

# Message

## Sustainability Leadership



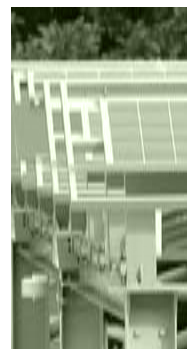
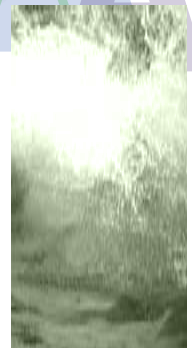
More than any other time in human history, the world now needs leaders who understand and are prepared to act upon the knowledge that development and sustainability are after all mutually compatible, attainable and inseparable. But the problem lies with the current global development models that rely heavily on fossil based energy generation, promote extremely resource intensive production and consumption, generate large scale waste, and accelerate land degradation resulting in the loss of valuable biological diversity. Add to this the impacts of growing population and poverty, current climatic variability and the impending climate change; we have a very difficult situation at hand. Therefore, our vision must be to eradicate poverty, reduce inequality, make growth more inclusive, and future development to be holistic, balancing the three pillars of sustainable development – environment, economy and society.

The United Nations Conference on Sustainable Development (UNCSD 2012, Rio+20) scheduled for June 2012 is organised to address this development dilemma, assess progress and gaps in the implementation of global commitment and to further strengthen humanities resolve to act with urgency. In this pursuit, education, especially higher education, has been identified by two major global summit outcomes viz Agenda 21 and

the Johannesburg Plan of Action, and various other global declarations to have a pivotal role to play. Thus, a Decade of Education for Sustainable Development (DESD) was launched by United Nations in 2005. ESD is a continuous process that enables human beings to develop, knowledge, skills, perspectives and values to motivate and empower people to work toward a balanced and sustainable lifestyle.

Therefore, in addition to our traditional role as the generators and disseminators of knowledge, we in universities should deliver also on our responsibility as the 'social conscience of the society' by engaging in knowledge transfer programs to empower the communities, enhance industrial performance and to promote science-policy interactions. As we strive hard for academic excellence and move ahead to contribute to Malaysia's knowledge society, we should be mindful that we must not relinquish our leadership role and become oblivious to the problems of the people we are called to serve within our shores and the world beyond our borders.

Professor Dato' Omar Osman  
Vice-Chancellor  
Universiti Sains Malaysia





Aspiring to Meet  
Global Challenges

WORLD  
WELFARE  
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# Foreword



As part of our APEX agenda, USM has embraced a whole-system sustainability transition which means that we will mainstream the social, economic and environmental components of sustainable development into our core activities such as teaching, research and institutional arrangement. I am aware that it is a lot easier said than done as the implied interconnectedness is often invisible and at times intangible, making integration an involved exercise. This is where the Fact Sheets produced by the Centre for Global Sustainability Studies will help enhance awareness and understanding of the principles and practice of sustainability at USM. At the outset, I would like to commend CGSS for this valuable contribution.

The ninth Malaysia Plan asserts that the most precious assets of the nation is its people. The Plan further states that the development of human capital, upgrading the mentality of its people and boosting the intellectual capacity of the nation are among our biggest challenges. Given the 2020 vision of Malaysia, development of high quality human capital has become a necessity, not merely a luxury. In this regard, institutions of higher educational have a very responsible role to play.

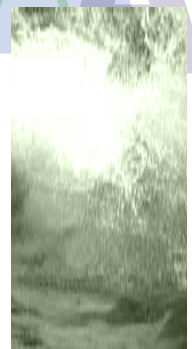
Universities of the 21st century, unlike their predecessors, are expected to be proactively involved in knowledge dissemination, using all modalities of delivery that technology offers. Although 'formal' education is what universities are usually known for, an educational

institution such as USM with its sustainability focus will be expected to place equal emphasis on non formal and informal approaches through outreaches, workshops, short-term training, public seminars, flyers and fact sheets.

The CGSS Fact Sheets are available in both English and Bahasa Malaysia to ensure maximum usage by the USM community as well as other interested parties elsewhere. I would like to encourage you to use the information in these sheets to educate yourself and to engage in discussions with your friends and colleagues. It is also highly recommended that you use them for your family and community awareness building on the nature and scope of the emerging large scale changes that affect their lives.

These Fact Sheets are therefore, a timely contribution for the promotion of capacity building initiatives at USM and it is with great pleasure that I recommend everyone read these sheets and become informed individuals who can face up to the sustainability challenges in measures commensurate with the gravity of the issues we confront. More importantly we need to take the leadership, and walk the talk!

Prof. Tan Sri Dato' Dzulkifli Abdul Razak  
Vice-Chancellor, Former  
Universiti Sains Malaysia





Aspiring to Meet  
Global Challenges



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# Preface



In 2007, Universiti Sains Malaysia became the first national university to be awarded the APEX status by the Ministry of Higher Education, for its outstanding accomplishments in teaching and research and for its ability to be competitive at a global level. Through a variety of student-focused campus sustainability initiatives, relating mainly to waste minimisation and value addition, landscaping, energy efficiency projects and the capacity building efforts of RCE-Penang, USM was already well on its way to mainstreaming sustainability. The APEX award has accelerated this process with the university taking steps to launch bigger and more ambitious initiatives. The establishment of a new Centre for Global Sustainability Studies (CGSS@USM) is one such strategic move.

In this package are a dozen Fact Sheets produced by CGSS to create a better understanding among the university and the outside community about USM's efforts to integrate sustainability into its academic as well as overall campus life. If you have been contemplating questions such as:

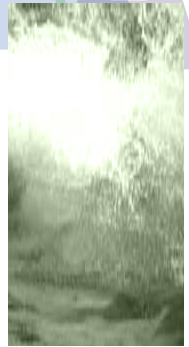
- Why is USM called an APEX university?
- What exactly does sustainable development (SD) mean?
- What are the major global, regional, and national sustainability challenges?
- What is meant by education for sustainable development (ESD)?
- How do universities mainstream sustainability into their core activities?
- What is the roadmap for sustainability integration at USM?
- Are there any success stories for SD-ESD?

- Will we be able to locate jobs with a focus on sustainability?

...then these Fact Sheets will guide you to the answers by introducing the importance of sustainable development (or sustainability) and the role institutions of higher education play in training students to effectively address sustainability at the national and local levels. Students graduating from such universities will develop into sustainability-driven individuals with a global outlook which is a pre-requisite for a sustainable world.

Furthermore, the straightforward presentation of facts correlating to the above questions provide the reader with a clearer understanding of what the SD umbrella encompasses while simultaneously demonstrating USM's ultimate sustainability goals and how these goals are to be met. The Fact Sheets also provide information about the USM Sustainability Roadmap and its practical applications. USM's motto states, "Kami Memimpin" or "We Lead", and it is our aspiration that CGSS will pave a clearer path for USM to lead its way to a sustainable future. Finally, I would like to thank the 'Sustainability Team' and Prof. K. Koshy in particular, for a job well done.

Prof. Emeritus Dato' Dr. Zakri A. Hamid  
Director, Former  
Centre for Global Sustainability Studies  
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# Acknowledgement

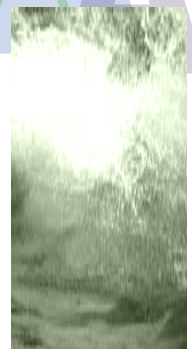
This set of Fact Sheets is the result of the collaborative and proactive dialogue that started during the first half of 2009 when the USM-Sustainability Task Force, chaired by Professor A. H. Zakri, Director, Centre for Global Sustainability Studies, initiated discussions for the development of a roadmap for the university's sustainability transformation under its APEX mandate.

The main challenge for the Task Force was to identify and prioritise sustainability issues to be addressed by USM and to come up with practical methods to address these challenges in multidisciplinary and innovative ways. This required a careful search of USM sources, the extensive sustainability literature, websites of UN system bodies and global change networks, outcomes of major international summits - especially the United Nations Conference on Environment and Development (UNCED, 2002) and the World Summit on Sustainable Development (WSSD, 2002), numerous booklets and brochures from global change networks and conference proceedings. The wealth of information generated was summarised into these Fact Sheets to be used as a resource material for awareness and capacity building both within and outside the university, with no profit making motive in mind. The style used is one usually found in newspaper articles and

information sheets and as such specific references are not provided. However, I would like to gratefully acknowledge the organisations listed above, their publications and the authors who remain anonymous.

I would also like to acknowledge all the members of the Sustainability Task Force and the CGSS@USM administrative staff for their support and cooperation, Mohamad Zaidi Jaini of Corporate and Sustainable Development Division for the professional graphics; Dayaneetha De Silva, Publishing and editorial consultant, for her editorial services; Nor Aini Ali of the School of Languages, Literacies and Translations for her translation of the English version to Bahasa Malaysia; Png Soo Hean and his staff at P&Y Design Network for layout design and printing; Centre for Global Sustainability Studies, USM, for financing the project and all others who have assisted in one way or another to make this project a success.

Professor Kanayathu C Koshy  
Coordinator, Fact Sheet Project  
Centre for Global Sustainability Studies,  
Universiti Sains Malaysia



# USM – the APEX University



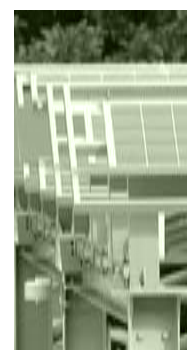
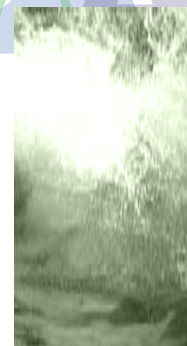
**Universiti Sains Malaysia (USM) was chosen in 2008 as the sole recipient of the Accelerated Programme for Excellence (APEX) award.** The Ministry of Higher Education (MOHE) made the announcement on the 3<sup>rd</sup> of September 2008, based on USM's track record, its plan for transforming higher education for a sustainable tomorrow, and its level of preparedness for action. USM's readiness is evident in the quality and reputation of its academic staff, research achievements, relevant academic programmes, strong leadership and management, strategic partnerships with industry and other stakeholders and excellent infrastructure. The new status comes with increased educational, administrative and financial autonomy, and a new system of governance. With this award, the expectation is that USM will be among the world's top 100 universities in five years, and one of the top 50 by 2020.

**APEX is MOHE's initiative to stimulate Malaysian universities to attain world-class status.** MOHE's plan to generate graduates with first-rate minds is founded on five 'institutional pillars' and five 'critical agenda' programmes. The institutional pillars cover: Governance, Leadership, Academia, Teaching & learning, and Research & development. The 'critical agenda' comprises: APEX universities, My Brain15, Life-long learning, Academic performance audits, and Graduate training schemes. Of these, the focus for USM is the APEX agenda, which also means, according to MOHE, that we have to serve as a catalyst for bringing about systemic changes in other institutions. Modelled along similar

initiatives in Germany, Japan, Singapore, China, South Korea and Taiwan, APEX universities will be given the latitude to have the best staff, best students, best research facilities and excellent infrastructure needed to transform themselves into national centres of academic distinction. The graduates of these universities are expected to be on par with their counterparts in similar institutions anywhere in the world.

**USM has come of age with its APEX status.** Established in 1969, USM is celebrating its 40<sup>th</sup> anniversary this year, 2009. During this journey, the university has grown from dream to reality, and from promise to performance. With about 30,000 students spread across three campuses and 24 schools, USM is one of Malaysia's top universities. It has had remarkable achievements and was rated as the only 'excellent' (or 5-star) university in a 2006 survey. USM is one of four pioneer research and innovation universities, with the reputation of being the best overall university for its research contributions to the community. In the region, USM is also a leading institution in terms of its student-focused campus sustainability initiatives. In recognition of its contributions to education for sustainable development (ESD), the university was made one of the 7 Foundation RCEs (Regional Centre of Expertise for ESD) in Asia in 2005.

**USM's APEX vision is to be a world-class sustainability-led university.** Since 2000, USM has embraced ecological protection, conservation of resources and initiatives aimed at promoting campus well-being as a platform for its sustainability transformation. USM has also begun to refocus and retool its teaching, research and community engagements to meet sustainability standards. The university believes that education is the best means to bring about social change for sustainable development. Various modes of teaching and learning – formal, non-formal and informal – and flexible course delivery, will be used to enable this transformation. To be more dynamic and competitive, USM is adopting some ideas and approaches that have been successfully rolled out elsewhere. This includes the EU universities' Lisbon strategy, the United Nation's ESD principles and practices, and the 'Blue Ocean Strategy' (BOS), which derives from the business world.







Water



Energy



Health



Agriculture



Biodiversity



Population / Poverty



Production / Consumption



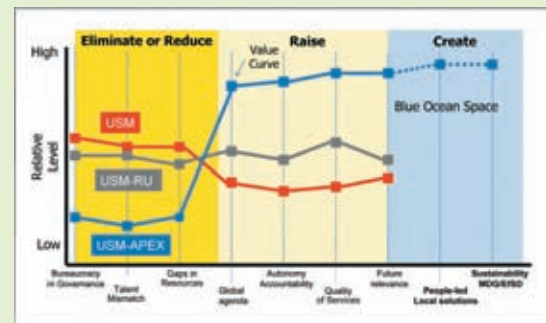
Climate change / Disasters

**USM adopts BOS as a major instrument for its sustainability transition.** In BOS, competition is made irrelevant by creating a leap for both the company and its customers through value innovation. Blue Ocean is also a metaphor to describe the wider and deeper potential of unexplored market space. While innovation is key to BOS, improving benefit-to-cost ratios is key to innovation and the terms *benefit* (e.g. effectiveness, profitability, safety, speed, pleasure, health, coolness, fun, etc) and *cost* (e.g. money, difficulty, skill level, physical pain, harm or risk, inconvenience, embarrassment, boredom, pollution, etc) assume broad meaning in this context. Innovation involves the creation and transformation of knowledge into new *products, processes* and *services* that meet market needs. If the last wave of innovation was related to digital networks, ICT and biotechnology, the next wave will be in the field of Sustainable Development – radical resource efficiency, renewable energy, whole system design, industrial ecology, nanotechnology, biomimicry, poverty alleviation and peaceful coexistence. In the USM context, this challenge requires a fusion of science and technology with the arts and humanities. Our products and services should reduce inequity and increase availability, affordability and accessibility to those who need them most – the bottom billion.



**The BOS Eliminate-Reduce-Raise-Create (ERRC) grid offers a particularly powerful tool for coming to grips with value innovation for integrating sustainability into all of USM's missions.** Aside from being a way to find uncontested 'market space', ERRC offers a way to carve out stronger competitive positions

within existing markets focusing on what needs to be *eliminated, reduced* or *raised*, while deciding what needs to be *created* to enter the blue ocean world. The red and the blue ocean spaces usually exist side by side and organisations have to increase competitiveness to stay successful in the red ocean and be innovative enough to move out to the blue ocean space as quickly as possible. USM has completed part of the difficult initial phase of charting out a transition during the development of its blue ocean blueprint – 'Transforming Higher Education for a Sustainable Tomorrow' (the 'black book') – and its implementation plans (the Bukit Merah and Vistana workshop reports) and the USM-APEX Sustainability Roadmap. The following **Figure** shows the general strategy canvas for USM; similar canvases have been developed for the seven thrust areas identified for its sustainability transformation: nurturing (teaching) and learning, research and innovation, services and external activities, students and alumni services, postgraduate studies, and concentrating talent and resources.



**In order to achieve the broad APEX vision, USM has embarked on a range of missions, the most important of which is the establishment of a Centre for Global Sustainability Studies (CGSS).** The Centre is expected to facilitate the mainstreaming of sustainability into the entire fabric of the university. In order to achieve this outcome, CGSS is designed to work with all other relevant sections of the University, regional and international sustainability organisations, national and regional governments, the private sector, civil society groups and NGOs, paying particular attention to the disempowered bottom billion.



# Sustainable Development: Antecedents, Definitions and Principles



The post-war era after 1945 was fuelled by a great desire for a peaceful world. The struggle to end imperialism to secure the *freedom* that ensures peace, democratic governance, human rights, and the rights of women, indigenous peoples and minorities were high on the agenda. The attainment of national independence by many former colonies was followed by a focus on *economic development*. It became obvious by the 1960s however, that the race for economic growth came at a high cost – that of a deteriorating global *environment*.

***Silent Spring* by Rachel Carson, published in 1962, is widely credited with helping to launch the environmental movement.** Carson's book drew attention to the impact of chemicals on the natural environment. Many such books connecting the adverse impacts of development on the environment were subsequently published worldwide in the 1970s and the 1980s, most notably, *Our Common Future* in 1987.

***Our Common Future* was the book version of the Brundtland Report, which argued that the 'environment' we live in and the 'development' that we do to improve our lot are inseparable.** The Report was named after the chairperson of

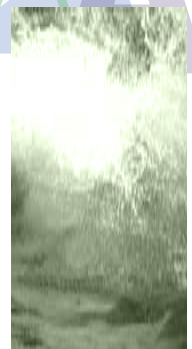
the UN World Commission on Environment and Development, then Norwegian prime minister Gro Harlem Brundtland. The Commission's roots were in the groundbreaking 1972 Stockholm Conference on the Human Environment – where the conflicts between the environment and development were first acknowledged globally. The Brundtland Report was the springboard for the next major international environmental meeting in Rio de Janeiro.

**The United Nations Conference on Environment and Development (UNCED, 1992, known as the Earth Summit) ignited a wildfire of interest in sustainable development.** The Declaration of Rio and its Agenda 21 action programme are now on everyone's agenda. While this is encouraging, the gap between the rich and the poor deepens daily, with about a billion people pushed to the bottom of the the world's resources and wealth.

**The Millennium Development Goals (MDGs, 2000) and the World Summit on Sustainable Development in Johannesburg (JPOI 2002), refocused global attention for action on the ground with a call to 'make it happen'.** While the debate on how we arrived at the current environmental predicament will continue, we need to seriously consider how we can get out of it. Global problems need global solutions and we have to act with extreme urgency, knowing full well that we are all in it together.

**Sustainable Development (SD) has been variously defined.** For targeted action, we need to understand what SD means. The Brundtland Report's 'Development that meets the needs of the present without compromising the ability of future generations to meet their own needs' is the most popular definition. Critics say that this is a reductionist way of simplifying a complex issue, making success hard to measure.

**There are many other working definitions of SD:** (i) a dynamic process enabling all people to realise their potential and improve their quality of life in ways which simultaneously protect and enhance the earth's life-support systems; (ii) development that meets human needs satisfactorily without





Water



Energy



Health



Agriculture



Biodiversity

Population /  
PovertyProduction /  
ConsumptionClimate change /  
Disasters

violating long-term natural resource capacities and standards of environmental quality and social equity; and (iii) development that is good for all, forever.

**As an evolving concept, SD may not be easy to define, but some effective explanations are possible:** (i) Environmentalists say that SD means living within the carrying capacity of the planet, leaving as small a footprint as possible; (ii) economists say that sustainability is living on the interest rather than the principal; and (iii) social scientists say that peace, justice and good governance are essential for sustainability.

**The lack of a precise definition is not an indication of SD's conceptual weakness.** Many concepts central to world civilisations such as democracy and equity are equally hard to define. What is important is that all definitions attempt to underline the importance of striking the necessary balance between our human need to improve lifestyles and well-being on the one hand, and the need to preserve natural resources and ecosystems, upon which we and future generations depend, on the other.

**Sustainable development requires therefore, a balance between economic growth, social development and environmental protection.** Underlying the *economic* dimension is the principle that society's welfare needs to be maximized and poverty eradicated. The *social* aspect relates to people, access to basic services in health, education, security, good governance,

human rights and maintenance of cultures. The *environmental* dimension is concerned with the integrity of bio-physical systems.

**The Rio Declaration on Environment and Development fleshes out the definition of sustainable development by listing 27 Principles which can be condensed to:**

**ECONOMY – Compatible with nature and human well-being.** Through improvements in management practices, technology, efficiency and lifestyle changes, all stakeholders shall work to ensure that economic development plans protect and/or enhance natural resources.

**ENVIRONMENT – Ecosystem's capacity to provide goods and services.** Environmental protection shall constitute an integral part of the development process with the understanding that we are living on a planet with finite resources. The integrity of ecosystems and biodiversity must be maintained and in order to protect the environment, this precautionary principle shall be used widely.

**EQUITY – Societal well-being for all.** Human beings are at the centre of concern for sustainable development. We are all entitled to equal access to jobs, education, natural resources and services to lead healthy and productive lives in harmony with nature. Eradicating poverty and reducing disparities in living standards between different parts of the world are essential to sustainable development.





# Sustainable Development: The Major Challenges



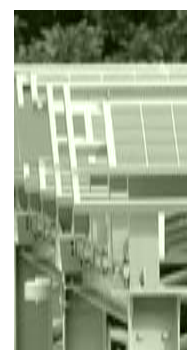
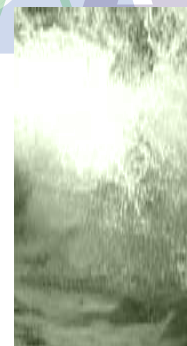
**The most pressing challenge is managing the various capital assets in a sustainable manner in the long term.** These assets include: *natural capital*: resources – renewable and non-renewable materials; sinks – that absorb, neutralise or recycle wastes, ecosystem and climatic processes; *human capital*: people's health, knowledge, skills and motivation; *social capital*: families, communities and service institutions, businesses, trade unions, educational institutions, and voluntary organisations; *manufactured capital*: infrastructure, technology, processes and material goods; and *financial capital*: plays an important role in the economy and represents the value of other forms of capital.

**For the short to mid-term, sustainability issues may be addressed in different ways depending on which aspect we choose to prioritise.** If living *within our environmental means* is the major concern, we should ensure that the ecosystem's goods and services are available for healthy and productive lives for both present and future generations. Likewise, to *Ensure a Progressive, Equitable and Healthy Society*, we need to promote a multicultural and multireligious

society based on social cohesion and inclusiveness. To *Achieve a Sustainable Economy*, efficient resource use must begin with eliminating unsustainable patterns of production and consumption. To *Enhance Sound Science–Policy Interactions*, we should ensure that relevant policies are developed and implemented on a scientific basis and to *Promote Good Governance*, effective and participatory systems of governance guided by transparency and accountability must be promoted. These challenges may be more broadly divided into three categories: sectoral, cross-sectoral and institutional.

**The UN has been promoting the following under 'Sectoral challenges': water, energy, health, agriculture and biodiversity (WEHAB).** Broadly, this would mean providing access to at least one billion people who lack clean drinking water and two billion people who lack proper sanitation, providing access to more than two billion people who lack modern energy services; promoting renewable energy and reducing over-consumption, addressing the effects of toxic and hazardous materials; reducing air pollution, which kills three million people each year, and lowering the incidence of treatable and lifestyle diseases; working to reverse land degradation, improving agricultural productivity and diversity; and reversing the processes that have destroyed almost half the world's tropical rainforests and mangroves, and are threatening 70 per cent of the world's coral reefs and decimating the world's fisheries.

**In addition to the above challenges, there are three sets of cross-sectoral issues, with multiple feedbacks on WEHAB, and all the three pillars of SD in general.** These cross-cutting issues are: (i) *Climate change and disaster risk management* – According to the fourth assessment report of the Inter-Governmental Panel on Climate Change (IPCC, AR4), warming of the climate system is unequivocal and climate change will have irreversible and long-lasting consequences. Heavier rainfall and shifts in rainfall patterns mean the increased likelihood of both flash floods and droughts. In a warming world the destructive potential of weather extremes is bound to increase in frequency and intensity; (ii) *Unsustainable Production and Consumption* – Resource-intensive production and consumption that deplete





Water



Energy



Health



Agriculture



Biodiversity



Population / Poverty



Production / Consumption



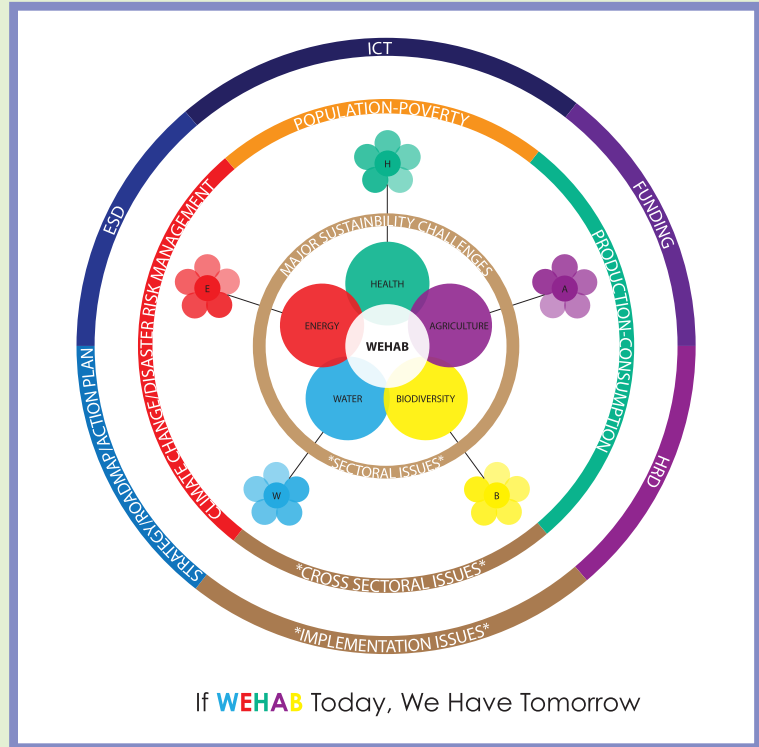
Climate change / Disasters

natural resources, generate waste and pollute the environment, tamper with biogeochemical cycles, and promote trade distortion need to be given particular attention as they impact the entire WEHAB sectors. Increasing eco-efficiency, cleaner production, enhancing corporate environmental and social responsibility are integral to sustainable production and consumption; and (iii) *Population and Poverty* – Nearly every other problem stems from overpopulation: we have close to 7 billion people on earth now and we are growing at a rate of 200,000 persons per day. The Millennium Development Goals are critical to sustainable development. The **Figure** on the right shows the inter connectedness of the 5 WEHAB and the 3 cross-sectoral (the 5+3 approach) issues.

**At the institutional level, the major SD challenge will be creating an enabling environment to ‘make it happen’.**

At the international level, capacity-building for SD and innovative approaches for financing SD implementation have gathered momentum. UNDP, UNEP, UNESCO, GEF and EU have been at the forefront for international HR development by financing training, encouraging technology transfer and supporting research. Many countries have pledged to promote a number of innovative financial arrangements such as increased ODA contributions (0.7 per cent of GDP), replenishment of GEF, debt swaps, private funding, carbon market, free and fair trading and other economic and fiscal incentives. There is, however, a disappointing mismatch between promise and performance. A World Sustainability Organisation (WSO, paralleling WHO and WTO), to accelerate

progress globally, has been talked about. Progress at individual institutional levels have been faster with the establishment of specialised centres for sustainability studies in universities, for example. ‘Systems make it possible, people make it happen’.



**There are significant drivers and barriers, both perceived and real, in terms of staff awareness, mindsets, expertise and institutional commitment to accelerating the embedding processes in the educational system.** There is a growing number of models for sustainability in higher education, which include: creating a space for sustainability through a rigorous review of existing curricula, developing credible teaching materials which are fully contextualised and consistent with the demands of each subject area, conducting innovative, relevant and targeted research, and significant investment in staff development and capacity-building.



# SD: the Asia-Pacific Context



Asia Pacific countries were an integral part of the Earth Summit (Rio 1992), which rallied the world around the concept of 'sustainable development'. The Summit, and the binding and non-binding agreements that resulted, focused on ways of protecting the planet from climate change, deforestation and species extinction. Although global awareness on SD has increased considerably and some progress has been made in its implementation, the consensus in the Asia Pacific is that too little has actually changed.

In preparation for the 2002 Earth Summit in Johannesburg (WSSD), Asia Pacific nations reviewed their post-Rio performance on a sub-regional basis. A number of sustainable development challenges were identified:

**Northeast Asia:** finance and technology, cooperative arrangements, natural resource management, education, land degradation, and biodiversity loss;

**Central Asia:** lack of implementation of multilateral environmental agreements (MEAs) and concerns relating to water, desertification and biodiversity, and natural resource use and management;

**South Asia:** poverty; overpopulation, conservation, economic growth, accountability, governance, global market access, and implementation of the Rio accords;

**Southeast Asia:** lack of capacity-building to integrate the three pillars of sustainable development, the lack of up-to-date data and statistics, the impacts

of globalisation, trade liberalisation, corruption and governance: and

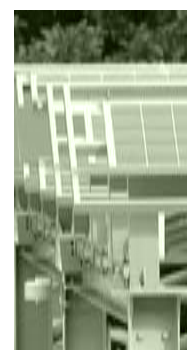
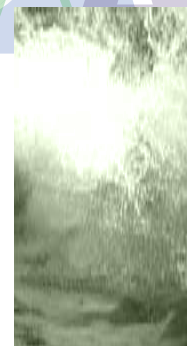
**South Pacific:** ocean management, climate change, insular vulnerability, energy, health and governance, capacity-building, and finance for sustainable development.

**Multilateral environmental agreements (MEAs) facilitated by UN and its related bodies are the primary means of advancing environmental cooperation and sustainable development.** The Asia Pacific nations are party to a broad range of MEAs, declarations and action programs, including the 1995 ASEAN Cooperation Plan on Transboundary Pollution and the 4<sup>th</sup> Ministerial Conference on Environment and Development in Asia and the Pacific (MECD), 2000. However, the MEA process – from negotiations to implementation – is a lengthy and involved exercise, which puts considerable strains on all developing country governments:

**Development of national positions for negotiations:** this takes into account the perspectives of a wide range of governmental agencies and other stakeholder groups. In Malaysia, the National Steering Committee for Environment and Development is the lead agency which formulates the national position.

**Framework to integrate international conventions:** legal and institutional measures required to implement accords: Signatories (Parties) of MEAs have legal obligations to implement commitments at the national level. This can include enacting laws (Indonesia), creating a steering committee (Malaysia), or setting up a legal and institutional framework (New Zealand).

**Experience with functioning of national committees for monitoring and enforcement and in benefiting from international commitments:** Monitoring and evaluation are integral parts of MEA implementation. National councils which will have responsibility for several MEAs may be set up (Fiji), National committees for specific MEAs (Malaysia/CITES, Convention on International Trade in Endangered Species of Wild Fauna and





Water



Energy



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Regional/subregional coordination related to the environment: There are a number of subregional organisations with broad MEA mandates, e.g. South Asia Cooperative Environment Programme (South Asia), Pacific regional Environment Programme (Pacific Islands), ASEAN Senior Officials on Environment (East and Southeast Asia).

**Asia Pacific countries have developed National Sustainable Development Strategies (NSDS) or their equivalents to implement MEAs within the context of their specific development priorities.**

Agenda 21 and JPOI called for the development of NSDS to establish a multi-stakeholder platform involving government, business and civil society for SD and MDG implementation. A precondition for a successful NSDS involves the development of the National Capacity Self Assessment (NCSA). Seventeen countries in the region are participating in NSDS and several more in NCSA facilitated by GEF, UNDP and UNEP.

**The 'Malaysia Plan' is the equivalent of NSDS for Malaysia.** The current ninth Malaysia Plan (2006–2010) represents the first of three such plans towards achieving 'Vision 2020'. The major thrusts of the ninth plan are: to move the economy up the value chain, enhance national capacity for knowledge and innovation and nurture citizens with a 'First Class Mentality', address socioeconomic disparities, enhance the level and quality of life, and strengthen Malaysia's institutional and implementation capacity.

**The plan asserts that Malaysia's most precious asset is its people. In order to be competitive in a globalising world and to become a knowledge-based economy, high quality 'human capital' has become a necessity, not merely a luxury.** Developing human capital means building capacity for and providing equal access to education and knowledge, enhancing science, technology and research, encouraging and rewarding innovation and creativity, and nurturing a multicultural society. Education, particularly higher education, has a key role to play in enabling our country to achieve these goals.

Universiti Sains Malaysia's APEX initiative therefore is conceived and implemented against this background.





# SD: A Science, Technology and Humanities Perspective



**Science, Technology and Innovation (STI) are instrumental in advancing civilisations and improving the quality of life.** Current examples include: health and sanitation improvements including access to clean water, life sciences research, which are undergoing a major revolution through genetics, biotechnology and biodiversity studies, innovative approaches in nanotechnology and industrial ecology, energy research, energy efficiency improvements, and increased use of renewable energy, development in marine and ocean sciences, integrated coastal management, and improved and integrated ways of waste management, pollution control and design for sustainability, the 'blue revolution' in agriculture that focuses on 'more crop per drop', and improved and predictive understanding of climate system changes and variability.

**The sciences should continue to play an increasing role in improving the efficiency of natural resource use and finding new development practices.** STI can provide this understanding through research into the underlying ecological processes and through the use of modern tools such as remote-sensing devices, robotics, computing and modelling capabilities.

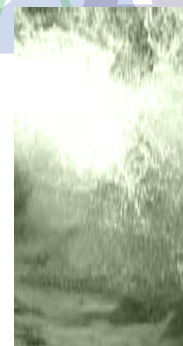
**However, there is a great imbalance when it comes to the accessibility and affordability of science and technology to address the basic needs of the poor and the socially excluded:** 20 per cent of the world's richest people account for 86 per cent of world consumption of energy and materials and the poorest 20 per cent account for only 1.3 per cent; 1.3 billion people live in abject poverty, subsisting on a daily income of less than \$1; 800 million people suffer from food insecurity; 1

billion suffer from water scarcity; and 2 billion people have no access to commercial energy. It has been estimated that the world's population will increase to 9–10 billion by 2050. This will immensely aggravate global sustainability challenges in this century.

**It therefore bears repeating that the most pressing issues facing the developing world today are poverty, hunger, disease, illiteracy and civil strife.** These problems are aggravated by the lack of access to education, employment, energy, food, healthcare, sanitation, shelter and water. It is imperative that Science, Engineering and Technology work on solutions to these grave problems. Even meeting the MDGs in the developing world will ultimately depend on the availability of scientifically skilled manpower and the technologies at their disposal – technology transfer from developed countries to developing countries being an integral part of this capacity component. The constant brain drain of scientists and technologists, usually the best and the brightest, to developed countries makes a bad situation even worse.



**The anchor of basic infrastructure services in any country is the indigenous engineering construction industry.** In developing countries, meeting the MDGs and achieving sustainability would entail the necessary development of infrastructure for housing, educational and healthcare facilities. More roads, ports and airports will be required to enable food, produce and products access to domestic, regional and overseas markets. Energy and water supply need to be made available to remote areas. ICT networks should cover most parts of the country.





Water



Energy



Health



Agriculture



Biodiversity



Population / Poverty



Production / Consumption



Climate change / Disasters

**Knowledge is power.** What it means in this context is that nations which have lagged behind during the Industrial Revolution can indeed be an integral part of the knowledge revolution because traditional economic concepts such as resource scarcity and economies of scale cease to apply here. The Knowledge Economy is based on creating, evaluating and trading knowledge, a precondition for which is globally significant human resource development.

### The Earth is one but the world is not.

Knowledge if applied without regard to overall well being can create this dichotomy. The centrality of humans and the role of the arts and social sciences – including literature and language, history, economics, geography, anthropology, philosophy – play in the whole endeavour towards sustainability and needs to be given much more emphasis than is being afforded now. The humanities cuts across disciplines, and offers deep reservoirs of knowledge, and intellectual and analytical depth to complex problems, while the arts offers much, including the creative power to understand paradoxes in ways that can bring meaning and purpose to our daily lives.

**‘... it is not the strongest of species that survive, nor the most intelligent, but the most responsive to change...’.** Charles Darwin.

Though Darwin was talking from an ecological perspective, this is equally true of the modern world and its sustainability pursuits. The Millennium Declaration and the Earth Charter call for a balanced response utilising knowledge and values in right proportions for sustainability.

### The UN Millennium Declaration in 2000 is founded on a core set of fundamental values essential to international and individual relations in the twenty-first century.

These include: Freedom; Equality; Solidarity; Tolerance; Respect for nature; and Shared responsibility. Values often invoke feelings, define or direct us to goals, frame our attitudes, and provide standards against which the behaviours of individuals and societies can be judged. Indeed the goals of sustainability transitions are all expressions of values. What is needed therefore, is a firm resolve

to celebrate life in ways that combine scientific and technological knowledge with human values and principles to achieve sustainability.

### The Earth Charter represents another value-based approach to sustainability by articulating that equitable human development, human rights, environmental protection, and peace are interdependent and indivisible

As a declaration of fundamental principles for building a just, sustainable and peaceful global society, the Earth Charter seeks to inspire in all people a new sense of shared responsibility for the well-being of the human family and the larger living world. The values of the Earth Charter are derived from contemporary science, international law, the teachings of indigenous peoples, the wisdom of the world's great religious and philosophical traditions, the declarations and reports of UN summit conferences, the global ethics movement, numerous non-governmental declarations and people's treaties, and best practices for building sustainable communities.





# Education for Sustainable Development (ESD)



**A Decade of Education for Sustainable Development (DESD) was launched by the United Nations in 2005.** The 'Decade of Education for Sustainable Development', (2005–2014) was launched on 1 March 2005 in New York with UNESCO serving as the lead agency.

**ESD is the mother of all international educational movements.** Since 2000, the governments of the world, together with United Nations agencies, have launched four initiatives which have a focus on education: (i) The Millennium Development Goals (MDGs) – target date 2015; Education for All (EFA) – target date 2015; The United Nations Literacy Decade (UNLD) – target date 2012; and the UNDESD – target date 2014. Although each is distinctive, these initiatives share in common the empowerment of people through education for a more meaningful and sustainable life. It may be said that DESD incorporates the educational goals of all the other global initiatives.

**ESD is a balancing act.** ESD can and should balance out the environment, the economy and the socio-cultural needs of society. This is however, easier said than done when profit motives and economic competition overrule other considerations, such as what might be good for the environment or desired by the people. Hence it is important to be precautionary and accept that economic goods and services absolutely depend on ecological and social goods and services.

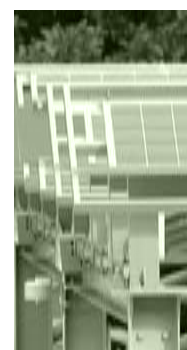
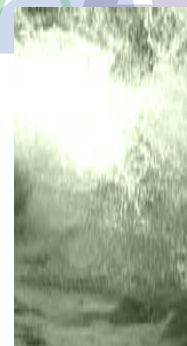
**ESD and EE are complementary.** Environmental Education has a rich and varied history, reaching back almost four decades and has always factored human well-being as an important element. Although terms such as ESD, education for sustainability (Efs), sustainability education and even EE are synonymously used, ESD is the terminology now used in global platforms and within UN documents when addressing the role education plays in promoting sustainable development. It is generally true that while EE focuses on environment, ESD focuses on sustainable development.

**ESD emphasises knowledge, skills, perspectives and value systems.** Education for Sustainable Development may be described as a continuous process that enables human beings to develop knowledge, skills, perspectives and values to motivate and empower people to work toward a balanced and sustainable lifestyle.

**A variety of stakeholders are important for ESD implementation.** Young and old, resource owners and users, policy-makers and implementers, producers and consumers, academic institutions and non-state actors, men and women alike, are all expected to play key roles in the implementation of ESD by using a variety of educational delivery modes – face to face and distance/flexible learning approaches. The emphasis here is on learning that leads to behavioural changes. Youth participation in ESD is critical.



**Indigenous knowledge and culture are very important for ESD.** Worldwide, there is increasing recognition of the intrinsic importance of indigenous knowledge and local cultures in sustainable development. Culture is defined as a way of life and includes language, accumulated knowledge and





Water



Energy



Health



Agriculture



Biodiversity

Population /  
PovertyProduction /  
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Disasters

understanding, and the values and beliefs that shape worldview. ESD efforts could be directed to protecting cultural diversity, promoting cultural industries (songs, dance, drama, etc), respecting intellectual property rights and encouraging public-private partnerships resulting in job creation and poverty reduction.

**A clear understanding of regional and national sustainable development challenges is essential for ESD implementation.** A host of issues such as poverty, gender, health, human rights, peace, cultural and linguistic diversity, rural/urban issues, trade, climate change and sea level rise, climate variability and extreme events, biological diversity, energy, and cross-cutting issues such as globalisation, governance and security, and ICT are found to have considerable impact on sustainable development in all regions. ESD should therefore build capacity to address these issues as they affect human welfare.

**Formal, non-formal, and informal educational approaches are important for the promotion of ESD.** Because ESD is a life-long process, the formal, non-formal, and informal educational sectors should work together to accomplish local sustainability goals. For any community or nation, implementing ESD is a huge task. Fortunately, formal education (based on curriculum, assessments and formal qualifications) does not carry this pedagogic responsibility alone. The non-formal educational sector (e.g. nature centres, museums, non-governmental

organisations, public health educators, and agricultural extension officers and learning environments provided by seminars, workshops, special training, outreach, networking, etc – usually with no formal accreditation) and the informal educational sector (e.g. radio, TV, the Internet, print, oral communications, or chance education in general) also share responsibilities. Reorientating the curriculum is key to ESD promotion. Reorienting education requires teaching and learning that guides and motivates people to pursue sustainable livelihoods, to participate in a democratic society, and to live in a sustainable manner. ESD is not about doing very different things but about doing things very differently in a more pragmatic way. Thus, a holistic, value-laden, action-oriented education is essential to generate 'positive societal transformation'.

**Essential to ESD are the following skills:**

*Envisioning* – being able to imagine a better future. The premise is that if we know where we want to go, we will be better able to work out how to get there. *Critical thinking and reflection* – learning to question our current belief systems and to recognise the assumptions underlying our knowledge, perspectives and opinions. *Systemic thinking* – acknowledging complexities and looking for links and synergies when trying to find solutions to problems. *Building partnerships* – promoting dialogue and negotiation, learning to work together. *Participation in decision-making* – empowering people.





# SD-ESD: From Compliance to Commitment



There has been a rapid increase in the number of international SD-ESD agreements in recent decades. The effectiveness of these agreements however, require not simply adoption but full implementation. Given the proliferation of multilateral environmental agreements (MEAs) aimed at promoting SD, it is essential that governments and other stakeholders work to transform their international obligations into national and local commitments and action.

Developing countries are often overwhelmed by this proliferation of MEAs, with their varied reporting obligations and implementation requirements. Most Asia Pacific countries have responded by adopting an integrated approach, which capitalises on synergies, minimises conflicts and considers trade-offs. The ASEAN enforcement network on CITES is a good model of this. An integrated implementation approach also helps to prioritise and mainstream MEAs within national SD strategies.

Asia Pacific countries are on the whole making slow progress vis-à-vis the MDGs. A joint UN-ESCAP, ADB and UNDP report, 'A Future Within Reach' (2008) provides the key indicators:

**Poverty:** The region has successfully reduced the proportion of people living on less than a US\$1/ day from 31 to 17 per cent, despite population growth.

**Maternal mortality:** The ratio has improved slightly from 395 deaths per 100,000 in 1990 to

300 in 2000. Yet some 250,000 women die each year during childbirth or from pregnancy related complications.

**Water and sanitation:** Here the region performs poorly, and is only about 50 per cent on track.

**Education:** This is one of the region's success stories – the net primary enrolment is above 90 per cent. Completion rates are less impressive.

**Health:** HIV/AIDS remains a major threat.

**Global cooperation:** more official development assistance (ODA), international trade and youth employment are needed – progress has been very slow.

## An Asia Pacific preparatory roundtable for WSSD 2002 in Kuala Lumpur summarised SD implementation in the region:

Absolute poverty is decreasing but income inequality has increased.

Rapid economic development has spurred the growth of megacities with their associated problems.

The Small Island Developing States in the region are very vulnerable to a host of natural and anthropogenic disasters, in particular, to the effects of climate change.

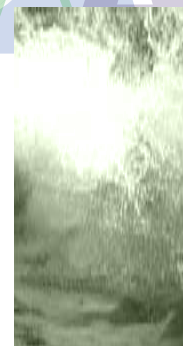
'National Agenda 21' or 'Green Vision 21' statements and corporate social responsibility moves in about 26 countries have resulted in more green businesses.

Non-state actors have emerged as an important factor in the promotion of SD.

SD needs to be financed strategically through external fund flows, new domestic fiscal resources and by innovative mechanisms.

Food and energy security continue to be daunting challenges.

Environmentally sound technologies – for production efficiency, waste minimisation, access and affordability – need to be transferred from developed to developing countries.





Water



Energy



Health



Agriculture



Biodiversity

Population /  
PovertyProduction /  
ConsumptionClimate change /  
Disasters

**The potential of adverse natural phenomena to become disasters is increasing due to anthropogenic factors, which are intensifying the frequency, ferocity and impact of these events.** Disaster risk management is being treated as a crucial component of national development and poverty alleviation by all governments, aid agencies and the research community in the region. One example of the recognition of the importance of DRM is the setting up of the Indian Ocean Tsunami Warning System.

#### **Education is the focus of four major global initiatives launched since 2000:**

The Millennium Development Goals (MDG) – eight goals with a target date of 2015

Education for all (EFA) – six goals with a target date of 2015

The United Nations Literacy Decade (UNLD) – from 2003 to 2012

The United Nations Decade of Education for Sustainable Development (ESD) – from 2005 to 2014

Although each has a distinct focus, these initiatives share much in common in terms of their ideals as well as broad goals. It is important that these similarities and overlaps are understood by those responsible for implementing these agreements, and that effective linkages and synergies develop between implementing agencies to maximise the impact of these initiatives as well as reduce wasteful duplication.

**USM's commitment to mainstream sustainability (SD-ESD) into the fabric of its activities has begun with the APEX initiative and the setting up of a Centre for Global Sustainability Studies (CGSS).** The key roles of CGSS are to:

Play the role of a catalyst in facilitating interdisciplinary and multidisciplinary initiatives needed for promoting sustainability studies

Contribute to teaching and research-based capacity building, particularly in Malaysia and other developing countries, focusing on individual, international and systemic concerns

Internalise the power or principles and practices of ESD as the best means for building capacity and changing mindsets necessary for the sustainability transition envisioned by USM-APEX

Serve as a forum for dialogue and new ideas

Serve as a hub for the international scholar community

Serve as a bridge between the national as well as international academic community on one hand and policy-makers, the corporate sector and civil society on the other.

Promote synergy by consciously avoiding duplication, filling gaps and promoting team spirit

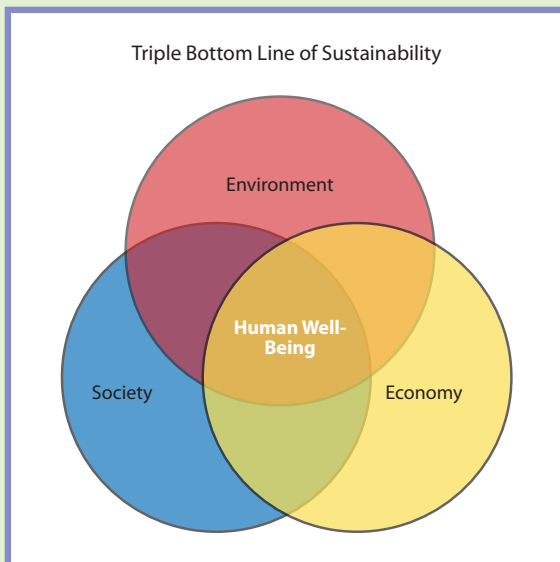
Carefully profile and position the Centre to become a leader in SD/ESD matters at a variety of levels.





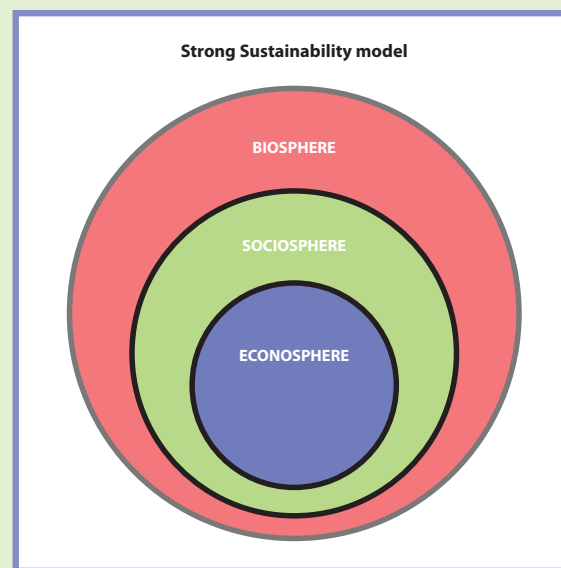
# SD-ESD Integration in Higher Educational Institutions

**Education for Sustainable Development (ESD) offers the best integrated pathway for sustainability in Universities.** With large pools of disciplinary experts, high quality research facilities, excellent infrastructure and students with varied academic interests, universities have a considerable comparative advantage in promoting sustainability in their communities. Sustainable development being a very complex process, has no standard recipe for the whole world. Universities, with their core functions as seekers of truth, knowledge and innovation, have a profound role to play in developing students' capacity to adaptively manage a changing world.



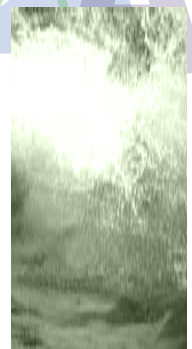
**In most global discourses on Sustainable Development (SD) or sustainability, a 'Triple Bottom Line' model has gained considerable currency.** If the three components of SD – environment, economy and society – are considered to be three overlapping circles of equal size, the area of overlap in the centre may be seen to represent the extent of sustainability or human well-being. As the circles become more aligned, the area of overlap increases and so does sustainability (Figure above). Rather than assuming unrealistically that it is possible to achieve increasing economic growth as long as the other circles keep growing, the diagram must be understood as a way of asserting the need to strike a balance between economic, environmental and social outcomes. The limits set by the environment on economy and society should never be ignored.

**A somewhat similar approach is seen in the 'Three Pillar Model or Three-legged Stool' Model of SD.** Here the image may be different, with the three legs being all of the same size for stability. While the model explains the equality of the pillars, the environmental limits seem to have been overlooked.



**The 'strong sustainability model' advocates a hierarchical relation of the three spheres.** In this model (Figure above) the circles are one inside the other with the environment (biosphere) outside. Society is seen as a subset of the biosphere and economy is merely a subsystem of human society. Without the biosphere, the other components do not exist. While this model provides a better sense of the relationships between the three components, it is seen as an ecologist's vision of sustainability, which grossly underestimates social and economic innovation possibilities. Such innovations may well have the potential to reduce human impacts on the environment to what might just be within the planet's carrying capacity. But this requires a radical change in conventional business goals, models and operations.

**A university's activities are usually categorised under Teaching, Research and Community engagement (also called the 'Triple Bottom Missions').** These missions have several dimensions. For example, *Teaching* includes formal, non-formal and informal approaches and different modes of delivery such as face to face, distance education, and





Water



Energy



Health



Agriculture



Biodiversity

Population /  
PovertyProduction /  
ConsumptionClimate change /  
Disasters

online learning, the emphasis being mainly on the learner as opposed to the teacher-focused 'chalk and talk' approach. Similarly, *Research* implies both the fundamental and applied (and action research), with innovation and marketing forming an integral part. *Community engagement* may include both the university community and the wider community outside – urban or village communities, industrial community, business community, policy community, all kinds of networks and project partners. ESD can only happen within this holistic educational framework.

**We may represent the triple bottom missions of ESD as overlapping circles, akin to the Venn diagram for SD, in order to illustrate their similarities and differences.** In this case, the space at the centre of the circles is seen as the degree of integration or the extent of the mainstreaming of sustainability in an institution.

**The institutional pillar, sometimes considered to be the fourth component of SD or ESD, is the ever present glue that provides system stability.** The institutional component comprises mainly the top management and other administrators, the constitution, strategies, policies, committees, infrastructure, utilities and finances, or simply put, the entire corporate system that provides the overall enabling environment within which the other three components can operate efficiently.

**The integration of sustainability into the core of a university's business means a whole system enterprise that links major sustainability challenges on one hand with different educational approaches on the other.** The sustainability challenges have to be selected very judiciously by each institution. While economic progress is critical for the disadvantaged, ecological protection may be the priority for the more affluent. However, there are certain sectoral considerations which are universal. These were highlighted during the World Summit on Sustainable Development (WSSD, Johannesburg, 2002) through the acronym, WEHAB (water, energy, health, agriculture, biodiversity) with the understanding that there are cross-sectoral issues such as climate change; unsustainable production, consumption and pollution; and escalating population, poverty and equity issues that impact

the WEHAB sectors. There are also additional implementation challenges associated with ICT, governance, security, and trade and finance (Fact Sheet 3, Page 2, **Figure**). Each of these factors has to be woven systematically and deliberately into the entire fabric of the university as part of any initiative for mainstreaming sustainability. (**Figure** below)

**The graduates of such an institution will leave thinking and acting like sustainability**



**champions.** A university that dares to journey the less travelled road to sustainability, integrating the principles and practices of ESD, will have a lot of synergies both internally and externally. Internally, its research will generate new knowledge to support its teaching and training while at the same time finding solutions to campus sustainability problems; its teaching pillar will strengthen research by providing high quality future researchers and participate in student-led sustainability initiatives on campus; and its community engagements will raise credibility in the learning environment by providing students with the opportunity to get involved in hands-on projects while creating piloting and prototyping opportunities for campus researchers. As this is happening internally, the external society benefits even more through well-trained professionals with the right mindset for action, research-based methodologies and solutions to major sustainability problems, innovative ideas that can be marketed and well-piloted micro-scale projects, with high potential for replication, likely to alleviate some of the immediate sustainability challenges of the bottom billion.

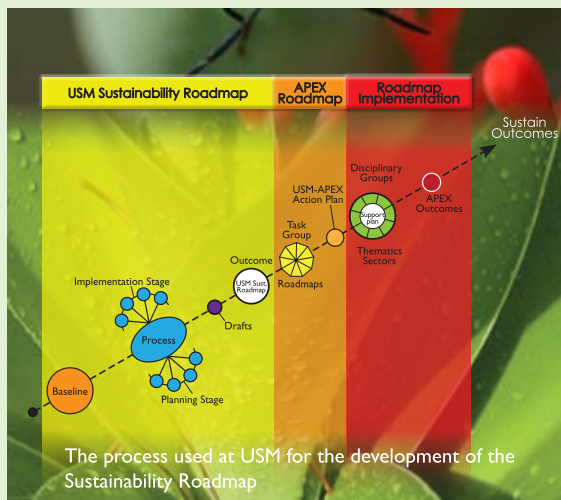
# Sustainability Mainstreaming at USM

Universiti Sains Malaysia's sustainability implementation programs should help achieve its APEX vision: 'Higher Education for a Sustainable Tomorrow'. In practice, this translates into making the University a world-class institution that provides high quality education through innovative teaching, research and community engagement, enabling a wider cross-section of students to become outstanding global citizens who have the capacity and mindset to address the pressing sustainability challenges of Malaysia and the developing world, in particular, those of the 'bottom billion'.

**USM aims to achieve this vision through the following strategies:** Integrated education; Knowledge, Skills, Perspectives and Values for sustainability; Institutional accountability; Enterprise and partnership; Skills-mix; Financing; Societal interaction; New markets; a Global outlook; and Excellence.

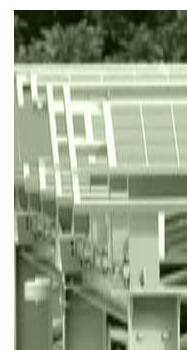
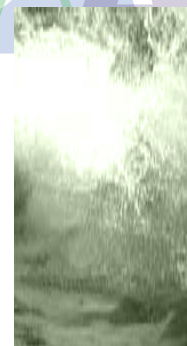
**USM's APEX implementation strategy and action plans are detailed in the university documents:** *'Transforming Higher Education for a Sustainable Tomorrow'*, *Bukit Merah and Vistana Workshop Reports* and the *USM-APEX Sustainability Roadmap*. In the short term, the emphasis will be on 'early wins'. For the mid to long-term, the plans cater for the re-evaluation and reorientation of the university's entire mission areas – teaching, research, community engagement and institutional arrangements – to improve efficiency, enhance relevance and increase competitiveness.

**The USM-APEX Sustainability Roadmap attempts to integrate all activities of the university to achieve two major goals: (i) to be a university world-renowned for sustainability (ii) to be a sustainability-led university.** In order to achieve these goals, a two-pronged approach will be required – one which focuses on the major global sustainability challenges and the other on campus sustainability. The first approach will build capacity at the individual, institutional and systemic levels to produce graduates who are equipped to address the sustainability challenges facing their communities and the world at large. The second will provide hands on practicum, piloting and prototyping experiences to students and staff alike to 'walk the talk' and to lead by example.



**USM's current 'strengths' are an excellent starting point for its sustainability journey.** Preliminary SWOT and situation analysis showed that USM has been consciously factoring sustainability into a variety of areas including: Geophysics and Biophysics, Engineering and Design, Society, Economics and Governance, Health and Medicine, and Arts and Humanities. The analysis revealed that there are 65 courses on offer and 99 research projects completed during the last 9 years that are distinctly sustainability-related. USM's outreach and networking portfolio was also found to be impressive, with 275 MOUs with a host of institutions in nearly 30 countries.

**The Sustainability Roadmap of the University clearly explains how to get from 'here' to 'there'.** The university's strategy to achieve its APEX vision is captured in the symbolic 'Sustainability-tree' roadmap (Figure on Page 2). This is designed to fit the spirit of USM's metaphor of being 'a University in a Garden' that nurtures 'seeds' to sprout, grow, bloom and bear fruit, symbiotically and synergistically. The Roadmap describes a strategy and direction for USM to move from its current strengths to the apex, via the *sustainability highway*. The map shows that USM plans to adopt two parallel approaches to sustainability: (i) integration of global sustainability challenges, and (ii) implementation of campus sustainability measures. The global sustainability focus is captured in the Roadmap through the UN-publicised WEHAB approach and the associated cross-sectoral areas – CC/P-C/P-P - (see Fact Sheet 3, Page 2). In embarking on this course, USM has no illusion that it is going to be an easy or a quick journey. The conviction that







Water



Energy



Health



Agriculture



Biodiversity



Population / Poverty



Production / Consumption



Climate change / Disasters

the prospects of success far outweigh the perils inherent in the journey is one of its major driving forces.

**In order to implement the USM Roadmap, each section of the university should have a separate support strategy and action plan.** It means that different players will adopt slightly different implementation modes that are suited to their circumstances. This does not necessarily constitute a conflict.



**Should we have separate courses and programs or an integrated perspective throughout the education cycle? The answer is that both are needed!** We need both disciplinary depth and inter/multidisciplinary breadth to understand and manage an endeavour as diverse and all-encompassing as SD. Many current SD courses at universities have an environmental focus – this needs to be balanced with the social and economic aspects of sustainability.

**While much has been written on education and pedagogy, the role that university research can play in achieving a sustainable society has largely been neglected.** Research

for Sustainability refers to any research that is directed at advancing our ability to incorporate sustainability concepts and insights into areas such as: policy, planning, and administration; curriculum/teaching; research and scholarship; service to communities; student life; and physical operations/infrastructure. Sustainability transition is more a process than a product; once set in motion within the existing structures in most modern and proactive universities, it will result in the overall capacity enhancement needed to lead us towards a sustainable tomorrow.

**Sustainability is a very broad and complex issue which will end up fragmented in different departments if it is not centrally coordinated and actively facilitated.** At USM the Centre for Global Sustainability Studies (CGSS) is envisioned as the conduit between science, policy, and innovation. The Centre will strive to forge and promote dialogue between the scientific community and policymakers to formulate better national policies, strategies, and programs, thus enabling the university as a whole to display an increased measure of corporate and social responsiveness in the interests of public good as well as global sustainability. As an integral part of the University, CGSS will:

teach specialised sustainability topics which it will require delivered in the most flexible modes in order to reach out to the usually unreached

conduct research specifically addressing sustainability issues and policy matters, and

promote networks and partnerships to improve USM's connectivity and positive impact on the community.

**CGSS will by design avoid unnecessary and costly duplication, fill gaps, and promote synergy.** In the complex exercise of sustainability mainstreaming at USM, a dedicated Centre to coordinate efforts is an absolute necessity as demonstrated by many other universities globally.

# Sustainability Monitoring and Evaluation at USM



## Monitoring and evaluation (M&E) are an integral part of any project cycle management.

M&E must be a continuous process, from start to end, to show how well a project is meeting its targets and the overall goal. M&E is sometimes extended to include a short post-project period beyond the completion of the final project report and external review. Good monitoring alerts project managers to emerging problems and provides valuable feedback to project planners, financial partners and implementers.

**A project that has been carefully planned and executed will be easy to monitor.** A Problem Tree-Objective Tree approach is often used for planning major projects. The European Union's EDULINK manual presents the example of a restaurant with business that is not profitable. The major contributing factors were: *too few customers* and *no return customers*. It turned out that there were too few customers because the restaurant was not known, and the reason for this was traced to the lack of publicity. The owner worked backwards, starting from the last identified problem, with interventions aimed at changing all the 'negatives' to 'positives'. The course of action involved placing yellow page advertisements, which made the restaurant better known, thus bringing in more customers and eventually, the business became profitable. Similarly, the second major problem of *no return customers* was addressed, by solving the lower level problems first and working up. There is a parallel here for us: at USM, the problem to be solved is that 'sustainability is not mainstreamed fully' throughout the university. A

Problem Tree-Objective Tree approach, implemented comprehensively, should result in sustainability being mainstreamed fully at all levels.

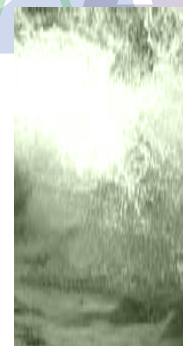
**Logframes make project planning more strategic and issues-based.** A properly prepared Logical Framework Matrix constitutes the basic structure for the entire project, be it the revision of an existing course in a School or a major proposal by a Research Cluster. The Logframe is a complete summary of the project proposal which mirrors the entire description of the action with specific objectives, strategy, action plan, activities, responsibility, expected results, verifiable indicators, timeline and assumptions.

**All Logframes call for SMART indicators.** SMART indicators are: S=Specific, M=Measurable, A=Attainable, R=Realistic and T=Time-bound. An indicator is a variable that provides a simple and reliable means to measure achievement or change connected to an intervention. Indicators must have a lock and key relationship with the goals and targets of the project. The sources of verification for the indicators are critical because if such information or data cannot be obtained, the indicator becomes useless.



## There are different types of Indicators for different periods in the lifetime of a project.

Three such important periods and their associated indicators are: (i) *short-term* – baseline, process, and drivers indicators, (ii) *mid-term* – response, action, and result indicators, and (iii) *long-term* – outcome or impact indicators.





Water



Energy



Health



Agriculture



Biodiversity



Population / Poverty



Production / Consumption



Climate change / Disasters

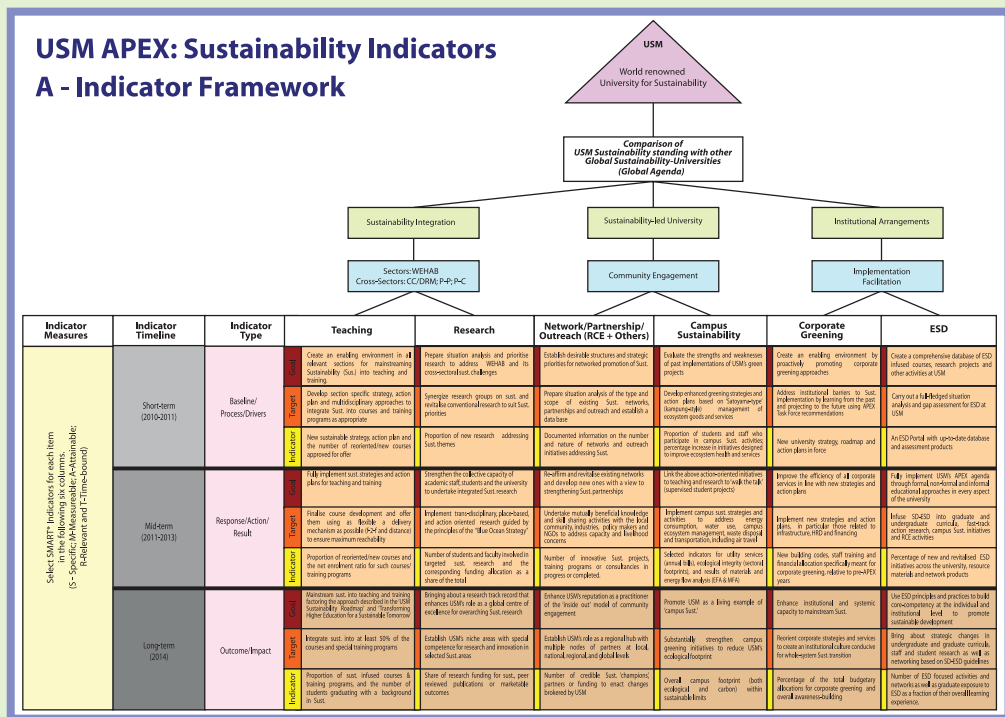
**Indicators of sustainability differ from traditional indicators of economic, social and environmental change.** While traditional indicators measure changes in only one part of the pillar areas of sustainability, as thought it is entirely independent, sustainability indicators require an integrated view of change. For example, Gross Domestic Product (GDP) measures only the amount of economic activity in a country, whereas the Index of Sustainable Economic Welfare (ISEW) makes adjustments to GDP to reflect the harmful effects of economic activities on the country's environment and society.

**In the case of USM, the sustainability indicators must address the priorities highlighted in the Sustainability Roadmap.** The *Indicator Framework* (Figure below) is designed to show the 'headline indicators' that go with the main goals for WEHAB and its cross-sectoral areas as described in the roadmap while the *Indicator Worksheets* ([www.usm.my/cgss](http://www.usm.my/cgss)) for 'Teaching', 'Research', 'Community Engagement', and 'Institutional Arrangements' described in the roadmap are intended to show supplementary indicators as they relate to the various activities to be carried out under APEX. In an area such as sustainability, the indicators will be as varied as the

specific activities they monitor. If preferred, these indicators may be regrouped as KPIs and KIPs to be consistent with the existing practice at USM.

**The indicators may be direct or indirect depending on the objectives being measured.** In developing sustainability indicators, the biggest problem is that the best indicators are those for which data is not usually available and where there is data, these are the least able to measure sustainability. Depending on data availability-direct, proxy, or interim indicators may be used, taking care not to compromise the quality of the results.

**Apart from providing valuable information about the rate at which sustainability is being integrated throughout USM, such indicators may also be used for rating or ranking other universities as appropriate.** The primary objective of a well-planned and tested set of indicators in our case is to rate the overall sustainability performance of USM. At the same time, these indicators also have the potential to form the basis for an alternate university rating or ranking system, better-suited for sustainability-driven universities, in a much wider global context.



(Please refer to [www.usm.my/cgss](http://www.usm.my/cgss))



# SD-ESD: Success Stories



**Success stories provide inspiration, models and lessons, are good to emulate, and amenable to replication.** They include creative initiatives which have a demonstrable effect and provide a tangible impact on improving people's knowledge and quality of life. While no two situations or places are alike and hence replication does not guarantee success, 'good or best' practices usually maximise the drivers and minimise barriers to achieving desired goals in innovative ways. In the SD-ESD context, these are socially, culturally, economically and environmentally sustainable projects, programs, teaching and learning processes, or new and creative solutions to community problems, which have met or are in the process of meeting their objectives.

**Governments, public and private sector agencies, NGOs, international organisations, higher educational institutions and various SD stakeholders have success stories to tell.** These come in different sizes and shapes: solar PV-based rural electrification, innovative strategies for supply and demand side management of the energy sector, cultural performances to raise environmental awareness, poverty alleviation initiatives through microfinance, sanitation and healthcare, creative natural resource management and technological improvements, to mention a few.

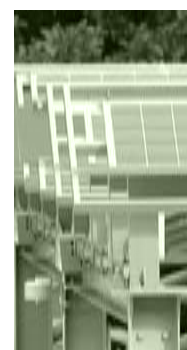
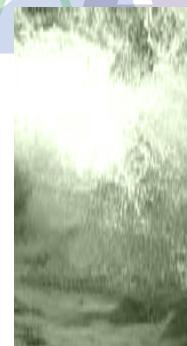
**Sustainable forest 'management and biodiversity conservation' is Sabah's success story.** Despite rapid land development since independence in 1963, about 60 per cent of Sabah's land is under natural forest cover. On the basis of

reduced impact logging (RIL), the Malaysia-German Deramakot Forest Reserve Project (1989–2000) has managed timber harvesting that is compatible with wildlife management. This project has received certification from the Forest Stewardship Council as a 'well managed forest', following which, the state government has brought another 466,000 hectares under the sustainable forest management model.

**Over the past two decades, Australian federal and state governments and businesses have introduced several initiatives to facilitate the adoption of new rural electrification technology, particularly renewable energy technologies.** The following initiatives were undertaken to facilitate the adoption of new renewable energy technologies by rural communities: demonstration projects (including solar and wind power for telephone and electricity services); development of training and standards; introduction of innovative renewable technology to remote areas (including hybrid technologies); diesel replacement in remote areas; electricity market reform; and access to finance. These initiatives have led to the supply of renewable energy power to 8,000 remote households for lighting, entertainment and refrigeration, whilst the telecommunications industry successfully provides 10,000 remote households with a solarpowered, microwave-based telephone system.

**WanSmol Bag (One Small Bag) is an indigenous theatre group from Vanuatu that produces plays and runs participatory workshops to increase awareness of social issues like HIV/AIDS, corruption and domestic violence, and the environment and development.** Established in 1989, WSB started as a travelling troupe and all the props were produced from 'one small bag'. It is now an NGO, known all over the Pacific, including Australia and New Zealand, for its creative development theatre and commitment to increasing the adoption of socially and environmentally responsible practices by individuals and communities.

**The Golden Hope oil palm company in Malaysia integrates environmental health, economic profitability and social responsibility in managing its 30-million-tree industry.** This is achieved through zero burning in replanting,





Water



Energy



Health



Agriculture



Biodiversity

Population /  
PovertyProduction /  
ConsumptionClimate change /  
Disasters

generating biogas from mill effluent, using shells and fibre for boiler fuel, composting using bacteria, construction of land terracing, and by providing welfare measures for its employees.

### Universities are not far behind in having sustainability visions and success stories.

The Technical University of Catalonia (Universitat Politècnica de Catalunya, Spain, UPC) is a case in point. UPC has moved from a ten-year institutional maturation from an initial 'greening' perspective towards a proactive sustainable development paradigm. Since 1996, the institution has developed and implemented two environmental plans (1996-2001 and 2002-2005), which have integrated research, education and operations in a comprehensive strategy. The weakness perhaps was the lack of a vibrant community component. The current strategic plan of UPC includes clear goals to improve its interaction with all stakeholders. One initiative that aims to fulfill this goal is the Regional Centre of Expertise (RCE)-Barcelona, established in 2005.

### The journey towards SD started in 1995 at the Monterrey Institute of Technology, Mexico.

Tecnológico de Monterrey (Tec) is committed to sustainable development, and manifests this commitment in all of its activities by promoting a balance between economic, social and environmental factors, over time. This commitment translates into six action items: weaving SD concepts throughout the courses and curricula at the undergraduate and graduate levels; performing campus operations based on sustainability criteria; ensuring that sustainability is incorporated, as the contextual framework, for disciplinary and multidisciplinary research; coordinating and integrating Tec's Societal Outreach, among Mexican and Latin American societies; preparing and disseminating regular reports of Tec's SD programs and progress and supporting high level conferences on conservation and sustainable development, twice a year, in

coordination with the Mexican National Secretary of Environment and Natural Resources.

### Founded in 1999, the Sierra Youth Coalition of Canada (SYC) is the most extensive North American network of campuses working for sustainability.

SYC is a Canadian leader developing expertise, tools, and resources on campus sustainability (NAAEE Award 2006). The most comprehensive *Campus Sustainability Assessment Framework* (CSAF) available was developed by this organisation. The Standards of good practice according to SYC are: governance and administration (sustainability strategy); research and scholarship (endowed chair, research centre); curriculum and student opportunities (formal and informal); operations (sust-office, climate neutral); faculty and staff development (tenure and promotion, rewards); and community outreach and service (university-community partnership/s).



### Judged against best practices elsewhere, USM is well on its way to excellence in sustainability integration and innovation.

Our achievements in Kampus Sejahtera (Healthy Campus), Rapid diagnostic test kits for typhoid and cholera, green fuel from palm oil waste, the 'Going Bananas' community project, RCE-Penang, CETREE, Wetlands ecosystem health initiative and above all, our APEX status, are second to none in planning, innovation and execution. The challenge is, we need more of such achievements.

# Green Growth and Green Jobs



The notion of 'green jobs' has become something of an emblem of a more sustainable economy. Green jobs hold the promise that we will be able to bring about economic progress while maintaining environmental integrity and providing decent work in the face of rapid population growth and the current exclusion of over a billion people from economic and social development.

The ILO defines decent work as opportunities for women and men to obtain productive work in civilised conditions of freedom, equity, security and human dignity. Decent work sums up everyone's aspirations for opportunity and income; rights, voice and recognition; for family stability and personal development; for fairness and gender equality. Ultimately, these various dimensions of decent work underpin peace in communities and society. Decent work is central to poverty-reduction efforts, and is a means for achieving equitable, inclusive and sustainable development.

Green jobs play a crucial role in reducing the environmental footprint of economic activities. The working definition paints a broad stroke: a job that's good for the economy while simultaneously healing the earth. Green jobs reduce the environmental impact of enterprises and economic sectors, ultimately to levels that are sustainable. Green jobs are found in many sectors of the economy from energy supply to recycling and from agriculture and construction to transportation. They help to cut the consumption of energy, raw materials and water through high-efficiency strategies, to de-carbonise the economy and reduce greenhouse gas emissions, minimise or avoid all

forms of waste and pollution, to protect and restore ecosystems and biodiversity.

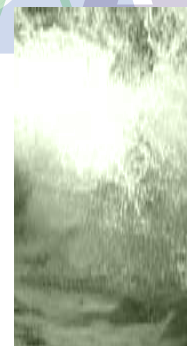
**Many jobs that are green in principle may not be green in practice.** Some because they may cause environmental damage by inappropriate practices, and others because they are inherently dangerous, dirty and difficult. There are actually many different shades of green and this is why green jobs are sometimes defined the way a US Supreme Court Justice Potter Stewart famously defined obscenity: I'll know it when I see it.

**It can also be argued that everything that is good for the environment and sustainable development is a green job.** Solar panels do not install themselves, wind turbines or hybrid cars don't manufacture themselves, and buildings do not weatherise or retrofit themselves. All these activities require human labour. By connecting the people who most need work to the work that most needs to be done, humanity can fight pollution and poverty at the same time.

**Millions of green jobs already exist.** In the 'energy supply-renewable energy' sector more than 2.3 million green jobs have been created in recent years. The wind power industry employs some 300,000 people, the solar PV sector an estimated 170,000, and the solar thermal industry more than 600,000, a large proportion of this in China. Bioenergy has a particularly high potential to create employment and accounts for nearly half of reported jobs. Energy efficiency, particularly in buildings and construction is an area with the highest potential to reduce greenhouse gas emissions and to create jobs in the process.

**Greener transportation will be the lifeblood of a global sustainable economy.** Urban public transport and railways offer lower emissions and more green jobs. Manufacturing low emission cars, retrofitting diesel buses to reduce air pollutants, and substituting cleaner compressed natural gas or hybrid-electric buses can create hundreds of thousands of green jobs.

**Basic industries and recycling are another promising sector for new green jobs.** Industries







Water



Energy



Health



Agriculture



Biodiversity

Population /  
PovertyProduction /  
ConsumptionClimate change /  
Disasters

such as iron and steel, aluminium, cement, pulp and paper are high energy and raw material intensive enterprises. The best option for reducing the negative environmental impact of these industries is through recycling. Secondary steel production, based on recycled scrap, requires 40-75 per cent less energy than primary production and can therefore be seen as a proxy for greener production.

**Agriculture is by far the largest employer in the world with about 1.3 billion workers in total.** While this sector may be blamed for bad jobs and low incomes, it is also a sector that holds much promise for sustainable practices and green jobs through organic farming, natural pesticides, adaptation to climate change and wise use of biotechnology.

**Forests are carbon sinks, providers of renewable raw material, pools of biodiversity, and regulators of water flow and other environmental services.** Sustainable forestry and related industries could account for a sizable proportion of green jobs in countries which still have substantial forest cover, such as Malaysia.

**The world's twin economic and ecological crises share striking parallels.** Both are driven by a short-term profit mentality and a value system that encourages us to live beyond our

means. Sounds a little like Wall Street? Sub-prime mortgages were the initial culprits in the financial crisis which caused substantial job losses across the world. In the ecological parallel, it could be called 'sub-prime development'.

**The greening of the economy presents a major opportunity to start new businesses, develop new markets and lower energy costs.** The global market for environmental products and services is projected to double from \$1,370 billion/year at present to \$2,740 billion by 2020. An early indicator of this shift is the surge of venture capital into clean technologies. In the United States, this currently constitutes the third largest sector after information and biotechnology. An estimated 400,000 to 500,000 green jobs will be generated as a result. Add to this Obama's stimulus package which brings another \$60 billion to greentech and clean energy sectors.

**Malaysia launched a Green Building Index (GBI) in May 2009.** In congratulating the GBI's founders, Pertubuhan Akitek Malaysia and the Association of Engineers Malaysia for this timely effort, Prime Minister YAB Dato' Sri Najib Abdul Razak said: 'it will allow us to undertake development in a more environment-friendly way'. Malaysia's commitment to green growth is reflected in the formation of the new Ministry of Energy, Green Technology and Water.

