CHAPTER III

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## Addressing climate change at its roots

Climate change is a global challenge, with discussions tending to focus on the greenhouse gas emissions of countries or regions. Governments must impose solutions, but it is also essential that climate change be addressed sustainably at the human level. Developing a sense of ownership and accountability begins with explicit acknowledgement that it is the behaviour and lifestyles of individuals and the societies in which they live that are ultimately responsible for the emissions that drive climate change.

Chapter III examines how young people's choices are affecting the environment. Many youth do not fully understand the environmental impact of their lifestyles. Education can play a key role in helping them make the connection between their consumption behaviour and ecological concerns. It can also help prepare young people to take advantage of environmental advocacy opportunities and the growing number of green jobs available, providing them with opportunities to effect change in the workplace and the world.

## CONSUMPTION PATTERNS AND SUSTAINABLE LIFESTYLES

Human consumption is a major contributor to climate change. What people consume and how they consume it affects the natural environment. A significant amount of energy is required for the production, transportation, use, and disposal of the goods consumed, resulting in substantial GHG emissions. Moreover, the extraction of natural resources, the use of water, and the creation of pollution associated with the various stages of the consumption process contribute to environmental degradation in general. Across the spectrum—from the desperate struggle to meet basic needs to the excessive use of resources to satisfy "wants"—consumption puts enormous stress on the environment. The present chapter will focus on the latter end of the spectrum.

The human race has consumed more natural resources in the past 50 years than in all of the previous years of human history combined (Bentley, Fien and Neil, 2004). In many developed and emerging economies, the growth of the market-based system has been paralleled by the emergence of a consumer society. In such a society, the quality of life of individuals—and even the definition of happiness—is increasingly associated with the expansion of ownership of material goods (Clover, 2001).

What, exactly, is consumption? The term is generally associated with the use of goods and services, including food or energy. However, that is just one aspect of the consumption process. As illustrated in figure III.1, consumption actually involves the selection and purchase of products, their use, and their disposal. Each of these three stages has an effect on the environment.

**Figure III.1**
**The consumption process**


Source: Anders Nyberg and Eivind Stø (2001).

Consumption and energy-intensive lifestyles are not equally distributed around the world. It is estimated that the 12 per cent of the world's population living in North America and Western Europe account for 60 per cent of global private consumer spending; in contrast, the one third living in South Asia and sub-Saharan Africa account for only 3 per cent (Gardner, Assadourian and Sarin, 2004).

Much of the available data relating to young people's sustainable consumption patterns and lifestyles focus on youth in the urban and suburban areas of developed countries. These youth constitute a minority, but it is their behaviour that has the greatest environmental impact. Conversely, the 79 per cent of the world's youth who live in regions where agriculture accounts for more than one third of employment and where almost half of all youth are rural residents generally leave a substantially smaller carbon footprint, but will bear the brunt of climate change over their lifetimes.

While inequalities in consumption remain high, growing numbers of people in developing countries are adopting lifestyles that incorporate the manifestations of a modern existence, including refrigerators, televisions, computers, and automobiles. It is estimated that the number of individuals with discretionary spending power worldwide is approaching 1.7 billion people and that nearly half live in developing economies (United Nations and United Nations Environment Programme, 2007). This trend seems

likely to continue; energy demand is expected to increase by half between 2007 and 2030, with over 70 per cent of the upsurge coming from developing countries (United Nations Development Programme, 2007). Even with this substantial increase in their share, however, total energy consumption in developing countries is likely to lag behind that of developed countries for some time.

## The dominant youth market

For many youth, consumption has become central to identity construction. The display of certain possessions and a particular style is one of the principal ways young people signal their membership in specific peer groups and their distance from others.

Young women and men represent close to one fifth of the global population, and their combined purchasing power translates into significant market control. In 2003, the combined spending power of youth in 11 major economies exceeded US$ 750 billion (Bentley, Fien and Neil, 2004). To put this into perspective, this amount is greater than the GDP of the entire African continent in that same year, which amounted to just over US$ 700 billion (World Bank, 2010). Young people not only make decisions about their own purchases, but they also exert a strong influence over the spending of their families and peers. It is estimated that youth in the United States spend or influence the spending of US$ 300 billion a year, or about 1 in 3 consumer dollars spent (World Wildlife Fund and Center for a New American Dream, 2003).

The influence young people have over the purchases of their friends and families and the fact that brand loyalties are developed early in life make youth a valuable market segment, especially for fashion items, food, and leisure goods. Youth have been specifically targeted by advertisers since the late 1950s (Kjeldgaard and Askegaard, 2006). Since then, advertising has boomed, becoming so pervasive that youth find it virtually impossible to escape its impact.[1]

The development of powerful information and communication technologies, which are increasingly accessible to youth in even the most remote areas, has helped to spread the advertising messages that have played such an important role in shaping young people's ideas, aspirations, cultures, and lifestyles and have ultimately contributed to the creation of consumer societies. Global media are portraying consumption-intensive lifestyles as desirable for youth from all backgrounds and regions. Influenced by advertising messages and the portrayal of their role models and peers by the media, many young people around the world feel the need to compete in the race for the latest gadgets and the newest and "coolest" products on the market.

## Young people's ecological footprint

Young people are very aware of how the products they own and display influence their social standing. However, many do not realize that their consumption also has a significant impact on the environment. The most serious climate-related consequences of the behaviour of today's youth will take years to manifest themselves, but young people must come to realize that their lifestyles and consumption patterns are having a substantial impact on overall environmental sustainability even now.

Although not enough hard data are available to adequately determine the ecological impact—or carbon footprint—of today's youth population, it is known that young people's expenditures, particularly in developed consumer societies, are largely devoted to conspicuous consumption goods and leisure activities deemed pivotal to youth peer group acceptance and differentiation (Brusdal and Langeby, 2001). Among the most popular consumption items for young people in these contexts are clothes, entertainment and communications equipment, and food (Bentley, Fien and Neil, 2004).

Fashion changes constantly as the frequent redefinition of what is "in" and what is "out" generates a "need" to buy the latest styles. Excess production and waste occur as outmoded products are discarded—not because they no longer fulfil their main functional purpose, but simply because they are no longer deemed desirable. Meeting strong consumer demand can put a strain on the environment. In the apparel sector, for example, the industrial manufacture

1 It is estimated that most teenagers in Australia, for example, will have been exposed to at least 350,000 television advertisements by the end of secondary school and will deal with more than 3,000 marketing messages each day as they move into adulthood. A study carried out in Hong Kong Special Administrative Region of China found that youth watched an average of two to three hours of television per day and were exposed to a substantial number of promotional messages during this time (Bentley, Fien and Neil, 2004).

of fabric and other fashion goods can undermine air quality; dyeing and printing use vast amounts of water and chemicals, and shipping garments around the world is energy-intensive and constitutes a source of GHG emissions. Even natural fibres are not always environmentally friendly. Cotton production accounts for less than 3 per cent of the world's farmed land but consumes almost 25 per cent of the insecticides and 10 per cent of the herbicides used worldwide (United Nations Educational, Scientific and Cultural Organization and United Nations Environment Programme, 2008).

Technology, like fashion, is constantly evolving. New technology items are becoming increasingly important to young people for the management of their leisure time and social relations, so it is not surprising that youth are among the main consumers of mobile telephones, computers, video game consoles, and other electronic equipment. These devices are becoming pervasive even among youth in some developing regions. In Africa, which has the highest mobile phone growth rate in the developing world, mobile penetration had reached more than 25 per cent by 2008 (International Telecommunication Union, 2009). Although electronic items are often small, their collective carbon footprint is quite large. It is estimated that between 3 and 13 per cent of residential electricity use in Organization for Economic Cooperation and Development (OECD) countries can be attributed to standby power consumption alone (European Environment Agency, 2005). High energy intensity characterizes not only the use but also the manufacture of many small electronic devices. In fact, manufacturing accounts for 80 per cent of a computer's energy use over its life cycle. Taken together, their high energy use in manufacturing and typically short lifespans make computers more energy-intensive than refrigerators (Williams, 2005).

The technology embedded in computers, mobile phones, music players, and video game consoles changes rapidly, and youth are under constant pressure to buy the newest models to take advantage of higher connectivity speeds and improvements in product size and sophistication. Once personal computers, televisions, mobile phones, video game consoles, and other electronic devices are discarded, they become e-waste. It is estimated that 20 million to 50 million metric tons of e-waste are generated worldwide every year, with developed countries accounting for the bulk of the total (United Nations Environment Programme, 2006; Schmidt, 2006).

Youth in consumer societies tend to have relatively few financial commitments and thus devote a fairly high proportion of their disposable income to leisure activities such as tourism. Their travel choices, including the mode of transportation and type of accommodation selected, the distance travelled, and the activities undertaken, all affect the environment. The precise contribution of tourism to human-induced climate change has not been comprehensively assessed. It is estimated, however, that emissions from three of the main tourism subsectors (transportation, accommodation and activities) represented between 3.9 and 6 per cent of global emissions in 2005, with a best estimate of 4.9 per cent (World Tourism Organization and United Nations Environment Programme, 2008). Staying longer in one location, using public transportation, and lodging with friends or relatives can reduce the environmental impact of tourism.

## The consumption paradox: Do young people walk the talk?

Young people around the world are very concerned about the environment. A UNEP poll of nearly 2,000 twelve- to eighteen-year olds in five countries—Brazil, India, the Russian Federation, South Africa, and the United States—found that close to 90 per cent believe world leaders should do whatever is necessary to address climate change (United Nations Environment Programme, 2008b). A number of other surveys have confirmed that youth are worried about the environment and climate change (see, for example, Special Eurobarometer 300, Directorate General for Communication of the European Commission, 2008; and Bentley, Fien and Neil, 2004).

Young people say they care about the environment, but to what extent does their consumption behaviour reflect this concern? Do they understand the environmental impact of their choices as consumers? Quantitative and qualitative studies on young people's perceptions of sustainable lifestyles (defined in box III.1) are limited in number and scope, particularly for youth living in developing countries. To provide an initial mapping of the attitudes, behaviours, and expectations of youth and their sense of power to change lifestyles and promote sustainable consumption, UNEP and the United

Nations Educational, Scientific and Cultural Organization (UNESCO) launched a survey in 2000 on the consumption patterns of more than 5,000 middle-class urban youth in 24 countries. The UNEP/UNESCO *Survey on Youth and Consumption: Is the Future Yours?* constituted part of the UNESCO/UNEP project on Youth, Sustainable Consumption and Life Styles. The few other existing studies on young people's perceptions about sustainable consumption have supported the findings of the UNEP/UNESCO research. UNEP is currently in the process of conducting a follow-up study, the *Global Survey on Sustainable Lifestyles*, which will shed more light on the perceptions and behaviours of youth in developing countries with regard to sustainable consumption and lifestyles.

**Box III.1**

**Defining sustainable lifestyles**

Sustainable lifestyles can be defined as practices and choices at the individual and collective levels that enable individuals to meet their needs and aspirations with a sense of responsibility for the well-being of present and future populations, taking into account the environmental and social consequences of their actions. Sustainable consumption behaviour is an important component of a sustainable lifestyle and is characterized by the following: satisfying basic human needs rather than the desire for luxuries; valuing quality-of-life concerns over material standards of living; minimizing resource use, waste and pollution; taking a life-cycle perspective in consumer decision-making; and acting with concern for future generations.

**Source**: Matthew Bentley, John Fien and Cameron Neil (2004), *Sustainable Consumption: Young Australians as Agents of Change.*

The consumer behaviour of young people suggests that their concern for the environment is not reflected in their purchasing decisions. The UNEP/UNESCO study found that young people often failed to consider all three phases of consumption—shopping behaviour, the use of products, and the disposal of products—in assessing the effect of their own consumption on the environment. Most recognized the environmental impact of the second and third phases but did not acknowledge the critical role their initial product selection and purchase played within this context. Whether it is a case of not knowing enough or not caring enough, environmental concerns appear to be given lower priority than other criteria in shopping decisions. The UNEP/UNESCO Survey found that environmental impact was assigned less weight than factors such as trendiness, price, and quality in young people's buying decisions (Nyberg and Stø, 2001). These results were confirmed by subsequent studies, which showed that variables such as price, brand name, quality, and peer pressure all seemed to exert a greater influence on young people's purchasing decisions than did sustainability considerations. In fact, an Australian study found that only 1 per cent of young respondents found the sustainability of a product to be the most important factor influencing their consumption (Bentley, Fien and Neil, 2004).

Several factors, including age, education, and gender, seem to influence youth perspectives on sustainable living. A number of studies have confirmed that younger members of the youth cohort are less inclined than older youth to believe they consume too much and are less conscious of the effects of their behaviour (see, for example, Bentley, Fien and Neil, 2004; and Autio and Heinonen, 2004). Interest in sustainable development and sustainable consumption appears to be positively correlated with the level of education (Maggi and others, 2001). With respect to gender, many studies have shown a particular tendency among girls and women to favour green values. Whereas males seem to associate environmentally conscious behaviour with limitations on their personal freedom, females generally appear to understand it as a reflection of the need to take action (Autio and Heinonen, 2004). In the UNEP/UNESCO study, more young women than young men reported basing their purchasing decisions on the eco-friendliness of a product (Nyberg and Stø, 2001).

The incongruity between young people's professed concern for the environment and their consumption behaviour is linked to several real and perceived barriers that may deter them from adopting sustainable consumption practices and lifestyles (Bentley, Fien and Neil,

2004). Many young people perceive existing green products to be incompatible with their needs, too expensive, or not readily available. In some cases, there may be no green products that can substitute for everyday goods or that serve the same identity-building function as the more popular consumer items. A substantial number of young people acknowledge that they may require more information about alternative products and services. Youth also need to be made aware of what constitutes over-consumption, as they may find it increasingly difficult to ignore the constant barrage of advertising messages directed at them.

Although many young people are genuinely concerned about the environment and climate change, their purchasing behaviour and leisure activities suggest that they do not fully comprehend the extent to which their purchases and actions affect the planet. Helping youth understand and acknowledge the impact their lifestyles have on the environment can help them make the connection between their consumption behaviour and environmental concerns. Education plays a crucial role in this regard.

# EDUCATION FOR CHANGE

Environmental education is a prerequisite for effective youth engagement and participation in efforts to address climate change. Young people need to be well-informed about climate change science and mitigation options and to be made aware of the consequences of their consumption behaviour so that they can play a strong role in combating climate change and promoting changes in attitudes and behaviours. Education and training in the field of climate change can also prepare young people to take advantage of new employment opportunities arising from the shift to a greener economy.

Climate change education is an element of the broader interdisciplinary framework of education for sustainable development, which promotes understanding of the social, cultural, economic, and environmental dimensions of sustainability and teaches students how to make decisions that take into account the long-term future of the economy, ecology, and society.

In addition to helping put the world on a more sustainable path in the future, climate change education can produce tangible benefits today. For instance, teaching energy-saving and resource-conserving behaviours not only promotes sustainable lifestyles but can also lead to cost savings. Similarly, learning about disaster risk reduction in schools can increase students' awareness and understanding of their immediate environment and provide them with empowering tools that will facilitate their active involvement in preserving the safety of their communities. Young people can also disseminate information on disaster risk management, educating their families and communities about disaster preparedness (Regional Consultative Committee on Disaster Management, 2007). When the residents of an area are aware of the risks around them and take the time to develop crisis response strategies, the injuries, damage, and trauma associated with disaster situations are significantly reduced.

## Key features of effective education for sustainable development

Education for sustainable development can be presented as a cross-cutting, interdisciplinary theme or integrated into the curricula of existing subjects such as geography, earth science, chemistry, economics, social studies, biology, and technology. The learning outcomes of climate change education and education for sustainable development should include the acquisition of attitudes, knowledge, skills, and behaviour that promote scientific inquiry, ecological and social responsibility, community action and involvement, and global solidarity (Thoresen, 2008).

Experience has shown that it is important to complement thematic teaching with practical activities and projects. These help make abstract information and theories more concrete and allow young people to see the connection between the target messages and their everyday lives. Students who are able to identify the direct relevance of a concept to their own lives are more likely to retain the information and act upon it. An ineffective approach to promoting environmental awareness would be to teach only the scientific facts, leaving out any reference to the personal and social relevance of the information (Uzzell, 1999). In environmental education, the connection between the student, climate change, and personal action is best emphasized through active learning meth-

ods. Students might, for example, be given an ecological footprint activity or asked to use a carbon footprint calculator to enhance their understanding of how their personal energy consumption contributes to climate change (Cordero, Todd and Abellera, 2008).

Other elements of effective environmental education might include presentations by experts, field trips, hands-on exposure to meteorological equipment or the establishment of small meteorological stations in schools, and participation in national science fair competitions that promote the development of environmental solutions. Media such as television and the Internet (including Web-based courses) can also be used effectively in teaching about climate change (United Nations Framework Convention on Climate Change, 2006).

Education for sustainable development continues to be driven by national circumstances and capacities. Educational materials should therefore incorporate locally relevant and culturally appropriate content that takes into account specific conditions and contexts and is geared towards local needs and perceptions.



Effective approaches to integrating climate change and other environmental issues in classroom instruction should be incorporated into teacher education and training. Teachers who are already working should receive additional training in climate change education to strengthen their scientific and pedagogical knowledge in this area (United Nations Framework Convention on Climate Change, 2003). A number of resources are readily available on the Internet to support teachers' efforts to raise environmental awareness. One example is the OzonAction Education Pack, jointly developed by several United Nations entities to ensure that high-quality, copyright-free instructional material on climate change would be available to all primary and secondary schools (see box III.2).

**Box III.2**

**The OzonAction Education Pack**

Environmental education should begin at an early age and continue throughout every phase of schooling. In order to ensure the availability of appropriate materials to achieve this objective, the United Nations Environment Programme, the United Nations Educational, Scientific and Cultural Organization, and the World Health Organization joined forces to develop an environmental awareness programme geared towards primary and secondary school students.

The OzonAction Education Pack for primary schools includes entertaining hands-on curriculum materials that can be used to educate children about the protective role of the ozone layer and the causes and consequences of its depletion. The Pack contains a teaching and learning programme that incorporates basic information as well as practical skill-building and participatory opportunities to provide students with simple, concrete steps they can take to protect the ozone layer and safely enjoy the sun.

The OzonAction Education Pack for secondary schools includes teacher and student materials that explore the same concepts—ozone layer depletion and protection and the health risks of strong ultraviolet radiation—at a more advanced level. The Pack allows young people to acquire a deeper understanding of the scientific concepts linked to ozone issues and provides them with opportunities to develop and apply policy solutions. Role-play is one strategy used to engage students right from the start. The first activity is one in which each student assumes the role of a young journalism graduate who is being considered for a job at an important news agency. The student is asked to write an article that not only informs the world about ozone depletion and its link to climate change but also provides practical tips for children and youth to help protect the planet.

In terms of educational outcomes, children and youth who have participated in this programme should exhibit the following:

- The ability to collect and analyse relevant information and to use it to develop practical action plans;
- A sense of environmental responsibility and a desire to become more active in protecting the ozone layer;
- An understanding of the health issues at stake and of how to protect oneself from the dangers of ultraviolet radiation.

Teacher and student books may be downloaded free of charge from www.unep.fr/ozonaction/information/educationpack.htm or www.unep.fr/ozonaction/information/ educationpacksec_school.htm.

**Sources**: United Nations Environment Programme, Division of Technology, Industry and Economics, OzonAction Branch (2006), *OzonAction Education Pack: A Guide for Primary School Teachers*; and (2007), *OzonAction Education Pack for Secondary Schools*.

The evaluation of existing tools and the identification of baseline indicators to monitor and assess the effectiveness of climate change education are also necessary to ensure that young people are benefiting from appropriate environmental content and instruction (United Nations Framework Convention on Climate Change, 2007c).

As a result of coordinated efforts by Governments and international organizations (see box III.3), climate change, sustainable development, and other environmental concerns are receiving increased attention in both developed and developing countries at all levels of education. In many countries, institutional and legal frameworks have been established to support the design and implementation of educational and awareness programmes focusing on climate change or broader sustainable development issues, and specific measures have been adopted to systematically support and monitor the implementation of innovative projects (United Nations Framework Convention on Climate Change, 2007c). In some countries, national climate change education units and coordinating committees have been set up to ensure that relevant information is effectively integrated throughout the formal education system. Non-governmental organizations (NGOs) have also been actively involved in the development and implementation of many environmental education initiatives.

### Box III.3

### Promoting education for sustainable development at the highest level

The crucial role played by climate change education in changing behaviours, attitudes, and values is explicitly recognized at the international level. Article 6 of the United Nations Framework Convention on Climate Change calls on Governments to promote and facilitate the development and implementation of relevant educational and public awareness programmes; public participation in efforts to address climate change; public access to pertinent information; and the training of scientific, technical, and managerial personnel. Similarly, article 10(e) of the Kyoto Protocol calls on Parties to "cooperate in and promote at the international level and, where appropriate, using existing bodies, the development and implementation of education and training programmes, including the strengthening of national capacity building … and [to] facilitate at the national level public awareness of, and public access to information on, climate change" (United Nations Framework Convention on Climate Change, n.d.).

In recognition of the importance of education for sustainable development, the United Nations General Assembly declared 2005-2014 the United Nations Decade of Education for Sustainable Development, with the United Nations Educational, Scientific and Cultural Organization as the lead agency. Information on the goals and strategies associated with the Decade is available at www.unesco.org/en/esd/.

## Challenges in implementing education for sustainable development

Effective basic education systems must be in place before education for sustainable development can be fully integrated. Reducing global disparities in educational access and quality is essential for the widespread implementation of climate change education. At this point, per capita spending on students remains highly variable. In 2004, North America and Western Europe accounted for 10 per cent of the world population aged 5 to 25 years, but 55 per cent of global education expenditure. In contrast, sub-Saharan Africa accounted for 15 per cent of the population between the ages of 5 and 25, but only 2 per cent of worldwide spending on education. (United Nations Educational, Scientific and Cultural Organization, 2008)

In developing countries, the implementation of education for sustainable development is often impeded by the lack of institutional, financial, and technical capacities and by the lack of relevant teaching materials and qualified instructors.

In spite of the various challenges, a number of countries have institutionalized environmental education. Their experience constitutes a valuable source of information and guidance for others seeking to integrate climate change education at the systemic level. In the Seychelles, for instance, the Ministry of Education created an Environmental Education Unit that has facilitated the successful integration of climate change issues into geography and science curricula and has also developed and implemented a compulsory teacher training programme on environmental education. The Unit regularly coordinates environmental education activities in schools, including extracurricular options such as an eco-school programme. Every year it puts together an annual environmental education calendar that includes competitions, environmental theme days, festivals, and other events geared towards increasing environmental awareness (United Nations Framework Convention on Climate Change, 2007b). The University of the South Pacific, a regional tertiary institution supported by 12 Pacific Island countries, has been providing climate change education for several years and now offers a number of degree programmes in the field (see box III.4).



**Box III.4**

### Tertiary climate change education in the Pacific Islands

Climate change threatens the sustainable development of the water supply, agriculture, coastal zones, tourism, health, and many other vital sectors in the Pacific Islands. At the University of the South Pacific (USP), climate change is addressed in a range of undergraduate courses in geography, marine science, agriculture, physics, and economics. For more than a decade, USP has offered a postgraduate course on climate change impacts, vulnerability and adaptation. The course focuses on the specific risks climate change poses to the Pacific Islands and examines strategies for managing those risks. Students are provided with a brief overview of climate science, mitigation measures, and relevant international political and legal institutions, and an adaptation policy framework is presented that can be applied at the community, regional, or national level. USP is offering a new postgraduate diploma in climate change beginning in 2010; the programme will include the existing course on climate change impacts and adaptation as well as a new course on climate science. USP also works closely with the START-Oceania secretariat (based at the University) to provide scholarship- and award-based training opportunities for young scientists studying environmental change.

**Source**: University of the South Pacific (2009); programme information is available from http://www.usp.ac.fj/index.php?id=8132.

### Non-formal climate change education

Formal education is only one means of creating awareness about climate change and teaching about adaptation and mitigation. Non-formal, out-of-school approaches also have a crucial role to play in sensitizing youth to the causes and consequences of climate change. By providing real-life experiences and the skills needed to adapt to climate change and mitigate its impact, non-formal and informal learning reinforce and supplement classroom learning. More importantly, non-formal approaches can offer many benefits and opportunities to young people who do not have access to formal education or to those who have dropped out of the formal education system.

Civic engagement and community service represent an important component of non-formal education, providing youth with personal, hands-on experience and training. Young people can play a key role in the promotion of climate change education through advocacy and by participating in local sustainable development initiatives. A number of youth initiatives relating to climate change are described in chapter IV of the present *Report*.

## PREPARING YOUNG PEOPLE TO TAKE ADVANTAGE OF GREEN JOB OPPORTUNITIES

Recent years have seen significant growth in green industries—and green jobs—around the world. In addition to providing much-needed employment opportunities for youth, green jobs represent a way for young people to contribute directly to the fight against climate change. They enable youth to move beyond adopting green behaviours in their private lives, making it possible for them to translate their convictions into action in the workplace.

What, exactly, are green jobs? They are defined by UNEP as work in agriculture, industry, research and development, services, and administration that contributes to preserving or restoring the quality of the environment (United Nations Environment Programme and others, 2008).

The growing attention given to climate change and sustainable development in the midst of the financial and economic crisis that began in 2008 translates into an ideal opportunity to promote green economic growth around the world. In the United States, US$ 60 billion in fiscal stimulus money will be invested in clean energy, including the creation of green jobs (United States, White House, 2009). In China, 12 per cent of a US$ 586 billion economic

stimulus package will be allocated to increasing energy efficiency and other environmental improvements (Barbier, 2009). The global market for environmental products and services is expected to double by 2020 (United Nations Environment Programme and others, 2008).

It has been argued that the renewable energy sector may be well situated for the creation of green jobs both now and in the future (United Nations Environment Programme and others, 2008). There have been more than 2.3 million green jobs created in the renewable energy sector in recent years, including 300,000 in the wind industry, 170,000 in solar photovoltaics, 624,000 in the solar thermal industry, and 1,174,000 in biomass production. Investment in renewable energy has increased significantly in the past decade, growing from US$ 10 billion in 1998 to US$ 66 billion in 2007. With investment rising at an annual rate of 20 per cent, the number of jobs in the renewable energy sector could exceed 20 million by 2030 (United Nations Environment Programme and others, 2008).

Potential job opportunities exist for youth in many areas of the renewable energy sector, including design and planning, energy policy analysis and development, energy economics and energy management, energy efficiency consulting, assessment of the social and environmental impact of energy systems, and research and development (United Nations Industrial Development Organization, 2003). Some young people, such as those involved in the Kibera Community Youth Programme in Nairobi, have already begun to inject themselves into the sector and its development (see box III.5).



**Box III.5**

**Youth harnessing the power of the sun through the production of solar photovoltaic panels**

The Kibera Community Youth Programme (KCYP) is a community-based organization established and run by young people in the Kibera slum in Nairobi, Kenya. The project provides youth with work assembling small and affordable solar panels. KCYP members sell hand-constructed solar chargers to other members of their community, enabling the buyers to access a mobile source of electricity (and thus receive news via radio and communicate by cell phone) at an affordable price.

Using skills and equipment passed on to them by a British volunteer, the young people are engaged in the entire line of production, from slicing the silicon sheets to wiring the connectors and calculating the correct voltage. Many of the youth involved in the solar project have never had a job or seen anyone in their families work. The young craftsmen, once trained and operating, receive a small income and see a portion of the profits from the sale of the photovoltaic cell units go directly into funding other KCYP programmes, such as theatre-based HIV/AIDS training, environmental clean-ups, and peace-building soccer teams. The average wage in Kibera is US$ 1 a day, but a small solar panel, which takes just minutes to put together, can sell for around US$ 5.

Fred Ouko, the coordinator of KCYP, says that the young people are starting to gain confidence: “What I want to see is real empowerment, real benefit trickling down to individual persons. … They’re actually making something up to a full product and then selling it, and they know now they can do this for themselves.”

The programme has had an immediate local impact, benefiting the residents of Kibera and surrounding rural communities. Groups in neighbouring Uganda have asked the members of KCYP to share their experience, knowledge, and training, which implies that even the simplest small-scale endeavour can potentially have a far-reaching impact. In 2007 KCYP won a World Clean Energy Award for its pioneering work.

**Source**: Kibera Community Youth Programme (2005); Alana Herro (2007), “Youth bring low-cost solar panels to Kenyan slum”; and Celeste Hicks (2004), “Kenya slum turns sun into energy” (source of quote from Fred Ouko).

Improving energy efficiency in building and construction constitutes another area with considerable potential for creating green jobs for youth. There are currently 4 million jobs in Europe and the United States devoted to energy resource optimization, and this number could increase significantly. Youth who are willing to complete apprenticeships in this field may find themselves well positioned to take advantage of new employment opportunities in the coming years.

Young people, in particular rural youth who seek continuity in their livelihoods, may want to take advantage of green jobs aimed at minimizing the negative impact of climate change on agriculture. Various efforts are under way to make agriculture more sustainable, both by reducing its effects on the environment and by safeguarding it against the consequences of environmental change. Organic farming is one area with enormous growth potential. This type of production is environmentally friendly, but it is also relatively labour-intensive, so a continued shift in this direction could lead to the creation of more jobs in the agriculture sector. Organic farming is expanding rapidly; in 2006, sales in this subsector amounted to US$ 100 billion globally (United Nations Environment Programme and others, 2008).

The rural non-farm economy, which accounts for 35-50 per cent of rural income across developing countries, also constitutes a potential source of green jobs for youth (Haggblade, Hazell and Reardon, 2009). Rural non-farm sectors, including energy production, trade, agroprocessing, manufacturing, and commercial and service activities, represent a viable complement or alternative to agriculture in stimulating rural income growth. Although non-farm sectors still frequently rely on a robust and successful agricultural sector, these two segments of the rural economy are increasingly decoupling as improved infrastructure opens up new opportunities that are less dependent on agriculture.

A number of different jobs for youth can be generated in environmental protection and sustainable land management. In South Africa, the Government's Expanded Public Works Programme has created more than 800,000 jobs in infrastructure, services, and agriculture. One particular programme, Working for Water, has provided at least 6,000 young people with short-term employment and is described in some detail later in the chapter (IRIN, 2009).

The recycling industry may offer young people entrepreneurial opportunities; however, careful implementation is necessary to ensure that practices undermining human development are not perpetuated. While recycling is a growth industry that accounts for a substantial number of new jobs, many of these do not constitute decent work and are concentrated in the informal sector, where wages tend to be relatively low and conditions precarious. Nevertheless, young people in developing countries have successfully started small-scale recycling businesses, an area with great potential for expansion (see box III.6).

**Box III.6**

**City garbage recyclers in low-income estates**

A forward-thinking entrepreneur and former truck driver, Andrew Macharia, won grants and awards to address the ever-increasing problem of solid waste, especially plastic bags, in the slums of Nairobi. With the support of local authorities and the Government of Kenya, the Kenya Institute of Manufacturers, the United Nations Children's Fund, the United Nations Development Programme, and other collaborators, he helped set up 20 community groups to collect plastic polyethylene waste products and turn them into reusable items such as fence posts, roofing tiles, rain gutters, and washbasins. The groups, which are all part of a cooperative primarily made up of youth and women, have already collected more than 100 metric tons of waste. The project has created employment for over 500 women and youth and has helped raise income for over 5,000 Nairobi slum residents. The project has also allowed cooperative members to save and take part in credit schemes, further improving their livelihoods. Macharia is encouraging the formation of additional recycling cooperatives and small business ventures that turn urban waste into products such as charcoal briquettes, →

nutrient-rich soil, and mattresses, all of which are ultimately sold back to the community.

**Source**: City Garbage Recyclers, Kenya (2008), "Unclogging sewers and drainage systems in Nairobi's low-income estates".

The green economy must be developed in a balanced and sustainable manner, with attention given to social development considerations. Green jobs have the potential to enhance employment in rural areas and across the globe. However, without careful implementation and proper monitoring, some green activities, including certain recycling practices and the production of biofuel crops, could actually undermine human development by, for example, perpetuating substandard working conditions or threatening food security (Food and Agriculture Organization of the United Nations, 2009b).

With climate change expected to bring about major shifts in the labour market and with unprecedented numbers of youth entering the labour market in the years to come, Governments must strive to ensure that young people are ready to take advantage of new environment-oriented employment opportunities. Currently, too few of the green jobs that are being created are filled by youth, primarily because most lack the necessary skills. This is also hampering growth in green sectors. Green energy operators have noted that one of the primary impediments to continued growth in the coming years will be insufficient access to new talent and employees. Although some progress has been made in providing young people with the knowledge and technical skills they need to take advantage of new employment opportunities afforded by the shift to a greener economy, much remains to be done.

## Education and training

As new entrants to the labour force, youth have an advantage over many adults in that they are less likely to suffer the negative effects of technological change. While older workers may experience job dislocation with the introduction of new technologies to combat climate change, youth are well positioned to acquire the requisite skills while they are still in education or training programmes.

In response to the increased interest in greening the workforce, universities and other post-secondary institutions have set up specialized programmes designed to ensure that youth acquire the necessary knowledge and skills. In recent years, the number of university courses and degrees focusing on environmental issues, renewable energy, and sustainable practices has surged.

Although tertiary studies can prepare students for a professional career in the environment sector, many green jobs do not require a university degree. Adjusting educational curricula and encouraging youth to take up technology-related subjects in secondary school are important steps in facilitating the transition to green employment. Vocational training oriented towards new technologies is equally essential. This type of training can range from courses at secondary schools and workforce development centres to longer, more specialized post-secondary programmes that prepare candidates for positions requiring particular skills.

Along with classroom-based learning and formal vocational training, green internships constitute an important means of promoting young people's interest in environmental employment and facilitating the development of relevant occupational skills. In the United States, the public transport sector has launched several initiatives that provide internship and education opportunities for young people. The Conference of Minority Transportation Officials has an internship programme for students, and similar opportunities that expose youth to the workings of the sector are offered by municipalities and campuses around the country through the National Summer Transportation Institute (United States Department of Transportation, Federal Highway Administration, Office of Civil Rights, 2007). During the Summer Institute students learn about problems such as traffic congestion, inefficient modes of transportation, urban sprawl and appropriate land-use planning, as well as sustainable transportation infrastructure and energy efficiency in the design of transportation projects. This initiative aims at creating awareness of transportation careers among secondary school students and encourages them to consider transportation-related courses in their higher-education pursuits.

Recent experience in green job training has yielded valuable lessons. First, in order to ensure the maintenance of high standards and job transferability, certification programmes must be developed; both Governments and industry leaders can play an important role in this regard. Second, training institutions must work closely with local employers and industry associations to meet emerging labour demand. Finally, it may still be necessary to raise awareness among some employers about the future potential of green sectors. A survey conducted in Australia among young tradespeople indicated that youth were willing to learn green skills; 87 per cent of the respondents were either "interested" or "very interested" in acquiring such skills, but three quarters of them felt they lacked the knowledge and opportunity to pursue their interest. While a significant proportion of those surveyed cited cost as an obstacle to the implementation of green skills on the job, an even larger percentage identified "lack of interest by employer" or "work attitudes" as barriers (Dusseldorp Skills Forum, 2008).

Aside from ensuring that young people are provided with a quality education and appropriate skills training, there are two key strategies that may be adopted to help youth make the transition to green jobs: promoting green entrepreneurship and (temporarily, at least) involving them in environmental public employment schemes.



## Youth entrepreneurship

With increasing numbers of youth joining the labour market, entrepreneurship can be an important source of job creation and can offer young people the chance to effect change. Young entrepreneurs can exploit opportunities to promote environmental sustainability in a number of different sectors including agriculture, renewable energy, and recycling.

Young people's entrepreneurial potential is fuelled by their creativity and willingness to try new approaches. However, their relative inexperience and limited resources and networks place them at a disadvantage. Starting a new business is risky, and potential entrepreneurs must be well prepared. In order to ensure the viability of green youth ventures, young people must be provided with entrepreneurship training, including support in the development of business plans and access to technology and technical know-how. Once the groundwork has been laid, seed grants and manageable financing options need to be made available to youth to start their own businesses.

In some regions, notably the Middle East and North Africa, entrepreneurship is still regarded as less appealing than public sector employment. In these areas, new initiatives that foster an entrepreneurial spirit among youth should be implemented, and increased emphasis on green and social entrepreneurship should be incorporated in existing initiatives.

## Environmental public employment programmes

Environmental public employment programmes can provide young people with marketable skills and work opportunities while at the same time engaging them in environmental rehabilitation and conservation. Historically, public employment programmes have been used to create jobs for the poor and unemployed in times of crisis. In some cases, these jobs have contributed to environmental sustainability while also providing a livelihood for those in need. The Civilian Conservation Corps, established in the United States in 1933 as one of the New Deal programmes during the Great Depression, is one such example. Active until 1942, this initiative provided employment for 2 million people. The Corps planted between 2 billion and 3 billion trees, controlled erosion on 40 million acres of farmland, facilitated mosquito control over 230,000 acres of land, established 711 State parks, and developed 3 million acres of land for park use (Lieuw-Kie-Song, 2009). Although this type of environmental public employment programme typically targets the poor, a case could be made for expanding it to include unemployed youth.

In response to the global financial and economic crisis set in motion in 2008, leaders around the world have called for the implementation of the Green Economy Initiative, or Global Green New Deal, launched by UNEP. Components of this initiative could be executed through public employment programmes, with specific areas of concentration selected on the basis of local and national needs and priorities. A number of countries, including India and South Africa, have piloted public employment initiatives that provide poor unemployed or underemployed individuals with labour-intensive work, and

many of these could be adapted to provide green jobs for youth (Lieuw-Kie-Song, 2009). The Working for Water initiative in South Africa is one such example (see box III.7). Public employment schemes could also be a useful mechanism for involving youth in specific industries such as public transportation, which might otherwise not seem like an obvious career choice for young people.

**Box III.7**

### Youth employment through invasive alien species eradication

Under the South African Government's Expanded Public Works Programme, more than 800,000 jobs have been created in sectors such as infrastructure, services, and agriculture. One particular programme—Working for Water—has provided at least 6,000 young people with short-term jobs and training in clearing invasive alien species and has supplied them with the information and experience they need to start their own micro-enterprises in the discipline. The Programme employs out-of-work youth and poor residents to clear areas where invasive alien species of plants are causing problems. Such efforts allow less-water-demanding native vegetation to flourish, increase stream flows and water availability, raise land productivity and hence land values, and strengthen resilience to fires.

The Programme's success has spurred the creation of spin-off initiatives using a similar labour-intensive, cost-effective, and sustainable approach to dealing with natural resource issues. These initiatives include Working for Wetlands, Working on Fire, Working for the Coast, Working on Waste, and more recently, Working for Forests and Working for Energy. The last initiative listed is designed to help provide universal access to affordable energy services through the use of decentralized renewable energy technologies such as solar water heaters. Because these types of technologies play such an important role in climate change mitigation and adaptation, there is substantial support for the rapid implementation and scaling up of this initiative, which could greatly benefit energy-poor communities and unemployed youth.

**Sources**: Maikel R. Lieuw-Kie-Song (2009), *Green Jobs for the Poor: A Public Employment Approac*h; and IRIN (2009), "South Africa: need to create more jobs for the youth".

In order to ensure sustained success, environmental public employment programmes must include components that facilitate young participants' transition to more permanent employment. One option might be to establish a link between these public employment programmes and existing youth training programmes in order to provide young people with targeted skills and environmental awareness so that they will be able to identify entrepreneurship opportunities in the field of environmental conservation and rehabilitation (Lieuw-Kie-Song, 2009).

Despite the divide between the environmental concerns and the consumption behaviour among youth, progress is being made. Climate change education is critical to bridge this gap and can teach youth to adopt a life-cycle perspective when making their consumption choices. What is important is for young people to have access to environmental education that is developed in a way that is relevant to their specific context. There is an opportunity for youth from all walks of life to contribute now, whether it is in their homes, schools or their places of work. Considering the influence young people have over the purchasing decisions of their friends and families, changes made now could produce not only immediate tangible benefits, but also have a far-reaching effect on the future of the economy, ecology and the societies of generations to come.

# SUGGESTIONS FOR FURTHER READING

- Bentley, Matthew, John Fien and Cameron Neil (2004). Sustainable Consumption: Young Australians as Agents of Change. Canberra: National Youth Affairs Research Scheme.

This study explores how young people can be encouraged and empowered to make changes in their own consumption patterns as well as being catalysts for change in the wider community. The focus is mainly on Australian youth, though international evidence is reported where available.

- United Nations Educational, Scientific and Cultural Organization and United Nations Environment Programme (2001). Youth, Sustainable Consumption Patterns and Life Styles. Prepared within the framework of the UNESCO Management of Social Transformations Programme. SHS-2001/WS/13. Available from **http://unesdoc.unesco.org/images/0012/001242/124238e.pdf**.

This report examines the results of the 2000 UNEP/UNESCO Survey on Youth and Consumption: Is the Future Yours?, which constituted part of the UNESCO/UNEP joint project on Youth, Sustainable Consumption and Life Styles. An effort is made in the report to interpret some preliminary findings on young people's attitudes towards consumption, and to identify the potential role of youth in the transition towards sustainable consumption lifestyles.

- United Nations Educational, Scientific and Cultural Organization and United Nations Environment Programme (2008). Towards Sustainable Lifestyles: youthXchange Training Kit on Responsible Consumption—The Guide. Available from **http://unesdoc.unesco.org/images/0015/001587/158700e.pdf**; the online training kit is available from **www.youthxchange.net**.

The youthXchange guide and related website constitute a toolkit to help teachers, NGOs, and youth groups raise awareness of sustainable consumption and empower youth to put theory into practice. By providing accessible information, concrete examples, and specific facts and figures, UNEP and UNESCO endeavour to show young people that it is possible to translate their aspirations for a better world into effective action.

- United Nations Environment Programme and others (2008). Green Jobs: Towards Decent Work in a Sustainable, Low-Carbon World. Report prepared by Worldwatch Institute, with assistance from Cornell University Global Labour Institute; commissioned and funded by UNEP as part of the joint UNEP, ILO, IOE, ITUC Green Jobs Initiative. Nairobi: September. DRC/1069/PA. Available from **http://www.unep.org/labour_environment/PDFs/Greenjobs/UNEP-Green-Jobs-Report.pdf**.

The *Green Jobs* report explores the impact a transformation to a green economy could have on work, enterprise, and the way people earn a living. Drawing on information from around the world, this study is the first that has provided a global overview of these issues.

- Worldwatch Institute (2004). *State of the World 2004—Special Focus: The Consumer Society*. New York: W.W. Norton/Worldwatch Institute.

This edition of State of the World examines how and why people consume and what kind of impact their consumption choices have on the planet and their fellow human beings. It argues that Governments, businesses, and concerned citizens can harness their purchasing power to build markets for products that do not destroy the environment and maintains that a less consumptive society is not only possible but essential.

- Worldwatch Institute (2010). *State of the World 2010—Transforming Cultures: From Consumerism to Sustainability*. New York: W.W. Norton/Worldwatch Institute. Available from **http://www.worldwatch.org/node/6369**.

The most recent edition of *State of the World* argues that consumerism has engulfed human cultures and the world's ecosystems. In the report, 60 renowned researchers and practitioners describe how the world's leading institutions—education, the media, business, Governments, traditions, and social movements—can be used to reorient cultures toward sustainability.