United Nations
Educational, Scientific and
Cultural Organization

Education for Sustainable Development and Climate Change

Policy Dialogue 4

The Intergovernmental Panel on Climate Change (IPCC), in its 2007 report, stated unequivocally that humans are contributing to climate change. People's actions are intensifying the climate's natural variability, and the Earth's temperature is rising. Scientists make a distinction between **climate variability** (where climatic variations are attributable to natural causes) and **climate change** (where human activities are altering the atmospheric composition). Human-induced (or anthropogenic) climate change is caused by increased production of greenhouse gases, including carbon dioxide (CO_2), methane and nitrous oxide. Carbon dioxide, the main contributor, is produced primarily by the burning of fossil fuels — oil, gas and coal. Although methane occurs in smaller quantities than CO_2, it has higher warming effects. Increased methane production is linked to increased levels of livestock farming for meat production. Warming of permafrost areas in Siberia and Canada may also contribute significantly to an increase of methane emissions, since permafrost lakes store methane gases. Increases in greenhouse gas production are directly linked to the post-1750 period of industrialisation in Western countries. These gases now far exceed the natural rate of greenhouse gas production as measured in pre-industrial era ice cores spanning many thousands of years.

The IPCC projects that global average temperatures are likely to rise by 1.8 - 4 degrees Celsius by 2100. This might sound small, but the difference between today's temperatures and the last Ice Age is around 4-5%. A small temperature rise is likely to have a substantial impact. It may also take many years for the real impact of current rises in temperature to show. Even if people substantially reduced CO_2 emissions tomorrow, the atmosphere would go on warming for a long time to come. Changes in temperature will impact on the whole of the Earth's system, and on human activities everywhere. Projected impacts include warming of the oceans, melting of the icecaps, sea level rise, unpredictable weather patterns, increased flooding and droughts, loss of biodiversity, changes in agricultural productivity, increased health risks, massive human migration and economic decline. Scientists are worried that change will be faster than expected due to 'positive feedback', which is a process where the warming fuels itself, causing accelerated temperature increase. The acceleration of climate change needs to be reduced urgently, and everyone everywhere needs to be involved.

Climate change has substantial implications for education and learning

Education needs to take into consideration the following implications of climate change, all of which are characteristics of *Education for Sustainable Development* (ESD):

- All levels and forms of existing educational and teaching and learning programmes need to be reviewed and re-oriented to address the causes and consequences of climate change.
- Climate change requires educators to include new content into education, training and public awareness programmes.
- Creativity, problem solving and social transformation skills need to be developed and nurtured.
- Positive, participatory action and solution-centred approaches to education and learning need to be developed.

Re-orient education to address the causes and consequences of climate change

Education systems everywhere will need to include a focus on the causes, consequences and solutions to climate change, if the necessary changes in society are to be effected in time. Addressing the causes and the consequences of climate change requires content and methodologies that will build capacity in society for **mitigation, adaptation,** and **transformability**.

Addressing the causes (mitigation): Since the causes of climate change are human-induced and directly linked to human actions, these actions need to be identified and changed. Education programmes can help people identify the causes of climate change, and mitigate them. Practically, this involves learning actions to reduce energy consumption, use renewable forms of energy, design and use greener technologies, make changes in consumption patterns, mitigate biodiversity loss, etc., while ensuring quality of life. At a societal and cultural level, this means ***learning how to change cultures, lifestyles, economies and social structures*** that are based on excessive greenhouse gas production. Education systems that address climate change will promote **different cultures, aspirations, purposes, value systems** and **future visions** to those established in the 18th-20th centuries (which were oriented towards expanding the consumption and production patterns that have caused climate change). These approaches to climate change education will be **transformative**, and not merely technical.

Addressing the consequences (adaptability): Some of the impacts of climate change are already visible, some are predicted and some are unknown. These impacts will manifest differently in different parts of the world, and governments everywhere are beginning to prioritise adaptation to climate change. Unique, locally relevant solutions and adaptation practices are needed, alongside efforts to share and transfer knowledge, social strategies, economic models and technologies that provide new solutions across the world. Consequences can be addressed at a technical level (e.g. through the introduction of new energy technologies), but will also need to be addressed at a wider societal and cultural level, where adaptation practices (e.g. new and adaptive, drought-resistant farming practices) will need to become part of, or replace, existing cultural practices and traditions. Such approaches will be **transformative,** and not just technical.

Climate change education that takes a cultural change approach to mitigation

The non-governmental organisation Japan for Sustainability has created an interactive website for children called *Create your Future*. Transmitting information to more than 170 countries worldwide, this website contains many stories that are "New Ideas for Earth". Stories include new ways of thinking about established cultural consumption practices, such as "How to create a city without automobiles", "Buy the function and not the product" and "How to create and keep up good habits". Children visiting the site are invited to respond to the stories, to share what they think, and to try out ideas in the stories.

(see www.kidsforfuture.net/index.php)

Transformative approaches to mitigation and adaptation require a change in values. The Earth Charter promotes such a change in values through education, as does the UN Decade on Education for Sustainable Development.

(www.earthcharter.org)
(www.unesco.org.desd/education)

New concepts and content

Climate change education requires people everywhere to understand and respond to the nature, causes and consequences of climate change. This requires ESD (see www.unesco.org/desd) programmes that attend to:

- clear distinctions between **different scientific concepts and processes** associated with climate change;
- knowledge of, and abilities to distinguish between, **certainties, uncertainties, projections and risks** associated with climate change;
- knowledge of the **history and interrelated causes** of climate change (which include *technical, scientific, ecological* and *social* dimensions; *economic* dimensions; and *political* dimensions);
- knowledge of **mitigation and adaptation** practices that can contribute to wider social transformation towards sustainability, including abilities to participate in such practices;
- knowledge of **consequences** and what is being learned about mitigation and adaptation to climate change;
- good understanding of the **time-space dynamics** of climate change, including the delayed consequences that current greenhouse gas emissions hold in store for the quality of life, security and development options of future generations;
- understanding of **different interests** that shape different responses to climate change (e.g. business interests, consumer interests, farmers' interests, political interests, future generations' interests, etc.) and abilities to critically judge the validity of these interests in relation to the public good; and
- critical **media literacy** to address the causes of overconsumption and develop capacity to make better lifestyle choices and to participate in climate change solutions.

Values, creativity, problem solving and social transformation skills

Simply introducing new content about climate change science, causes, consequences and solutions will not be an adequate response to climate change. Central to processes of mitigation, adaptation and transformation are *new values*, *creative thinking* and *problem solving skills*. These skills require learners to engage in critical analysis of causes and consequences, creative proposals for possible solutions to problems, testing of new solutions and evaluation of the outcomes. This requires ESD teaching and learning methodologies that are **participatory**, **experiential**, **critical** and **open-ended**.

Practice and solution-centred approaches

As time is of the essence in reducing the production of greenhouse gasses, and in preparing societies for adaptability to risk and physical environmental change, climate change education also needs to be **practice-centred** and focused on **solutions**. Learning-centred actions for change are needed (e.g. learning to implement energy saving measures), so that learners can *experience* and *reflexively review* their participation in climate change solutions. Such methodologies are culturally situated and learner-centred. They require teachers to have a good knowledge and understanding of their content and possibilities. For effective change, such participatory, practice-centred methodologies need to be well researched and prepared to ensure maximum benefit and real engagement with change. These approaches should provide learners with positive ways of contributing to the future to avoid 'doom and gloom' approaches to climate change education. They should provide hope for the future.

Practice and solution-centred climate change education

UNICEF, in partnership with UNESCO and other UN agencies, is developing an Environmental Education Resource Pack to help children understand the links between the physical environment and health, education and development. It focuses on child-centred activities that involve children in wind energy water pumps, using solar technologies to reduce indoor air pollution, planting food gardens, irrigation water testing and treatment, and other adaptation and risk management practices.

(see http://www.ungei.org/resources/files/EERP_modular_contents_web.pdf)

In India and Africa a 'handprints for change' project is being developed to involve learners in actions for change.

(see www.handsforchange.org)

Policy Dialogue Questions

Use these questions to review education and development policies

Does the education system include approaches to education that focus on the causes (mitigation) and consequences (adaptation) of climate change? Are these approaches transformative or merely technical?

To what extent does the education system include new concepts and content required to address climate change?

To what extent are the aims and objectives underpinning the education system congruent with the need to mitigate and adapt to climate change? Do they reflect principles of Education for Sustainable Development?

Does the education system support the development of creative and critical thinking skills and problem solving actions?

Are participatory practice- and solution-centred approaches evident?

Are climate change issues integrated into the formal curriculum and into teacher education programmes?

Are climate change issues introduced into community learning systems?

The UN Decade of Education for Sustainable Development (DESD) and Climate Change

In December 2002, the UN General Assembly proclaimed a UN Decade of Education for Sustainable Development (2005-2014), to speed up the re-orientation of education towards sustainable development and to ensure that training and public awareness systems also focus on sustainability issues. Projected climate change impacts have infused a sense of urgency into the DESD.

www.unesco.org/education/desd

"Climate change doesn't care if you are coming from developing or industrialized countries"

—Ban Ki-Moon, UN Secretary General

References and Resources

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Children in a changing climate: http://www.childreninachangingclimate.org

Gateway to the UN System's work on climate change: http://www.un.org/climatechange/index.shtml

http://www.climate-l.org — A knowledgebase of International Climate Change Activities, provided by IISD in cooperation with the UN Chief Executives Board for Coordination (CEB) Secretariat

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Japanese Funds-in-Trust

ED-2009/WS/10