still practice very disciplined manners of research, teaching and administrating. This is one of the main obstacles against the implementation of a holistic concept like sustainability in disciplined organizations. These clusters are obviously incompatible with sustainability and this matter is not easily overcome. As Cortese (1999) argues, “Many schools around the world are making important strikes toward necessary changes in education.” This in itself is an indication that transforming conventional higher education systems toward a sustainable one is not an easy task.

Looking at the World Commission on Environment and Development Report’s (1987) definition of sustainable development, it is defined as development “which meets the needs of the present without compromising the ability of future generation to meet their own needs.” This is a clear reflection that the concept is not to be limited to a number of disciplines or areas, but is in fact applicable on a global scale inclusive of everyone and everything in it, both now and in the future.

Given this introduction, it is clear to see that sustainable development must form a central part of any strategy that involves the future development of the education sector. The ultimate goal of such an initiative is to facilitate the recognition of IHEs as major contributors toward society’s efforts in achieving sustainability. This is true both through the skills and knowledge that graduates learn and put into practice and through an institution’s own strategies and operations in conjunction with its ties to society.

With this in mind, it is plain to see that the role of the academia is vital to the success of any plan or strategy that is concerned with achieving a sustainably developed society. Nonetheless, it is also common knowledge that there are still many barriers to face with regard to the interactions between academia and the society. Occasionally, academic institutions and the societies they are located in have been at loggerheads with regard to their respective roles and missions areas. As Altbach argues, “This anxiety has contributed to the creativity of universities over time but has also placed sometimes overwhelming burdens on them. In response to this issue many Universities are trying to connect their missions and actions to social demands.”

At the dawn of the 21st century, many colleges and universities started redirecting their economic and intellectual resources, facilities, and other assets to benefit their communities in many innovative ways. According to Berry (2009), “They are working to facilitate economic development, provide much-needed social services, support public schools, offer technical assistance to community-based organizations, target research that provides guidance for community problem solving, and create opportunities for faculty, students, and community residents to learn from one another.” With large pools of disciplinary experts, high quality research facilities, the best infrastructure and a cohort of students with varied academic interests, universities have a considerable advantage in promoting sustainability in the communities they serve. Being the complex process that it is, sustainable development has no standard application that is designed to fit all communities. This is exactly why universities, with their core values of knowledge-acquisition and insight for innovation, have profound roles to play in developing students’ capacity to adaptively manage a changing world.

This matter then creates a unique position for an institution of higher education to act as a meeting point between the different groups that exist within societies, NGOs, etc., as well as a place for different ideas and potentials to meet and interact. However, in order to understand the extent to which an institute of higher education can contribute to the concept of sustainable development, some crucial issues must first be addressed and considered;

4. Leadership

Leadership has a pivotal and practical role to play in supporting the transition toward sustainable development by guiding the strategic planning phases of IHEs, managing major capital programs and leading the

interactions between institution and external stakeholders. Leadership also has a symbolic role in influencing the views of staff and students on sustainable development. It is therefore extremely important that leaders have the skills required to make decisions that are compatible with the sustainability agenda.

The important question to consider however is “Are IHEs capable of shouldering the lead role in sustainable development?” The answer to this question will largely facilitate the approach we use toward addressing the different aspects of sustainability.

IHEs do in fact have essential roles to play in helping societies develop sustainably. This is rooted in the reality that sustainable development is fundamentally a process through which we learn to build our capacities toward living more sustainable lives. While it is a process that everyone should participate in, the involvement of IHEs is particularly important as IHE graduates are the ones who will go on to occupy the vast majority of the country’s managerial and leadership positions. As of such, the role of higher education institutions far outweighs the size of the sector in terms of its resources.

Based on this argument, it is clear to see why universities are deemed important players who should take the lead in sustainable development. This idea is considered particularly feasible also because this reality is recognized by many people in the higher education community and reflected by several international agreements between institutions that pursue sustainable development. Examples of such agreements include the Copernicus University Charter for Sustainable Development (1993), the Kyoto Declaration on Sustainable Development issued by the International Association of Universities (1993) and the UNESCO World Declaration on Higher Education (1998).

These agreements acknowledge that the role of IHEs can be categorized into three groups. The first is that higher education has a role to play in helping students gain awareness of the world in which they live. The second, an understanding of the way in which multifaceted economic, social and environmental processes interact with each other (including the contribution individuals make to these processes) and lastly, familiarity with the perspectives of other societies and cultures on these issues.

It is also important to note that the issue of institutional leadership for sustainable development covers a vast range of elements such as legislation, enforcement, rules and regulations, economic incentives and education. It is therefore important to consider all of the above elements comprehensively if an inclusive leadership strategy for SD is to be devised.

In addressing SD related issues, it is important to bear in mind that more than planning, sustainable development is about implementation and practices. Interestingly, and in parallel to this matter, is the fact that practices which result from a particular leadership is what gives value to the leadership in question. Along this line of thought, the second reason can then be viewed as IHEs playing their role in helping societies find social and technical solutions to the challenges presented by sustainable development. This scenario would then find us looking at different examples such as recycling or green energy issues in which universities play vital roles in finding solutions through academic researches and experiences. In time, such on-campus practices will inevitably migrate to the nexus of society and be utilized there as well. Additionally, university academicians, researchers and students also play important roles in disseminating knowledge and expertise beyond university walls. They can effectively train the community on the skills needed to solve certain problems while exposing them to new ideas and innovations. In time, this scheme will help universities strengthen their ties with the communities that surround them.

The third important factor in making universities the appropriate choice for assuming leadership in sustainable development is that each university is a combination of several different centers and organizations. In time, each of these centers or organizations can contribute a significant amount of knowledge and practices to the sectors of society within which they are located. Historically, the poor and those at society’s *bottom billion* are the ones who benefit the least from any kind of research or scientific development. This is a result of the conventional way in which research centers at universities view the market; on the other hand, the focus of sustainability is a holistic aim geared toward serving humanity. The social sector is one of the main pillars of sustainable development and a pattern of development that does not consider society’s *bottom billion* is a far cry from the definition of sustainability.

In order to reach the *bottom billion*, science has to be able to meet the public and collaborate on relevant societal issues with members of the society. The transdisciplinarity approach is one such avenue, as argued by Jahn (2005), “Transdisciplinarity is always related to something; it is connected with concrete societal problems and means a higher quality of a research process by integrating practice experience.”

With this in mind, universities do indeed seem to be an ideal platform for transdisciplinary research as they consist of several departments and faculties. This pool of knowledge and expertise can then be coordinated and synchronized toward main sustainability goals. According to Klein (2001), "The core idea of transdisciplinarity is different academic disciplines working jointly with practitioners to solve a real-world problem." The third factor leads us to yet another equally important factor in the relationship between the academia and the community - the concept of partnership. However, in order to move this train, there has to be a well-defined strategy to enable networking and partnerships.

5. Partnerships and Networking

In a report titled *The Engaged Institution: Returning to Our Roots*, provided by the Kellogg Commission on the Future of State and Land-Grant Universities (1999), the issue of the university's relationship with the community is focused in such a way that all of the university's functions are encouraged to be "more sympathetically and productively involved with their communities."

One of the most important aspects of sustainability at a university is to enable free access of the university's knowledge and expertise to the community. University academicians, researchers and students can therefore play important roles in spreading knowledge and expertise beyond university walls. They can train the community on the skills needed by them in order to solve problems while exposing them to new ideas and innovations. Furthermore, this scheme will enable the strengthening of a university's ties with its surrounding communities. That being said, lacking appropriate structure in this regard will result in community engagement activities being less operative. According to Sabir (2008), "Hence, academia's main objective in this matter should be to define the networking structure in a way that gives direction and purpose to the engagement agenda. Following this, the academia should design a model of engagement and describe how it is related to the practice of community development."

There are many different reasons as to why networking is considered an important and vital element in EfSD. Most of these reasons however, can be combined into three main areas of interest which are described by Creech (2005) in Figure 1.

There are a number of conditions required for implementing effective networking and partnerships:

- The need for a common vision, passion and commitment by all partners,
- The importance of shared values among partners, including a shared commitment to sustainable development,
- Trust and respect for each other, combined with a common and consistent adherence to processes for decision making and for execution of tasks,
- Commitment and credibility of the individuals from each organization who are actively involved in the work (their outlook and character, as one participant mentioned),
- Institutional support and recognition to the individuals for their work in the partnership,
- In general, "ownership" and commitment to the partnership by every organization involved.

Based on what has been said, a successful network should consider the above elements to guarantee smooth and productive functioning.

The above points suggest a practical model for university engagement. As Holland (2001) suggests, this model can possibly be created as a "direct interaction with external constituencies and communities through mutually beneficial exchange, exploration, and application of knowledge, expertise and information. These interactions enrich and expand the learning and discovery functions of the academic institution while also enhancing community capacity."

6. Institutions of Higher Education as the Center Point of EfSD

It is important to realize that choosing the university as an appropriate leader for EfSD does not on its own guarantee the success of the project. Another crucial issue to be addressed is the need for a strong coordinator within the university, to enable the administration of researches and the implementation of activities among other stakeholders via EfSD.

In order to achieve such status, the need for having a strong coordinator and secretariat in each university to handle, organize and synchronize EfSD related issues is of paramount importance. In this vein, the example of RCEs (Regional Centers of Expertise on EfSD) - in particular RCE Penang at Universiti Sains Malaysia (USM) - is a successful illustration of the role of coordinators in EfSD.

On the 29th of June 2005, USM was appointed the United Nations University's Regional Center of Expertise (RCE) on Education for Sustainable Development in conjunction with the United Nations' Decade on Education

for Sustainable Development in Nagoya, Japan. Subsequently, this resulted in USM being one of seven pioneering groups of RCEs in the world. The RCE is part of a global network managed by the United Nations University to offer global education programs and activities for sustainable development. The aim of the program is to educate members of the public throughout the world on the importance of sustainable development as an over-arching principle for the future. The RCE for Penang Island and the Northern region of Malaysia aims to develop understanding on sustainable development and to introduce it into educational contents and practices. It also aspires to create a framework, including policies to facilitate the introduction of the sustainable development into decision-making sectors and communities.

As is clearly defined by the United Nations University-Institution of Advanced Studies (UNU-IAS), “An RCE is a network of existing formal, non-formal and informal education organizations aiming to deliver education for sustainable development (ESD) to a regional/local community. RCEs aspire to achieve the goals of the UN Decade of Education for Sustainable Development (DESD, 2005-2014), by translating its global objectives into the context of the local/regional community in which it operates.”

RCEs bring together institutions at the regional/local level to jointly promote ESD. They build innovative platforms to share information and experiences and to promote dialogue among regional/local stakeholders through partnerships for sustainable development. They create a local/regional knowledge base to support ESD actors, and promote four major goals of ESD in a resource-effective manner. These four goals are to:

- re-orient education towards SD, covering existing programs/subjects from the point of ESD and designing an integrated SD curricula. ESD programs are tailored to address issues and local context of the community in which they operate;
- increase access to quality education that is most needed in the regional context;
- deliver trainers’ training programs and to develop methodologies and learning materials for them;
- lead advocacy and awareness raising efforts to raise public awareness about the importance of educators and the essential role of ESD in achieving a sustainable future. RCEs promote the long-term goals of ESD, such as environmental stewardship, social justice, and improvement of the quality of life.

RCE Penang’s perceived role is to address existing needs and challenges by means of an educational framework that is capable of ensuring sustainability in the region. Thus, educational programs form the backbone of RCE Penang through integration and re-orientation of existing platforms and programs that are being carried out in the name of sustainable development. There is a high level of concern and awareness on environmental issues within communities and a variety of programs and activities are in place to address these as well as the social and economic aspects of sustainable development. While these awareness-raising programs are very important, a more comprehensive education-based approach is still needed.

The mission of RCE Penang is to build capacity to deliver, support and generate innovative education for sustainable development (ESD) in Penang. This will be achieved by working with partners and by developing a coordinated communication and dissemination framework for regional ESD projects and programs.

6.1 Framework:

In order to implement the above concepts in an institution of higher education, a framework that could guarantee the success of this implementation had to be designed. To design such a framework, five core elements were taken into consideration by RCE Penang as it is shown in Table 1.

6.2 Objectives:

Recognizing the challenges and needs of the region within which it operates, RCE Penang’s objectives are demonstrated in figure 2.

6.3 Goals:

RCE Penang attempts to achieve a set of goals that are rooted in its nature as an EfSD institution. These set of goals are illustrated in figure 3.

6.4 Strategies:

It is a fact that the above -mentioned goals cannot be accomplished without the adoption of several relevant strategies. As of such, RCE Penang has developed a number of strategies to attain these goals and objectives:

- Making USM and its entity a working example of RCE,
- Establishing leadership for sustainable development,
- Developing and promoting compelling images of regional sustainable development,

- Developing and promoting sustainable development training opportunities for school teachers, teacher educators and school administrators,
- Working with key partners to identify funding sources for ESD projects,
- Developing an ESD strategy guide for local authorities, and
- Establishing a one-stop center for information on ESD best practices in the region.

RCE Penang has undergone dynamic developmental processes since its recognition in 2005. Initially, the concept of EfSD was a rather marginalized one and there were a number of difficulties in explaining and getting the concept understood. Over time however, RCE Penang has gained recognition as a 'reference and resource pool' for EfSD not only in Penang but also in the national arena.

6.5 Stakeholders:

Anchored as they are in RCE's nature, stakeholders play a vital role in the existence and efficiency of an RCE. An RCE involves school teachers, professors at higher education institutions, environmental NGOs, scientists, researchers, museums, zoos, botanical gardens, local government officials, representatives of local enterprises, volunteers, media, civic associations or individuals who work in the spheres of sustainable development such as economic growth, social development, and environmental protection, students and learners at all levels. By taking this key element into account, RCE Penang endeavors to create a bridge between the various active organizations, institutions, NGOs, agencies and concerned individuals to accomplish common goals and objectives.

RCE Penang has already initiated and conducted many projects and activities through its stakeholders by emphasizing the vital role of partnerships with communities. These activities include:

- The Healthy-Sustainable Campus Program
- Programs on energy saving
- Campus-Wide Recycling Project
- University-Community Program in which faculty members disseminate research findings to benefit the community or in which student clubs and societies work on various SD-related activities together with the members of off-campus communities.

RCE Penang's stakeholders play a very important role in running these programs. In addition to the activities which mentioned above, RCE Penang has also carried out several other activities in the form of conferences, workshops, seminars, forums, round-tables, etc., based on both the national and international scale frameworks which were mentioned at the beginning of the report.

Through USM and with the help of its stakeholders (which play a vital role in RCE's activities), RCE Penang has played the role of leading actor and main operations center which have both contributed to the expected functions of RCE in several ways. This is particularly true in the manner in which awareness on the issue of ESD has been raised among USM's campus community and among Penang's general public. In addition to this, ESD awareness has also been raised at the national level through government representatives who worked on ESD and for the recognition of the RCE. Contributions have also been made to reorient the approach toward environmental education with ideas and information on the implementation of the DESD strategy disseminated. Driving these initiatives home are the collaborations and network among various stakeholders in the region which are continuously being developed.

RCE Penang is encouraging the active engagement of stakeholders through relevant programs, developing ESD partnerships that focus on priority themes in the region such as waste management, tourism, and cultural heritage, cultivate ESD partnerships that address social equity issues with education activities that aim to address the social, environmental and economic dimensions of ESD, foster ESD partnerships that address the concept of efficiency in the use of natural resources, develop partnerships to test the potential of the Internet to develop innovative and effective online ESD learning communities and promote the professional development of teachers.

RCE Penang has also successfully conducted a number of workshops and training sessions as part of its capacity building programs for elementary school teachers. These programs were conducted to give teachers a better understanding of sustainable development and how it relates to education. In these programs, a vast range of issues regarding curriculum are designed to address sustainability, examine the extent of sustainability in the education system's management sectors and many other related issues which were discussed and reviewed.

7. Conclusion

As explained theoretically in this paper and through the successful experience of RCE Penang, Institutes of Higher Education appear to be appropriate candidates for assuming the SD leadership and becoming center points of coordination between different actors and members of society (NGOs, individuals, private sector, etc.) in achieving sustainable development goals.

It is important to note that there is no need to change or revolutionize an existing system in order to tune an Institution of Higher Learning to SD principles. Given the highly integrated nature of SD, many institutions have already unknowingly adopted certain principles and elements of SD or EfSD. Understandably, this then allows for a smoother transition from the existing system to one that accommodates a higher amount of SD principles. To facilitate this transition, a balanced and harmonious translation of the existing system into an action plan that is more coherent is needed. This transition, adjustment and re-orientation needs to be appropriately coordinated to enable maximum impact on the education system and ensuring a higher degree of sustainability.

At the same time, it is vital to recognize the role of partnerships with relevant sectors in the community to ensure the holistic nature of this transition. As was mentioned in the body of this paper, this partnership can be achieved by coordinating the SD related strategies and practices of Institutions of Higher Learning.

References

- Dzulkifli, A., R., et al. (2006). Education for Sustainable Development and the Higher Education Institutions – Directions and Futures Scenarios. *The 2006 Conference of the Association of Southeast Asian Institutions of Higher Learning (ASAIHL)*. Penang, Malaysia. pp. 14-27.
- Adomssent, M. (2006). Higher Education for Sustainability: Challenges and Obligations from a Global Perspective, in Adomssent, M., Godemann J., Leicht A., Busch A. (Eds) *Higher Education for Sustainability*. New Challenges from a Global Perspective, VAS, Frankfurt, Germany.
- Altbach, P. (in press). The Complex Roles of Universities in the in the period of globalization. *Higher Education in the World. GUNI Series on the Social commitment of Universities*.
- Berry, J. M. (2009). *An Examination of Partnership Development between Community Service Agencies and an Institution of Higher Education: Implications for Service Learning*. The Ohio State University, USA.
- Bok, D. (2003). *Universities in the marketplace*. Princeton, N.J.: Princeton University Press.
- Cortese, A. D. (1999). *Education for Sustainability: The Need for a New Human Perspective*. Second Nature. p. 7.
- Creech, H. (2005). *The Terminology of Knowledge for Sustainable Development*. An IISD Knowledge Communications Practice Note. Winnipeg, Canada.
- ESD&GC (2008). *Higher Education Sector and ESD*. Assembly of Sustainable Development Scheme for Wales. [Online] Available: <http://www.esd-wales.org.uk/> (October 2010)
- Holland, B. (2001). *Exploring the challenge of documenting and measuring civic engagement endeavors of colleges and universities*. Paper presented at the Campus Compact, Advanced Institute on Classifications For Civic Engagement, 23 March. [Online] Available: <http://www.compact.org/advancedtoolkit/measuring.html> (October 2010)
- Jahn, T. (2005). *Soziale Ökologie, kognitive Integration und Transdisziplinarität*. Technikfolgenabschätzung -Theorie und Praxis, 14 (2), S 32-38.
- Kellogg Commission on the Future of State and Land-Grant Universities. (1999). *Returning to our roots: The engaged institution*. Washington, D.C.: National Association of State Universities and Land-Grant Colleges.
- Klein, J. T., et al. (2001). *Transdisciplinarity : Joint Problem Solving among Science, Technology, and Society*. Synthesebücher, SPP Environment, Basel, Birkhäuser Verlag.
- Sabir, M. (2008). *The Role of Universities in Sustainable Development with Special Focus on Pakistan*. Universiti Malaysia Perlis (UNIMAP) Digital library Journal, pp.60-68.
- Sterling, S. (2004). *Higher Education, Sustainability and the Role of Systemic Learning*. Higher Education and the Challenge of Sustainability, pp. 49-70.
- United Nations University (2005). Regional Centers of Expertise on Education for Sustainable Development. Concept paper. On-line document [Online] Available: <http://www.ias.unu.edu/research/regionalcenters.cfm> (October 2010)

UNESCO Bonn Declaration. (2009). UNESCO World Conference on Education for Sustainable Development, Bonn, Germany: [Online] Available: http://www.esd-world-conference-2009.org/fileadmin/download/ESD2009_BonnDeclaration080409.pdf (October 2010)

UN Decade of Education for Sustainable Development. (2005). [Online] Available: <http://www.unesco.org/en/education-for-sustainable-development/decade-of-esd/> (November 2010)

UN Division for Sustainable Development. (1992). *Agenda 21*. United Nations Conference on Environment and Development (UNCED), Rio de Janeiro, Brazil. [Online] Available: <http://www.un.org/esa/dsd/agenda21/index.shtml>

UN DESA. (2001a). *Commission on Sustainable Development Indicators of Sustainable Development*, www.un.org/esa/sustdev/isd.htm (October 2010)

Willard, T. and Creech, H. (2008). *Public Policy Influence of International Development Networks: Review of IDRC Experience (1995-2005)*. International Development Research Center (IDRC). Ottawa, ON, Canada.

World Commission on Environment and Development Report, (1987). *Our Common Future*. New York: Oxford University Press, UK.

Table 1. RCE Penang's Framework

The Principle	Research	Support	Networking	Program
Meeting the needs of the present without compromising the ability of future generations to meet their own needs	Sustainable development researches should be supported.	which includes projects, strategies, scenario planning, monitoring, audit and reporting for sustainable development related subjects which can be led by RCE.	which includes dialogs and forming linkages with communities in order to engage them in the process and achieve wider participation.	which includes all types of education namely formal, informal and non-formal with all three of its approaches - vertical, horizontal and diagonal

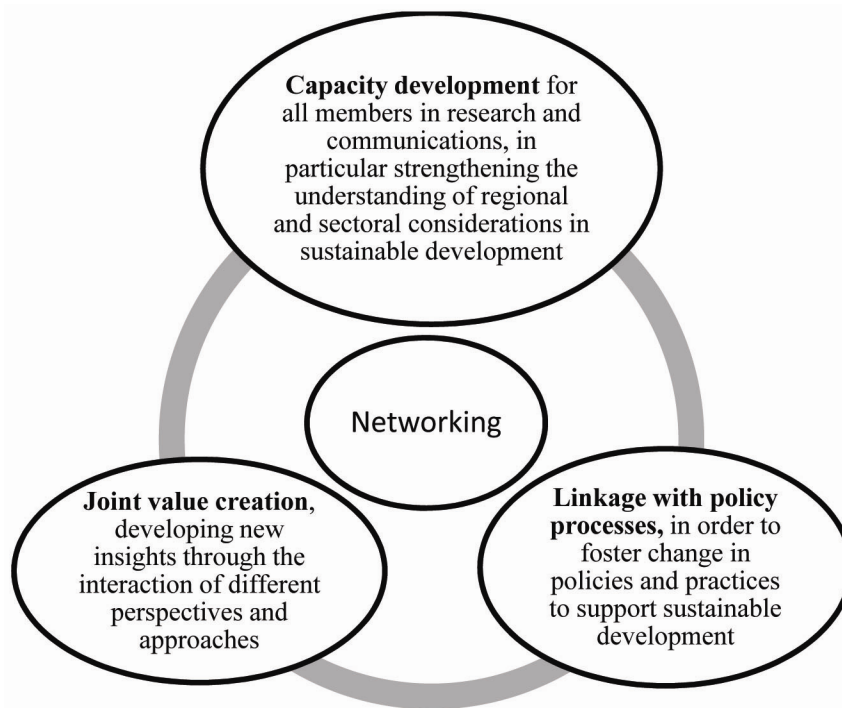


Figure 1. Areas of interests in networking

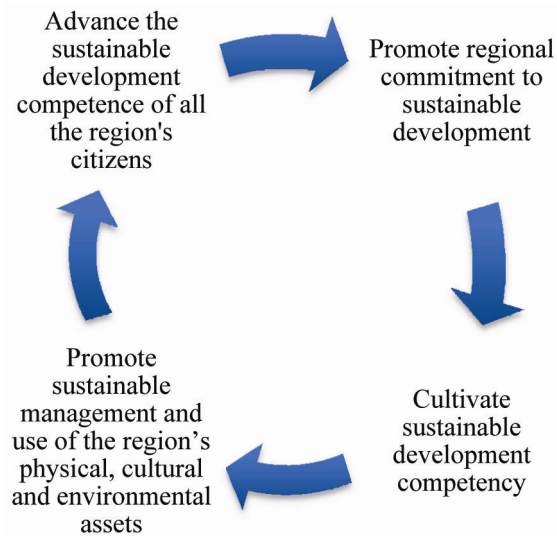


Figure 2. RCE Penang's Objectives

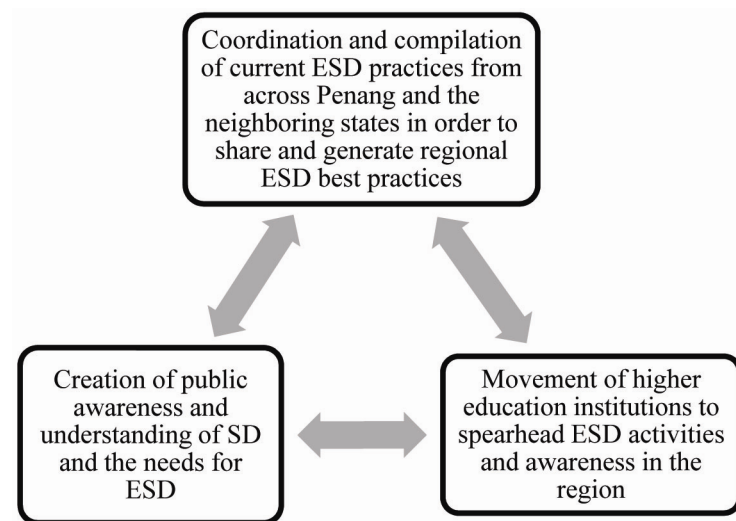


Figure 3. RCE' Penang's Goals