UN DECADE OF EDUCATION FOR SUSTAINABLE DEVELOPMENT
DÉCENNIE N.U POUR L'ÉDUCATION EV VUE DU DÉVELOPPEMENT DURABLE

2005 - 2014

Inter-Agency Committee (IAC) of the UN Decade of Education for Sustainable Development (DESD 2005-2014)

Symposium on Climate Change Education and Sustainable Cities

31 August 2009

United Nations Office at Nairobi, Kenya

UNEP

UN⊕HABITAT
FOR A BETTER URBAN FUTURE

UNESCO

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Background and Introduction

Inter-Agency Committee of the UN Decade of Education for Sustainable Development

In December 2002, at its 57th session, the United Nations General Assembly proclaimed the Decade of Education for Sustainable Development (DESD, 2005-2014) to promote reorienting education towards sustainable development. To ensure coherent and timely UN collaboration to implement the Decade goals, the Inter-Agency Committee (IAC) was established, bringing together 15 UN agencies.

This symposium on Climate Change Education and Sustainable Cities was organized by the 2009/2010 IAC co-Chairs, UNEP and UN-HABITAT in collaboration with UNESCO, the lead agency of the DESD. Below is a brief on each of these three agencies;

UNEP - The mission of the United Nations Environment Programme is to provide leadership and encourage partnership in caring for the environment by inspiring, informing, and enabling nations and people to improve their quality of life without compromising that of future generations. UNEP's six thematic priority areas include climate change; disasters and conflicts; ecosystem management; environmental governance; harmful substances and hazardous waste; and resource efficiency, encompasingsustainable consumption and production. For more information about UNEP visit www.unep.org.

UN-HABITAT - The United Nations Human Settlements Programme, UN-HABITAT, is mandated by the UN General Assembly to promote socially and environmentally sustainable towns and cities with the goal of providing adequate shelter for all. As our cities and towns grow at unprecedented rates, setting the social, political, cultural and environmental trends of the world, sustainable urbanization is one of the most pressing challenges for the global community in the 21st century. For more information about UN-HABITAT visit www.unhabitat.org.

UNESCO - The United Nations Educational, Scientific and Cultural Organization (UNESCO) promotes international cooperation in the areas of education, science, culture and communication. The world urgently requires global visions of sustainable development based on observance of human rights, mutual respect and the alleviation of poverty, all of which lie at the heart of UNESCO's mission and activities. For more information about UNESCO visit www.unesco.org.

Theme: Education

Education plays an important role in promoting knowledge, skills and values that are necessary for the realization of a sustainable society. It also assists learners to learn to cope with today's challenges such as climate change and urbanization. The overarching theme of the symposium was the critical role of education in promoting sustainable urbanization with a particular focus on climate change and its challenges.

This broad theme was divided into two major sub-themes:

1.   Role of education in building sustainable cities

2.   Mainstreaming climate change in education for building sustainable cities.

Objectives

The key objective of the symposium was to raise awareness about the decade of education on sustainable development and to promote a constructive dialogue between local authorities, practitioners, academia and civil society organizations on the role of education in addressing the challenges of sustainable urbanization and climate change. A major thrust of the dialogue was "moving from rhetoric to action".

Key concepts of the Symposium

Cities

Half of humanity now lives in cities, and around one billion urban residents live in slums. The urbanization of poverty is therefore one of the most daunting challenges of the 21st century. Cities offer opportunities, but most urban development is largely toxic, segregated and inefficient. If cities are to come to terms with rapid levels of urbanization, they require leaders, managers and staff capable of adopting innovative and robust approaches to planning, developing, managing and financing growth for all citizens.

Climate Change

Globally, climate change is now recognized as one of the defining challenges of the 21st century. The future of hundreds of millions of people in urban areas across the world will be affected by the different impacts of climate change. Developing and least developed countries have higher vulnerability to climate change impacts compared to developed countries. Climate change has been identified as one of the main strategic perspectives to inform education and learning for sustainable development and by extension sustainable city development. Climate change issues need to be part of public awareness, learning and education for a sustainable future.

The integrated, multifaceted vision provided by ESD is particularly well-suited to addressing climate change and city development in terms of understanding its causes, recognising its impact and effects, and preparing and implementing appropriate mitigation and adaptation responses.

Symposium Programme

TIME	SPEAKERS
	Opening
9.00 - 9.10	Mr. Achim Steiner, Executive Director, UNEP
9.10 - 9.20	Mr. Aeneas C. Chuma, Resident Coordinator, UNDP
9.20 - 9.30	Mr. Mark Richmond, Director, Division for the Coordination of UN Priorities in Education, UNESCO
9.30 - 10.10	Prof. Wangari Maathai, Nobel Laureate and Ambassador for the Earth Charter (Keynote Speaker), Prof. Peter Brown, McGill University *(*Key-note speech)
10.10 - 10.30	COFFEE BREAK / LAUNCH OF EXHIBITION
	Round Table 1: The Role of Education in Building Sustainable Cities
10.30 - 11.35	Ms. Christine Platt (Moderator)
10.35 - 10.45	Prof. Peter Brown, McGill University
10.45 - 10.55	Hon. Stephen Kabuye, Mayor of Entebbe, Uganda
10.55 - 11.15	Dr. Art Ong, Water and sanitation Expert
11.15 - 11.25	Ms. Agnes Yobterik, Director, Programmes & Projects , Ministry of Environment and Forestry, Kenya
11.25 - 12.30	Discussion
12.30 - 14.00	EXHIBITION / LUNCH (Main Lobby, Fountain Room)
	Round Table 2 : Mainstreaming Climate Change Education for Building Sustainable Cities
14.00 - 14.05	Ms Christine Platt (Moderator)
14.05 - 14.15	Mr. Mark Richmond, Director, Division for the Coordination of UN Priorities in Education, UNESCO
14.15 - 14.25	Hon. Sam Okello, Mayor of Kisumu, Kenya
14.25 -14.35	Dr. Adly Hassanein, Mediterranean Center for Sustainable Development Programmes
14.35 - 14.45	Dr. Mweru Mwingi, Aga Khan University-Institute for Educational Development, East Africa
14.45 - 14.55	Dr. Ayub Macharia, National Environmental Management Authority, Kenya
14.55 - 15.55	Discussion
15.45 - 16.00	Closing Ms. Inga Bjork-Klevby, Deputy Executive Director, UN-HABITAT
16.00 - 16-30	COFFEE BREAK

Opening Ceremony

A number of eminent persons spoke at the opening session. This section captures a snapshot of their speeches.

Mark Richmond - Director, Division for the Coordination of the UN Priorities in Education - UNESCO

UNESCO has been advocating the importance and relevance of education in addressing sustainable development challenges. The relevance of Education for Sustainable Development in particular to the Millennium Development Goals (MDGs) and the wider development agenda needs to be more widely recognized. ESD addresses interrelated social, economic, environmental and cultural issues informed by current and future perspectives. ESD not only supports the education and learning goals of the MDGs, but it also enhances knowledge of MDG-related issues and fosters critical and creative thinking in order to generate sustainable development solutions.

ESD is the best available framework and vision for addressing climate change through education. Five bases of engagement between ESD and climate change were introduced:

1. Evidence base

   The science of climate change makes important contributions to the knowledge and information   that ESD contains and disseminates.

2. Values base or the ethical dimension

   Climate change is a challenge not only to global sustainability but also to the relevance and strength of our values and the traction of our codes of ethics with changing realities. ESD is grounded upon a values approach and is drawn

Education is a point at which we decide if we love the world enough to take responsibility for it and if we love our children enough to take responsibility for it – Peter Blaze Corcoran

towards the ethical debates surrounding sustainability and climate change, debates that are of acute interest to children and young people.

3. Emotional and attitudinal base

Climate change issues provide valuable examples through which to explore how we feel about the transformations surging through our world. ESD can provide a vision and approach that can help people, especially young people, to engage positively and creatively rather than fall into a state of alienation, passivity and hopelessness.

4. Pedagogical and curricular base

Climate change issues often have an urgency, vividness and immediacy that can be a strong stimulus to effective teaching and learning and to the design and renewal of curricula; ESD should enrich itself even further from this source of lessons, cases and examples.

5. Situational base

Climate change is a global process but its impact and effects are highly situation-specific. It is imperative that educational responses, especially ESD, are grounded upon situation-specific knowledge and culturally sensitive understanding. Teachers are key when it comes to showing learners, in practical and concrete ways, how the global and the local are linked.

It is important to know, for example, as reported by the 2008/2009 State of the World's Cities, that the level of greenhouse gas emissions per capita is determined by consumption patterns, lifestyles, income levels, urban form and structure, and national and local environmental policies rather than the level of urbanization in a country or the sheer size of a city. Such information is important for analysing and understanding both the evidence base and the situational base. Similarly, of relevance to informing ethical debate is the fact that while cities consume a

disproportionate share of the world's energy resources, it is coastal zones and Small Island Developing States (SIDS) that will be most severely affected by the projected rise in sea levels and the increase in extreme weather events.

It was pointed out that climate change was one of several key sustainable development challenges addressed at the UNESCO World Conference on Education for Sustainable Development, held in Bonn, Germany, on 31 March to 2 April 2009. The Bonn Declaration called on UNESCO to "highlight, through ESD, the relevance and importance of education and training to climate change issues". The Declaration also requested UNESCO to "intensify efforts and initiatives to put climate change education higher on the international agenda, in the framework of the DESD, in the context of UNESCO's strategy for action on climate change, and as a component of UN-wide action". UNESCO will take this forward to the 65th session of the UN General Assembly that will take place in New York in the autumn of 2010 where a mid-term progress report on the implementation of the Decade will be presented.

Achim Steiner – UNEP Executive Director

Today, the world is faced with the compelling task of strengthening the ability of individuals, communities and nations to adapt to climate change, move towards low-carbon societies, improve understanding of climate science and raise public awareness about the earth's changing climate. Africa will be the most affected by the impact of global warming and climate change. For instance the sea level rise will affect cities such as Johannesburg and Maputo. Already wetlands have been reduced to 50% in the last 100 years. Over 67 billion dollars a year of investment is needed to cope with climate change and delink development or urbanization from consumption footprint. For the first time in human history we have a challenge that no one country can deal with on its own and we need cooperation and partnerships among nations. Mitigating the impact of climate change can only be achieved through targeted ESD programmes at all levels of society. It helps to rethink development and orient society to sustainability. ESD can play a major role in meeting the targets that the international community has set for itself regarding climate change. The cost of restoring ecosystem is higher than the investment being put into conservation. So we better take action now than later.

Cities are the epicenter of global socio-economic change. Half of the world's population is now living in urban areas with the other half increasingly dependent upon cities for its economic, social, and environmental progress. Urban areas undeniably pose potential environmental threats. Cities, however, as well hold immense opportunities for social, economic and environmental rebirth. People have become much aware about environmental concerns in the cities. Through education and public awareness people are able to make wise and environmentally-sound choices and decisions.

Aeneas Chapinga Chuma – UNDP Resident Coordinator

The concept of sustainable development assumed importance in the late 1980s with the publication of the World Commission on Sustainable Development (WCSD). The report highlighted the need for Education for Sustainable Development. Later,

Agenda 21 identified education as an essential tool for achieving sustainable development. Agenda 21 identified four key areas of action, namely:

- Improving access to quality basic education,
- Re-orienting existing educational programmes,
- Developing public understanding and awareness of sustainability, and
- Providing training.

Despite the many efforts towards sustainable development, reports at the World Summit on Sustainable Development (WSSD) in 2002 revealed that the goals of agenda 21 were still a long way to become a reality. The challenge is to bring together diverse stakeholders such as governments, mass media, NGO, private and learning institutions to form partnerships to promote collective actions for change.

Prof Wangari Maathai – Nobel Laureate, member of the Earth Charter Commission and Earth Charter Ambassador on "The Role of the Earth Charter in Education for Sustainable Development"

Education is a key to advancing the transition to more sustainable ways of living as it can help rekindle more caring relationships between humans and the natural world. It can facilitate the creative exploration of more environmentally and socially responsible forms of development. For this to happen, it is crucial to foster an education that helps people to understand the kind of fundamental changes needed if sustainable development is to be realized. We need to commit ourselves to the noble goals of sustainability. The earth charter provides a powerful tool to communicate to our leaders and citizens the principles and values, and actions we all need to commit to.

The Earth Charter provides an integrated and coherent framework for developing educational programmes and curricula aimed at educating and learning towards a more just, sustainable and peaceful world. The integrated approach promoted by the Earth Charter emphasizes the relationships between the different challenges faced by humanity. These relationships range from the eradication of poverty, to the protection of Earth's ecological systems, and to the elimination of all forms of discrimination. The Earth Charter sets forth ethical principles and general guidelines for sustainable ways of living and for building a global community. It challenges people to think about ethical values and to expand their ethical consciousness. It is designed as a vision of global ethics, which can be used to promote ongoing reflection and dialogue across different cultural perspectives. The Earth Charter can be used as a resource to undertake teaching and learning in many fields. It can help in exploring the links and interrelationships between the various dimensions of sustainability. It is for these reasons that there is urgent need to mainstream environmental education into primary and secondary education, in addition to higher and tertiary level of education.

Peter Blaze Corcoran – Florida Gulf Coast University

In 1987, United Nations World Commission on Environment and Development (WCED) made several significant contributions to the understanding of our

responsibilities to future generations. It introduced the vocabulary of sustainable development to a wider audience. The WCED also called for a 'new charter' to consolidate and extend relevant legal principles creating new norms, values and ethics needed to maintain livelihoods and life in our shared planet. The Earth Charter was developed through a wide global consultation process. By drawing on a comprehensive review of documents on environment and development. The Earth Charter represents a socially validated definition of "sustainability." It reminds us that we have ethical consideration for all living things. 'Education is a point at which we decide if we love the world enough to take responsibility for it and if we love our children enough to take responsibility for it'.

Opening Keynote Speech – Peter Brown, McGill University

Climate change is a symptom of wrong relationship. It is a result of not seeing ourselves as part of nature – a feature of the Western tradition. Other symptoms are the oceans, biodiversity loss, deforestation, etc. The current economic system is a main driver of the decline in Earth's life support systems. Thus there is need to forge right relationships between humans and nature. The following are the four steps to right relationship:

- Recognizing that the main narrative we teach is factually and morally wrong.

- Re-grounding education in a narrative of Earth Citizenship

- Placing what we teach and do about the economy and its governance in terms of Right Relationship with the Universe.

- Re-conceptualizing the city in thermodynamic terms.

We all know that the principle goal of the economy is social stability, but we need to broaden this to include the well being of Earth's ecological systems. We seek a flourishing commonwealth of life which encompasses human and natural communities. To obtain this perspective we need an ethic of respect and reciprocity such as that found in the wisdom of many indigenous cultures, and in some of the world's major religions.

We have done so much yet the problem of climate change seems to be with us forever. Effects of climate change have caused some people to flee their homes to become environmental refugees. We have entered a post-national period of governmental function and purpose. The nation state is a metaphysical anachronism and a moral and spiritual impediment to a flourishing Earth.

Characteristics of a city in right relationship

The city as a dissipative structure takes in highly organized material and degrades it. It uses material and waste absorbing capacity locally and globally. Cities in the "developed" world take much more of these capacities per capita than those in the "developing" world. A city in the right relationship is integrated with thriving life forms characteristic of its region. It is part of a global regime dedicated to peace and respect for life. Its impact is confined to its region and its global share of sources and sinks. The technological dimension is characterized by use of gradients such as wind and heat.

Roundtable 1: The Role of Education
in Building Sustainable Cities

Key Questions

The following key questions guided the deliberations during Roundtable 1 discussions:

- How vital is education in promoting sustainable urban development?

- Identify policies or practices that enable or constrain education working for sustainable urban development.

- Consider strategies for bridging the gap between education, research, policy and practice for building sustainable cities.

- What policies/tools/resources/commitments need to be in place in order to implement these strategies?

Panelists:

1. Art Ong , Director of Institute for Sathya Sai Education , Thailand

2. Stephen Kabuye, Mayor of Entebbe, Uganda

3. Agnes Yoterik, Director, Programmes and Projects, Ministry of Environment and Forestry, Kenya

4. Peter Brown, McGill University

Summary of Each Presentation

Art Ong

Topic: Sustainable School Project in Thailand

In order to take action about the environment, we started a small sustainable school project in Thailand. Using education as an entry point, teachers start to learn to 'walk the talk' through the application of pedagogical methods that enabled the achievement of Education for Sustainable Development goals and ideals. The school whose major aim was to reduce emission carried out activities in; recycling, renewable energy systems, biogas, wind energy, garbage to produce electricity, and bio diesel.

The school's activities were supported by a National Policy that promotes a Self Sufficient Economy in Thailand. This policy provides guidance to the school leadership and students to take action. For example, the school grows its own rice and vegetables using organic fertilisers. It also carries out a range of self sufficient economic activities that focus on sustainability.
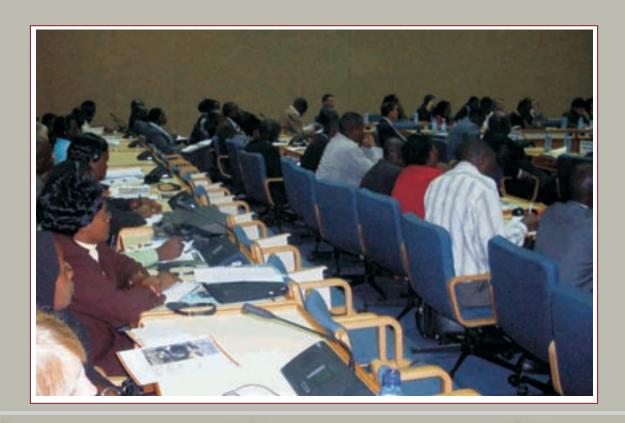
Stephen Kabuye

Topic: Strategies for Developing Sustainable Cities: The Case of Entebbe City, Uganda

A sustainable city can be defined as a city that works for its residents today but also one that works well enough to maintain a good standard for future residents. Hence a sustainable city will have to address the interests of all stakeholders without compromising the capacity of the city to address the future needs of incoming residents. Education for all stakeholders will enable them to understand the challenge of making the city work for everyone.

Many people who are migrating to the cities are poor, and overtime, urban growth has led to urbanization of poverty. Thus, in order to create sustainable cities, it will be very important to address the issue of urban poverty.

As city leaders in Entebbe and most cities in Uganda we facilitate the coming together of the stakeholders in annual budget conference. We have also through the UN-HABITAT developed action plans under the City Development Strategy. These practices are very helpful for the development of a collective vision for a sustainable city. In the Lake Victoria Region we carry out annual clean up weeks to reach the ordinary resident in the struggle for preservation of local resources.

Education is vital for changing people's attitude towards sustainability. However, there is still a long way to educate everyone on the need for sustainable cities. This can be attributed to poor reading culture in many cities, especially that most of the messages are in print. Other means of sending messages need to be devised if we have to reach many residents. There is need to use the mass media such as radios. In addition, holding of local debates and discussion on sustainability issues within cities would extend the sharing of environmental messages beyond the technocrats, scientific community and policy makers.

Proposed strategies for achieving sustainable cities

- Develop packages with environmental messages for residents,
- Promote environmental education and awareness,
- Invest in environmental renewable strategies such as tree planting,
- Encourage partnerships and exchange of visits to learn from each other and jointly document best practice among cities, and
- Ensure that sustainability and sound environmental and resources management are integrated in the government system.

Agnes Yoterik

Topic: Climate Change in Kenyan Context

Kenya has witnessed alarming upsurge in incidences and severity of extreme climatic events caused by climate change. Floods, droughts and landslides have ravaged all parts of the country. Deforestation, soil erosion and land degradation have wiped out thousands of acres of fertile land, while epidemics like cholera and other waterborne diseases have claimed many lives. Climate change impacts have been felt not only on human and animal health, but on agriculture, water supplies, transport, tourism and hydropower generation. The drought has not only left more than 10 million Kenyans hungry, but also devastated several businesses – since power generation has been affected by the low water levels in dams.

To correct this, the Government is rethinking a development policy that can help to meet these challenges and to exploit the new competitive landscape created by climate change. It is in this respect that the Government is developing a comprehensive Climate Change policy. It is also developing a National Climate Change Response Strategy and Investment framework. Kenya might not achieve the economic development goal stipulated in Vision 2030 as it failed to factor in climate change. However, it has become imperative to ensure that measures are put in place to ensure that economic plans are revised to include climate change scenarios and how to lessen its impact. In Kenya, the recommendation is to revisit Vision 2030 and incorporate it with climate change.

Peter Brown

Topic: Education for Earth Citizenship

Beginning 13.8 billion years ago it is evolutionary in which biological evolution is a special case. The principal driver of the process is the second law of thermodynamics. The law of why everything is not the same as everything else. The law describes the processes that reduce temperature and other gradients. To do this the universe uses dissipative structures wind, currents and life. It both creates and destroys complexity. In closed systems entropy rules, but in open systems complexity can increase.

Mind and Spirit – This universe has direction but no destination. It is an optimizing process trying to be as cool as it can be. Human mind and spirit are emergent properties implicit from the beginning. But mind is widespread.

Aldo Leopold's Challenge – "If there be …a special nobility inherent in the human race a special cosmic value, …by what token shall it manifest? By a society decently respectful of its own and all other life, capable of inhabiting the earth without defiling it.

What is citizenship?

● The character of games: Finite and Infinite.

● The character of citizenship: to recognize one's membership as a finite player in an infinite game.

- The ultimate infinite game is evolution chemical, biological, ethical, cultural, economic, spiritual, and political which all require flourishing communities.

Rethinking the Economy from the point of view of Earth Citizenship:

- Changing what we teach and do
- New answers to five questions about the economy based on right relationship.
  - What's the economy for? A flourishing commonwealth of life
  - How does it work? Putting the economy in its place
  - How big is too big? Boundaries on consumption and waste
  - What's fair?: Sharing life's bounty
  - How should it be governed?

The economy is for maintaining a thriving commonwealth of life. It is part of the universe and subject to its laws.

Key Issues Emerging from Roundtable 1 Discussions

Chapter 36 of Agenda 21 fore grounded education (including formal education, public awareness and training) as a process by which human beings and societies can reach their fullest potential. Agenda 21 also sees education critical for promoting sustainable development and improving the capacity of people to address environment and development issues (UNCED, 1992). The main focus areas discussed in Chapter 36 of Agenda 21 were:

● Reorienting education towards sustainable development;

● Increasing public awareness; and promoting training.

Source: United Nations Conference on Environment and Development (UNCED, 1992)

1. Importance of Education for Sustainable Development in promoting sustainable cities

Education for Sustainable Development is setting a new direction for education and learning for all. It helps societies to address different priorities and issues *inter alia* water, energy, climate change, disaster and risk reduction, loss of biodiversity, food crises, health risks, and social vulnerability. All these issues affect sustainable city development. Participants to the symposium noted that ESD was an important vehicle to minimise effects of climate change. It provides the knowledge, skills and attitude needed to transform our cities to sustainable communities. Advocating for the importance of Education for Sustainable Development is the major issue in environment and climate change education. A number of speakers at the roundtable discussions observed that economic growth was essential for improving human well being. They, however, emphasized the fact that economic growth should take into account the earth's carrying capacity. They noted that sustainable development can only be achieved when economic growth, social justice, equity and environmental integrity are balanced.

The participants underscored the importance of ESD in building sustainable cities but suggested that there was, need to find strategies that will help to move from rhetoric to action. Hence "from Rhetoric to Action" became the buzz word of the symposium. Each participant was challenged to explore the value and usefulness of Education for Sustainable Development in their own work.

2. Policy and practice

Some participants observed that in order to address the effects of climate change, urbanization and unsustainable development, governments should rethink development policies that can help to meet these challenges and to exploit the new competitive landscape created by climate change. They seemed to suggest that success in this process requires that policy makers take the following measures:

● Incorporating ESD in government programmes and activities;

● Need for sustainability and sound environmental and resources management

issues to be brought out regularly in city government's policy processes;

- Ensure that decision making is informed by a critical consideration of environmental concerns and knowledge of existing sustainable solutions;

- Planning policy and guidance can be used to embed green infrastructure in regional spatial strategies and local development frameworks;

- Planning and climate change should recognise that open spaces and green infrastructure can contribute to 'urban cooling' sustainable drainage systems and conserving and enhancing biodiversity';

- Urban planning and mushrooming settlements need to take into account the population increase; and

- Development of sustainable city should have in-built adaptation and mitigation objectives.

It was further noted that government action and leadership is very critical in the policy making process. Participants observed that to postpone policy actions now in the hope of taking them at a time when greater resources are available may be disastrous as the cost of environmental degradation are often very high.

3. Curriculum, culture and indigenous knowledge

Item four of the Bonn Declaration called, in part, for developing shared commitment to education that empowers people for change. Such education should be of a quality that infuses the values, knowledge, skills and competences for sustainable development. The declaration resonated with the views of the participants to symposium on the need for coherence with the pedagogy, education materials, tools, and practices. They reiterated the importance of ethical consideration in ensuring sustainability and pointed out that ethics begin with responsibility and care for the common interests.

Unless ESD is mainstreamed in the school systems, the graduates will continue coming out without a clue on the need to protect the environment ~ Wangari Maathai

Despite increased awareness on climate change, too few people make it a priority, and too many fail to act when they have an opportunity. The greatest challenge lies with changing behaviours and institutions. Further the participants emphasized the need to draw and build on indigenous knowledge about climate change mitigation measures that exists in different cultures. They noted that climate change education should be informed and shaped by indigenous knowledge by drawing on ethic of respect and reciprocity such as that found in the wisdom of many indigenous cultures, and in some of the world's major religions. Culture was said to play essential underlying role in sustainable development in different contexts. A suggestion to engage local people in roundtable discussions within the cities where they live and around issues that affect them was muted. It was argued that a sustainable city will have to address the interests of the present residents without compromising the capacity of the city to address the future needs of incoming residents.

4. Tools and resources for building sustainable cities

The symposium observed that Education for Sustainable Development provides a good framework for addressing climate change. A number of tools and resources needed to build sustainable cities were discussed. Education information sharing and awareness was said to be the most powerful tool towards combating climate change and achieving global sustainability. Other tools and resources included teaching and learning materials, awareness materials, and policy frameworks. However, two key international documents stood out as essential tools for discussing sustainable development. These were Agenda 21 and the Earth Charter.

Chapter 36 of Agenda 21 fore grounded education (including formal education, public awareness and training) as a process by which human beings and societies can reach their fullest potential. Agenda 21 also sees education as being critical for promoting sustainable development and improving the capacity of people to address environment and development issues (UNCED, 1992).

It was heard that Earth Charter is a valuable teaching instrument in Education for Sustainable Development. It has been used in human rights and peace education. Practitioners in environmental sustainability education also draw on the Earth Charter as an aid to the conceptualization of education processes that aim to develop understanding and promote justice, sustainability and peace. It provides an integrated and coherent framework for developing educational programmes and curricula aimed at teaching and learning for a more just, sustainable and peaceful world. The integrated approach promoted by the Earth Charter emphasizes the relationships between the different challenges faced by humanity. The Earth Charter has been found to be a useful resource to undertake teaching and learning in many fields. It was also noted that it can help in exploring the links and inter-relationships between the various dimensions of sustainability.

Roundtable 2: Mainstreaming Climate Change Education for Building Sustainable Cities

Key Questions

Panelists were guided by the following key discussion questions and issues:

- Discuss specific issues related to mainstreaming of Climate Change Education for Building Sustainable Cities.

- Consider strategies for mainstreaming Climate Change in Education for Building Sustainable Cities in the education system of your institution/country

- What would be the roles and responsibilities of different stakeholders from primary to tertiary education institutions in mainstreaming Climate Change in school curricula?

- What are the main challenges associated with mainstreaming Climate Change in Education in your institution or country?

- What assumptions influence curriculum policy and curriculum development processes in your institution/country? How can these assumptions constrain or enable the process of mainstreaming Climate Change Education for Sustainable Cities?

- What training tools and opportunities exist or need to be developed for mainstreaming Climate Change Education and Building Sustainable Cities?

Panelists:

1. Samuel Okello – Major of Kisumu, Kenya

2. Adly Hassanein – Director, Mediterranean Center for Sustainable Development Programme

3. Mark Richmond – Director, Division for the Coordination of UN Priorities in Education, UNESCO

4. Mweru Mwingi – Lecturer, Aga Khan University, Institute of Education Development, East Africa

5. Ayub Macharia – Director, National Environment Management Authority, Kenya

Summary of Each Presentation

Samuel Okello

Topic: Role of Cities in Addressing Climate Change

Cities contribute significantly to climate change given the intensity of activities and interaction with the urban space. They are a major contributor to global greenhouse gas emissions. Cities therefore have a critical role in any global initiative if efforts to address climate change have to succeed. There is urgent need to reverse the trend by addressing some of the concerns that have led to the climate change with the resultant adverse climate. City authorities must give priority to their core business, which is service delivery. This must translate to better and sustainable urban environment, i.e. improved air quality, sustainable use of ecosystems, cleaner energy, improved waste management (solid, liquid and chemical) better flood control systems.

Mainstreaming good environmental conservation practices in the curriculum of our schools is vital if we are to enable our youth embrace good environmental practices. The curriculum content, teaching materials and methods and delivery approaches equip students with skills and knowledge to tackle the challenges presented by climate change. It will be important to encourage students to undertake research on practical issues within their communities that relate to climate change. The process of mainstreaming climate change education should encourage research and development, especially action research to come up with home grown and practical solutions to inform our planning for interventions.

Role of city councils

- Mitigate climate change by reducing greenhouse gas emissions.
- Encourage use of cleaner technologies that do not emit green house gases e.g. Biomass-based technologies like bio-gas fuel from bio-waste.
- Adapt to a changing climate by providing more comfortable environments for people to live and work in.
- Provide an enabling environment that encourages stakeholder participation in addressing issues of climate change through education and sensitization.
- Formulate policies that protect and conserve the environment against pollution by green house gasses.
- Promote ecologically friendly interventions like eco-san toilets.
- Promote sustainable waste management interventions like recycling and re-use as opposed to crude dumping of waste that exacerbates the emission of green house gasses into the environment.
- Ensure vulnerable people are protected from climate change risk.
- Encourage and promote city greening to enhance absorption of green house gases, e.g. Carbon dioxide.
- Capacity building for the officers on climate change, advocacy and lobbying

techniques to enable them effectively disseminate and or sensitize members of the public on effects of climate change and influence behaviour change.

Adly Hassanein

Topic: Outdoor Education and Sustainable Cities: What is Wrong with our Education System?

Outdoor Education Programmes should be an integral component of national education systems to help students understand and value our planet's eco-systems, tackle global warming, build good character and sustain their future. Sustainable Cities Planning should incorporate a maximum number of environmental education centers to lead the change towards sustainable future in urban environment.

Without making outdoor education a statutory part of every child's schooling, any government risks undermining its ability to tackle important environmental issues such as climate change. Outdoor classroom education allows student to connect abstract scientific ideas with hands on experiences. Biological field work may provide the only unique opportunity for urban students to observe animals and plants in their natural habitat. This will help to promote a deeper understanding of the investigatory approaches that underpin the whole of science.

The Importance of outdoor education

● It promotes active learning through direct personal experience and offers

excitement, fun and adventure within a framework of safety.

- It helps children to develop the confidence, coordination, strength and perseverance to lead rewarding and exceptional lives.

- It helps children differentiate between independence and interdependence when faced with challenges.

- Use of the outdoors activities makes a major contribution to physical and environmental education and enhances many other curriculum areas.

- Direct experience out of doors stimulates and reinforces learning across many areas of the curriculum, and the use of the outdoors encourages young people to take greater responsibility for their own learning.

- Outdoor education provides valuable alternative, often non-competitive, avenues for achievement, as well as opportunities to develop independence and self-reliance.

Outdoor education centers will bring nature to urban dwellers, will support climate ethics. It will also bring environmental justice to the under privileged. It will play a great role in leading the way towards the reduction of our environmental foot print in schools, colleges and local communities. The younger generation will lead the way when they discover very early the benefits and the values of protecting our ecosystems and the foundation of the life support system on our planet.

Mark Richmond

Topic: UNESCO International Seminar on Climate Change

In the context of the UN Climate Change Conference (COP 15) taking place in Copenhagen, from 7 to 18 December 2009, UNESCO organized a 3-day international seminar on climate change education from 27 to 29 July 2009 in Paris. The seminar was attended by approximately 60 participants from diverse backgrounds. The participants included: teachers and educators, national education representatives, curricula development experts, representatives of school and

education networks, scientists and climate change experts, individuals from civil society, representatives from UN bodies from all over the world.

The Seminar focused on the role of education in addressing climate change, linking the local, regional and global contexts with particular emphasis on the challenges faced by Small Island Developing States (SIDS). While contributing very little to causing climate change, SIDS stand to be severely impacted by the projected rise in sea levels and increase in extreme weather events. Small island regions with limited funding and institutional capacity in the formal education sector face particular constraints in terms of undertaking often costly curriculum reviews, procurement of new materials, and training of personnel required for the introduction of such new material.

The seminar's participants cautioned against climate change education becoming a new adjectival education and called for a drastically accelerated mainstreaming of ESD into all levels and types of education. The need to approach climate change education through ESD emerged strongly, especially in relation to education reform.

With regard to climate change education materials, there are already many in existence and in use in various contexts around the world. However, little has been done at the international level to take stock of existing materials, their applicability, content, quality, and area of focus. The need to better understand ecological and social, as well as economic aspects and implications of climate change was recognized. It was recommended to carry out research on vulnerabilities caused by climate change and address social mechanisms that created such vulnerabilities. The group also proposed creating the Hub for Climate Change Education, which will become a doorway for the exchange of information for climate change education and promote networks and partnerships.

Mweru Mwingi

Topic: Climate Change Education Curricula Development Initiatives

In the last decade, primary, secondary and teacher education curricula in Kenya, Uganda and Tanzania have undergone reviews. Curricula change range from major overhauls that include integration of contemporary issues such as gender education, peace education, special needs education, environmental education, and citizenship to cosmetic changes in selected subject areas. Thus climate change education can be mainstreamed and become another of the important social issues that we need to address in our somewhat traditional curricula.

Challenges associated with mainstreaming climate change education

With no doubt, mainstreaming Climate Change Education will face a lot of challenges associated with curriculum reform. But experiences of mainstreaming HIV/AIDS in East African curricula might be useful in guiding how we think through climate education curricula.

Assumptions influencing curricula policy and curricula development processes

As we think about curriculum reform, there is also need to examine the assumptions that influence curriculum policy and curriculum development processes. What are

contextual realities pervading climate change education? Whose curricula is it, who owns it?

Tools and opportunities for mainstreaming climate change education

- *Partnerships and collaborations*, partnerships and collaborative work with all stakeholders in the education sector will be very important in the process of mainstreaming climate change education. These may include government departments, civil society, NGOs and institutions of learning.

- *Policy*, Climate change education is not well articulated in education and environmental policies in most countries in Africa. There needs to be concerted effort by all stakeholders in articulating clear education policy on Education for Sustainable Development so that it is easier to actualise the mainstreaming of climate change into education curricula.

- *Research and ICT*, will be important to enhance research and the attempt to mainstream climate change for people to appreciate the importance of Education for Sustainable Development.

Ayub Macharia

Topic: Mainstreaming ESD in Government Ministries in Kenya: Lessons and Challenges

Kenya has developed an ESD Implementation Strategy to guide all educational interventions to make them responsive to sustainable development. The ESD Strategy was approved by the National Environment Council on 24th April 2008 and is now being implemented. ESD has also been captured in the government's development blueprint document Vision 2030 with a target to develop an ESD policy and reorient all curricula by 2012.

So far the National Environmental Management Authority has facilitated half day training sessions for senior government officers on ESD in 17 government ministries. The training expected outcome is mainstreaming of ESD in all government operations. All ministries visited so far appreciated that ESD is a remedy for addressing the country's sustainable development challenges including climate change. The training sessions have also been used as a forum to capture the issues and concerns that hinder mainstreaming of ESD in operations of government ministries.

The general observation during the visits to the various ministries is that the current ongoing educational interventions are fragmented and not holistic. Climate change is a major challenge and all educational interventions need to be reoriented to address its holistic nature. There is need for elaborate planning and capacity building for policy makers and implementers.

Key issues emerging from Roundtable 2 Discussions

The discussion pointed at the need to reorient curriculum and teacher education programmes to mainstream ESD in both formal and non formal education programmes. For example it was argued as follows:

- Educational programmes are too focused on policy makers and restricted to experts. There is need to expand to larger groups e.g. through environmental pedagogical centres,

- Education trains people to implement best practices and influence behavioural and attitude change to embrace conservation especially at the municipality level.

- Teachers should use the local context to explain the climate change issues and degradation first hand to help them take practical positive action in their homes,

- Involve the private sector to develop educational curriculum,

- Climate change provides urgency for action, pedagogical and curriculum development,

- Education responses for climate change such as ESD are grounded in situational context thus the need to integrate indigenous knowledge systems, and

- Create pedagogy of hope for the youth to enable them to experience the power of social action.

1. Curriculum transformation

   Participants recognise the need for curriculum reform that allows for some flexibility to deal with and respond to local issues and risks. Integration of socio-ecological issues into the curriculum requires integrationist approaches that recognise the multi-disciplinary nature of ESD and climate change issues. Integration into assessment and development of performance indicators in the implementation processes was also underscored. They also noted the need for significant pedagogical change towards participatory, action-centred and practice-based approaches to learning, and, to learner-centred ways of teaching.

2. Mainstreaming ESD in formal and non formal education

   Participants supported the notion that sustainable development issues need to be incorporated in formal and non formal education in an integrated manner, particularly through the development of effective pedagogical approaches, teacher education, curricula, learning materials, and education leadership development. Governments were urged to accelerate mainstreaming ESD into all types of educational processes so that climate change education and building sustainable cities do not become an 'add-on' in the curriculum. It was observed the environmental education /Education for Sustainable Development was rated as low priority and environmental awareness remains limited. The participants observed that most efforts at mainstreaming ended at the basic education level. They urged the tertiary education institutions to take a lead in environmental education. On the challenges and difficulties in the process of mainstreaming, participants observed that there were a number of lessons which could be

borrowed from the mainstreaming of HIV/AIDS and other cross cutting issues such as gender issues.

3. Establishing partnership and networks

Due to complexity of climate change coupled with the limited resources available at national and regional levels, the symposium called for formation of partnerships and networks that start from the grassroots. Participants noted that there was a need to build on existing partnerships and networks in order to maximize efforts in climate change education. It was argued that partnerships and networks can provide insights into climate change science, integration of scientific materials into traditional knowledge system. Through such partnerships a better understanding of ecological, social and economic aspects and implication of climate change would be enabled among stakeholders. It was also noted that there is no single route to sustainable development thus the need for working together to negotiate sustainability processes. Teachers, civil leaders and scholars need to work together to build sustainable cities. Participants identified the need to develop partnerships and networks to promote dialogue among stakeholders as one of the fundamental methods of addressing dangers of climate change.

It was noted that UN is playing a key role in bringing together different stakeholders governments, NGOs, mass media, private sector-to redefine Education for Sustainable Development. Civic leaders were urged to develop partnerships with academia where, for example, higher education institutions will package environmental and awareness educational materials that target different stakeholders in cities councils in Africa. Working with academia should initiate research on vulnerabilities caused by climate change and other forces. It was further noted that efforts to achieve sustainable cities will be futile if the needs of all stakeholders are not taken into account.

4. Challenges of local authorities

Local authorities in eastern African region, like elsewhere in Africa, face numerous challenges such as high levels of poverty, political interference and limited financial resources. When communities are preoccupied with the challenges of meeting basic needs, services and jobs, we face hard choices and trade-offs. In such conditions, mainstreaming of climate change education becomes a challenge.

Concluding Remarks

After a day's deliberation, Inga Klevby, Deputy Executive Director, United Nations Human Settlements Programme gave closing remarks. Below is a summarised version of her speech.

Education is critical for our progress, particularly for our countries in sub Saharan Africa. Education is fundamental for creating just, peaceful and adaptable societies. It prepares citizens for gaining employment and making healthy life choices. At the United Nations we believe education is a right, a foundation and a prerequisite for sustainable development and that learning happens throughout life. In today's rapidly globalizing and urbanizing world, societies lagging behind in the development of their human capital will not be able to manage the challenges ahead. In the long run, policies that neglect the health and education sectors or deny citizens access to education opportunities will have detrimental consequences.

We live in a rapidly urbanizing world, with complex realities and challenges. The rapid urbanization in developing countries is coupled with the urbanization of poverty. For millions of urban dwellers of the developing world, the urbanization of poverty is chaotic and brutal. It is inhumane and debilitating. It affects between 30 and 70 percent of all urban dwellers in developing countries who live in slums, which globally amounts to over one billion people living in slums across the planet, a figure that could be doubled by 2030 if steps are not made to reverse this trend. The vast majority of these people live on less than one dollar a day. They also lack safe water, a major contributing factor to mal-nutrition, disease and loss of productivity.

We are also experiencing climate change, which is now recognized as one of the most pressing challenges to our planet. It is no coincidence that global climate change has become a leading international development issue at the same time as the world has become urbanized. The way we plan, manage, operate and consume energy in our cities will have a critical role in our quest to reverse climate change and its impact. 75% of commercial energy is consumed in urban and peri urban areas. In addition, 80% of Greenhouse Gas Emissions emanate from cities. At the same time, more and more people are drawn to the urban magnet. In many parts of the world, climate refugees from rural areas that have been hit by drought or flooding aggravate the migration to cities. Those parts of the population who already suffer from poor health conditions, unemployment or social exclusion are rendered more vulnerable to the effects of climate change and tend to migrate to cities within or outside their countries. The UN predicts that there will be millions of environmental migrants by 2020, with climate change as one of the major underlying factors.

Cities do offer opportunities, but current urbanization trends linked with increasing climate change challenges, have led to most urban development being largely toxic, segregated and inefficient. Reversing this trend requires institutions that support sound governance and regulatory regimes, and deliver public infrastructure and social services. This means that, if cities are to come to terms with rapid levels of urbanization, they require leaders, managers and staff capable of adopting innovative and robust approaches to planning, developing, managing and financing growth for all citizens. But cities in this context also need to build communities of informed citizens who make wise consumption and development choices, and pursue sustainability in all spheres of life as a matter of shared values and

convictions. In the context of cities this is abundantly clear. Cities with good education opportunities, and a high concentration of knowledge and skills, thrive in economic growth and development. Cities who invest in education and research, and who promote knowledge arenas and networks stay ahead in the pursuit of sustainability by effectively and innovatively responding to challenges.

Education institutions, at all levels, can contribute to positive change towards sustainable urban development, but they face challenges in realizing this potential. In many countries, there is a gap between how future urban practitioners, managers and decision makers are trained, and what cities' emerging needs actually are. Today, you have also discussed the role of education and education institutions in addressing this disconnect. We firmly believe that through joint efforts with all stakeholders; learning institutions, local and national governments, the private sector, and communities, and through learning from and capitalizing on the good practices which exist all around us, we can make education a vital tool for sustainable development. Together we can help bridge the gap between education, training, research and practice, making education a potent force of change.

For UN-HABITAT, promoting education for sustainable urbanization is one of the key strategies. In this context, we aim to pursue evidence based education by promoting curricula that is based on practical and experiential learning. Through our Habitat Partner University initiative, we encourage universities to engage cities and their citizens through education and research, and collaborative learning, and become vital forces in the realization of sustainable urban development.

List of Participants

Institution	Participants Name and Title
Speakers and Distinguished guests	- Wangari Maathai, Nobel laureate - Peter Blaze Corcoran, Florida Gulf Coast University - Peter Brown, McGill University - Christine Platt, President of the Commonwealth Association of Planners - Peter Brown, McGill University - Art Ong, Water and sanitation Expert - Adly Hassanein, Mediterranean Center for Sustainable Development Programmes (MCCDP) - Mweru Mwingi, Aga Khan University - Institute for Educational Development, East Africa
Embassy	- Excellency Maria Victoria Diaz de Suarez, Ambassador of Columbia - Ms Patricia Murcia-Velasco, Embassy of Columbia - Francesco Calcagno - Development Co-operation Office, Embassy of Italy
UN Agencies	- Achim Steiner, Executive Director of UNEP - Inga Bjork-Klevby, Deputy Executive Director, UN–HABITAT - Mark Richmond, UNESCO - Aline Bory-Adams, UNESCO - Kaori Adachi, UNESCO - Stephanie Hodge, UNICEF - Yoshihiro Natori, UNU - Aeneas C. Chuma, UNDP Resident Representative - Henrike Peichert, UNDP
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National Environment Management Authority (NEMA), Kenya	- Ayub Macharia, Director, Environmental Education, Information & Public Participation

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Biodiversity International	- Jojo Baidu-Forson, Regional Director, Sub-Saharan Africa
Strathmore University	- David Wangombe, Dean, Faculty of Commerce - Fredah Mwiti, Lecturer - Mary Njenga - Rehema Maria
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Faculty of Education University of Nairobi	- Karen Odhiambo, Lecturer
African Virtual University/Université Virtuelle Africaine	- Bakary Diallo, Rector
Centre for Environmental Legal Research & Education (CREEL)	- Titus Wamae, Programme Officer
Health Schedule National Council for Science and Technology	- Simon K. Langat, Senior Chief Secretary
African Centre for Technology Studies (ACTS)	- Judi W. Wakhungu, Executive Director
Tropical Biology Association	- Martin Mwema
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National Environment Management Authority (NEMA), Uganda	- Daniel Babikwa, Deputy Director
University of Nairobi (Master Programme on Environmental Planning and Management)	- Sylvia Wachira - African Youth Initiative on Climate Change Kenya - Debel Girma Kenea - Pius Kasusya Resource Projects & Director Nomotio Pastoralist Trust, Samburu - Mary Kirabui Department of Conservation Education & Senior Warden, Kenya Wildlife Service - Robert Sangori - Geoffrey M. Omedo , Research Officer NEPAD Kenya Secretariat - Joyce Wanjiru Gachugi, Member, Kenya Climate Change Working Group, Environmental Management Cost Centre - Pauline Wamureithi, Senior Superintending Quantity Surveyor. Ministry of Public Works - James Thiaine, Environment, Health & Safety Coordinator, Toyota Kenya

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	- Daniel Oruoch, Lecturer
	- Fuchaka Waswa, Lecturer
	- Kennedy Mutundu, Lecturer
	- Mary Otieno, Lecturer
	- Nelson Mango, Lecturer
	- Steven Nyagah, Lecturer
	- David Mungai, Lecturer
	- Dorcas Otieno, Head, Kenya Organisation of Environmental Education (KOEE)
	- Dr Jones Agwata, Department of Environmental Sciences
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	- Merioth W. Njuguna
	- Nusrat Begum
	- Theresia N Kiema
	- Mr. Joshua Minai Okach, School of Environmental Studies
	- Margaret Demba

List of Abbreviations and Acronyms

AIDS	Acquired Immuno Deficiency Syndrome
DESD	Decade of Education for Sustainable Development
ESD	Education for Sustainable Development
HIV	Human Immuno Virus
IAC	Inter-Agency Committee (of the UN DESD)
ICT	Information and Communication Technology
MDG	Millennium Development Goals
NGO	Non Governmental Organisation
SIDS	Small Island Developing States
UN	United Nations
UNCED	United Nations Conference on Environment and Development
UNEP	United Nations Environment Programme
UNESCO	United Nations Educational, Scientific and Cultural Organisation
WCED	World Commission on Environment Development: Our Common Future
WSSD	World Summit on Sustainable Development
UN-HABITAT	United Nations Settlements Programme
UNDP	United Nations Development Programme