



United Nations
Educational, Scientific and
Cultural Organization



African Union
Union Africaine

SCIENCE, TECHNOLOGY & INNOVATION POLICY INITIATIVE



Responding to the needs of
Africa

"We, the Heads of State and Government of the African Union, meeting at the 8th ordinary session of our Assembly in Addis Ababa, Ethiopia, from 29 to 30 January 2007, ..."

"We call on UNESCO and other bilateral and multilateral organizations to support the Member States, Regional Economic Communities and the African Union to implement the Summit decision on Science and Technology."

Addis Ababa Declaration on Science and Technology and Scientific Research for Development adopted by Heads of State and Government of the African Union, Ethiopia, January 2007.

"The 'Science and Technology Consolidated Plan of Action' marks the start of an African process that offers many opportunities to strengthen scientific and technological capacities. Its implementation will go a long way to ensure that Africa achieves its aspirations embodied in the AU and NEPAD and meet the MDGs."

(AU, Consolidated Plan of Action for Science and Technology, Jan 2007)

"...UNESCO intends to make a decisive contribution in the implementation [of the AU/NEPAD Consolidated Plan of Action (CPA)], as requested by Heads of State and Government in their final declaration in Addis Ababa in January 2007. UNESCO will continue to coordinate the response of the United Nations system in the field of science and technology. The implementation of the CPA will also be based on an inter-agency partnership approach at the continental and sub-regional levels. An increasing number of African countries are reviewing and reformulating their national science policies, for which they have requested UNESCO's assistance"

Extract of address delivered by Mr Koichiro Matsuura, Director-General (UNESCO) at the 179th Session of UNESCO's Executive Board, 9 April 2008

"As the principal agency in the UN system with a mandate for the promotion of science and technology, as well as the designated lead agency in the UN for the NEPAD Science and Technology Cluster, it is incumbent upon UNESCO to be proactive in catalyzing the engagement of other agencies in the implementation of NEPAD's Science and Technology Consolidated Plan of Action. Our efforts are intended to ensure coherent approaches by all agencies and to maximize synergies between the UN as a whole and NEPAD in implementing the CPA."

Extract of address delivered by Mr Walter Erdelen, Assistant Director-General for Natural Sciences, (UNESCO) at the Third African Ministerial Conference on Science and Technology for Development (AMCOST III), Mombasa, 15 November 2007.

Front Cover:

Mubarak Science Park, Alexandria, Egypt (Eiman Aleem)

Back Cover:

Encyclopedia of Life Support Systems (Knowledge for Sustainable Development, EOLSS),
Science, Technology and Gender (An International Report), Future Directions for National Reviews of Science,
Technology, and Innovation in Developing Countries

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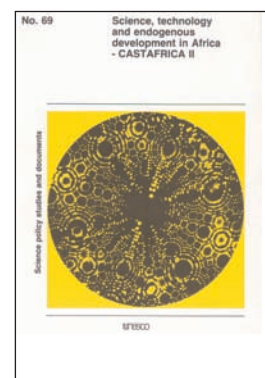
June 2008

UNESCO and Science Policy

New scientific paradigms are pushing the frontier in all areas of the natural, social and human sciences. Science, Technology and Innovation (STI) are now universally recognized as the drivers of national economic development, and key contributors to poverty reduction, disease prevention and environmental conservation. Strengthening capacity in science for sustainable development, and harnessing the fruits of scientific discoveries, can only be achieved within a comprehensive framework of science and technology. Countries need to respond with policies, programmes, institutions and partnerships, which maximize their economic opportunities. Governments need to re-evaluate not only where they spend their S&T resources, but also how they can maximize effective spending.

The role of UNESCO in STI policy is threefold: a think tank on policy development; a guide for national policy reforms; and a catalyst for regional and international cooperation.

UNESCO has a long tradition in assisting Member States in science policy reviews, which dates back to the early 1960s. These efforts culminated in a series of Ministerial meetings in Africa, known as CASTs, including the Conference of Ministers Responsible for the Application of Science and Technology to Development in Africa (CASTAFRICA). Subsequently, national authorities have become increasingly aware of the importance of elaborating national policies and strategies in the area of science and technology, as a prerequisite for effective development policies. As a result, many African Member States have sought, and are still seeking, UNESCO's support in formulating National science policies.



UNESCO and the AFRICAN UNION (AU)

The African Union (AU) Heads of State and Governments requested UNESCO's assistance in the implementation of the Consolidated Plan of Action (CPA) for science and technology in Africa (2008-2013). The CPA consists of three inter linked pillars: capacity building, knowledge production and technological innovation. The CPA recognizes that it is vital to institutionalize S&T processes in Africa policy-making where scientists are expected to play an enhanced and visible role.

As a response to the AU request, the Executive Board (177 EX/16) and the General Conference (194 member states) of UNESCO (November 2007) approved the UNESCO Plan of Action proposed by the Director General (UNESCO Resolution 21).

The governing bodies of UNESCO adopted 3 flagship projects: i) capacity building in science, technology, and innovation policy; ii) enhancing science and technology education and iii) the African Virtual Campus.

The present document focuses on past and current initiatives undertaken by UNESCO, Division for Science Policy and Sustainable Development (SC/PSD), in close cooperation with the Africa Department and the Bureau of Strategic Planning (BSP), in support of the implementation of the CPA on capacity-building in science policy, improving policy conditions and building mechanisms for innovation.



UNESCO and the AU/ CPA Science Policy Programmes

CPA objective: creation of institutional and policy frameworks to conduct and generate STI

Africa's ambitious CPA objectives cannot be fulfilled without a broad and integrated strategy involving all stakeholders, and taking into account the ever changing environment in which research is conducted.

UNESCO has launched the African Science, Technology and Innovation Policy Initiative (ASTIPI) to build capacities in STI policy formulation and develop national STI policies for all African countries still without one. UNESCO is working with these countries to reform their science systems and assist them in elaborating and implementing strategies and programmes.





UNESCO's University-Industry-Science Partnership (UNISPAR) programme was launched in 1993 to improve the quality of universities in developing countries, and to encourage their involvement in the process of industrialization of their country.

Sustainable solutions, whether at the global, regional or country level, require more advances in scientific knowledge, discoveries and innovations. The university-industry cooperation is vital in this process. Since 2002, UNISPAR has focused on capacity-building and technical assistance in the governance of science and technology parks: promoting stronger partnerships and linkages between universities and industry, innovation, and transfer of knowledge.

To this end, UNESCO works in close cooperation with the international professional organizations in this field, including the World Technopolis Association (WTA) and the International Association of Science Parks (IASP). Science and Technology Parks (STP) are economic and technological development complexes that aim at fostering knowledge-based economies by bringing together scientific research, business and governmental organizations in one physical location, and supporting interrelationships between these groups. STP can house centers for scientific research, technological innovation and incubation, training, forecasting, as well as facilities for fairs, exhibitions and market development.

Today, there are over 400 science parks in the world. The concept of Science Parks in Africa is now recognized as one of the means to promote STI, commercialization of Research and Development (R&D), scientific and engineering education, and continued professional training. Science Parks are present in Egypt (Sinai Technology Valley), Madagascar (Technopole du Toamasina), Morocco (Technopole de l'Aéroport Mohammed V and Casablanca Technopark), Senegal (Technopole de Dakar) and South Africa (Technopark Stellenbosch).

UNESCO science, technology and innovation policy review and formulation in African Member States

Using both national and international experts, UNESCO accompanied a number of African Member States in reviewing and (re)formulating their national policies. These include Ethiopia, Congo, Kenya, Lesotho, Namibia, and Nigeria. In response to the diversity of national landscapes for R&D in Africa, individual reviews of STI policies were designed for each country to map out a specific route, which draws substantial benefits from S&T.

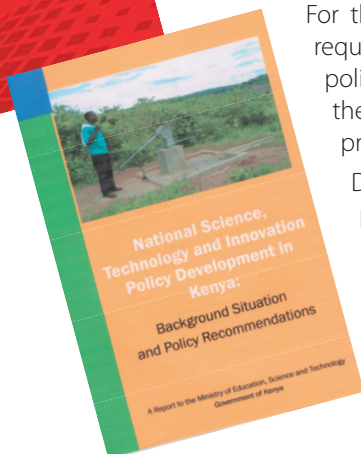
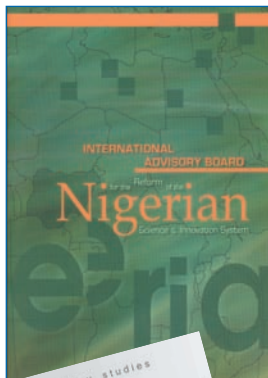
Key features reviewed include the:

- current pool of S&T personnel;
- investment in human resources training and development;
- demand for knowledge by the private sector;
- institutional knowledge assets;
- enabling environment;
- functioning S&T infrastructures;
- challenges and opportunities;
- socio-economic features and the technological status of a nation.

For the 2008-2009 programme, a number of countries have made formal requests through their governments to UNESCO to assist them in science policy reviews. UNESCO is planning to support these efforts by providing the necessary expertise and policy advice to accompany them in the reform process of their national STI systems.

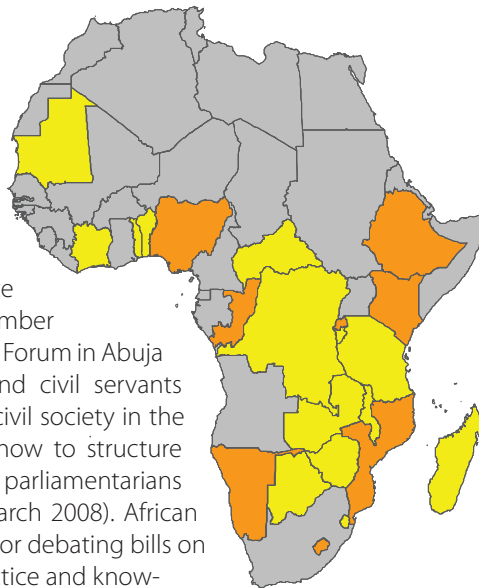
During 2008/09 science policy formulation exercises and reviews are planned in the following countries (in yellow on the map, see opposite):

Benin, Togo, Botswana, Burundi, Cote d'Ivoire, Madagascar, Malawi, Morocco, RD Congo, Swaziland, Zambia, and Zimbabwe.




CPA objective: build a critical mass of science policy advisors

UNESCO recognizes that both scientists and policy makers are “essential policy advisors”, and therefore convenes regional science policy fora with scientists and parliamentarians. Since 2003, the following parliamentary fora were organized in Africa: the Arab Science and Technology Policy Forum (Cairo, December 2004), and the Nigerian parliamentary S&T Forum in Abuja (June 2006). Recently, parliamentarians and civil servants met with scientists and representatives of civil society in the Congolese capital to exchange ideas on how to structure inter-parliamentary cooperation and train parliamentarians and government officials in S&T policy (March 2008). African parliamentarians responsible for proposing or debating bills on science-related issues, exchanged best practice and know-how in STI policy-making and science legislation.



Current status of UNESCO STI Policy review in Africa

STI Policies requested 

STI Policies Formulated 

The boundaries and names shown on this map do not imply official endorsement or acceptance by the United Nations.

UNESCO's assessment of status of science and technology policy formulation:

In cooperation with AU/NEPAD, UNESCO will conduct a survey of African Member States to determine which countries have STI policies, and whether these policies are adequate for meeting present STI needs and orientations. The survey will include an analysis of training needs in terms of the capacity to develop policies.

CPA objective: African science, technology and innovation indicators initiative to monitor Africa's S&T development

UNESCO, through its Institute for Statistics (UIS-Montreal), is responsible for collecting and disseminating statistics across the United Nations System in education and science. It gathers data from all African countries through its biennial surveys and partnerships with key organizations. The UIS, and the SC/PSD, in cooperation with the AUC/NEPAD, regularly hold regional workshops and training sessions on the relevance of S&T statistics. The aims of the workshops are to:

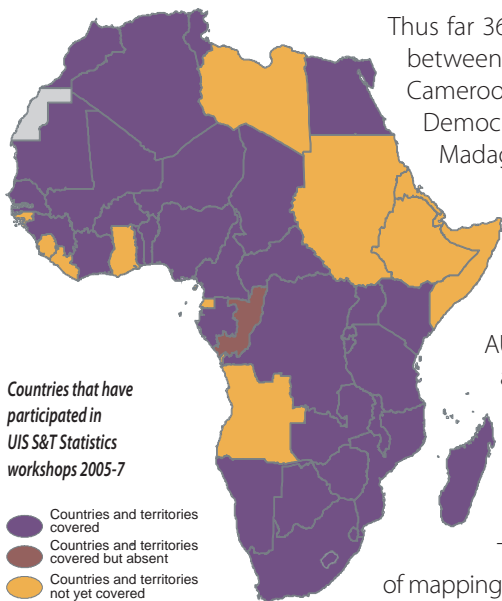
- increase the number of countries in Africa regularly producing quality S&T indicators;
- share experiences and address common problems with other African countries in the field of S&T indicators, and in collecting S&T statistics;
- reinforce local capacities for the production and sustainability of national S&T statistics systems;
- promote the use of S&T indicators in evidence-based policy-making;
- improve knowledge about the particular characteristics of S&T statistics data collection use in the context of African country regions;
- share and develop initiatives that could serve as “good practices” in other countries of the region.

Training programmes for policy analysts were developed and implemented in the area of science policy formulation - as well as in the area of mapping science statistics and indicators - by UIS, and SC/PSD, in cooperation with AUC/NEPAD in the following regions:

West Africa: Douala (Cameroon), 5-9 November 2007; North Africa: Tunis (Tunisia), 23-25 January 2007; West Africa: Dakar (Senegal) in October 2006; East/Southern Africa: Entebbe (Uganda), September 2005.

Participants were trained to use: techniques to measure research and experimental development; strategies to apply the OECD Frascati Manual for R&D statistics; international and national issues concerning the production of quality S&T indicators.





Source UIS, December 2007
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Thus far 36 countries in Africa have participated in the statistics workshops between 2005-2007: Algeria, Benin, Botswana, Burkina Faso, Burundi, Cameroon, Cape-Verde, Central African Republic, Chad, Côte d'Ivoire, Democratic Republic of Congo, Egypt, Gabon, Guinea, Kenya, Lesotho, Madagascar, Malawi, Mali, Mauritania, Morocco, Mozambique, Namibia, Niger, Nigeria, Rwanda, Senegal, South Africa, Swaziland, Tanzania, Togo, Tunisia, Uganda, Zambia, and Zimbabwe.

CPA objective: establishing an African STI observatory

UNESCO, through UIS and the SC/PSD, in cooperation with the AUC, and NEPAD, envisages a feasibility study for the establishment and operation of an African STI observatory. An observatory of professional statisticians would be made responsible for providing government and other stakeholders with up-to-date information on the performance of the institutions (and firms) involved in R&D and related innovative activities.

The main mission of an African STI Observatory would consist of mapping Africa wide STI capacity, producing basic indicators (statistics) on: human resources, funding of R&D activities, publications, patents, and research institutions.

Expected achievements in support of the CPA (2010)

African STI Observatory

- feasibility study for the establishment and operation of an African STI Observatory completed

Africa wide mapping of STI capacity building

- status report prepared and published
- status of STI policy formulation and training needs assessed in African Member States

STI policy reviews

- STI policies reviewed and (re)formulated in at least eight countries
- policies for STI adopted by African governments
- adoption of national STI policies, and
- strategies and programmes elaborated and implemented

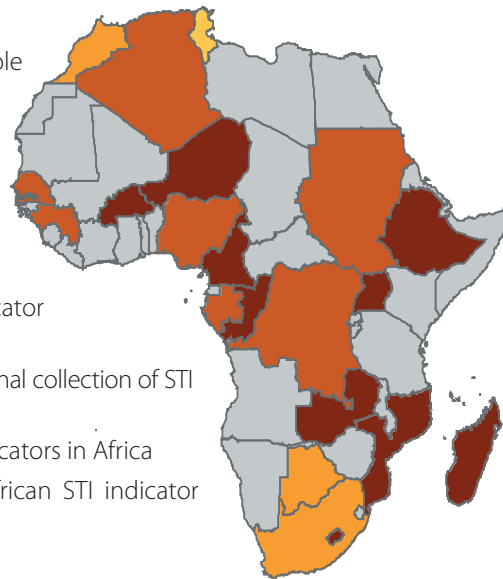
African Science Technology and Innovation Policy Initiative ASTIPI

- at least 100 specialists trained in policy analysis
- an ASTIPI postgraduate course designed and implemented
- creation of an African e-library of STI policy
- short-term executive workshops organized for senior government officials



Supporting evidence based policy making in Africa

- promote adaptation and adoption of internationally compatible policy relevant STI indicators and methodologies
- training seminars and workshops on STI policy-relevant indicators organized in 2008 for English-speaking Africa, and in 2009 for French-speaking Africa
- existing national S&T statistical and indicator systems examined
- national capacities for collection and interpretation of STI indicator data strengthened
- design of questionnaires, manuals and documentation for national collection of STI data
- regional analysis and dissemination of policy-relevant STI indicators in Africa
- develop an African Network for STI, envisage Common African STI indicator outlook



UNESCO as the Convener of the UN S&T Cluster in Support of AU/NEPAD

Since 1999, as an important component of the UN Secretary-General's reform agenda and as urged by the UN Economic and Social Council (ECOSOC), regional consultative meetings are held to improve the coherence of the activities of the various UN agencies working in the five regions of the world including in Africa. For Africa, six thematic cluster areas involving different UN agencies concerning the priority areas for NEPAD were established to serve as an operational framework to support NEPAD. The Science and Technology (S&T) Cluster was established at the Fifth Regional Consultation in May 2003, designating UNESCO as the Convener and the UN Commission for Africa (UNECA) as the Vice-Convener. The cluster engages in a mix of activities:

- focus on the NEPAD's Science and Technology Initiative aimed at the explicit application of S&T for industrialization and economic growth;
- mainstream S&T in other NEPAD initiatives by defining issues which require S&T research, analysis and capacity building;
- better coordination of the different partners' actions, and how the UN system can best respond to the call by the AU Summit of Heads of States and Governments in the implementation of the CPA and the Summit's decisions on science and technology.

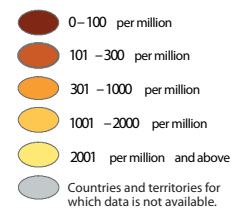
Members of the Cluster include: UNESCO, UNECA, UNIDO, WIPO, UNEP, UNDP, IAEA, ILO, UNCTAD, OSAA (NY), UNU MERIT, FAO, WHO

The inaugural meeting of the S&T Cluster took place in July 2004 during the Sixth Regional Consultation. The meeting adopted an initial programme of activities for active cooperation which included collaboration with AU/NEPAD within the framework of the AU summit on the theme of science and technology. UNESCO organized the Second Meeting of the Cluster in Paris on 9 June 2006. The meeting presented a unique opportunity to launch a platform/forum and a process to collectively harness African and international efforts in science and technology for Africa's development through the AU/NEPAD process in S&T.

In cooperation with the African Union Commission, Department for Human Resources, Science and Technology (AUC/HRST), UNESCO convened the 3rd meeting of the Cluster in April 2008 in Addis Ababa. The Terms of Reference (TOR) for the creation of an African Cluster for Science and Technology (ACST), introduced on this occasion by the AUC/HRST was welcomed by the participants to the UN S&T Cluster. The ACST presents a mechanism to coordinate activities that contribute to the implementation of the CPA, in a bid to eliminate duplications and resource wastage, within the framework of the AU.

Major outcomes of the May 2008, AMCOST Bureau meeting were: the nomination of UNESCO to its Steering Committee and the establishment of the ACST.

Number of Researchers in Africa (per million inhabitants)



Source: UIS, September 2007

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