



Textile workers in Adwa in 2005. Textiles and leather goods are the two largest manufacturing sectors in Ethiopia

A new **science policy** for Ethiopia

Ethiopia unveiled a new national science and technology (S&T) policy in Addis Ababa on 26 June. The launch marked the end of a review of existing policy undertaken by the government with UNESCO support. The review recommended that S&T policy be seen as part and parcel of the country's overall development plan and that research in the social sciences be integrated in national development priority programmes. It also recommended that at least 1.5% of GDP be allocated annually to research and development (R&D).

Ethiopia has gone through intensive administrative decentralization, restructuring and privatization. The 1993 science policy set out to transform an agricultural economy into an industrial one, using agriculture as a springboard to develop the other sectors. The current review sets out to develop a clearer vision of how the country can achieve socio-economic development in the next 10–20 years and to align policy objectives more on needs.

Ethiopia's population of 73 million is among the poorest in Africa. The population is growing rapidly (2.8% per annum), even as life expectancy has dropped from 48 years in 1998 to just 38 years today owing to HIV/AIDS. There are insufficient hospitals (115) and just 62% of the urban population and 6% of the rural population has access to basic sanitation. Per capita electricity consumption is extremely low (39 kWh in 2001) and is put mainly to household use: agriculture consumes just 0.2%, transport 1.2%, industry 1.3% and services 3.5%.

The review recognizes that most of Ethiopia's socio-economic problems are deeply rooted in the absence of a well-established S&T base. The agricultural sector, which accounts for 45–50% of GDP, 63% of export earnings and nearly 85% of employment, has a low level of mechanization and fertilizer use. Ethiopia has more livestock than any other African country but productivity is low. Some 19% of land is not utilized and recurrent drought, combined with a significant loss of soil due to environmental degradation, has led to persistent poverty and famine. The country possesses rich biodiversity however and diverse geographic and climatic conditions.

Ethiopia's mineral resources are underexploited. There is tangible evidence of petroleum, natural gas, platinum, copper, nickel, iron ore, tin, zinc, coal and potassium but the quality and quantity of most mineral deposits are not fully known. The Geological Survey is engaged only in routine mapping and exploration.

Industry – excluding mining – accounts for about 11% of GDP, 10% of employment and 22% of foreign exchange. The sector remains dominated by light manufacturing and agro-processing. Other enterprises are active in food processing, timber and wood products, paper and printing, and chemicals. Engineering produces mainly equipment destined for the transport sector and machinery.

With industrial R&D still in its infancy, much of the review focuses on way of stimulating technological innovation. It recommends stronger linkages between

engineering institutions like universities, industry and end-users, with feedback mechanisms to policy-makers. It advocates tax incentives for private firms wishing to invest in R&D, including the removal of duties on all equipment and materials imported for the purposes of R&D, to help companies acquire technology. It recommends developing business and technology incubators and a national framework to facilitate effective protection of intellectual property rights. It advocates making greater use of the media, exhibitions and other forms of outreach to disseminate locally produced technologies and 'useful imported' research results.

The review calls for research institutions to be strengthened and for a results-based research management system to be put in place. It also recommends setting up research centres in the water, industry, mining and energy sectors.

The new policy was unveiled by the Minister of Industry, Girma Biru, and the Director-General of the Ethiopian Science & Technology Agency, Zerihun Kebede, at a launch attended by about 150 organizations, including UNESCO.

Ethiopia used the methodology adopted by UNESCO to prepare the first draft of the policy document, which was then reviewed by UNESCO's science policy team in Paris, in tandem with the representative of the Ethiopian authorities, Ali Osman from the Ethiopian Science & Technology Agency. Mr Nirya, a UNESCO consultant, undertook two missions to Ethiopia and, as the review was nearing completion, UNESCO's Addis Ababa office helped the Ethiopian government to organize a national conference of stakeholders.

For details (in Addis Ababa): n.satti@unesco.org; on Ethiopia, see also *A World of Science*, April 2006

Manual alerts children to **plight of dolphins**

An educational campaign and manual promoting the conservation of dolphins and their habitats was launched at a press conference at UNESCO in Paris on 2 May.

All about dolphins! is a multilingual educational manual for children aged 6–14 years. It has been produced by UNEP, the UN Convention on Migratory Species,

UNESCO and others as part of the 2007 Year of the Dolphin campaign.

The manual comes in two multilingual editions: English, German, Italian, French and Spanish; and English, German, Turkish, Greek and Arabic. It will be distributed around the world by UNESCO's Associated Schools Network, via UNEP channels and in major tourist destinations.

The Year focuses on educating children and adults about dolphins and building awareness of the threats they face. How many people know, for instance, that there are 38 species of dolphin, or that dolphins can be frightened or harmed by underwater noise pollution from shipping traffic, wind farms, seismic surveys or military sonars? The Year will also be providing information to decision-makers and involving local communities in the campaign. For all these reasons, it has been incorporated in the UN Decade of Education for Sustainable Development, administered by UNESCO.

The dolphin campaign also makes a tangible contribution to meeting international targets endorsed by the world's governments to reduce the loss of biodiversity by 2010. It involves the United Nations, governments, IGOs, NGOs and the private sector. UNESCO itself actively promotes marine biodiversity through its 70 coastal marine biosphere reserves in over 30 countries.

For details of the Year: www.yod2007.org

Biosphere Connections takes to the sky

On 14 May, the global airline coalition Star Alliance joined forces with UNESCO-MAB, the Ramsar Convention on Wetlands and the World Conservation Union to support the conservation of biodiversity within a new Biosphere Connections programme.

Under the scheme, the Star Alliance will assist field workers from the three environmental bodies with transport to relevant meetings, conferences and events. 'The programme will help field staff and managers of biosphere reserves in particular to attend training courses and workshops designed to build their skills in conserving biodiversity in their regions,' explains Natarajan Ishwaran, Director of UNESCO's Division of Ecological and Earth Sciences. 'Biosphere Connections will also help to raise awareness among governments, businesses, civil society and the media of the important work done by field staff and biosphere managers, by featuring information on Biosphere Connections during in-flight programmes and in in-flight magazines.'

In return, the three environmental bodies will help the airlines within the Star Alliance to fulfill the Environmental Commitment Statement they have all signed, in terms of communicating and working



Dolphins are threatened by pollution, habitat destruction, overfishing, climate change and underwater noise pollution caused by humans. Each year, an estimated 100 000 are killed for commercial purposes and an additional 300 000 perish after becoming accidentally entangled in fishing nets

with customers, governments, local communities, employees and suppliers to identify and resolve environmental issues.

Another way of helping airlines to improve their environmental performance could include joint work to mitigate the contribution airplanes make to climate change via the emission of greenhouse gases by developing and funding bio-carbon offsetting projects. 'Over time,' Ishwaran says, 'UNESCO will identify projects in biosphere reserves that could offset carbon emissions and which may be of interest to airlines and their customers.'

One example of the type of carbon emission-offsetting project which could be envisaged is carbon sequestration via the capture of carbon by biomass, such as through forest conservation and rehabilitation. In addition to mitigating climate change, these projects will also serve to conserve biodiversity and foster rural development in tandem with local communities. Carbon emissions could also be cut back in biosphere reserves by such measures as the development of new technologies, improvements in energy efficiency and greater use of renewable energies.

Through these carbon schemes, countries could participate in carbon trading, a mechanism permitted under the Kyoto Protocol by which developed countries are entitled to buy certificates from developing countries. This creates cost-effective win-win situations.

The World Network of Biosphere Reserves is also home to 59 Ramsar wetlands and scores of World Heritage sites. Many biosphere reserves are located in countries serviced by the Star Alliance network³, which offers more than 16 000 flights daily to 855 destinations in 155 countries.

*For details: www.biosphereconnections.com;
www.unesco.org/mab/biosphereconnections/bc.shtml*

3. Its members are Air Canada, Air New Zealand, ANA, Asian Airlines, Austrian Airlines, British Midlands Airlines, LOT Polish Airlines, Lufthansa, Scandinavian Airlines, Singapore Airlines, South African Airways, Spanair, SWISS, TAP Portugal, Thai Airways, United and US Airways, Adria Airways (Slovenia), Blue1 (Finland) and Croatia Airlines. Air China, Shanghai Airlines and Turkish Airlines have all been accepted as future members

International **rock stars** meet to map the world

Between 12 and 16 March, the British Geological Survey hosted a kick-off event for perhaps the most ambitious mapping project yet. Over the next two years, geologists will be putting together the details of a global project which will ultimately see each nation providing data on the Internet about the rocks from their territory, effectively putting together the biggest jigsaw puzzle ever.

OneGeology involves leading scientists from national Geological Surveys in more than 55 countries and is supported by UNESCO and 6 other global umbrella bodies. The project will map dynamic geological data across the surface of the Earth which will then be converted to a new international standard: a geological exchange language known as GeoSciML. Greater use of this language will allow geological data to be shared and integrated across the planet. It will also transfer valuable know-how to the developing world, shortening the digital learning curve.

'All geologists know well that geology and rocks don't respect man-made political frontiers,' comments Ian Jackson, who is leading the project for the British Geological Survey. 'Nor do the environmental problems and natural resources that go with them. With our changing climate, there is even more urgent need for good quality and more complete data about our environment to be available for those who need it. By contributing to OneGeology, each nation can do something locally to make a huge difference globally.'

OneGeology will be making a tangible contribution to the International Year of Planet Earth, which gets under way officially on 1 January within a partnership involving UNESCO, the International Union of Geological Sciences and national Geological Surveys. The Year will demonstrate why the Earth sciences are indispensable for society.

UNESCO is organizing an exhibition on this theme in Paris from 16 October to 3 November during its General Conference. The exhibition will cover the origins of the Earth, plate tectonics, natural hazards, biological and geological diversity, indigenous knowledge, climate change and sustainable development.

For details of the project: mtc@bgs.ac.uk; www.OneGeology.org; and of the exhibition: a.candau@unesco.org

Photo contest

UNESCO's International Geoscience Programme (IGCP) is launching a photo contest on 1 September on the theme of The Changing Face of the Earth, to raise awareness among youth of the state of the planet. The competition is open to 15–20 year-olds around the world and there are 40 prizes to be won. Entries close on 31 January 2008.

Each contestant is invited to submit a single colour photo depicting his or her personal testimony of the Earth's rapidly changing landscape in a positive or negative way. The photo should illustrate one of the ten themes from the International Year of Planet Earth (see *list*). Photos may portray rural or urban scenes and should depict changes to the landscape caused by natural phenomena or resulting from human intervention.

Each of the winning contestants will receive a copy of two UNESCO books: *Explaining the Earth* and *The Changing Face of the Earth*. The names of the 40 winning contestants will be announced in the April 2008 issue of *A World of Science* and on UNESCO's science portal.

How to enter

Contestants should include the following information with their entry:

- Theme of your photo (*from the list on the right*);
- First and last names, and age;
- Full postal address and, if possible, an e-mail address;
- Descriptive caption placing the photo in context in 2 or 3 sentences;
- Language in which you wish to receive the books (English or French).

If sending in your entry electronically, place a high resolution photo (300 dpi, 700 KB minimum) bearing your name as an image file in UNESCO's server: <ftp://ftp.unesco.org/upload/sc> (User name: ftp-sc, password: /*ftpsc!*) in the **Photo contest 2007** folder. Send a confirmation e-mail to photocontest@unesco.org giving the entry details (see *the list above*). Photos sent through the ftp server will be kept there for only five days to avoid overload, so do not delay in confirming your entry by e-mail.

If sending in your entry by post, address the envelope to: Changing Face of the Earth Photo Contest, Editor, *A World of Science*, UNESCO, 1 rue Miollis, 75732 Paris, France.

All entries will be made accessible from the science portal as of March 2008 and may be reproduced by UNESCO in other ways, with due acknowledgement of the photographer. No entries will be returned.



Photo contest website: www.unesco.org/science; contest themes: www.esfs.org



Jayanta Shaw captured his changed surroundings in this poignant photo of a rickshaw puller making his way through a flooded Calcutta street in July 2006. Shaw entered this photo in the UNESCO-IHE Institute for Water Education photo contest, ultimately won by Prasanta Biswas, also from India. To see all entries: www.unesco-ihe.org

The ten themes of the Changing Face of the Earth photo contest:

- Soil – Earth's living skin, Planet Earth in our hands
- Groundwater – towards sustainable use
- Hazards – minimizing risk, maximizing awards
- Earth and health – building a safer environment
- Climate change – the 'stone tape'
- Resource issues – towards sustainable use
- Megacities – going deeper, building safer
- Deep Earth – from crust to core
- Ocean – abyss of time
- Earth and life – the origins of diversity

The prize

Explaining the Earth describes basic aspects of the Earth sciences: our planet's place in the Universe and in our Solar System, the Earth's structure, plate tectonics, the role of the atmosphere and hydrosphere, the formation of reliefs, the ice ages and natural hazards. It was published by UNESCO in 2006.

In ten steps, *The Changing Face of the Earth* traces continental shift since the Pangaea, a single supercontinent, began breaking up 250 million years ago. Published in 2003 by UNESCO and the Commission for the Geological Map of the World, it comes with maps and a CD-ROM.

A virtual campus for teacher training in Egypt

The Egyptian Ministry of Education gave UNESCO the green light on 13 June for the launch of the Egyptian Virtual School Campus. The campus will be put in place over the next four years and will ultimately train Egypt's one million teachers.

The project will build on the experience of the Internet-based Avicenna Virtual Campus put in place by UNESCO in the Mediterranean basin between 2003 and 2006 in cooperation with the European Commission.

Teachers will be trained using 'blended' learning, a method combining distance learning and conventional instruction. They will have access to the Virtual Library and all the other teaching resources shared by the partner universities within the Avicenna Virtual Campus (see *A World of Science*, October 2006).

Some 27 e-learning centres will be set up across Egypt. Within a year, these should be capable of providing training and tutoring in the e-learning concept, quality control, course production and online teacher training. These centres will form a national network which could serve as a model for the African and Arab regions.

Egypt's education system is one of the largest in the world, according to the World Bank, with 16 million students in the 6–18-year age bracket and 41 000 schools. Population growth has slowed in recent years but still stood at 1.9% in 2005 (Egypt State Information Service), meaning that Egypt's population will soon hit the 80 million mark.

Egypt has achieved full primary and secondary enrolment, according to this year's *Global Education Digest* published by UNESCO. Providing quality education remains a challenge however. Moreover, the sheer numbers of teachers needed for the growing school rolls makes it urgent to incorporate the e-learning concept in teacher training.

The Egyptian Ministry of Education will contribute about one-fifth of the US\$20 million budget for this extrabudgetary project. The remainder will be provided by UNESCO and donors such as the African and Arab Development Banks, and the European Commission.

In June last year, the Egyptian government addressed an official request to UNESCO's Director-General for the establishment of a virtual school campus in Egypt. Consequently, Mohamed Miloudi from UNESCO's Division of Science Policy and Sustainable Development prepared a feasibility study, followed by a technical project document, in consultation with UNESCO's Cairo and Beirut Offices, and in cooperation with Prof. Gamal Darwish, Director of the Egyptian Avicenna Centre in Cairo.

For details: t.miloudi@unesco.org;
<http://avicenna.unesco.org>

Systematic measures needed to end poaching in DRC

UNESCO Director-General Koïchiro Matsuura wrote to Joseph Kabila, President of the Democratic Republic of the Congo (DRC), and Jean-Marie Guehenno, UN Under-Secretary-General for Peacekeeping Operations, on 12 April asking for urgent, systematic measures to stop the poaching and killing of endangered animals in the DRC's five World Heritage Sites.

The Director-General's initiative followed reports that several hundred hippopotami and at least two mountain gorillas had been killed in recent months in the Virunga National Park, inscribed on the World Heritage List in 1979 and on the World Heritage List in Danger in 1994. The DRC's four other World Heritage sites, the national parks of Garamba, Kahuzi-Biega, Salonga and the Okapi Wildlife Reserve, are all inscribed on the World Heritage in Danger List.

Mr Matsuura acknowledged the quality of the conservation work carried out by the Congolese Institute for Nature Conservation but observed that the presence of armed groups at these sites, including Mai Mai and Rwandan rebels, presented a threat to the parks which rangers of the Congolese Wildlife Authority were unable to contain. Rangers and their families have been targeted by militias, resulting in loss of property, injuries and even death.

The Director-General asked that the mandate of the UN Organization Mission in DRC (MONUC) be extended to include the protection of the DRC's World Heritage sites and other protected areas.

For details: www.unesco.org/mab/grasplhome.shtml;
<http://whc.unesco.org/en/statesparties/ld>



Mother and child mountain gorillas in Rwanda. Two mountain gorillas at least have been killed in the Virunga National Park in the DRC in recent months. UNESCO and UNEP coordinate the Great Apes Survival Project

A first geopark for Southeast Asia

Langkawi Geopark in Malaysia officially became the 52nd member of the Global Network of National Geoparks on 1 June. Launched by UNESCO in 2004, the Geoparks initiative is now present in 17 countries.⁴

The tropical Malaysian archipelago owes its membership of UNESCO's Geoparks Network to its rich natural geological and biological diversity. So far, 90 geoheritage sites have been identified throughout the Langkawi Geopark, nine of which feature on the National Geological Heritage List of Malaysia. Given the general paucity of geological outcrop in tropical regions, where the vegetation cover is dense, Langkawi makes an ideal open-air classroom for edutourism at all levels.

Some geoheritage sites in the archipelago have been studied in greater detail than others and are grouped together within a larger conservation unit called a 'geoforest park'; others are classified either as geological monuments or protected geosites.

Langkawi Island owes its status as Malaysia's premier tourism destination largely to two factors: its declaration as a Duty Free Island in 1987; and the inception of the Langkawi Development Authority (LADA) in 1990, which has brought development to the archipelago by promoting it as both a national and international destination for ecotourism. The aim now is to turn Langkawi into a premier ecotourism destination in Southeast Asia.

Langkawi Geopark enjoys strong support from Malaysia's central government and the Kedah state government authorities. It also counts among its patrons the Kedah Royal Family and the former Prime Minister,



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*Langkawi Island Geopark includes Kilim Geoforest Park, pictured here, which combines geological and biological features. The plant growing in crevices on the limestone cliff-face is unique to this ecosystem: vaguely resembling a miniature palm or tree fern, the cycad (*Cycas clivicola*) has large, divided leaves and grows in full sunlight; it is classified as nearly threatened on the IUCN's Red List. Langkawi Island Geopark consists of 99 islands, the largest of which is about 50 km in diameter. The archipelago is situated on the western side of the Malayan peninsula in the State of Kedah in northwest Malaysia, adjacent to the border with Thailand. It is easily accessible by sea and by air*

Tun Dr Mahathir Mohammad. The close cooperation between LADA and the wider tourism industry could serve as a model for many of the more established members of UNESCO's Geoparks Network.

For details: www.unesco.org/science/earth/geoparks.shtml; m.patzak@unesco.org

4. Austria (2), Brazil (1), PR China (18), Croatia (1), Czech Republic (1), France (2), Greece (2), Germany (6), Iran (1), Italy (3), Malaysia (1), Norway (1), Portugal (1), Ireland (1), Romania (1), Spain (4), UK (6)



UNESCO pays tribute to Pierre-Gilles de Gennes

Nobel laureate for Physics in 1991, Professor Pierre-Gilles de Gennes died in Orsay (France) on 18 May at the age of 74. UNESCO pays tribute to this exceptional researcher, who had presided the International Jury for the L'OREAL–UNESCO Awards for Women in Science in material sciences since 2003.

In parallel to his demanding research workload – he received the Nobel Prize for work on liquid crystals which paved the way for today's popular flat television screens, among other applications – Professor de Gennes was a staunch defender of the right for all to access science. In consenting to participate in the L'OREAL–UNESCO Prize promoting women in research, he also wished to encourage girls to embark on an adventure close to his heart.

Pierre-Gilles de Gennes presided over this year's award ceremony on 22 February, which recompensed five women from as many continents. He will be sorely missed by the community of laureates, the jury members and his collaborators at UNESCO and L'OREAL.