United Nations
Educational, Scientific and
Cultural Organization

Organisation
des Nations Unies
pour l'éducation,
la science et la culture

Organización
de las Naciones Unidas
para la Educación,
la Ciencia y la Cultura

Организация
Объединенных Наций по
вопросам образования,
науки и культуры

منظمة الأمم المتحدة
للتربيـة والعلم والثقافة

联合国教育、
科学及文化组织

Bureau of Strategic Planning /
Internal Oversight Service

IOS/EVS/PI/59 REV.
Original: English

Results Achieved for the Individual Main Lines of Action (MLA) of the Natural Sciences Sector

UNESCO
2006

Title of element/unit

32 C/5 paragraph 02111 **MLA 1 - Global change and water: advancing hydrological sciences for improved assessment**

Inputs/Funding

32 C/5 Approved – Regular budget: $2,530,000; Extrabudgetary resources: $30,000

Justification/Identification of needs/Background

WSSD extended the water-related goals of the MDGs by adopting a new time-bound international goal which stipulates that the number of peoples without access to safe drinking water and adequate sanitation should be halved by 2015. This clearly establishes the fulfilment of human needs as one of the overriding objectives. Thus, pertinent approaches coupling scientific endeavours to their application in improving the conditions of society must be supported and developed. WSSD also confirmed the need to initiate action leading to a comprehensive assessment of the world's freshwater resources. Particular attention will therefore be given to strengthening the capacity and the long-term mandate of the United Nations system-wide World Water Assessment Programme (WWAP) led by UNESCO. WSSD also stressed that issues related to the impact of global change on water resources availability, including those induced by both human and natural process interactions, needs to be addressed with particular attention to the study, assessment and management of freshwater resources in Africa. The first three themes of IHP-VI provide the essential substantive scientific support to respond to this requirement, especially the initiatives on groundwater, Hydrology for the Environment, Life and Policy (HELP) and Flow Regimes from International Experimental and Network Data (FRIEND).

Strategies/Implementation

WWAP and its series of *World Water Development Reports* will pay particular attention to monitoring progress made in meeting the growing demand for water resources. The activities of the sixth phase of IHP (2002-2007) will continue to focus on hydrological processes, assessment of availability and use of water resources and watershed and aquifer dynamics.

IHP cooperation with Member States, United Nations system agencies, intergovernmental and non-governmental partners will be strengthened for the implementation of these activities. Joint actions with other international scientific endeavours of UNESCO (MAB, IGCP, IOC, MOST, WHC and CSI) will be pursued creating opportunities for intra- and intersectoral cooperation. This, in particular, calls for innovative approaches that minimize risks to vulnerable water-related ecosystems. The principles adopted by, and included in, the international conventions on combating desertification and on wetlands will serve as important orientation points. The inter-agency initiative ISARM (Internationally Shared Aquifers Resources Management Programme), led by UNESCO, and implemented jointly with FAO and UNECE, JIIHP (Joint International Isotopes in Hydrology Programme), carried out jointly by IAEA and UNESCO, and the cross-cutting initiatives FRIEND and HELP will provide transdisciplinary platforms for launching integrated efforts incorporating surface-groundwater-ecohydrological interactions. These programmes will also contribute to the study of physical and social processes and to the formulation of integrated water resources management approaches and policy-relevant recommendations.

A coordination framework will be established to collect data related to extreme events (floods and droughts) within vulnerable basins, targeting the formulation of mitigation schemes (cooperation and joint action). To this end the enhancement of modelling capabilities of processes at the interfaces of the hydrologic cycle, and a comprehensive assessment of human-watershed-aquifer interactions, will be undertaken in coordination with IHP National Committees, WMO and international NGOs. Specific attention will be given to water quality processes, dry lands and mountain hydrology and to the hydrological impacts of climatic change, including the use of HELP basins. In implementing the programme full and open access to hydrological data and information for all will be promoted.

Expected results *(and performance indicators)*	**Results achieved**	**Results not achieved**	**Lessons/Challenges**
Assessment of water-related stress under various socio-economic conditions in selected river basins and aquifers completed – *number of assessments carried out* – *number of pilot basins established through WWAP and HELP*	• 42 new basins added to the Hydrology for the Environment, Life and Policy (HELP) network (67 total); twinning arrangements between selected HELP basins for technology transfer between basins • Establishment of IHP-HELP International Centre for Water Law, Policy and Science as a category 2 centre under UNESCO's auspices; several international seminars on HELP and a HELP South Pacific Symposium hosted by Member States; establishment of Steering Committee for an International HELP Symposium (2007) on "The South" HELP basins aimed at further strengthening the HELP network		In view of the rapid expansion of HELP, the need to secure a host country to support an enlarged HELP secretariat
Second World Water Development Report prepared	• UNESCO's contributions to WWDR-2 completed and remitted to WWAP • Editing of overall report under way		
Global capacities built to monitor groundwater resources availability and related management issues addressed – *global framework established through the International Groundwater Resources Assessment database* – *World Hydrogeological Map (WHYMAP) prepared* – *number of contributing national and regional centres and their geographical distribution*	• Third WHYMAP Workshop held in Paris and presentation of the groundwater resources of the World Map • First phase of the establishment of a database system with a set of selected aquifer attributes for the Transboundary Aquifers of the Americas initiated by IGRAC • Data Base of the Transboundary Aquifers of SADC Region initiated by IGRAC		
Policies for improved coordination among countries sharing transboundary aquifer systems (ISARM) elaborated, management of shared groundwater resources improved – *number of countries participating, implementing and adhering to the policies*	• ISARM activities in the Caribbean initiated in cooperation with OAS; inventory of transboundary aquifers in the Balkans, the Americas, North Africa and the Sahel prepared • Scientific advice provided for the preparation of the third report on transboundary aquifers submitted to the United Nations International Law Commission • Workshop on Transboundary Aquifers of the Americas held in São Paulo, Brazil		

River basin management improved – *number of HELP river basins and regional data sets established and operational* – *number of river basins and regions covered by UNESCO FRIEND project* – *number of countries utilizing FRIEND concept*	• South American Chapter of the FRIEND project established; a total of 56 HELP basins now located in FRIEND regional groups • Capacity-building activities carried out by the UNESCO-IAEA Joint International Isotope Hydrology Programme (JIIHP) • Joint UNESCO-ESA earth observation (TIGER) initiative launched in Africa • Results of integrated science workshop on water quality (biodegradation of organic agrochemicals) published in an international hydrology journal		
Methodologies for the mitigation of the effects of floods and droughts improved – *a set of concrete methodologies developed and disseminated* – *number of national and regional institutions utilizing the produced methodologies*	• International Flood Initiative (IFI) launched and establishment of the International Centre for Water Hazard and Risk Management (ICHARM) in Tsukuba, Japan, as a category 2 centre under UNESCO's auspices • Pilot project for community-based flood mitigation and preparedness carried out in Jakarta • Scale methodologies linked with climate variability vis-à-vis land-use change impacts on floods and low flows using HELP basins are also being addressed		

Title of element/unit

32 C/5 paragraph 02112 **MLA 2 - Water for human needs**

Inputs/Funding

32 C/5 Approved – Regular budget: $2,152,500; Extrabudgetary resources: $120,000

Justification/Identification of needs/Background

WSSD, agreeing on a new water-related Millennium Development Goal (MDG), also called in its Plan of Implementation for Integrated Water Resources Management and Water Efficiency Plans to be implemented by all countries by 2005.

Recognizing that the lack of sustainable access to safe drinking water is directly linked with poverty, WSSD recommended an enhanced people-oriented approach to water management and development with emphasis on human needs. In this regard, an interdisciplinary approach to water resources management in arid, urban and coastal zones was also recognized by WSSD as a critical issue for sustaining economic prosperity and the well-being of many national economies. Likewise, surface and aquifer contamination was identified as a major problem, underlining the importance of groundwater management to meet the water needs of society.

The Third World Water Forum (Kyoto, Japan) in March 2003 demonstrated through various panels, exhibitions, sessions and multi-partner activities how the concepts and commitments of the 2nd World Water Forum of The Hague (2000), the Bonn Conference (2001) and the WSSD recommendations can be translated into concrete action in the area of water management. UNESCO's contribution was based on the priorities emphasized in the five themes of IHP-VI and the implementation of WWAP.

Strategies/Implementation

Building upon work performed in the 2002-2003 biennium, IHP will continue to contribute to the MDGs and to the implementation of the recommendations of WSSD. High priority will be given to the crucial role of water in poverty alleviation, setting innovative practices and identifying best strategies to enable less-developed countries to enhance their capabilities to secure sustainable and safe water supplies.

UNESCO will actively contribute to the enhancement of United Nations water-related system-wide and bilateral cooperation and coordination. IHP cooperation with Member States, United Nations system agencies, intergovernmental and non-governmental partners will be a key feature in this effort. The UNESCO/IHP intergovernmental mechanism will also support the formulation of action to achieve sustainable development goals, including through collaboration with other international programmes of UNESCO (MAB, IGCP, IOC, MOST, WHC and CSI).

Plans to formulate water management strategies for arid and semi-arid zones, urban areas and coastal zones will be initiated by the UNESCO/IHP regional centres, which will be given an active role in many regional and transregional actions, and in cooperation with the Regional Centre for Training and Water Studies in Arid and Semi-arid Zones (RCTWS) in Egypt and the Regional Centre for Urban Water Management in Iran (RCUWM). Both are category 2 UNESCO centres. The integration of sound approaches to groundwater management will be an essential feature in these efforts. The efficient use of energy/water interactions and the applicability of new technologies for urban drainage and sanitation and for waste water recycling, such as bio-remediation, will be examined. Suitable urban and peri-urban water management strategies, institutional frameworks and participatory processes in the context of poverty alleviation will be explored.

As WSSD follow-up, UNESCO and IAEA will jointly implement the Type II Partnership Initiative on Science and Technology Application of Isotope Techniques for Sustainable Water Resources and Coastal Zone Management (SWARCOZM).

The study of social processes involved in the generation of water conflicts and approaches to prevent and resolve these situations will be part of a continued and ongoing effort. Both ethical and sustainability imperatives underline the importance for UNESCO to pursue its "From Potential Conflict to Cooperation Potential: Water for Peace" (PC→CP: WfP) project in a subsequent phase. Next to the further elaboration of methods and principles of international (shared) water management and incorporation of the project results in educational material and capacity-building the next phase will also address potential water conflicts among different users, or between users within the same jurisdictional area. The proven model of IGO-NGO partnerships will be further strengthened and extended. The value assigned to water by different social groups will be taken into consideration in the design of water management strategies.

Expected results *(and performance indicators)*	**Results achieved**	**Results not achieved**	**Lessons/Challenges**
Knowledge base established and capacities built for water resources management, particularly in arid and semi-arid areas – *number of knowledge networks created and operational for development and implementation of regional policies* – *training courses and technical meetings conducted*	• Major workshops on modelling (Roorkee, India), isotope techniques (Oxford, United Kingdom) and climate research and information for water resource management (Cairo, Egypt) by the UNESCO-created G-WADI (Water and Development Information for Arid Lands: A Global Network) • Regional Asian G-WADI constituted and G-WADI website set up		
Capacities for management of water resources in urban and rural areas improved – *appropriate guidelines for urban water management strategies, with emphasis on developing countries, developed and disseminated* – *number of developing countries using the guidelines*	• Progress in urban water management aspects through the production of: data requirements and management guidelines; manual on water and environment sensitive urban development; a new generation urban groundwater model; ecological sanitation monograph; urban water and waste water reuse publication; and integrated urban water management in different climates: humid tropics, arid and semi-arid zones and in cold climates; guidelines on urban aquatic habitats; treatise on urban water conflicts; and urban water education and training material and platform • Establishment of the Urban Water Management Centre in Cali, Colombia, as a category 2 centre under UNESCO's auspices		Dissemination of the voluminous material produced to be completed in 2006-2007 (final biennium of IHP-VI)
Integrated river basin management improved through approaches incorporating social and institutional aspects – *different approaches developed and disseminated* – *number and type of countries using the approaches*	• In-depth review of guidelines for integrated river basin management launched; major international workshop carried out on the topic, resulting in the production of a state-of-the-art assessment and recommendations on the scope and approaches necessary for the formulation of new guidelines and for forging new partnership arrangements • Books on analytical techniques for operation optimization of multi-reservoir systems and on system approaches to water engineering finalized		International workshop issued substantial recommendations which will require an extension of work to the 2006-2007 biennium – still within IHP-VI execution period
Understanding of the role of groundwater in satisfying human needs enhanced – *training materials on groundwater resources management developed and disseminated* – *wise practices on artificial recharge systems identified and documented* – *number of national and regional institutions adopting the training material* – *number of countries where training facilities on artificial recharge have been created*	• Publications on Management of Aquifer Recharge and Subsurface Storage and Strategies for managing aquifer recharge in semi-arid areas disseminated • Regional workshops on managing aquifer recharge organized in Yadz (Islamic Republic of Iran) and Lahore (Pakistan) to enhance knowledge base in arid and semi-arid areas		

Capacities of developing countries and guidelines for efficient management of water resources in coastal zones and mountainous areas improved – *guidelines improved and disseminated to a number of countries*	• Capacities improved through a multi-partner workshop (Mombassa, Kenya) on African Catchment Studies on the topic of "coastal environmental and social impacts" (in cooperation with LOICZ - Land Ocean Interactions in the Coastal Zones), a multi-partner international conference on "Hydrology of Mountain Environments" and a "Symposium on Mass Balance of Andean Glaciers"		
Methodologies on water conflict resolution and cooperation improved – *methodologies drafted and widely disseminated* – *number of countries following the approaches and methodologies*	• Set of indicators linked to methodologies of water conflict resolution finalized and Central Asian workshop on artificial recharge for groundwater management cooperation organized by IHP and the UNESCO Tehran Office • Creation of an expert working group and development of a course on water conflict management for Latin America and the Caribbean; same process launched for Iraq with the involvement of professionals from the region • Initiation of the Lake Titicaca case study		
Development of partnership with United Nations agencies, development agencies, intergovernmental organizations in water management enhanced – *number of effective partnership established*	• UNESCO is a major partner in UN Water, which is the United Nations inter-agency coordinating mechanism for water issues; the WWAP led by UNESCO is a flagship project of UN Water and brings together 24 United Nations agencies • Participation in CSD 12 and CSD 13 (Commission on Sustainable Development) • International Flood Initiative launched in close cooperation with WMO and UNU		

Title of element/unit

32 C/5 paragraph 02113 **MLA 3 - Water education and capacity-building for sustainable development and security**

Inputs/Funding

32 C/5 Approved – Regular budget: $2,627,000; Extrabudgetary resources: $3,526,000

Justification/Identification of needs/Background

By resolution 57/254, the United Nations General Assembly proclaimed the 10-year period beginning on 1 January 2005 the "United Nations Decade of Education for Sustainable Development". The Assembly further designated UNESCO as lead agency for the promotion of the Decade and requested it to develop a draft implementation scheme. IHP will contribute to this global challenge. During the period 2002-2003, WWAP, IHP and MOST contributed to the better management of shared water resources through the project "From Potential Conflict to Cooperation Potential: Water for Peace" (PC → CP: WfP), jointly with Green Cross International.

Strategies/Implementation

Building on the achievements and preparatory work during the first two years (2002-2003) of IHP-VI, the second biennium will focus on institutional strengthening of water educational capacities worldwide in order to contribute to the United Nations Decade and to sustainable development and human security. Through intersectoral cooperation with ED, IHP will also strengthen the links between the water-related UNESCO chairs.

Major efforts will be made to bring about stronger cooperation and task-sharing between the UNESCO IHE Institute for Water Education and the UNESCO associated centres in human capacity-building in the various aspects of integrated water resources management (see box IHE, page 96). The network of institutions will be strengthened through support to PoWER (Partnership for Water Education and Research) launched by the UNESCO-IHE Institute. It is expected that the proposed Central Asian Network (WaterCAN), a follow-up activity to UNESCO's initiative in the Aral Sea Basin, will become operational during the biennium.

The Global Observatory for Units Teaching, Training and Ethics of Water (GOUTTE of Water) in which UNESCO is a main partner will facilitate, in close cooperation with the Subcommission on Freshwater of COMEST (see also Subprogramme III.1.2), the networking of institutes engaged in the implementation of the ethical, educational and awareness-raising aspects of water management. This forum will be developed in order to facilitate quality control of human capacity-building. Existing alumni networks will be strengthened to assist this process.

In preparation for the United Nations Decade on Education for Sustainable Development (2005-2014), human capacity-building institutions will focus on all three pillars of sustainability – social, environmental and economic – in line with the recommendation of IHP Theme Advisory Boards. In order to strengthen the capacity of IHP-related educational institutions, an IHP scholarship programme will be initiated for teaching staff providing sabbatical and on-the-job training placements at leading academic institutions such as the UNESCO-IHE Institute for Water Education and UNESCO related centres. A major international water educational conference in 2004 will be devoted to these issues to assess preparedness and guide educational policies and practices for the Decade. The web-based UNESCO water portal – a part of the UNESCO knowledge portal – will increasingly serve as a channel for information dissemination, exchange of information and a medium for distance learning. It will also be instrumental in the follow-up of the International Year of Freshwater (2003).

The importance of water in the creation, development and sustainability of human civilizations will be further explored and documented in close cooperation with the Culture Sector and networks of water historians and anthropologists.

Expected results *(and performance indicators)*	**Results achieved**	**Results not achieved**	**Lessons/Challenges**
Education capabilities for sustainable water resources management enhanced – *number of personnel trained* – *curricula and training models developed* – *number of institutions assisted*	• Capacity-building activities in Afghanistan and training of Iraqi experts in water resource management by UNESCO-IHE; 14th IHP Nagoya training course held at the Humid Tropics Centre (Kuala Lumpur)		
Effectiveness of water educational networks at the regional and global levels improved – *"Global Observatory of Units for Teaching, Training and Ethics" of Water (GOUTTE) established and operational* – *number of countries actively participating in the network*	• GOUTTE of Water launched on the occasion of the International Symposium of Invited Stakeholders and Service Providers "Education, Training and Capacity-Building for Integrated Water Resources Management: Strategies and Actions after Kyoto" at UNESCO-IHE Institute • Arab Regional Centre for Water Ethics established in Egypt		
Methodologies for quality control and monitoring of the transfer of knowledge into practical applications improved, particularly in least developed countries – *number and distribution of countries utilizing the methodologies* – *number and geographical distribution of countries benefiting from practical applications*	• Training activities on water desalination and water reuse carried out in Yemen and Eritrea within the framework of the Italian-funded project "Water Programme for Africa" • Low-cost technology for arsenic removal in drinking water developed by UNESCO-IHE and successfully tested in Bangladesh		
Methodologies for water conflict resolution and cooperation established and integrated into education programmes at university level – *methodologies developed and disseminated* – *number of universities utilizing the methodologies and integrating them into their curricula*	• One-year programme on water conflict resolution developed for the Balkans (in cooperation with UNESCO-IHE) and subsequently adapted for Latin America and the Caribbean		
Modules and tools for the integration of cultural dimension into water resources management developed – *number of countries by region adopting the modules and utilizing the tools* – *World Water Portal prototype and Water Portal for the Americas established and operational* – *number of subscribers by region and number of hits*	• Publication of: – first 12 volumes of the IHP series "Water and Ethics" (with COMEST) – "Water, Sanitation and Sustainable Development" (in collaboration with French NGO and Company) – "UNESCO Water Adventure" • Two sessions organized at the International Symposium on "Conserving Cultural and Biological Diversity: The Role of Sacred Natural Sites and Cultural Landscapes", Tokyo, Japan • Network on Water Anthropology initiated • Fourth biennial conference of the International Water History association co-organized and hosted by UNESCO		

Title of element/unit

32 C/5 paragraph 02114 **MLA 4 – Land-water interactions: towards sustainable development**

Inputs/Funding

32 C/5 Approved – Regular budget: $1,600,000; Extrabudgetary resources: $100,000

Justification/Identification of needs/Background

This MLA continues the development of coupled water, land and biodiversity management strategies for ecological, social and economic sustainability, in line with WSSD's focus on the key issue of water resources, from provision to sanitation. It is a joint MLA which brings together the resources of the IHP and MAB programmes at national, regional and global levels to implement the activities in the framework of the ecohydrology approach.

Strategies/Implementation

The MLA will focus on identifying and testing options for wisely managing and conserving source and sink ecosystems and for reverting the increasing lack of available "ecological water" – water needed by ecological systems to maintain biodiversity, ecological processes and evolutionary capacity. Continuing especially the development of the ecohydrology approach, methodologies will be developed to reduce the vulnerability of hydro- and related ecosystems and improve the efficiency of water management.

Specific attention will be given to the relationship between ecological and hydrological systems, to gain a better understanding of the processes of the water cycle at different scales, leading to the development of sustainable water resources management. Research for environmentally sound management will be focused on ecosystems that have differential distributions of water in space and time (e.g. arid and semi-arid ecosystems, tropical swamp forests, montane ecosystems) and thus pose both problems and opportunities for human development. Restoration of degraded ecosystems is a key element in better natural resource management. Studies will be undertaken of hydrological and ecological dynamics, set in the socio-economic context, to ensure a comprehensive and comparative approach (see SIMDAS in box, page 99).

Urban ecosystems will be examined, particularly regarding integration of urban aquatic habitats and urban water development and management strategies. The increasingly critical relationship between water, land and tourism will be explored using specific sites in the biosphere reserve and world heritage networks.

River basins and component ecosystems, including underlying aquifers, need to be analysed in their entirety to ensure wise water management. MAB national networks will engage in cooperative activities with IHP national networks in a special effort to understand the dynamics of selected river basins of global significance. Research to underpin integrated coastal area management will be undertaken through inter-programme cooperation, especially in coastal areas. In mountain areas, a global study on the impact of global climatic change on the biophysical environment and the socio-economic conditions of mountain people and ecosystems will be implemented, also following up on the agreements reached at the Summit held in Bishek during the International Year of Mountains, 2002.

Expected results *(and performance indicators)*	**Results achieved**	**Results not achieved**	**Lessons/Challenges**
Research and capacity-building networks constituting an information, data- and knowledge-base for the sustainable management of water resources as a key component of poverty reduction strengthened – *sound scientific information, data and methodologies produced and disseminated* – *number of specialists trained* – *number of networks created and number of participants by region*	• Global network to manage cyanobacterial blooms and toxins in water resources (CYANONET) launched; "CYANONET, A global network for cyanobacterial bloom and toxin risk management: Initial situation assessment and recommendations" published • Training-of-trainers workshop and major planning conference held by the Regional Centre for Urban Water Management (Tehran), in cooperation with IHP		
Ecohydrology and ecosystem approaches for integrated water resource management in various ecosystems, including at the river basin scale, developed – *ecohydrology approach developed and applied for different hydroclimatic zones* – *number of countries having tested the ecohydrology approach*	• Second workshop on ecohydrology in Arab countries held; ecohydrology and ecosystem management workshops on tropical forests, coastal zones and urban areas organized; regional master of science programme on ecohydrological approaches established at the Universidad de La Plata • "Volga Vision" on the sustainable development of the Volga-Caspian basin published • Extrabudgetary project "Sustainable Management of Marginal Drylands (SUMAMAD)", focusing on Northern Africa and Central Asia, launched • Establishment of the European Regional Ecohydrology Centre in Lodz, Poland, as a category 2 centre under UNESCO's auspices		

Ecohydrology approach incorporated into the work programmes of the Convention on Wetlands (Ramsar, Iran, 1971), the Convention on Biological Diversity and the United Nations Convention to Combat Desertification			The conceptual framework and methodology to analyse the degree of application of the ecohydrology approach to the wise use of wetland ecosystems and the conservation and sustainable use of inland water biodiversity are being increasingly mainstreamed in the work of the Ramsar Convention and the CBD. However, in the context of these two international legal instruments, the terminology used when referring to ecohydrology-related approaches is different: the Ramsar Convention refers to the ecological quality concept and wise use approach, and the CBD to the ecosystem approach. Hence, further work is needed to bring these different concepts and approaches towards an even more convergent path, although harmonizing terminology may prove difficult due to the specificity of the UNESCO, Ramsar and CBD constituencies
Hydro-informatics tools for integrated modelling and operational management of water-based systems improved – *number and type of tools developed* – *extent of utilization of various tools at national and regional levels*	• Publications on the specifics of integrated urban water management (including modelling and analytical tools) based on results of workshops on "Integrated water modelling and management under specific climates" for humid tropics, arid and semi-arid zones and cold climates		
Innovative institutional arrangements for managing hydrological and related ecological systems in biosphere reserves/World Heritage sites/Ramsar wetland sites promoted and used – *number of sites having put in place relevant innovative institutional arrangements*	• Ecohydrology principles presented to the secretariats of relevant multilateral environmental agreements • Research project "Global Change Research Initiative in Mountain Biosphere Reserves (GLOCHAMORE)" launched		

Methodologies and techniques for impact assessment in the context of water resources and relevant ecosystems reviewed and disseminated – *A set of concrete methodologies and techniques reviewed and disseminated*	• Special publication on "Issues of Local and Global Use of Water from the Amazon" prepared in cooperation with eight Amazon countries and disseminated in Spanish, Portuguese and English (also available in electronic format - UNESCO website and CD) • "Populations of the Amazon", prepared and published (in Spanish and Portuguese) in cooperation with the University of Belem, Brazil, based on information provided by all Amazon countries • 34th working document on "Waters of the Mata Atlantica: Programme on Water and Forests of the Mata Atlantica" prepared (South-South cooperation) • Scientific workshop on "Water and Ecosystems: Water Resources Management in Diverse Ecosystems and Providing for Human Needs", Canada (15 participating countries)		
Scientific capacity-building, didactic material for the rehabilitation of degraded land and water ecosystems developed – *number of countries benefiting from didactic material to combat desertification.*	• Eight countries (China, Egypt, Islamic Republic of Iran, Jordan, Pakistan, Syria, Tunisia, Uzbekistan) benefited from scientific information exchange and training in the context of SUMAMAD • The UNESCO/UNCCD "Education Kit on Combating Desertification" translated into nine languages (Arabic, Chinese, English, French, German, Hindi, Mongolian, Russian and Spanish) and distributed to dryland countries for use in UNESCO Associated Schools Project Network		
Research results about interlinkages between climate change and sustainable development in montane regions documented and disseminated – *number of countries participating in a global study on the impact of global change on montane environment* – *number of relevant research studies documented and disseminated*	• Three international workshops held and methodology developed to assess the impact of global change in mountain biosphere reserves • Workshop on oasis ecosystems in the Middle East • Preparations for United Nations conference on arid lands initiated • environmental education kit to combat desertification disseminated in all United Nations official languages except Chinese • Interregional network constituted by 18 countries (Australia, Austria, Canada, Chile, China, Colombia, Germany, Kenya, Kyrgyzstan, Mongolia, Morocco, Peru, Russian Federation, South Africa, Spain, Sweden, Switzerland, United States) in the context of the initiative "Global Change in Mountain Regions" • Scientific papers presented at four international workshops on "Global Change in Mountain Regions" (Austria, Italy, Spain, Switzerland) published and widely distributed		

Sustainable Integrated Management and Development of Arid and Semi-Arid Regions of Southern Africa (SIMDAS)

Justification/Identification of needs/Background

SIMDAS was created in support of the development of activities in the Southern African Development Community (SADC) subregion as a follow-up to the WSSD (Johannesburg, 2002) and the Third World Water Forum (Kyoto, 2003). The programme was developed by scientists and other water-related stakeholders from SADC countries. Stakeholders from SADC countries, including governments, educational institutions, NGOs and local communities will implement SIMDAS, with help and guidance jointly from IHP and MAB Headquarters and appropriate field offices. SIMDAS is a multidisciplinary undertaking, around the central theme of water, that spans all of UNESCO's fields of competence, including the cross-cutting themes related to extreme poverty eradication and the contribution of ICTs to the development of a knowledge society. SIMDAS will greatly contribute to the United Nations World Water Assessment Programme (WWAP), hosted by UNESCO. SIMDAS will also contribute to UNESCO's commitment to NEPAD, by using science and technology to address problems such as diseases, energy insecurity, communication and environmental problems in Africa. Activities will contribute towards achieving the Millennium Development Goals, in particular towards integrating the principles of sustainable development into country policies, increasing the number of people with access to safe drinking water, contributing to the reduction of child mortality and promoting gender equality.

Strategies/Implementation

The aim of SIMDAS is to conduct multidisciplinary studies in arid and semi-arid areas of southern Africa and integrate the results into a coherent master programme of long-term sustainable development and social transformations in both urban and rural areas of SADC countries. SIMDAS will emphasize the development of community-based projects, focusing in particular on the role of rural women. Long-term capacity-building will be stepped up through the creation of postgraduate programmes. All SIMDAS projects are designed to provide decision-support at all levels, nationally and regionally in SADC countries, in particular through the development of a network of databases, connected to a central database housed by the SADC Secretariat. SIMDAS projects and activities will cover a broad range of topics concerning sustainable development in southern Africa. Under SIMDAS, SADC countries, in close collaboration with UNESCO's IHP and MAB programmes and field offices, will:

- define strategies for the supply of water to rural and urban areas within semi-arid and arid regions of southern Africa, using both underground and surface water from the Congo river and Zambezi river systems to ensure proper water quantity and quality. Particular emphasis will be placed on capacity-building in water sciences, strengthening of water networks and sharing experience and knowledge through ICTs;
- study biodiversity loss caused by humans (including the impact of tourism) and promote the involvement of local communities in the protection and management of ecosystems;
- promote the identification and establishment of biosphere reserves including transboundary reserves;
- assess energy resources in southern Africa, taking into account critical scientific parameters such as the huge hydroelectric resources available and the need for regional interconnection of electric networks, alternative sources such as solar energy and the potential impact of new sources. The project will contribute towards the NEPAD objective of ensuring access to energy for at least 35% of the African population within 30 years;
- study the environmental health of the SADC countries and develop specific actions aimed at fighting the damaging effects of chemicals on soil, agriculture, ecosystems and animal and human life, whether the sources of chemical pollution are natural, such as the generation of mineral dust, or caused by human activities (such as additives and pesticides in agriculture, and chemicals caused by mining activities).

Expected results *(and performance indicators)*	**Results achieved**	**Results not achieved**	**Lessons/Challenges**
Increased capacities and involvement of women in water sciences, ecological sciences and environmental health in SADC countries – *28 Masters/Ph.D. researchers trained in water sciences, 28 Masters/Ph.D. researchers in ecological sciences, 28 Masters/Ph.D. researchers in energy sciences and 28 Masters/Ph.D. researchers in environmental health at the end of the project trained in centres of excellence (evenly divided between SADC countries, half being women)* – *regional networks in water sciences, in ecological sciences and in environmental health using Ph.D. graduates as backbones of centres in each country, created* – *sites for biosphere reserves, including transboundary identified and steps towards their establishment undertaken*	• Experts consultative meeting on biosphere reserves and SIMDAS • Launch of the first SIMDAS project on "Headstreams Soil-Water Management" at the Harry Oppenheimer Okavango Research Centre of the University of Botswana • First meeting of the SIMDAS Steering Committee • Selection of four new SIMDAS projects: "International Masters Degree Programme in Environmental Protection and Sustainable Development at the University of Namibia"; "Research and Development of a Mobile Water Laboratory Service for Application in Southern Pretoria, South Africa"; "Energy Conservation in Building Design Programme in Botswana"; and "Improving the Management of flows for people and the environment through dialogue and research in South Africa"		
Assessment made, in SADC countries, of water resources (in particular in the Congo and Zambezi water basins), ecosystem resources, energy resources and environmental health issues – *regional data sets for water resource, ecological resources, energy resources and environmental health established and operational* – *technical reports on: (i) all water resources options and their respective costs; (ii) existing biosphere reserves in terms of biodiversity and geodiversity; (iii) all energy options and their respective costs submitted to SADC secretariat and to Member States; (iv) the establishment of baseline data relevant to environmental health in each SADC country* – *hydrological map of SADC and database* – *critical assessment of the real socio-economic impact of biosphere reserves and their contribution to poverty alleviation in each SADC country* – *proposing interconnection schemes to be established for efficient use of the hydroelectric power available in the region (extension grid)* – *development of SADC-wide guidelines for environmental health*	• Brochure on "Groundwater Resources and Transboundary Aquifers of Southern Africa" • Data Base on the "Transboundary Aquifers of SADC Region" • Training material for the training course on "Management of Transboundary Aquifers" organized at the UNESCO Chair at the University of Cape Town (South Africa) • Incorporation of IWRM in the Country Pilot Partnership for Integrated Sustainable Land Management (CPP-ISLM) in Namibia • Training of youth in water related issues on the Orange river, in cooperation with Namibia's Desert Research Foundation (DRFN) and the University of Lesotho • Workshop on the utilization of remote sensing for water resources at the University of Western Cape as a follow-up to the 2004 TIGER workshop in Pretoria • Support to the Biennial Groundwater Conference (Pretoria) organized by the Groundwater Division of the Geological Society of South Africa (GSSA) • Framework Programme for Education and Training in the Water Sector in IWRM in Southern Africa (FET-WATER) developed (South African and SADC components of FET-WATER contributed to the needs identified within SIMDAS)		

Title of element/unit

32 C/5 paragraph 02121 **MLA 1 - Biosphere reserves: approaches to sustainable development**

Inputs/Funding

32 C/5 Approved – Regular budget: $1,286,000; Extrabudgetary resources: $184,000

Justification/Identification of needs/Background

Biosphere reserves are places to test and develop ways of sustainable living through integrated management of natural resources and the conservation of biodiversity, contributing to poverty alleviation and enhancing living conditions of rural communities in particular. They provide demonstration sites for the ecosystem approach endorsed and being developed by the Convention on Biological Diversity (CBD) and a key component in the WSSD Plan of Implementation.

Strategies/Implementation

Using the World Network of Biosphere Reserves (WNBR), the Man and the Biosphere Programme will continue to develop an approach to conservation and sustainable use based on an integrated approach to land, freshwater and marine ecosystems. The focus will be on providing more support to small island States, and the establishment of transboundary biosphere reserves; promoting adaptive management and quality economies; and creating partnerships between all sectors of society, with a new effort to involve the private sector.

The MAB Programme will contribute to providing the short and long-term security and economic viability for eradicating extreme poverty and hunger (MDG 1) and MDG 7 on environmental sustainability and contribute to the implementation of these goals through activities under its World Network of Biosphere Reserves, and to the environmental goals of NEPAD. In poor rural areas in particular, biosphere reserves can help to alleviate poverty by facilitating access to and sharing of benefits deriving from natural resources, thus promoting sustainable living and stemming the exodus towards urban centres. Green belt biosphere reserves can assist megacities and urban people by protecting vital ecosystem goods and services such as water and food supplies.

By providing an instrument for joint management of transboundary ecosystems, biosphere reserves can promote cooperation on shared resources, including water and biodiversity, and hence can serve to mitigate conflicts in the process enhancing environmental and human security – a strategic objective for UNESCO’s science programmes.

Another major focus will be to provide science-based advice for the implementation of the ecosystem approach, by using and expanding the WNBR. This will be pursued through the regional MAB networks using regional and cluster offices as a means of inducing global action. Linkages will be developed through joint activities with the multilateral environmental agreements (MEA) and efforts will be made to integrate ecotourism better into the strategies for biosphere reserve management.

Assistance will be provided to Member States to improve the functioning of their biosphere reserves through the periodic review process, and to establish new (including transboundary) biosphere reserves, particularly in Africa, also as a contribution to NEPAD. Key results from the World Parks Congress (Durban, 2003) will be used to anchor the World Network of Biosphere Reserves in national policies for biodiversity conservation at the landscape scale, as will be the results of the Conference of the Parties (COP VII) of the CBD (2004) devoted to protected areas. Pertinent recommendations emanating from the International Years of Ecotourism, Mountains and Freshwater – observed in 2002 and 2003 – will also be implemented.

Expected results *(and performance indicators)*	**Results achieved**	**Results not achieved**	**Lessons/Challenges**

Sustainable use of natural resources promoted – *number of new sites included in the World Network of Biosphere Reserves (WNBR)* – *number of transboundary biosphere reserves and wetland sites among the new sites* – *recommendations of periodic review concerning existing sites implemented*	• 42 new BR established, including first-ever BR in four Member States (Federated States of Micronesia, Palau, Turkey and Lebanon) and Africa's second transborder BR (Senegal-Mauritania) in wetlands of Senegal Delta • Periodic review reports of 23 biosphere reserves examined and recommendations formulated; progress reports on four biosphere reserves		Good coordination between Headquarters and field offices resulted in good quality biosphere reserve nominations
Access to and sharing of benefits derived from natural resources improved – *number of sites where alternative development projects or policies have been put in place* – *impact of such policies on local incomes and benefits, employment opportunities, and reduction of migration to cities*	• New round of UNESCO-ISC ROLL grants to strengthen biosphere reserves in the Russian Federation implemented by UNESCO Moscow • Cooperation with the Regional Organization for the Protection of the Marine Environment (ROPME, Tehran) to analyse coastal and marine environmental issues, including the identification of potential biosphere reserves		
Progress achieved towards biodiversity targets under the WSSD Plan of Implementation and under the WEHAB (Water, Energy, Health, Agriculture, Biodiversity) initiative of the United Nations Secretary-General – *number of species and ecosystems for which conservation status has improved* – *number of national biodiversity action plans having integrated biosphere reserves* – *number of areas conserved or wisely managed* – *guidelines on linkages between objectives of biosphere reserves and multilateral environmental agreements, including the Ecosystem Approach, produced and disseminated*	• Improved conservation status of species and ecosystems and wisely managed and conserved areas in the 42 new biosphere reserves and the 23 biosphere reserves having submitted their periodic reviews • Guidelines prepared and released in the form of a brochure "Biosphere Reserves: benefits and opportunities" (English and French, other language versions to be produced by field offices)		In the context of UNDESD, MAB partners are encouraged to promote the use of biosphere reserves as learning sites for sustainable development; biosphere reserves are also being used as a mechanism to integrate regional conservation and development strategies Number of national bio-diversity action plans having integrated biosphere reserves is difficult to assess, but may be estimated at three at least
Operation of regional and thematic MAB networks improved – *number of regional and thematic meetings held* – *number of regional and thematic networks consolidated*	• Major meetings for the following regional networks held: ArabMAB, EABRN, IberoMAB, Redbios, EuroMAB, SACAM, and for thematic networks such as mountains, coastal and marine biosphere reserves, transboundary biosphere reserves, dryland biosphere reserves in West Africa, SeaBRNet and Ecotones	AfriMAB still to be consolidated	Need for improved coordination to ensure consolidation of AfriMAB in document 33 C/5
Selected biosphere reserves developed as demonstration sites for sustainable living and results disseminated – *number of demonstration sites having implemented policy guidance on quality economies, including ecotourism and other sustainable use activities* – *experience of demonstration sites documented and disseminated*	• Panel on quality economies in biosphere reserves with focus on oasis systems; pilot study on a labelling scheme for quality products from biosphere reserves launched; ecotourism guidelines (GEF supported project) tested out in selected biosphere reserves in central Europe	Project to document and analyse progress made in developing biosphere reserves as demonstration sites for sustainable living to be launched in document 33 C/5 in conformity with recommendation of MAB Bureau	

Title of element/unit

32 C/5 paragraph 02122 **MLA 2 - Helping to reduce biodiversity loss: science and capacity-building in the service of ecological sustainability**

Inputs/Funding

32 C/5 Approved – Regular budget: $1,486,000; Extrabudgetary resources: $250,000

Justification/Identification of needs/Background

The WSSD Plan of Implementation has set a goal for reducing biodiversity loss by 2010, thus creating another new time-bound international development goal. Research and capacity-building, at institutional and individual levels, will be crucial for achieving this goal. Securing the participation of local communities in conserving and managing ecosystems and ensuring good ecological stewardship remains a central tenet of MAB, especially for wetlands and coastal systems.

Strategies/Implementation

The complexity of ecosystem conservation and the sustainable management and use of natural resources can only be addressed through collaboration with scientific partner programmes in UNESCO, the ICSU global change community, biodiversity-related conventions, and United Nations partners in ecosystem management. Special attention will be given to the field of ecohydrology, covering ecosystem types with different water cycles ranging from deserts to tropical forests, wetlands and marshlands (Polesia region).

There will be a focus on the research and capacity-building required for the development of economies based on local products so as to provide benefits to local communities, including through ecotourism. A global network will be developed integrating research and training institutions in developing and developed countries and aimed at sharing knowledge and experience. This network will focus on issues of human use of natural resources, including especially fresh water, in an ecosystem context – thus contributing directly to MDG 7. Special attention will be paid to the role of women as community ecological stewards, and to the role of local and indigenous knowledge systems.

Research and capacity-building will also be conducted on innovative institutional mechanisms to manage a new generation of biosphere reserves covering large areas of land and water. Special training on conflict resolution for biosphere reserves managers will be organized in each region.

The Biosphere Reserves Integrated Monitoring (BRIM) initiative will be further developed, including the elaboration and testing of a set of policy-relevant scientific indicators for sustainable landscape management and planning, in cooperation with a range of regional and global partners. In the process, the MAB database and web access to information will also be improved.

There will be a special focus on producing an integrated science base for biodiversity, in cooperation with a wide range of partners, and strengthening the role of UNESCO as an active partner in biodiversity with the Convention on Biological Diversity, UNEP, UNDP, FAO and the World Bank. Recognizing the need for an ethical context, work on the ethics of conservation science, in cooperation with the Social and Human Sciences Sector, will be pursued. Research on the sustainability of mangrove systems will also be advanced and the Great Apes Survival Project (GRASP) will be launched as a WSSD type II partnership, especially in Africa and Asia, aimed at protecting great apes as a key species.

As measures to reinforce national capacities for ecosystem research, competitive grants will be offered for young scientists (MAB Young Scientists Research Awards), training programmes consolidated and delivered through regional and cluster offices and ad hoc training workshops, the UNESCO-Cousteau Ecotechnie Chairs network developed and reinforced, and the Global Initiative on Biodiversity Education pursued, together with CBD and extended to other conventions, in particular Ramsar, UNCCD, UNFCCC and CMS.

Expected results *(and performance indicators)*	**Results achieved**	**Results not achieved**	**Lessons/Challenges**
Capacities of Member States to apply integrated ecosystem management improved – *methodologies for monitoring activities at site level harmonized and disseminated through the BRIM initiative* – *contributions to number of international conferences and events* – *guidelines for institutional mechanisms for planning and management of biosphere reserves produced and disseminated* – *number of biosphere reserve managers trained in conflict resolution*	• Two BRIM methodological guides for social and abiotic monitoring prepared • Millennium Ecosystem Assessment completed with UNESCO's active involvement; International Assessment on Agricultural Science and Technology for Development launched • Draft of handbook to guide biosphere reserve management prepared • Work initiated on "World Atlas of Mangroves" (joint venture between FAO, the International Society for Mangrove Ecosystems (ISME), the International Timber Trade Organization (ITTO), UNEP/WCMC, UNU and UNESCO/MAB to be completed in 2007) • Subregional MAB project for capacity-building for sustainable development in biosphere reserves in six African countries launched in 2004 (financed by UNEP-GEF for a total budget of $6 million): research and training activities, including on sustainable use of biodiversity, conflict prevention and support to young researchers using biosphere reserves as learning sites (12 Ph.D. and 20 Masters initiated) • Twenty biosphere reserve staff trained in conflict prevention and management in Latin America (co-organized with Montevideo Office)		Regional comparative approach proven to be useful as a learning process to effectively implement the biosphere reserve concept as a land management tool
Biodiversity education in connection with MEAs improved – *number of educational materials in different languages produced and disseminated to a number of countries*	• One educational kit for primary school prepared jointly with the Convention on Wetlands and the DANONE Group • Discussion under way with the Convention on Biological Diversity Secretariat for joint preparation of a kit on biodiversity education		
Capacities of Member States, especially in Africa, enhanced to address environment and development issues – *number of specialists trained by ERAIFT to apply remote-sensing techniques in integrated ecosystem management* – *extension of ERAIFT concept to at least one other location* – *number of MAB Young Scientists Research Awards allocated* – *number of active Ecotechnie Chairs*	• ERAIFT in Kinshasa provided benefits to 10 Central and West African countries and signed an agreement with ENEF in Gabon for strengthening collaboration for sustainable development of tropical lands in the Congo basin • Award of 20 MAB Young Scientists grants and establishment of three UNESCO-Ecotechnie Chairs, bringing the total number of active Chairs to 13		ERAIFT benefited from new funding and the international dimension of the school was enhanced Extrabudgetary funds need to be identified for additional MAB awards

Urban systems and the urban-rural interface incorporated into Member States conservation planning frameworks – *number of new urban-oriented biosphere reserves nominated* – *number of biosphere reserves upgraded to include urban areas* – *publications and guidelines on urban ecological systems produced and disseminated in various languages*	• Three urban-oriented biosphere reserves designated (Wienerwald, Austria; Selva Pisana, Italy; Kristianstad Vattenrike, Sweden) • One biosphere reserve with more human settlements (Wadden Sea of Schleswig Holstein, Germany) upgraded/extended • Several publications under way on biodiversity and cities and the application of the biosphere reserve concept to urban areas		Increasing interest among Member States to promote urban sustainability through ecosystem approaches and the biosphere reserve concept

Title of element/unit

32 C/5 paragraph 02123 **MLA 3 - Enhancing the linkages between biological and cultural diversity as a key basis for sustainable development**

Inputs/Funding

32 C/5 Approved – Regular budget: $200,000; Extrabudgetary resources: $……

Justification/Identification of needs/Background

This main line of action reflects a joint initiative between the Natural Sciences Sector and the Culture Sector (see also MP IV, paragraph 04122), to which Major Programme II contributes inputs from MAB and the Coastal Regions and Small Islands Platform.

Biological and cultural diversities are mutually reinforcing and interdependent. Natural systems cannot be understood, conserved and managed, without recognizing the human cultures that shape them. Together, cultural diversity and biological diversity hold the key to ensuring resilience in both social and ecological systems. This interdependence was explored at the High-level Round Table on "Cultural and biological diversity for sustainable development", convened by UNESCO in the context of WSSD, where agreement was reached on the need to further understanding and promoting collaborative action. As a follow-up to WSSD, UNESCO decided to adopt an interdisciplinary and intersectoral approach combining the perspectives of the Culture Sector and the Natural Sciences Sector.

Strategies/Implementation

Building awareness of the fundamental interdependence of biological and cultural diversity is an essential first step. The infinite variety of the natural world provides material for cultural inspiration, meaning and practice. Words, expressions, stories, legends, etc., encode human relationships with the environment. And for eons, human ingenuity has participated directly in enriching biodiversity – from the level of genes, to species, ecosystems and landscapes. But beyond this fundamental understanding, cultural and biological diversity have yet to be linked as vital and interdependent components for sustainable development and the alleviation of poverty.

This MLA therefore seeks to combine the strengths of the Culture and Natural Sciences Sectors with a view to developing a new perspective on sustaining diversities, both cultural and biological. It is aimed at the elaboration of a strategy linking the implementation of the UNESCO Universal Declaration on Cultural Diversity and the WSSD Plan of Implementation. Field activities will focus on sites within the World Network of Biosphere Reserves, World Heritage sites and island systems where unique expressions of biological and cultural diversity coincide.

The primary aim of this MLA is therefore to demonstrate that linkages and synergies between cultural and biological diversities are a key component of conservation and development. Member States will be assisted to put in place strategies for the conservation of cultural and biological diversity, thus responding, among others, to objective I of the Seville Strategy for Biosphere Reserves, United Nations Programme of Action for Small Islands Developing States (paras. 41 and 44), the Convention on Biological Diversity, and MDG 1.

Overall, the activities will seek to: (i) demonstrate the interdependence of biological and cultural diversity and the need to jointly conceptualize their sustainability; (ii) recognize the cultural diversity of human-environment relationships and promote cultural pluralism in development strategies; and (iii) develop site-specific pilot actions to exemplify practical ways forward to mutually sustain the two diversities.

The main focus will be on sustaining cultural traditions, including traditional uses of land, fresh water and sea, thus directly contributing to paragraph 14 of the action plan for the implementation of the UNESCO Universal Declaration on Cultural Diversity. Research on how cultural traditions impact on, or are supported by, biological diversity will be undertaken and demonstrated. Feedback between cultural and biological diversity will be explored and analysed, and examples of wise practice for sustaining diversities will be developed. A particular emphasis will be on linking language and its diversity with biological diversity in particular exploring parallels between endangered languages and endangered species.

Expected results *(and performance indicators)*	**Results achieved**	**Results not achieved**	**Lessons/Challenges**
Progress made in the knowledge of the interdependence of biological diversity and cultural diversity and its implications – *number of specialized knowledge networks created* – *number of research activities and studies initiated and their results disseminated*	• Mobilization of knowledge networks through workshop on "Sustaining Cultural and Biological Diversities" organized by CSI- LINKS in cooperation with the National Centre for Scientific Research (CNRS, France) as part of the International Conference on "Biodiversity: Science and Governance" (Paris) • International experts seminar, in the context of the World EXPO 2005 (Aichi, Japan), to explore linkages between cultural and biological diversity, develop a network of experts and provide first guidelines for "Safeguarding the Transmission of Local and Indigenous Knowledge of Nature" (organized by CSI-LINKS and the Culture Sector in collaboration with the National Museum of Ethnology and the Aichi Prefectural University) • Overall survey on existing networks and expertise, in cooperation with UNEP		
Improved understanding of decision-makers on the linkages between biodiversity and cultural diversity, including cultural perspectives on production and maintenance of ecosystem services – *guidelines on incorporating cultural diversity and biodiversity conservation policies produced and disseminated* – *number of countries having developed and integrated cultural and biological diversity policies*	• Declaration issued and a global comparative research study on sacred mountains launched during the MAB-WHC international symposium on "Conserving Cultural and Biological Diversity: The Role of Sacred Natural Sites and Cultural Landscapes", in the context of the World EXPO 2005; UNESCO, IUCN, CBD, FAO and the United Nations Permanent Forum on Indigenous Issues subsequently decided to continue collaboration on this topic by establishing a global research network on cultural and biological diversity as exemplified by "Sacred Mountains". The operationalization of the research network will be a focus of the 2006-2007 biennium	Guidelines produced on specific themes (such as the transmission of local knowledge or the management of sacred natural sites). This thematic approach was deemed more appropriate than the production of general guidelines initially foreseen	The integration of cultural and biological diversity in policies is a long-term process

Improved sustainability of both cultural and biological diversity in selected sites – *number of projects developed in biosphere reserves, world heritage sites and in selected island systems*	• In the framework of the Andaman Sea project, stakeholder meetings, organized by CSI-LINKS, the Culture Sector and the Bangkok Office with funding from the National Oceanic and Atmospheric Administration (USA), to highlight and strengthen the role of indigenous sea peoples (Moken, Urak Lawoi) in the sustainable use and management of coastal biodiversity of the Andaman Sea (Thailand); data also collected on indigenous knowledge of coastal resources, environmental and socio-economic indicators, as well as tourism opportunities and their impacts in the Andaman Sea (Thailand) • Action research launched by CSI-LINKS in cooperation with the Dar es Salaam Office on Creole women's knowledge in the Indian Ocean islands of Mauritius, Rodrigues and Reunion, notably traditional medicinal practices that blend natural products, local plant biodiversity and the culturally diverse traditions emanating from Madagascar, East Africa, India, China and Europe; fieldwork completed • Pedagogical learning resource pack prepared in support of the interactive LINKS CD-ROM entitled "The Canoe is the People: Indigenous Navigation in the Pacific" in order to teach young Pacific islanders about the interrelationship between the ocean environment and the preservation of traditional wayfaring knowledge and practice; draft elements for the learning resource pack distributed for critical review to the Curriculum Development Units of the Ministries of Education of Fiji, New Zealand and Palau, as well as to ED Sector • Research programmes initiated in selected biosphere reserves in all regions capitalizing on cultural approaches to biodiversity management and dialogue among stakeholders (India, Papua New Guinea, Lebanon, Russian Federation, etc.)		
Linkages between language diversity and biological diversity assessed – *number of case studies illustrating such linkages undertaken and results disseminated*	• Workshop to explore parallels between endangered languages and endangered species through a cultural mapping (Nairobi) • Links between an endangered language and biodiversity documented (Mexico) • Research initiated to understand linkages between indigenous cultural diversity and biological diversity in the Jarawa Tribal Reserve of South and Middle Andaman Islands (India), in cooperation with the New Delhi Office		

Title of element/unit

32 C/5 paragraph 02131 **MLA 1 - Geology in the service of society: rock-water-life interactions**

Inputs/Funding

32 C/5 Approved – Regular budget: $660,000; Extrabudgetary resources: $60,000

Justification/Identification of needs/Background

As UNESCO is the only United Nations agency dealing with geological and geophysical research and training activities, it is in a privileged position to include earth science activities into its recognized goal to treat the earth's environment as a single system that must be observed globally – not least as a contribution to the Organization's strategic objective to improve human security through better management of the environment. The International Geoscience Programme (IGCP) remains UNESCO's major instrument for comparative research, elaboration and dissemination of data in the earth sciences, run in close cooperation with the International Union of Geological Sciences (IUGS). More than 330 projects, involving several thousands of scientists all over the world, have contributed to "real world" problems related to hydrogeology, global geodynamic processes and ecosystems, biogeography, geomedicine, and natural hazards, modelling and forecasting of environmental and climate change, as well as the assessment of natural resources.

Strategies/Implementation

Through about 40 projects annually IGCP continues to build a global platform for the improvement of scientific cooperation across political boundaries using geo-environmental and hydrogeological management issues as an entry point for societal and political dialogue. Special emphasis will be given to enhancing scientific, technical and human capacities in developing countries. IGCP will ensure a strict quality control of its projects through an annual critical evaluation, addressing the scientific potential and the feasibility of proposals, the qualifications of proposers, the scientific progress of the projects, and the practical significance of their results. In cooperation with other international scientific partners and programmes like ICSU's International Union of Geodesy and Geophysics (IUGG), International Geographical Union (IGU) or International Geosphere Biosphere Programme (IGBP), emphasis will be placed on projects dealing with fundamental geosciences, geo-related education, applied earth sciences, and interdisciplinarity. IGCP will offer its geohydrology, palaeohydrology, palaeoecosystem analysis, climate and geohazard expertise to joint efforts with other scientific programmes and other programme sectors by addressing among others the problems of fossil groundwater, water resources in the world's drylands, hydrogeological mapping, aquifer resource management, global karst ecosystem assessment, river basins analysis, coastal zones and continental shelf and rise interactions, as well as the protection of geological and cultural heritage.

Efforts will be made to launch or coordinate activities devoted to "Education in and popularization of earth sciences" under which national "Geoparks" with geoscience and natural history museums could provide outreach to students, out-of-school youth, and adults, in order to increase public respect and understanding for the value of geological landscapes.

Expected results *(and performance indicators)*	**Results achieved**	**Results not achieved**	**Lessons/Challenges**
Interaction and networking between geo-, hydro- and bio-scientists improved in solving fundamental geoscientific problems relevant to sustainable development – *number of IGCP projects undertaken annually* – *number of capacity-building activities conducted* – *number of international conferences and workshops organized*	• 56 multidisciplinary IGCP projects, including 24 new ones, addressing issues relevant to sustainable development and forming interactive networks • Incorporation of capacity-building and educational activities into IGCP projects and increased number of participating doctoral students, thus strengthening indigenous capacity • Cooperation between geo-hydro and ecological scientific communities reinforced through approximately 130 conferences		Steps taken to streamline the programme with a view to aligning it with the priorities of IUGS and UNESCO, and in order to widen its funding base by attracting additional sponsors Strengthening of the role of IGCP National Committees to foster closer cooperation with representatives from the wider geo-scientific community
Wise management practices in earth sciences promoted by activities related to applied geosciences and hydrogeology with emphasis on Africa and developing countries in other continents, women and young scientists – *number of multidisciplinary research groups initiated* – *number of scientists, including women and young scientists involved* – *number of scientists from various developing regions and countries engaged*	• Capacity of IGCP in applied hydrogeological research increased through the newly created joint IGCP-IHP task force on hydrogeology • Four IGCP projects with particular focus on Africa • Two IGCP projects led by young scientists • Number of women scientists participating in IGCP increased • Nearly all IGCP projects now involve scientists from developing countries		As a result of priorities set by Member States, support to an increasing number of groundwater-related IGCP projects, in cooperation with the Division of Water
Institutional and individual capacities strengthened for hydrogeology, ancient ecosystems, desertification, climate change, coastal zones, environmental catastrophes and geological heritage – *number of scientific publications, textbooks and training materials developed by IGCP project leaders* – *number of countries assisted*	• Research projects related to desertification, climate change, paeleo-ecosystems and environmental extreme events strengthened • Capacities to develop strategies for economic sustainable development and for the protection of geological heritage reinforced through the establishment of a network of national geoparks (currently 35 in 10 countries); increased IGCP scientific publication outputs in applied and fundamental geoscientific journals		

National and international public awareness in geo-environmental policies increased through support to current and proposed international initiatives – *national and international outreach accomplished and interest raised in terms of media coverage related to earth sciences and society* – *international Geological Congress, 2004, in Florence co-organized* – *dedicated website created and number of hits received*	• Public awareness of the importance of earth sciences and of the use of geo-scientific data and information regarding disaster reduction and building sustainable communities increased through special outreach activities for the preparation of the proclamation of the International Year of Planet Earth • International Geological Congress held		

Title of element/unit

32 C/5 paragraph 02132 **MLA 2 - Global Partnership in Earth Observation from space for sustainable development**

Inputs/Funding

32 C/5 Approved – Regular budget: $440.000; Extrabudgetary resources: $……

Justification/Identification of needs/Background

The development of Global Partnerships in Earth Observation through satellite and *in situ* measurements has proved to be an important component for improved monitoring and modelling of the Earth and its resources, facilitating better planning of socio-economic development and promoting sustainable development.

Strategies/Implementation

UNESCO will expand Earth observation activities through enhanced cooperation with international mechanisms such as the Committee on Earth Observation Satellites (CEOS) and the Integrated Global Observing Strategy (IGOS) Partnership. In collaboration with international and national space agencies, specialized NGOs, academic institutions, international research programmes and intergovernmental programmes, the Sector will actively participate in thematic studies on the environment, in particular the carbon and hydrological cycle, coastal zone management and geohazard prevention studies. In addition, scientific and technical support will be provided for pilot studies on the improved use of remote sensing and GIS for the monitoring and management of MAB reserves and World Heritage sites. In the framework of the GARS (Geological Applications of Remote Sensing Programme)-PANGIS (Pan-African Network for a Geological Information System) and SANGIS (Southeast Asian Network for a Geological Information System) geo-information networks, *in situ* and space-based global observing systems will be strengthened, global mapping will be improved and access to environmental data will be facilitated. Scientific data will be transformed into a knowledge base for decision-and policy-makers for better assessment and management of the earth's resources.

Effective links will be developed with the United Nations agencies for the implementation of the recommendations of UNISPACE-III, especially those relevant to awareness-raising and capacity-building in space technology applications, with emphasis on the Africa region in the framework of NEPAD. Efforts will be enhanced to encourage twinning activities in the framework of the Space Education Programme (SEP) through academic exchange programmes, fellowships and summer school schemes. Awareness-raising activities will be pursued in schools and universities, offering teacher training courses in United Nations-affiliated Regional Centres for Space Science and Technology Education and specialized training centres in industrialized countries. Support will further be given to the development of multimedia educational materials. A space volunteer corps (SVC) will be created in cooperation with the International Space University and other relevant universities to carry out volunteer teaching work in developing countries. Capacity-building in earth sciences will be continued through postgraduate training courses, and shall also be developed in the formal education system as well as through the UNITWIN/UNESCO Chairs Network.

Expected results *(and performance indicators)*	**Results achieved**	**Results not achieved**	**Lessons/Challenges**
Core sets of Earth observation parameters defined – *number of earth observation partners engaged* – *number of networks involved and decision-makers reached*	• Contribution to the development of a ten-year implementation plan for GEOSS (Global Earth Observation System of Systems) to strengthen the use of earth observations in planning for sustainable development; plan endorsed by 60 countries and 40 participating organizations and networks • Partnerships with national and international space agencies strengthened under the Open Initiative in order to integrate satellite data into environmental and hazard monitoring • Five support networks put in place to define user needs		

Regional networks on data collection, exchange and global mapping created – *number of linkages created and WSSD Type II partnerships developed* – *number of institutions involved in different countries*	• Local, regional and global networks on the transformation of geoscience data into information products for decision-makers created and/or strengthened as a follow-up to WSSD, Ministerial Summits on Earth Observation (EOS) and IGOS and GEOSS meetings • Currently, 35 countries in Africa and 10 in Asia contribute to this information exchange initiative; similar efforts are being initiated in Latin America; computerized thesaurus for geoscientific terminology created in six national languages in Asia		
Awareness of the benefits of space technology enhanced in specific subregions – *number of spatial and geodata handling networks engaged or created* – *number of scientists involved by countries and subregions*	• Capacity-building workshops for the Arab region (Beirut) and for Latin America (Cordoba, Argentina) in partnership with ESA and EURISY • Survey of earth observation data centres in Africa carried out in the framework of NEPAD • Awareness-raising activities for primary and secondary school students in cooperation with EURISY and the Norwegian Space Agency's education centre		
Awareness raised and capacities built in space technology applications – *number of agreements reached with partner institutions* – *number of training activities, workshops and seminars undertaken* – *number of space outreach activities implemented* – *extent and quality of media coverage received*	• 18 agreements with international or national space agencies and research institutions established in the framework of the UNESCO Open Initiative on the use of space technologies to support the World Heritage Convention; the Open Initiative assists developing countries for natural and cultural heritage conservation through space technologies • Projects were initiated under the Open Initiative for: the Democratic Republic of Congo, Uganda, Rwanda, Peru, Guatemala, Mexico, Russia, Brazil, Argentina • Multilingual (E, F, S, P) remote-sensing dictionary in digital form initiated in cooperation with SELPER (Association of remote sensing specialists in LA) • The Open Initiative induced increased media visibility of UNESCO's remote sensing and GIS activities: more than 50 citations of UNESCO work in the area of remote sensing for conservation of cultural and natural heritage in the media in 2004-2005		
Best practices in teaching space applications identified and tested in selected academic institutes in Africa, Asia and the Pacific and Latin America – *number of academic institutes benefiting from pilot testing of best practices in space education* – *number of educators involved* – *number of countries participating* – *number of publications prepared*	• Three sessions (Philippines, Nigeria and Colombia) of the Space Education Programme for students and teachers at secondary, tertiary and postgraduate levels to demonstrate best teaching practices and hands-on projects and to explain the societal benefits of space technology applications • Survey of science curricula at secondary level in selected African countries as a first step in identifying entry points for space-related subjects • Grants to geoscientists from developing country to attend postgraduate courses • Metallogenic map of South Africa and geodynamic maps of the		

		Mediterranean and of Asia finalized, in cooperation with the Commission of the Geological Map of the World		

Title of element/unit

32 C/5 paragraph 02133 **MLA 3 - Enhancing disaster preparedness and prevention**

Inputs/Funding

32 C/5 Approved – Regular budget: $255,500; Extrabudgetary resources: $1,330,000

Justification/Identification of needs/Background

This main line of action is designed as an intra- and intersectoral approach, involving also IOC, CLT and SHS.

Disasters caused by natural hazards such as earthquakes, floods, landslides, drought, tropical cyclones and volcanic eruptions are increasingly affecting Member States. Other catastrophes caused by sudden technological accidents and unexpected events are also striking urban centres. The trend for catastrophic events poses a major threat to sustainable development and risks worsening the plight of poor populations. UNESCO is engaged in interdisciplinary action to promote wise disaster reduction practices and will pursue this action in the framework of the United Nations International Strategy for Disaster Reduction (ISDR).

Strategies/Implementation

UNESCO will focus on the building of a culture of prevention in the face of natural hazards and environmental disasters, thereby contributing to improving human security. To this end, the effective use of advances in scientific knowledge and know-how to underpin preventive action and encourage disaster preparedness will be promoted. The promotion of wise disaster reduction practices will be encouraged with particular attention to poor vulnerable zones in least developed countries and in some megacities, small islands and coastal zones. Efforts will focus on capacity-building mechanisms aimed at sensitizing and educating decision-makers and municipal authorities in specific disaster mitigation strategies. Support will be given to the elaboration, dissemination and testing of information and training materials and tools on disaster prevention bearing in mind the specific requirements of the poor, urban dwellers and rural areas. Studies on drought and flood-related hazards in Africa will be supported. To further enhance local empowerment and participation of communities at risk with emphasis on women and youth involvement, attention will be paid to realizing synergies between science and technology and local and indigenous risk reduction knowledge, notably in the framework of the WSSD Type II Partnership on “Resilient Communities”. Seismology for peace and disaster prevention for peace perspectives will be promoted in selected regions (Middle East, Central America), with particular emphasis on the development of cross-border innovative mechanisms. Upon request of Member States affected, post-disaster field investigations will be encouraged in the aftermath of major disasters. Interdisciplinary approaches integrating natural and social sciences, technology and engineering will be applied in the implementation of the activities with the active involvement of the national committees of the five intergovernmental scientific programmes.

Expected results *(and performance indicators)*	**Results achieved**	**Results not achieved**	**Lessons/Challenges**
Capacities of Member States for better disaster prevention improved, especially in communities at risk – *number of tools, training and awareness materials for disaster prevention and preparedness produced and disseminated* – *number of disaster management institutions reinforced or supported* – *number of disaster management professionals trained*	• Advice and guidance for enhancing capacities in disaster reduction provided to several countries under the framework of UN-ISDR • Contribution to the building of a culture of safety and resilience through support to eight institutions, the dissemination of scientific data on earthquake location, and the production and distribution of awareness and capacity-building materials on hazard mapping, safe construction and preparedness • Cooperation on disaster risk reduction in the Balkan region initiated • 52 participants from 19 countries attended the 22nd UNESCO-sponsored International Workshop on Reducing Earthquake Losses in the Eastern Mediterranean Region (RELEMR) in Crete, Greece • Sixth International Workshop on Seismic Analysis in the South Asia Region, Xi'An, China, with special sessions on the 26 December 2004 earthquake and tsunami and on the 8 October 2005 Pakistan earthquake	Promotional brochure on UNESCO's contribution to natural disaster reduction postponed to 2006	Active involvement in the World Conference on Disaster Reduction (Kobe, Japan) but need to assert, in the implementation of the Hyogo Framework for Action 2005-2015, the leadership role that was assigned to UNESCO under the cluster on *Knowledge, Innovation and Education*
Range of approaches and applications implemented to enhance resistance of sites and structures to disasters – *guidelines for designing disaster-resistant sites and structures, including for educational buildings and for the protection of cultural sites, developed and disseminated* – *number of ICT-based integrated systems developed and promoted for improved disaster prevention and warning*	• Scientific knowledge and technical capacities of 352 specialists representing 48 institutions from 32 Mediterranean and Asian countries reinforced through technical and training workshops and dissemination of data analysis software packages; promotion of landslides risk reduction practices, including protection of cultural sites • Installation of the National Seismic Network of Libya (self-benefiting FIT) composed of 15 digital stations successfully completed, including the training of 16 technicians and scientists operating the network; first seismologic bulletin published	ICT-based integrated systems	Survey of existing guidelines and materials for production of future materials to focus on closing gaps
Risk reduction master plans for selected communities at risk developed and promoted	• Tools for multi-stakeholder cooperation for hazards mitigation at the community level elaborated and disseminated in three cities • Educational communication and public awareness promoted through support to a community radio (Africa), technical and training activities (Latin America and the Caribbean), and a disaster safety and preparedness programme for schools (Asia); contribution to building new educational infrastructure after the destructive eruption of Manam Island and Mount Tavurvur in Papua New Guinea		Replication of similar tools for other communities should be envisaged

Title of element/unit

32 C/5 paragraph 02141 **MLA 1 - Advancing an intersectoral and interregional programme of action in Small Island Developing States**

Inputs/Funding

32 C/5 Approved – Regular budget: $350,000; Extrabudgetary resources: $……

Justification/Identification of needs/Background

MDGs and WSSD draw attention to the needs of Small Island Developing States (SIDS), many of which are also least developed countries. In 2004, a high-level United Nations meeting will be held in Mauritius to review progress with respect to the 1994 Programme of Action for the sustainable development of SIDS (Barbados+10). The Coastal Regions and Small Islands Platform (CSI) coordinated UNESCO's inputs to the five-year SIDS review in 1999.

Strategies/Implementation

CSI, in close collaboration with concerned field offices and Headquarters units, will assist small islands with the identification and prioritization of national, regional and global actions in preparation for the 2004 review meeting and its follow-up. While the principal themes will be determined by the review process, the management of key natural resources, like fresh water and renewable energy, as well as the environmental impact of wastes will likely be high on the agenda. In order to build consensus interregionally, small island projects and programmes will be linked within and across regions, in particular the Pacific, Indian Ocean and the Caribbean. Civil society inputs will be enhanced through on-the-ground activities and virtual forum discussions. Particular emphasis will be placed on building capacity by professional exchanges between islands and regions, creating and strengthening networks, including the sharing of experience and knowledge through ICTs.

Expected results *(and performance indicators)*	**Results achieved**	**Results not achieved**	**Lessons/Challenges**
Capacities in Member States in SIDS strengthened for contributions to the high-level United Nations review meeting (Barbados+10) – *number of island countries and regions assisted*	• Contribution to regional and interregional preparatory meetings to help SIDS review progress in respect of the Barbados Programme of Action, consolidate national and regional reviews and determine their common priorities • Participation of the general public in SIDS in the review process ensured through virtual forums and an interactive website • Contribution to the Mauritius International Meeting (MIM, January 2005) in the following areas: culture, youth (UNESCO-sponsored Youth Visioning for Island Living brought together young people from SIDS), communities in action and ocean and coastal management; additionally, support provided to the Mauritius Civil Society Forum		Changing the date of the International Meeting posed a considerable challenge for maintaining momentum for preparatory activities involving youth and other groups

SIDS assisted in following up on the agenda resulting from the January 2005 review – *number of intersectoral and interregional activities initiated*	• Contributions to UN-SG report on the Strategy for the Further Implementation of the Programme of Action for the Sustainable Development of SIDS (October 2005), which provides a road map for enhancing the participation of the whole United Nations system as well as regional bodies in the implementation of the Mauritius Strategy • House-wide response to the Mauritius Strategy developed in relation to the work of programme sectors and the Youth Visioning process (including the elaboration of intersectoral and inter-agency activities) and made available on the Organization's website and through a six-page booklet "Embarking on Mauritius Strategy Implementation" • Youth and civil society organizations assisted in implementation of their commitments through follow-up projects • Support to 13 island partners from the Caribbean, Indian Ocean and Pacific regions to share sustainable development experiences and to plan future activities within the overall framework of the implementation of the Mauritius Strategy • Newly formed Universities Consortium for SIDS strengthened through the development of a course on sustainable development in cooperation with the University of the West Indies		Follow-up to the Mauritius agenda is proving challenging as it involves activities at different levels – island, regional and interregional levels Scheduling of the regional and interregional UNDESA follow-up meetings did not provide sufficient time for preparation
Linkages established between small island projects in the Caribbean, Indian Ocean and Pacific regions – *number of projects and people networked*	• Network of partners and projects in small islands developed and strengthened through meetings, exchanges, Internet forums, websites and the media • New Youth Visioning network established in the context of youth-led follow-up projects ranging from how to help youth start their own business to strengthening the use of local languages, and from awareness of the importance of a clean environment to education about HIV/AIDS		Though there are several examples of outstanding innovation, enthusiasm and success, working with the youth-led projects has proved especially challenging as in many cases they have little experience of project design and implementation

Title of element/unit

32 C/5 paragraph 02142 **MLA 2 - Developing wise practices: building capacities for managing conflicts over coastal resources in small islands and continental regions**

Inputs/Funding

32 C/5 Approved – Regular budget: $450,000; Extrabudgetary resources: $……

Justification/Identification of needs/Background

Competition for resource access tends to escalate as population increases in small islands and along continental coasts. “Wise coastal practices”, informed by natural and social science expertise, as well as traditional knowledge, have been refined through the CSI core modalities: (i) intersectoral field projects, (ii) interdisciplinary university chairs and twinning networks, and (iii) a virtual forum. Assessments of these activities have led to the conceptualization of “wise practice agreements” in line with the CSI external evaluation (2001).

Strategies/Implementation

Field projects will be selected to test the effectiveness of wise practice agreements which will provide a mechanism for managing conflicts at the local level. This process will aim at establishing informed and equitable stakeholder dialogue, which will be able to explore possible solutions and help avoid the recurrence of similar conflicts. Resulting agreements and lessons learned will provide the basis for a set of practical tools that can be applied to coastal dispute situations elsewhere. The Internet-based forum *Wise Coastal Practices for Sustainable Human Development* will continue to serve as a global virtual laboratory for sharing experiences and refining wise practices. Since differences in value systems, with their inherent moral and ethical dimensions, lie at the heart of many problems facing small islands and coastal regions, the development of interregional “ethical codes of practice” for donors and investors in coastal development will be pursued in line with the Organization’s standard-setting function.

Expected results *(and performance indicators)*	**Results achieved**	**Results not achieved**	**Lessons/Challenges**
National capacities reinforced to manage conflicts over coastal resources and social, economic and cultural values – *number of sites where wise practice agreements were tested and assessed*	• An educational tool for sustainable development, a series of wise practices and lessons learned developed through the Sandwatch project to involve students, teachers and communities in the critical evaluation and management of coastal issues in islands in the Caribbean, Indian Ocean and Pacific regions • Wise practices for sustainable island living (relating to community visioning, youth visioning, environmental monitoring, eco-friendly practices) implemented in several islands • Wise practices for coastal zone management in the White Sea region of northern Russia developed and being implanted in the communities in the region		Wise practice agreements have remained, up to now, verbal rather than written, this being partly a function of the fact that islanders are traditionally oral societies; nevertheless, preliminary successes, particularly in areas such as community visioning are providing insights for sustainable, community-led island living.

Ethical codes of practice for donors and investors in coastal development drafted and discussed through the global virtual forum – *number and origin of inputs to the forum discussion* – *number of active visitors to the forum website* – *number of external websites linked to the global virtual forum*	• Ethical codes of practice for donors and investors in coastal development drafted and discussed through global Internet forums (over 30,000 hits); major topics discussed included: foreign investment, sustainable development, taxation, renewable energy and adaptation to climate change		Moving the concept of ethical codes of practice from discussion to reality has proven to be a huge challenge notwithstanding the fact that so many groups have vested interests which are magnified in SIDS due to their small size

Title of element/unit

32 C/5 paragraph 02151 **MLA 1 - Addressing scientific uncertainties for the management of marine environment and climate change**

Inputs/Funding

32 C/5 Approved – Regular budget: $885,000; Extrabudgetary resources: $500,000

Justification/Identification of needs/Background

One of IOC's missions is: to catalyse and coordinate oceanographic research addressing critical uncertainties for the management of the marine environment and climate change; and to communicate the results of these investigations to the Member States of the IOC, the United Nations, and the general public. To this end, IOC is (i) addressing critical uncertainties in the coupled ocean-atmosphere system that drives climate change and variability; (ii) providing interdisciplinary approaches to research on ocean ecosystems, coupling between the geosphere and biosphere and marine environmental protection; and (iii) assisting IOC Member States to build marine scientific and technological capabilities in coastal zone management.

Strategies/Implementation

The IOC Ocean Science Programme will: (i) integrate the needs and concerns of the Member States into the agendas of international, regional and national research programmes through interactions with the global and international research programmes and partner organizations; (ii) assist regional and international coordination of research programmes, especially focusing on the participation of developing nations and training programmes by providing: limited financial assistance to scientists from developing nations to participate in international and regional research programmes, financial assistance (seed money) to research programmes, and support for expert groups to provide scientific guidance on specific topics; and (iii) as the United Nations focal point for ocean science, provide information on ocean science and programmes within the United Nations system, as well as information on international, regional and national research programmes supported by the United Nations and other international organizations.

Expected results *(and performance indicators)*	**Results achieved**	**Results not achieved**	**Lessons/Challenges**
Scientific and technical guidance to Member States enhanced on observations and research needed to understand the ocean's role in the climate change and in the global carbon cycle – *international forum created* – *scientific advice and technical guidance published and disseminated*	• "Guide on Best Practices for Oceanic pCO_2 Measurement and Data Reporting" finalized by the IOC-SCOR Panel on CO_2 • Approval by the 23rd IOC Assembly of the TORs for the expanded International Ocean Carbon Coordination Pilot Project (IOCCP), intended to serve as an international communication and coordination centre for ocean carbon research as well as for observations as called for by the global research programmes of SCOR and IGBP (the Scientific Committee on Oceanic Research, an interdisciplinary body of ICSU, and the International Geosphere-Biosphere Programme) • IOCCP – published a special issue of the Journal of Geophysical Research highlighting research from the international symposium The Ocean in a High CO_2 World – held its first Scientific Steering Group meeting, which reviewed ongoing activities and planned international coordination activities for the coming year – co-hosted an international repeat hydrography and carbon workshop, which made plans to develop a sustained programme to carry out decadal global surveys of hydrographic parameters and carbon measurements		
Capacities of Member States for monitoring and prediction of harmful algal blooms (HABs) improved – *publication of scientific results on improved understanding of factors controlling harmful algal blooms* – *adoption of national science-based strategies for monitoring and predicting blooms by a number of countries*	• Individual training and study opportunities provided to over 100 individuals through the IOC Science and Communication Centres in Copenhagen (Denmark) and Vigo (Spain) and through international or regional training workshops in Brazil, Germany, Italy, Kuwait, Philippines, South Africa and Viet Nam • Inter-calibration exercise on new and classic techniques for the determination of numerical abundance and biovolume of HAB-species completed jointly with the International Council for the Exploration of the Sea, ICES (results to be published in peer reviewed journal) • GEOHAB (Global Ecology and Oceanography of Harmful Algal Blooms) completed its series of Open Science Meetings and formulated a subset of research plans for the GEOHAB core research projects; agreement with PICES (North Pacific Marine Science Organization) on a common IOC-ICES-PICES database on harmful algal events (HAEDAT) materialized through first submission of data by PICES member states	Publication of "Real-time coastal observing systems: ecosystem dynamics and harmful algal blooms" in UNESCO series on oceanographic methodology postponed to 2006	

Capacity of scientific and research programmes increased to assess the health of the ocean ecosystems – *easy to use indicators developed to assess ocean ecosystem health* – *models developed to assess effects of human activities on ocean ecosystems*	• GCRMN (Global Coral Reef Monitoring Network) report on the state of coral reefs worldwide, including suggested remedies, published and widely publicized to stakeholders • Funds secured from the Belgian Government ($250,000) and the European Union project Hermes ($100,000) for the TTR (Training-through-Research) programme, which studies geosphere-biosphere coupling processes in relation to the protection of the high seas marine environment		
Capacity of coastal countries and regions to undertake Integrated Coastal Area Management (ICAM) increased – *set of global and regional assessments conducted* – *number of pilot projects implemented in several regions* – *number of measurement indicators developed* – *technical and scientific guidelines and tools published and disseminated*	• *Handbook on the Application of Indicators for Integrated Coastal Area Management* released for testing by coastal managers in up to 12 ICAM projects around the world before publication • Support to participants from developing countries to attend the LOICZ Open Science Conference “Coasts and Coastal People-Scenarios of Change and Responses” • Fourth Inter-calibration experiment on submarine groundwater discharges in the coastal zones organized in cooperation with IAEA and UNESCO-IHP (Mauritius) • Publication of a brochure highlighting the objectives of the IOC project on the development of indicators to measure the effectiveness of integrated coastal management		

Capacities of African Member States for regional coastal management enhanced – *number of countries provided with scientific and technical assistance* – *number of workshops conducted* – *number of coastal managers and scientists trained* – *number of coastal projects implemented* – *number of publications with scientific and technical guidance*	• IOC designated as executing agency of a $1 million GEF/UNDP-funded project on climate change adaptation in coastal zones and shoreline change management through ICAM in West Africa; this extrabudgetary contribution will be instrumental to mainstream adaptation to climate change into ICAM planning in the participating countries (Mauritania, Senegal, Gambia, Guinea-Bissau and Cape Verde) through the development and implementation of pilot adaptation activities in response to shoreline change, and will involve the development of strategies, policies and measures, based on technical/scientific information and appropriate policy instruments; a major preliminary objective will therefore be to pilot adaptation activities in a local to subregional context, as there is a strong rationale for addressing the issue of adaptation and shoreline change not only at the national level but also through the development of a (sub)regional approach; first regional workshop and steering committee in Dakar to launch this high priority project under the NEPAD Environmental Action Plan • Three newsletters and an African ocean portal developed by the NEPAD Coastal and Marine Unit (COSMAR, Kenya) through support provided by IOC and ODINAFRICA (Ocean Data and Information Network for Africa)		

Title of element/unit

32 C/5 paragraph 02152 **MLA 2 - Developing monitoring and forecasting capabilities for the management and sustainable development of the open and coastal oceans**

Inputs/Funding

32 C/5 Approved – Regular budget: $1,340,000; Extrabudgetary resources: $1,420,000

Justification/Identification of needs/Background

IOC leads a partnership with WMO, UNEP and ICSU to coordinate the implementation of a Global Ocean Observing System (GOOS), a permanent system built with contributions from Member States. GOOS responds to calls by Agenda 21 to improve the monitoring of the global environment. It is part of an Integrated Global Observing Strategy (IGOS), that is shared by United Nations agencies (UNESCO, UNEP, FAO, WMO), by ICSU, the International Geosphere Biosphere Programme (IGBP) and the world's space agencies. It has an open ocean subsystem to improve weather and climate forecasting, and a coastal one for coastal seas. The open ocean one is the oceanic component of the Global Climate Observing System (GCOS). GOOS comprises remote sensing from satellites; coastal instruments including tide gauges; buoys, drifters and other platforms; ships of opportunity (including commercial ferries); and long time series records of variability. It produces data and information meeting the needs of many users.

Strategies/Implementation

The strategy includes: the implementation of pilot projects to demonstrate and validate the GOOS concept; the involvement of more developing countries in the implementation of GOOS; improving the ability of regional groups to participate in and benefit from GOOS; expanding implementation by incorporating national activities; and soliciting increased extrabudgetary support. Many of the applications of GOOS will take place through the new Joint WMO/IOC Technical Commission for Oceanography and Marine Meteorology (JCOMM).

Expected results *(and performance indicators)*	**Results achieved**	**Results not achieved**	**Lessons/Challenges**
Ocean and climate forecasting models resulting in production of new high resolution ocean products improved – *Global Ocean Data Assimilation Experiment (GODAE) and its associated Argo profiling float project fully implemented and tested*	• GODAE (Global Ocean Data Assimilation Experiment) modelling successfully implemented and Argo float programme in progress with 2,415 operating floats, representing 80% of the target 3,000-float array by 2006		Argo and GODAE are entirely extrabudgetary supported activities. The two major challenges for GODAE are to find users for the open ocean products it now provides and to produce similar products for high-resolution coastal areas where there are more interested users

Initial Global Ocean Observing System (GOOS) expanded and fully operational – *JCOMM fully functional* – *number and quality of GOOS components expanded* – *ocean carbon observing system initiated* – *network of open-ocean time series stations initiated* – *satellite for Ocean Salinity Measurements (SMOS) launched* – *number of coastal GOOS pilot demonstration projects conducted* – *requirements for ocean observation measurements refined*	• JCOMM fully functional • Number and quality of GOOS components expanded in a manner fully consistent with plans • Open-ocean time series stations exist as a component of JCOMM (UNESCO's role was negligible) • Launching of SMOS agreed to by NASA (UNESCO's role was negligible) • Requirements for open ocean and coastal ocean observations fully refined in the GCOS and COOP (Coastal Ocean Observations Panel) strategy and implementation plans	Ocean carbon observing system and associated results are dealt with under MLA 1 Result partially achieved	Concentration of resources is the major challenge facing GOOS; less time and resources should be spent on workshops, developing plans, guidance and governance and more on coordinating and facilitating implementation of the observing system
Flow of climate and weather related information improved – *forecasting of weather and El Niño events improved* – *warnings about other severe events provided* – *information on ocean data management requirements and practices improved* – *assistance provided to countries to meet the obligations for ocean monitoring under the United Nations Framework Convention on Climate Change* – *coastal GOOS implementation plan and a GOOS Handbook published*	• Technical support tools for operational oceanography and marine meteorology improved by JCOMM Observing Platform Support Centre through its website and development of a web application dedicated to the collection of metadata from drifting and moored buoys • Second session of the IOC/WMO Joint Technical Commission for Oceanography and Marine Meteorology (JCOMM), Halifax, reviewed progress in operational marine meteorology since the establishment of JCOMM in 1999 and defined plans for the next four years • Tsunami warning system now operational in the Indian Ocean using real time tide gauges that are part of GOOS (through extrabudgetary funding) • Coastal GOOS implementation plan published	No significant improvement in El Niño forecasting (negligible role for UNESCO)	Developing tractable and realistic goals consistent with the demands of IOC governing bodies and financial and management constraints at UNESCO is a major challenge for GOOS

Title of element/unit

32 C/5 paragraph 02153 **MLA 3 - Developing and strengthening a global mechanism to ensure full and open access to ocean data and information for all**

Inputs/Funding

32 C/5 Approved – Regular budget: $495,000; Extrabudgetary resources: $290,000

Justification/Identification of needs/Background

Decentralized networks of data centres providing access to a wide variety of users over the Internet are gradually replacing the traditional model of centralized data management. This model enables the development of a wide range of user communities having access to data, data products and information. The International Oceanographic Data and Information Exchange (IODE) Programme will help to narrow the “digital divide” between developing and developed countries, through the creation of ODIN – Ocean Data and Information Network – projects to aid developing countries. Information provided will include certain specialized functions including seabed mapping and tsunami forecasting.

Strategies/Implementation

The IODE Programme will develop applications of ICTs for data management and dissemination. It will strengthen cooperation with ocean research and monitoring programmes to ensure that data and information needs of Member States are met, through close collaboration with the programmes and communities of Main Lines of Action 1 and 2, and especially with the Joint WMO-IOC Technical Commission for Oceanography and Marine Meteorology (JCOMM). The IODE Programme will also increasingly play an active role in guiding users to information through the development and maintenance of specialized portals and clearing-house mechanisms, in close collaboration with United Nations and other agencies.

Advances in seabed mapping will be achieved through collaboration with international hydrographic agencies. In liaison with Subprogramme II.1.3 related to earth sciences and disaster reduction, tsunami forecasting will be improved through cooperation between the scientific research community of IUGG and operational experts dealing with seismic and tidal observations, with the objective of disaster mitigation. Assistance to the establishment of national tsunami warning systems will be critical in that regard.

Expected results *(and performance indicators)*	Results achieved	Results not achieved	Lessons/Challenges
Full and open access to ocean data and information promoted and communication of ocean research findings to decision-makers and the public improved – *improved access to ocean data and information and products through user-friendly Internet-based data and information portals* – *extent and reach of media coverage of issues involved*	• "OceanExpert" re-engineered to refocus on its main aim, i.e. an authoritative and user-friendly portal providing information on ocean professionals; it will also be used as an "IODE training course alumni" tracker database • "OceanPortal" now contains nearly 4,700 links to ocean related websites and number of unique visits increased by 13% to 129,000/year as compared to 2004; over 100 poster requests received and serviced • Training course on website development organized for ODINAFRICA was attended by 11 countries; new websites created as a result of this training will include data and information for all relevant stakeholders and will be hosted, as necessary, by the IOC Project Office for IODE (but developed and maintained in the concerned African Member States) • Prototype distributed data portal: pilot project 3 (end-to-end data management system), which is a joint IODE/JCOMM initiative, successfully completed; prototype integration server established and maintained at the IOC Project Office for IODE; five national oceanographic data centres (NODCs) of the IODE network involved in the activity and linked to the integration server; pilot demonstrates – real-time access to, and fusion of, data: operational timescale, across multiple disciplines, non-traditional variables, from multiple source formats, from multiple providers in different geographic regions – the full range of processes including data discovery, access and visualization • System of Industry Metocean data for the Offshore and Research Communities (SIMORC) being established to stimulate and support a wider application of the industry metocean datasets; SIMORC system will consist of an index metadatabase and a database of actual data sets that together will be accessible to the scientific community through the Internet		The limited bandwidth available to developing countries in Africa (digital divide) remains a problem in the efforts to promote African science at the global level. Promoting the prototype and identifying centres able and willing to collaborate was challenging, for technical as well as organizational reasons. IOC Project Office for IODE established in Ostend (Belgium) with extrabudgetary funding by the Government of Flanders (€500,000/year); it will facilitate the further development and maintenance of IODE Projects, services and products with emphasis on improving the efficiency and effectiveness of the data and product/service stream between the stage of sampling and the user; it is also a well-equipped training centre intended to strengthen the capacity of Member States to manage oceanographic data and information and to provide ocean data and information products and services required by users; the Project Office will reinforce and support all IODE technical standard-setting and technological development projects, as well as capacity-building activities.

Capacity to collect, preserve, disseminate and use ocean data and information strengthened – *establishment of numbers of national oceanographic data centres and their networking at regional and global scales*	• Training activities on ocean data management and marine information management for the Indian Ocean region expected to lead to the creation of new data centres in 2006 (project preparation involved 14 countries and 29 experts as well as close liaison with the IOGOOS network – Global Ocean Observing System in the Indian Ocean); capacity of existing data centres strengthened through training courses for Africa, the Caribbean and South America • Preparations under way to develop an ODIN (Ocean data and information network) for the WESTPAC region • The project "Development of an African repository for electronic publications" contributes to ODINAFRICA-III (supported by the Government of Flanders for an amount of $2,530,000) and aims at facilitating the publishing of research findings by African scientists and at making African research publications more easily accessible to the (African) research and decision-making community; pilot to be eventually implemented in other developing regions	No new data and information centres formally established Extrabudgetary funds for the operation of the ODINCINDIO (Ocean Data and Information Network for the Central Indian Ocean region) not yet identified	Identifying and bringing together relevant experts in the Indian Ocean for the establishment of ODINCINDIO was a challenge Convince scientists that an e-repository does not compete with traditional journals Reliance of IOC/WESTPAC Office on extrabudgetary sources for its programme and project operations increased significantly since 1999 and indications are that this trend will continue well beyond the next biennium; extrabudgetary sources are: Japanese-Funds-in-Trust (JFiT), Chinese Trust Fund, SIDA-SAREC, German Trust Fund, UNEP Trust Fund, UNEP/GEF, MAB, Japan Society for the Promotion of Science (JSPS), Australian Bureau of Meteorology (AUS BoM), Office of Naval Reserve (ONR) and Sloan Foundation
Global standards for the collection, management and exchange of ocean data and information developed and disseminated – *publication and widespread use of global standards*	• MarineXML project test-bed demonstrations completed and presented at the final project meeting (Liverpool); work initiated is being pursued under the EU MOTIVE Project and links between this initiative and JCOMM are being established (Data Management Programme Area)		XML standards are being developed in various disciplines and for the marine area there are several parallel initiatives; this needs to be taken into consideration to avoid dilution of the standard-setting effort

Information on the topography of the world ocean floor and its geological/geophysical parameters improved – *numbers of countries showing improvements in compiling and managing bathymetric data* – *publication and dissemination of regional International Bathymetric Charts*	• Knowledge on the topography of the world ocean floor and skill in compilation and management of bathymetric data improved in more than 50 countries through establishment of the new Global Regional Digital Bathymetric Data Base (GRDBD) • Quality of tsunami modelling and prediction significantly improved through publication of full set of the International Bathymetric Chart of the Caribbean Sea and Gulf of Mexico, International Digital Bathymetric Data Base of the North Atlantic, sheets NN 9, 10, 12 of the International Bathymetric Chart of the Western Indian Ocean, as well as the second edition of the International Bathymetric Chart of the Mediterranean Sea and its dissemination together with the 4th edition of the GEBCO Digital Atlas		
Tsunami warning systems and mitigation procedures strengthened – *public awareness raised through media coverage and education tools* – *national capabilities in tsunami preparedness enhanced* – *numbers of managers trained and workshops held*	• Lead role by UNESCO/IOC for the establishment of a Tsunami Warning and Mitigation System for the Indian Ocean • Technical support and key resource persons provided by ITSU (International Coordination Group for the Tsunami Warning System in the Pacific, ICG/ITSU) and its ITIC (International Tsunami Information Centre) for coordinating the establishment of a Tsunami Warning and Mitigation System for the Indian Ocean (IOTWS) • Intergovernmental Coordination Group for IOTWS established as a subsidiary body of IOC • ITSU-XX Session decided – to align itself with the newly established IOTWS, specifically through the establishment of technical working groups and through mutual participation in management group meetings – to rename itself “Intergovernmental Coordination Group for the Pacific Tsunami Warning and Mitigation System (ICG/PTWS)”, in line with the other tsunami warning and mitigation systems and their governing bodies established under the auspices of IOC (with IOC’s ITIC in Honolulu, Hawaii, assuming the role of Secretariat for the ICG/PTWS) • Fourth session of IOC Regional Committee for the Central Indian Ocean (Colombo, Sri Lanka) gathered 10 countries which agreed on priority actions for the region in terms of ocean science, services and observation, including capacity-building activities to strengthen the participation of countries in the Indian Ocean Tsunami Warning System	The ITSU-XIX work plan could not be fully implemented due to competing resource requirements for the establishment of the IOTWS	

Title of element/unit

32 C/5 paragraph 02154 **MLA 4 - Developing ocean governance issues and increasing the effectiveness of the IOC governing bodies**

Inputs/Funding

32 C/5 Approved – Regular budget: $854,000; Extrabudgetary resources: $200,000

Justification/Identification of needs/Background

IOC acts as the Ocean Science and Ocean Services focal point for the United Nations system. As such it offers a platform for the coordination of system-wide activities in this domain. Specifically, IOC carries an international responsibility to: build capacity in marine science and the sustainable development of oceans and their resources as a follow-up to the WSSD Plan of Implementation; support the Global Assessment of the Marine Environment (GMA); and transfer marine technology and marine scientific research under the United Nations Convention on the Law of the Sea (UNCLOS/UN-GA).

Strategies/Implementation

The IOC strategy is based on building partnerships with United Nations agencies, intergovernmental and non-governmental organizations, as well as the private sector, to respond to the mandates from WSSD, the United Nations General Assembly and the UNEP Governing Council. It also seeks to modernize the governance of IOC by increasing the effectiveness of the Commission and by improving the functioning of the Secretariat. To that end, a pilot project will be conducted to make full use of the new management tools of UNESCO, namely reports from FABS and SISTER, and to apply fully results-based planning, programming, management and monitoring.

Expected results *(and performance indicators)*	**Results achieved**	**Results not achieved**	**Lessons/Challenges**
Increased coordination among governments, IGOs, NGOs, the private sector, and research institutions in the execution of the WSSD Plan of Implementation – *establishment of the Global Forum on Oceans, Coasts and Islands, and related high-level intergovernmental and non-governmental processes initiated*	• IOC's role in building the capacity of SIDS in marine sciences acknowledged in the Mauritius Strategy • $1 million GEF grant secured to support the 2005-2006 activities of the Global Forum on Oceans, Coasts and Islands jointly operated with UNEP and the Centre for Marine Policy/University of Delaware; this extrabudgetary contribution is intended to foster a global South-South and South-North dialogue on the implementation of activities towards the achievement of JPOI targets and timetables related to oceans, coastal areas and islands, with special focus on SIDS and the interlinkages between fresh water and the coastal and marine environment; activities will assist developing countries and countries in transition to put oceans, coasts and islands issues high on the political agenda and will help build their capacity in addressing those issues; the first activity supported by the project was the Ocean Policy Summit (Lisbon), organized by the Global Forum on Oceans, Coasts and Islands, that gathered 250 participants to discuss the development of national and regional ocean policy guidance as well as capacity-building needs for SIDS		The Global Forum on Oceans, Coasts and Islands has proven to be a useful mechanism to involve non-governmental associations in a fruitful dialogue with governmental and intergovernmental processes related to JPOI

Contribution to the implementation of 10 WSSD Type II Partnerships on Oceans where IOC is identified as a partner – *WSSD Ocean partnerships implemented with IOC participation*	• UNESCO/IOC identified as an active partner in a number of Partnerships Type II: ADRICOSM (ADRIatic sea integrated COastal areaS and river basin Management system pilot project), the African Process for the Development and Protection of the Coastal and Marine Environment, the Coral Reef initiative and the POGO-IOC Initiative for Intelligent Use and Management of the Oceans *(IOC contribution to the implementation of these partnerships is reported mainly under MLAs 1 and 5 of the subprogramme)*		A successful story is the Partnership for Observation of the Global Oceans (POGO), which is a forum created by directors and leaders of major oceanographic institutions around the world to promote global oceanography, particularly the implementation of an international and integrated global ocean observing system; activities include grants for technicians and scientists from LDC
Management and effectiveness of IOC statutory meetings and business improved – *approved processes for IOC management* – *numbers of countries engaged in depth in IOC results-based management*	• Officers' Meeting and 23rd IOC Assembly organized as planned, including the timely circulation of all working documents • Systematic use of SISTER and SAP for reporting purposes (result-based and financial) to both IOC and UNESCO governing bodies		Fuller use of SISTER by programme specialist once the recasted version is available
Research activities in Ocean Sciences and related services reinforced in conjunction with partner organizations – *numbers of partnerships developed* – *numbers of organizations in each partnership*	• MoU with the International Council for the Exploration of the Sea (ICES) to (*inter alia)* – prepare specific plans to intensify cooperation, to coordinate programmes and to avoid unnecessary duplication in the study of the North Atlantic and its adjacent seas – develop a common approach to specific issues, for example education, training, and technology transfer for third parties, or joint workshops, symposia and conferences on key issues • Letter of Agreement with the North Pacific Marine Science Organization (PICES) to establish a partnership in systematically compiling, storing and presenting online records on harmful algal events • MoU with the UNEP Regional Seas Programme • Long-standing cooperation with the Scientific Committee on Oceanographic Research (SCOR) and the World Climate Research Programme (WCRP) continued		
Storage, access, production and distribution of IOC statutory meeting documents and information materials improved – *faster, more efficient and more cost-effective provision of information to Member States and the wider public*	• Reports of workshops, groups of experts meetings, training courses as well as administrative reports published electronically under the editorial responsibility of each programme, thus reducing printing costs and enlarging timely distribution in line with the IOC Publications Policy approved by the IOC Executive Council in 2002		The Indian Ocean tsunami-related activities challenged the capacity of UNESCO/IOC to deal in an extremely short period of time with the timely production of documents for non-statutory but critical meetings; challenge successfully taken up

Title of element/unit

32 C/5 paragraph 02155 **MLA 5 - Developing the capacities and effectiveness of Member States in marine scientific research, and in the management and sustainable development of the open and coastal ocean**

Inputs/Funding

32 C/5 Approved – Regular budget: $1,169,900; Extrabudgetary resources: $1,150,000

Justification/Identification of needs/Background

Capacity-building through Training, Education and Mutual Assistance in Marine Sciences (CB-TEMA) Programme is central to the IOC strategy. A strong CB-TEMA ensures that capacity-building activities link the IOC programmes to existing and planned national and regional programmes. This enhances the success of IOC's programme activities and makes national efforts more sustainable and effective. The IOC's regional subsidiary bodies, regional networks like the Ocean Data Information Networks (ODIN), the regional GOOS groups, and regional project/programme offices, as well as UNESCO/IOC Chairs, are mechanisms to stimulate the development of IOC programmes in the regions.

IOC supports the regional implementation of its Programme through a regionalized intergovernmental governance system composed of regional subsidiary bodies – two subcommissions and five regional committees. In addition IOC with the help of Member States has set up several regional project/programme offices in the field, most recently in Perth, Australia, to serve GOOS in the Indian Ocean; in Mombassa, Kenya, to serve the ODINAFRICA Project and the North and Central Western Indian Ocean region; in Lagos, Nigeria, to serve the Central Eastern Atlantic region; and in Rio de Janeiro, Brazil, to serve GOOS in the South Atlantic.

Strategies/Implementation

The CB-TEMA efforts will be strengthened through partnerships with other organizations such as the Partnership for Observation of the Global Ocean (POGO), the International Geosphere Biosphere Programme (IGBP) (via the Global Change System for Analysis, Research and Training – START), the Committee on Earth Observation Satellites (CEOS) and WMO (through JCOMM), as well as with UNESCO's IGCP, IHP, MAB and other entities as necessary. The number of UNESCO/IOC Chairs will be increased.

Through the new IOC Guidelines for the Establishment of Regional, Programme and Project Offices the IOC governing bodies will provide a framework to continue the decentralization and regional reinforcement of IOC programmes. The subsidiary bodies will hold statutory meetings and will report to the governing bodies of the Commission. The regional project/programme offices will ensure implementation/expansion of IOC's activities at the regional level.

Expected results *(and performance indicators)*	**Results achieved**	**Results not achieved**	**Lessons/Challenges**

Grants to individuals and institutions for scientific, technical and engineering training/formal education increased – *number of UNESCO/IOC Chairs established and active* – *number of grants awarded*	• Links with the four established IOC Chairs strengthened notably through: – building capacity to assemble and service a satellite transmitter for oceanographic data (Maputo) – organization of summer school on oceanography and remote sensing (Concepcion, Chile) – organization of 15th TTR Cruise on geosphere-biosphere coupling processes of the continental margins (Moscow) • New initiative launched with the University of Nice (France) to organize training courses on Mediterranean integrated coastal area management • Negotiations under way both with the University of Nice and the State Hydrometeorological University (St Petersburg, Russian Federation) for the establishment of two new UNESCO/IOC Chairs • Completion of a best practices study based on an evaluation of past capacity-building efforts, including grants awarded; recommendations from the study are being used in the selection and follow-up of grantees for travel and research • 24 travel, research and fellowship grants awarded: – seven individual travel grants for participation in major scientific events – seven research fellowships in partnership with POGO and SCOR – seven travel grants to attend the COSPAR (Committee on Space Research) capacity-building workshop on satellite oceanography – three research grants to enable young scientists from developing countries to pursue their careers at leading research institutes • Major training effort by the Training-Through-Research programme, complemented by follow-up conferences and publication of research results: – 15th TTR cruise to the North Atlantic, Mediterranean and Black Seas with the participation of 50 students from Africa, Asia and Europe – two TTR field trips to the coastal Morocco Rif Region • Workshop for marine scientists from the Caribbean and Latin America to identify priority issues for capacity-building in that region • Implementation Plan for capacity-building designed by a regional experts workshop and approved by IOC Assembly for initial implementation; first intervention of the Initial Implementation Plan was a leadership workshop for heads of marine science institutes of the Western Indian Ocean region • Execution of the ADRICOSM-EXT project, a joint research and observation effort funded by the Italian Government and involving 23 leading research institutes in Italy, Serbia and Montenegro, Croatia, Slovenia, Bosnia and Herzegovina and Albania; the project seeks to extend the experience and knowledge-base generated by the original ADRICOSM network to other Adriatic countries to continue the implementation of a state-of-the-art monitoring and forecasting system for the marine coastal areas and their adjacent river catchments around the Adriatic Sea; it includes 23 research contracts with partner institutes and the provision of capital scientific equipments to these institutes	Increasing usage of UNESCO Participation Programme and Fellowship Schemes into the overall capacity-building effort	Training-Through-Research (TTR), providing the most direct research experiences for oceanographers, was extended to the Asian region with French and Australian assistance. The original TTR programme conducted jointly by Universities of Moscow and Southampton continues, and the Caspian Floating University was active as well. Travel and research grants were focused to issues concerning the coastal zone, a priority indicated by developing regions, while the open ocean training was conducted in collaboration with partners from POGO. Training in remote sensing, a priority of the Assembly was conducted in Morocco in partnership with COSPAR. Extended support was granted to the chairs in Moscow, Maputo and Concepcion. A workshop on coastal management with extensions to training of institutes in North Africa was supported in Nice with a view to ultimately creating a chair in the Mediterranean on coastal zone issues. However, the most important new intervention was the first implementation step of the strategy for capacity-building. This took the form of a 3½-day workshop in Maputo, conducted for heads of marine institutes in the Western Indian Ocean. These workshops will be continued and expanded in the coming biennium

Regional development of GOOS in support of sustainable development enhanced – *development of strategic and implementation plans for regional GOOS development in the Caribbean, Indian Ocean, Pacific Ocean and South-East Asia* – *broadening of the strategic and implementation plans for North-East Asia* – *improvement of an initial observing system for the Mediterranean* – *implementation of pilot demonstration projects in the Caribbean and Pacific regions* – *pilot project demonstrating the ecosystem-based approach to fisheries management, in association with ICES in the North Sea* – *increase in use of remote-sensing satellite data in support of decision-making with respect to coastal seas around Africa and in the Pacific and Indian Oceans* – *creation of an improved tide gauge network around Africa* – *development of closer relationships between regional GOOS bodies and appropriate Regional Seas Programmes* – *adoption of GOOS as a tool for the achievement of Regional Seas Conventions and Action Plans in those areas*	• The Southeast Asian Global Ocean Observing System (SEAGOOS) established, hosted and coordinated by the Government of Thailand; it aims at building regional capacity to understand and address issues on climate and tropical cyclones, coastal dynamics and pollution, ecosystems and fisheries, and natural hazards • Results of discussions by a Working Group for the establishment of ODIN-WESTPAC synthesized to support capacity-building needs in the region • More effective strategic plan developed by NEAR-GOOS (North-East Asian Regional GOOS) for its second phase of operations (2004-2008) • Closer relationships forged with, *inter alia*, the UNEP-GEF South China Sea Programme (through the establishment of demonstration sites), PEMSEA (Partnership in Environmental Management for the Seas of East Asia), SOLAS (Surface Ocean - Lower Atmosphere Study), PICES, NOWPAP (Northwest Pacific Action Plan), ISDR (International Strategy for Disaster Reduction), DIPECHO (DIsaster Preparedness ECHO), UNESCAP (United Nations Economic and Social Commission for Asia and the Pacific) and the UNDP Yellow Sea Large Marine Ecosystem Programme (through joint undertakings, participation in meetings and data and information exchange)		
Ocean Data and Information Networks (ODIN) developed for different regions – *successful development of ODIN for Caribbean and South America (ODINCARSA)* – *number of organizations and experts active in ODINCARSA* – *number of countries and experts active in ODIN in other regions (e.g. Western Pacific – WESTPAC and Indian Ocean)*	• Main achievements are reported under MLA 3		

Title of element/unit

32 C/5 paragraph 02211 **MLA 1 - Cross-disciplinary partnerships in promoting basic research and the use of scientific knowledge**

Inputs/Funding

32 C/5 Approved – Regular budget: $1,500,000; Extrabudgetary resources: $600,000

Justification/Identification of needs/Background

The worldwide consensus that developed at the World Conference on Science (WCS) in Budapest, 1999, and embodied in two principal documents: the *Declaration on Science and the Use of Scientific Knowledge* and the *Science Agenda-Framework for Action* has conditioned the activities of the Natural Sciences Sector in recent years, in particular through cross-disciplinary multilateral partnerships in the basic sciences. The Organization accepted the role of clearing house to review the execution of follow-up and foster and promote international scientific cooperation. A longstanding efficient partnership of UNESCO with ICSU and other cross-disciplinary bodies provides a sound basis for action.

Strategies/Implementation

UNESCO will pursue innovative approaches, initiatives and opportunities within the cross-disciplinary partnership and follow-up to WCS. Partners of the Organization in the international arena will be encouraged to closely collaborate with UNESCO's field network and institutions so as to respond better to local and national priorities.

The UNESCO/ICSU Framework Agreement for 2002-2007 will be a major means of fostering cooperation in order to ensure the full participation of ICSU scientific unions in the implementation of three key UNESCO/ICSU projects, namely: (i) increasing national capacities in science through sharing of knowledge and information; (ii) innovation of science education; and (iii) sustainable development through international partnerships.

New modalities for international cooperation in the basic sciences will be explored in cooperation with Member States and international scientific organizations. Efforts will be made to further consolidate the activity of UNESCO's interdisciplinary science networks and centres of excellence in the South in line with priorities identified at the Budapest Conference. An international action for increasing awareness of science advances and opportunities they offer for sustainable development will be undertaken through preparation of open lectures on videocassettes and CD-ROMs in cooperation with non-governmental organizations and centres of excellence.

In cooperation with partners, an evaluation of the follow-up to WCS in 2004 will be undertaken. A consultative meeting of partners will be organized so as to evaluate the results achieved, and identify major endeavours to be undertaken. The meeting is expected to stimulate further measures to promote science and the use of scientific knowledge.

Expected results *(and performance indicators)*	**Results achieved**	**Results not achieved**	**Lessons/Challenges**

Public awareness increased of services by basic sciences and interdisciplinary areas of science to societal needs – *several open lectures delivered and disseminated on a number of videocassettes, CD-ROMs and websites* – *extent of media coverage obtained*	• Several open lectures delivered in conjunction with scientific conferences in the basic sciences and international meetings, e.g. at Venice experts meeting on follow-up to the World Conference on Science or during Ministerial Round Table on the Basic Sciences • Several workshops held to promote experiments in science teaching through CD-ROMs and advanced teaching and learning packages; some 5,000 Didac CD-ROMs produced and disseminated in cooperation with Agfa/Kodak in English, French and Dutch, and 3,000 produced in Chinese in cooperation with the local chemical industry • Information on the basic sciences programme and its service to society was posted on the website of the Division as well as that of relevant scientific unions • Media coverage through press releases, web transmissions and publications		
Science education in basic sciences strengthened – *number of researchers and university teachers trained in current advances of basic sciences in a number of countries*	• Some 300 researchers and university science teachers from about 50 countries received training in current advances in basic sciences at training courses in the basic sciences and within ICSU/UNESCO projects such as African Institute for Mathematical Sciences, Human Dimension of Global Change, Global Iron Cycle, Biodiversity, Health and the Environment		
Scientific information transferred to developing countries – *number of universities in a number of countries successfully involved as beneficiaries*	• Over 100 institutions from some 50 countries benefited from the sharing of knowledge through 15 ICSU/UNESCO/US State Department cooperative projects on global change, sustainable water use, access to environmental data, biodiversity, health and the environment, the global iron cycle and comet/asteroid impacts		
National capacities in basic research enlarged – *evaluation of national capacities in basic research completed in a number of least developed countries* – *number of national networks created* – *number of new interdisciplinary projects induced*	• National capacities in pure and applied mathematics increased through the foundation of an African Institute for Mathematical Sciences and consolidation of a network of national mathematical institutions under this Institute • Cooperation increased with the International Mathematical Union and the International Union for Pure and Applied Physics		
Knowledge of basic sciences improved in various regions – *extent of dissemination of innovative initiatives* – *best practices and opportunities for cooperation documented, evaluated and disseminated in a number of least developed countries*	• 18 projects launched in the framework of innovative initiatives of the International Basic Sciences Programme (IBSP) in Africa, Arab States, Asia, Latin America and Europe; SESAME project developed, in particular through the users training programme • Documentation on opportunities for cooperation within IBSP and a model form for submission of project proposals circulated to all LDCs • Cooperative projects in mathematics education, development of anti-viral agents, plasma in nature initiated in Viet Nam, Cambodia and the Lao		

	People's Democratic Republic in the framework of North-South cooperation		
New actions for the second phase of the WCS follow-up formulated and launched – *consultative meeting held and its conclusions published*	• Updated programme of action developed at the International Symposium "Harnessing Science for Society: Further Partnerships" • Ministerial Round Table on the Basic Sciences: Science Lever for Development (Paris) considered Symposium proposals and issued communiqué summarizing plans and recommendations for actions • IBSP launched as a new major follow-up action in the basic sciences with 39 projects recommended at the first meeting of its Scientific Board; 16 of the selected projects received support in 2005 and are being implemented with participation of some 50 national and regional institutions; IBSP strategy of action for 2006-2007 approved by UNESCO's governing bodies		

Science for Peace in the Middle East: SESAME

Justification/Identification of needs/Background

UNESCO has actively facilitated the setting up of the Synchrotron Light for Experimental Science and its Applications in the Middle East (SESAME) Centre in Jordan, established under the auspices of the Organization. The creation of the Centre heralds a new phase of international scientific cooperation in the region in a field of modern science that offers many opportunities for training and research in a wide range of basic and applied sciences, technology and medicine.

Close collaboration between Member States has been at the very root of this international endeavour, to which the German authorities donated a major research facility – the BESSY I machine. A conceptual design for increasing the number of hard X-ray beam lines and upgrading the energy of the SESAME machine to 2 GeV is under way. With this new design, the machine will become a very advanced facility available for research in the region.

Strategies/Implementation

UNESCO will foster the building up and development of the SESAME Centre. It will promote its science programme and forge international partnerships in the framework of the project. The Organization will focus on its catalytic function in order to increase Member States' participation in the activities of SESAME. It will promote the excellence of national basic and applied research by enhancing the participation of national and regional institutions in the activity of the Centre and by promoting networking among institutions requiring synchrotron radiation in research and its applications.

Overall, the activity of the Centre will be well-suited to foster solidarity and thus contribute to peace through regional cooperation in science as called for by UNESCO's Constitution.

Expected results *(and performance indicators)*	**Results achieved**	**Results not achieved**	**Lessons/Challenges**
New major research facility in the region established and operational – *construction of the building completed* – *installation and upgrading of the machine accomplished* – *staff assembled*	• Foundations of the main building and of the main hall floor completed and experimental floor under construction • Design of the SESAME machine for a final energy of 2.5 GeV elaborated and approved • Appointment of the Scientific Director • Substantial financial support (€1 million) secured from the EU Commission through EU-Jordan bilateral collaboration • Assistance from IAEA in the form of 40 fellowships to SESAME scientific staff for training in other light-synchrotron centres • Viability and sustainability of SESAME project assured with the recent announcement by Jordan of its willingness to support SESAME as from 2006 with a $1 million yearly grant towards running costs		
New research community and scientific partnerships induced in the region – *number of users and accelerator specialists from the region trained* – *number of priority projects for user countries developed* – *number of cooperation agreements between the SESAME Centre and synchrotron radiation centres in others regions established* – *number of conferences and workshops held*	• Three meetings of international expert committees and one users' meeting held to upgrade the accelerator system and identify the type of experiments to be carried out with SESAME beamlines • Five scientific directions identified for SESAME: physical science, biological and medical sciences, environmental sciences, industrial applications and archaeology • Tripartite cooperative agreement signed between CERN, Jordan and SESAME		

Title of element/unit

32 C/5 paragraph 02212 **MLA 2 - Capacity-building in the basic sciences**

Inputs/Funding

32 C/5 Approved – Regular budget: $3,055,300; Extrabudgetary resources: $2,560,000

Justification/Identification of needs/Background

Capacity-building in the basic sciences is a prerequisite for the advancement, transfer and dissemination of knowledge. It is a priority for any long-term socio-economic development, for poverty eradication and for improvement in the quality of life. UNESCO’s activity in mathematics, physics, chemistry and biological sciences has always focused on assisting Member States in advanced training and research through close cooperation with professional IGOs, NGOs, networks, centres of excellence and UNESCO associated centres. The sharing and transfer of knowledge on advances in mathematics, physics and chemistry that nowadays is at the core of modern science education and the breakthroughs in information technologies, the engineering sciences, the creation of new materials and progress in technology and industry. It was and continues to be critical for building national capacities in science. In the life sciences, rapid advances in genetics, biochemistry and microbiology, supplemented with modern cell biology techniques, with techniques of structural biology, with the wide use of bioinformatics, and the creation of genomics and proteomics, have all led to a new approach to biological studies and their application. Molecular and cellular biology, embracing all aspects mentioned above, have become a true basis for further development of life sciences, including modern biomedical and agricultural use of current knowledge, and are providing novel tools to respond to many global needs and concerns faced today.

Strategies/Implementation

Mathematical, physical and chemical sciences: Scientists, especially young and women scientists, as well as university and pre-university staff, will be trained in the chemical, mathematical and physical sciences in advanced scientific research and teaching innovations. For these activities, cooperation with specialized institutions and centres will be strengthened, in particular with the International Centre for Pure and Applied Mathematics (ICPAM), the Abdus Salam International Centre for Theoretical Physics (ICTP) (see box on ICTP, page 127), the Trace Elements Institute for UNESCO, and the International Centre for Chemical Studies (ICCE), as well as with UNESCO-associated centres, centres of excellence and networks in these disciplines.

In partnership with the international scientific unions of ICSU, UNESCO, including all its regional science bureaux, will seek to reinforce the quality, effectiveness and relevance of training programmes and activities at all levels through the preparation of new educational materials and recommendations for their application. Teaching and learning materials in the chemical and physical sciences, as well as materials to raise public understanding of mathematics, will be offered through the Internet. International and regional Olympiads in basic science disciplines will be supported. Projects promoting public understanding of mathematics and physics will be pursued.

Special attention will be paid to the introduction of active learning techniques in physics and of microscience experiments in chemistry, as examples of new teaching and learning methodologies, especially in least developed countries and countries in transition. Support will be provided to physicists from developing countries to participate in international and regional activities marking the IUPAP (International Union of Pure and Applied Physics) initiative for the World Year of Physics 2005. Interdisciplinarity among mathematics, physics and chemistry will be a priority during the biennium as a model for the reinforcement of educational facilities in Member States. Extrabudgetary activities will be sought in the basic science disciplines, especially for macromolecular chemistry, water chemistry, medicinal chemistry, green chemistry, trace elements and environmental chemistry.

As follow-up of WSSD, a special project on the linkage between basic sciences and the environment will be developed. UNESCO-ICTP scientific collaboration will be strengthened with joint activities, in areas such as mathematical modelling, environmental protection and natural hazards, and in collaboration with activities under MLA 3 in Subprogramme II.1.3 on disaster prevention.

Life sciences: In the life sciences, UNESCO's efforts will focus on the development of institutional capacity and infrastructure by providing catalytic support to international centres, national institutions and UNESCO Chairs in the life sciences and biotechnologies. Grants and advisory services will be provided to upgrade scientific teaching equipment and facilities at universities and institutions of higher learning, especially in Africa.

Further, UNESCO will continue its efforts in strengthening human capacities, with special emphasis on capacities for scientific research in molecular and cell biology and biotechnology, highlighting food security, poverty alleviation and awareness building in bio-safety issues, both within the research community and in the public domain. This will be achieved through support for specialized and high-level conferences, meetings, workshops and courses, and through providing research fellowships and travel grants, especially to young and women scientists, as well as through visiting professorships for more advanced researchers, especially for those coming from least developed countries. UNESCO programmes like the Biotechnology Action Council (BAC) and Microbial Resources Centres (MIRCENs), will be involved in these activities.

Efforts will be made to mobilize extrabudgetary resources to support further development of life sciences, especially in such areas as HIV/AIDS research and prevention (in collaboration with the World Foundation for AIDS Research and Prevention). UNESCO shall promote scientific research in the prevention of HIV/AIDS transmission and help disseminate its findings widely.

Strengthening of networking programmes (e.g. in collaboration with the Global Network of Molecular and Cell Biology (MCBN) and MIRCENs) at national, regional and international levels, as well as the development of new interdisciplinary projects will be used to foster capacity-building and sustainable development, in keeping with the follow-up action to WSSD and the UNIDO *Global Biotechnology Forum* in December 2003.

In association with activities on disaster preparedness and prevention, the risks stemming from biohazards in the context of natural and environmental disasters will be addressed, as a contribution to improving human security, through analysis and formulation of a set of guidelines.

UNESCO will contribute to the development and use of technology-enhanced information dissemination tools to improve scientific information dissemination and understanding of advances in life sciences, with a concomitant emphasis on further development and use of bioinformatics.

UNESCO will advocate, in cooperation with National Commissions, regional and international NGOs, with specialized scientific organizations and with United Nations specialized agencies the application of best practices in the use of new technologies and scientific advances for improving the quality of life.

Expected results *(and performance indicators)*	**Results achieved**	**Results not achieved**	**Lessons/Challenges**
Mathematical, physical and chemical sciences			
Research and teaching capacities enhanced in the mathematical, physical and chemical sciences and their applications – *number of scientists, specialists, teaching staf, and students trained, especially in Africa and least developed countries* – *number of innovative teaching and learning materials disseminated* – *number of materials provided to least developed countries, especially in Africa and in countries in post-conflict situations*	• 6,000 scientists and specialists from developing countries, especially women and young researchers, trained by ICTP and the International Centre for Pure and Applied Mathematics (ICPAM) • About 100 physics faculties benefited from workshops on optics and photonics, with material and equipment provided to participants • Over 2,000 chemists received training or attended workshops on microscience experiments; Associate UNESCO Centre for MicroSciences established at the University of Bergen (Norway)		A reduced regular budget required a more focused approach in defining the needs of developing countries, especially Africa, for enhancing research and teaching capacities in physics, mathematics and chemistry Collaboration with and extrabudgetary resources from various international partners and organizations were essential in attaining results achieved in cooperation with ICTP and CIMPA, in organizing active learning workshops on optics and photonics, in implementing activities for the International Year of Physics 2005, and for continuation of the travelling international exhibition in mathematics; with respect to the Global Microscience Project and the training workshops in chemistry, donor support was also critical for expanding these capacity-building activities to a larger number of countries

Collaboration and networking strengthened in chemistry, mathematics and physics with international specialized institutions and centres – *number of international centres involved* – *number of conferences, courses and workshops organized, especially in and/or for least developed countries*	• 10 workshops and summer schools in mathematics organized by ICPAM • Several activities celebrating the International Year of Physics (IYP) 2005 organized in partnership with international, regional and national physical societies • As part of the celebration of the International Year of Physics and also as a follow-up to the UNESCO-ICSU World Conference (1999) and to WSSD, UNESCO, ICTP, IUPAP and the South African Institute of Physics (SAIP) jointly organized the World Conference on Physics and Sustainable Development (Durban), which focused on how developing countries could benefit more from results of physics studies and research around the themes of energy and environment, physics and health, physics education, physics and economic development (about 350 participants, including representatives of physics organizations and the private sector and more than 175 physicists from developing countries and Eastern Europe); Agenda for Action formulated that will become the basis for follow-up activities in 2006 and in the years to come • Capacity-building in advanced training, research and teaching carried out through close cooperation with a number of universities, international scientific unions and foundations		Implementing/supporting various activities for IYP 2005 and discussing with partners with very little regular budget available
Public recognition improved of the importance of the mathematical, physical and chemical sciences for life and societal development – *extent of outreach accomplished* – *extent of media coverage about issues and feedback*	• International Year of Physics 2005 – activities implemented in 85 countries have gained momentum for raising public awareness and visibility of physics, especially among the youth – commemorative stamps issued and popular physics stories published, including a World Year of Physics guidebook – extensive media coverage for IYP 2005 and the numerous national activities related to the Year, including innovative activities involving students and the general public • Public understanding and appreciation of mathematics enhanced in southern Africa through the travelling international exhibition “Experiencing Mathematics” supported by the French Ministry of Foreign Affairs; some countries in the Middle East have requested to host the exhibition next year but this will be contingent on availability of resources		To be continued in the years to come

Life sciences			
Endogenous capacities and research skills strengthened in cell and molecular biology, novel biotechnologies and bioinformatics – *number and type of training delivered* – *number of young researchers trained mainly from developing countries in Africa, countries in transition and small island States* – *collaborative activities with professional biological and biotechnological agencies implemented*	• 15 training workshops and 25 meetings supported, and 40 research fellowships for young scientists implemented, with a focus on capacity-building for developing countries • Outstanding world-class women scientists honoured for excellence in research in condensed matter sciences (five in 2004) and in life sciences (five in 2005) as laureates of the L'OREAL-UNESCO Award for Women in Science; 15 young women researchers granted UNESCO-L'OREAL fellowships to pursue research projects in the life sciences		Reduced budget led to a further concentration of activities with emphasis on LDCs and Africa; in view of the high demand for capacity-building activities in the life sciences, raising additional extrabudgetary resources remains the challenge
Technical capacity of national institutions for research and training enhanced – *number of courses and workshops organized in various regions* – *number of national and regional networks engaged*	• Workshops for developing capacities towards the establishment of biological resource centres (BRCs) in North and Eastern Africa supported		In keeping with the initiative of the OECD to establish BRCs and eventually a Global Biological Resources Centres Network, which have major potential for research and development in the biological sciences
Regional and national biological networks enlarged and strengthened – *number of conferences and workshops organized with number of scientific networks* – *number of scientific networks engaged* – *number of scientists involved from various regions*	• Active participation in the initiation of the Inter-Agency Cooperation Network on Biotechnology (IACNB) • UNESCO-supported networks, MIRCENs and MCBN strengthened and links with the African-Asian-Latin American Network for Natural Products research developed		Support to networks is a low-cost, high impact activity and is an efficient mechanism for focusing resources where budget is limited
Public awareness increased of the safety, health and other issues involved in the application of scientific advances, in particular in relation to biotechnology – *number of workshops and training sessions organized in number of countries* – *public information systems engaged* – *number of educational and informational materials produced and disseminated in number of least developed countries*	• Educational and informational materials produced and disseminated by field offices, including one edition of a biotechnology and bioethics journal • Production of a CD-ROM for increased public awareness of services by basic sciences to society in progress • Dissemination among developing country scientists of peer-reviewed and up-to-date scientific information in the field of biotechnology, through digital, online and paper publications, continued in collaboration with traditional partners		Digital and online dissemination of advances in science is a cost-effective method of information dissemination for professionals while being more limited for the public

Issues of biological and biotechnological hazards in relation to natural disasters analysed and described – *number of expert meetings held and results distributed* – *guidelines drawn up and disseminated in conjunction with MLA II.1.3*		Expert meeting in the field of Geobiotechnology postponed to January 2006; guidelines will be drawn up and disseminated subsequently		
Research promoted to identify and disseminate low-cost therapy and prevention for AIDS and other infectious diseases – *collaboration with number of bioclinical institutions developed* – *dissemination of research results in several countries, especially in Africa, achieved* – *technology transfer to a number of least developed countries facilitated* – *number of training activities organized*	• Second phase of the Families First Africa Project for development of a paediatric vaccine for prevention of mother-to-child transmission of HIV, including research and training components; major extrabudgetary resources provided by the Italian Government while traditional partners assisted with fellowships and workshops on a cost-sharing basis • Three workshops in health-related water microbiology, emerging infectious diseases and culturing of microbes organized or supported through the MIRCEN programme			

Title of element/unit

32 C/5 paragraph 02213 **MLA 3 - Capacity-building in engineering sciences and technology**

Inputs/Funding

32 C/5 Approved – Regular budget: $1,000,000; Extrabudgetary resources: $2,400,000

Justification/Identification of needs/Background

Engineering and technology are a vital but often overlooked part of our knowledge, infrastructure, culture and heritage, and are vital assets that require development, management and maintenance. The development and application of knowledge in engineering and technology is a driving force of sustainable social and economic development and an important factor for poverty eradication. These issues were underlined at the World Conference on Science in 1999 and the World Engineers' Convention in 2000. Human and institutional capacity-building, policy and planning issues in the engineering sciences and technology are important priorities in the development and application of knowledge in many developing countries and transitional economies. International cooperation in engineering and technology is essential in many areas and also contributes to intercultural dialogue.

Strategies/Implementation

The overall strategy of UNESCO in the engineering sciences and technology is to promote human and institutional capacity-building, particularly in the developing countries. Emphasis will be given to information, communication, advocacy and the promotion of engineering and technology, especially among young people, equity and participation and the application of research and knowledge management for development. There will be a focus on the development of information, learning and teaching materials, education and training, professional development, standards, accreditation and quality assurance. Other initiatives include the development of ethics and codes of professional practice, engineering and the promotion of a culture of maintenance and asset management. In poverty eradication the focus will be on technology for basic needs, and will involve close cooperation with the cross-cutting project on technology and poverty eradication. Member States will be assisted in this process through international cooperation and sharing of good practice in public and private partnerships.

An interdisciplinary, intersectoral approach will be pursued in close cooperation with several partners. Cooperation will also continue with other programme sectors, with field offices and national commissions. Through public and private partnerships efforts will be made to mobilize extrabudgetary resources. The concept of an international initiative in engineering and development technologies will be developed. UNESCO will assist in the organization of the second World Engineers' Convention in Shanghai in 2004, follow up the "World Congress on Engineering and the Digital Divide" in 2003, the proposed Congress on "Megacities of the Future" and other international events of significance.

Expected results *(and performance indicators)*	**Results achieved**	**Results not achieved**	**Lessons/Challenges**
Enhanced advocacy, awareness and promotion of engineering as a component of the knowledge society and tool for social and economic development – *number of workshops and public events regarding knowledge management and research applications in the engineering sciences and technology organized* – *governmental and non-governmental partners identified, involved and engaged* – *enhanced media coverage obtained*	• Cooperation with the World Federation of Engineering Organizations in preparation for WEC 2008 in Brazil • Organization of an international seminar on engineering and the knowledge economy in Tunis as a preparatory activity for WSIS-II; hosting of a meeting to help establish Engineers without Borders International and an international network for engineering studies		

Human and institutional capacities strengthened in engineering and technology – *development and distribution of information, learning and teaching materials* – *number of courses and workshops organized* – *standards and accreditation improved through development and distribution of guidelines regarding quality assurance in engineering education and continued professional development, with particular reference to the developing and least developed countries*	• Workshops held on capacity-building in S&T education and approaches to reform, faculty training provided on online teaching and initiation of an online Master certification programme in the Arab States • Curricula and teaching materials prepared, including photovoltaic project development and training, and major study on quality engineering education in the Arab States carried out • "International Forum on Reform and Innovation in Science and Engineering Education in the Southeast Asia Pacific Region" (Seoul) organized in cooperation with the Korea National Commission for UNESCO and the Korea Science Foundation (KSF) • "Fourth Global Colloquium on Engineering Education" (Sydney) jointly organized by the Australasian Association for Engineering Education and the American Society for Engineering Education (AAEE/ASEE Global Colloquium) sponsored, and formation of the International Federation of Engineering Education Societies supported		
Contribution of engineering and technology to poverty eradication and sustainable development highlighted and developed – *number of workshops organized for policy-makers and practitioners* – *information, learning and teaching materials developed and disseminated* – *networking supported for sharing good practice*	• Active involvement in the United Nations Millennium Project Task Force on Science, Technology and Innovation • Forum on technology and poverty eradication for sub-Saharan Africa organized • DaimlerChrysler-UNESCO Mondialogo Engineering Award proposals selected • Dissemination of publications, including "Small is Working: Technology for Poverty Reduction" and "Rays of Hope: Renewable Energy in the Pacific Islands" • Support to the 2005 Conference of "Engineers for a Sustainable World" (Austin, Texas, United States) and development of "Engineers for a Sustainable World" international network, associated partnerships and national organizations		
Access and participation of women in engineering and technology and associated gender and equity issues promoted – *number of expert meetings organized* – *information, advocacy, learning and teaching materials regarding the access and participation of women and gender issues in engineering and technology developed and disseminated*	• UNESCO toolkit on "Gender Issues in Engineering, Science and Technology" developed for review and publication • Gender and equity in engineering, science and technology discussed and promoted at several workshops		Human resource constraints hampered the full implementation of activities

A culture of maintenance promoted in the context of physical asset management in engineering and technology – *number of capacity-building workshops organized* – *guidelines for maintenance activities in engineering and technology developed and disseminated* – *extrabudgetary resources solicited and obtained for the establishment of a centre for maintenance in Africa and a network of such centres created and made operational*	• UNESCO toolkit on the "Management of Maintenance" developed for review and publication • Asset maintenance was emphasized at several workshops relating to capacity-building in engineering, science and technology • Information and resources developed for Member States towards the establishment of a centre and network for maintenance		Human resource constraints hampered the full implementation of activities

Promoting sustainable and renewable energies for development

Justification/Identification of needs/Background

WSSD has placed the promotion of sustainable and renewable energies high on the international agenda. In its contribution to the World Solar Programme (WSP), UNESCO has pursued efforts towards the development of human resources geared to promoting renewable energies. Within the Global Renewable Energy Education and Training (GREET) Programme, activities aimed mainly at the improvement of use, maintenance and management of solar energy projects and programmes, as well as transfer of technological know-how. UNESCO will continue to advocate for renewable energies, capacity-building and development of competent human resources.

Strategies/Implementation

Efforts will be made towards human resources development geared to promoting large-scale use of sustainable and renewable energies, energy diversification and efficiency with emphasis on improving the living conditions in rural areas of poor countries, especially in the developing countries and small island States, particularly for women, youth, girls and facilitating the extension of learning opportunities. As a follow up to the WSSD and in furthering the implementation of the WSP, exploration of WSSD Type II Partnership on renewable energies between UNESCO and other partners including the European Commission will be made. UNESCO will give priority to capacity-building and development of cooperation in the renewable energy sector through the implementation of the GREET Programme and its regional component with particular emphasis on its African Chapter. This will involve the design and field implementation of a training platform, the elaboration and dissemination of learning and teaching material, the introduction of training programmes at all educational levels, the setting of educational standards and certification of centres of excellence to serve as a catalyst. Concurrently, support will be given to the formulation of national energy strategies and experimentation of pilot projects aiming at developmental purposes. The promotion of renewable energies in addressing developmental issues will be pursued through intersectoral collaboration and in association with UNESCO's intergovernmental scientific programmes. Reinforced consultations with relevant United Nations agencies and programmes will be carried out, including through active participation in the United Nations Ad hoc Inter-Agency Task Force on Energy and in cooperation with competent regional and national NGOs. Concerted action will be taken to stimulate the use of renewable energies to meet sustainable developmental goals (social, environmental and productive) and improve living conditions in rural areas. Priority will be given to Africa, LDCs and small island States and extrabudgetary resources will be mobilized to extend the scope of activities.

Expected results *(and performance indicators)*	**Results achieved**	**Results not achieved**	**Lessons/Challenges**
Capacities enhanced in Member States, particularly developing countries and small island developing States, to formulate energy policies and planning, and to manage, use and maintain renewable energy systems – *number of learning/teaching materials and tools on renewable energies produced and disseminated* – *training curricula revised in a number of countries* – *number of selected training courses certified* – *number of centres of excellence to serve as models and catalysts for capacity-building on renewable energy recognized*	• Approximately 350 participants trained through nine workshops organized in collaboration with ISESCO within the Global Renewable Energy Education and Training (GREET) Programme (Jakarta, Dakar, Niamey, Nouakchott, Bissau, Abuja, Yaoundé, Maldives, Kuala Lumpur and Quito) • 26 participants from 14 countries benefited from the annual UNESCO summer school on solar electricity (Turkey, Senegal, Mali, Mauritania, Burkina Faso, Cameroon, Djibouti, Niger, Algeria, France, Morocco, Congo, Chad and Togo) • Training and technical capacity-building curricula developed in four countries (Niger, Republic Dominican, Cuba and Haiti) • A book series on renewable energies comprising six volumes produced in French and published within the UNESCO/ISESCO joint programme • Review of renewable energy policies and capacity-building activities in Pakistan • Scholarships granted to electricians from the Galapagos Islands for training on installation and maintenance of solar energy systems under the UNDP Clean Energy project • Two international conferences on solar photovoltaic and wind energy organized in collaboration with international partners • Two training platforms on renewable energy developed and implemented in Mali and Burkina Faso, covering the following main areas: solar photovoltaic, solar pumping, mini-hydro and mini-grid • Elaboration of standards and setting up of process for the identification of centres of excellence to serve as models and catalysts for capacity-building on renewable energy • Evaluation of the European education and training programmes by a working group of the UNESCO established European Network on Education and Training in Renewable Energy Sources (EURONETRES) composed of representatives of European universities and engineering schools		Due to limited resources (both human and financial), focus placed on catalytic character and multiplier effect of activities implemented mainly in collaboration with international organizations and national partners; nearly all training activities carried out in partnership and with the financial support of ISESCO UNESCO's summer schools and learning/teaching materials and textbooks are very useful tools and serve as models Training solar platforms adopted by United Nations agencies to implement their own activities

Innovative collaboration between specialized non-governmental organizations and intergovernmental bodies promoting innovative programmes on the use of renewable energies facilitated and promoted, especially in Africa and least developed countries from other regions – *number of pilot projects conducted* – *number of countries involved*	• Technical Support provided to the Community of Sahel – Saharan States (CEN-SAD) for meeting of Ministers of Energy and Mines (Niamey) and an integrated renewable energy programme presented to the CEN-SAD Conference of Leaders and Heads of State (June 2005, Ouagadougou), including three working documents on: renewable sources of energy in the Sahel-Saharan region, the CEN-SAD Chapter for capacity-building and renewable sources of energy for development • Technical support provided to the African Energy Commission (AFREC) for the elaboration of a comprehensive energy information system for Africa and the establishment of an AFREC energy database • Two pilot solar villages in Burkina Faso (Bougue) and in Mali (Atta) mainly concerned with public facilities (schools, health care centre, maternity, medicine storage, storage of agriculture products, public place, etc.) benefited respectively to 5,000 and 1,733 local rural people • Preparatory work for implementation of a solar village in Uzbekistan • Support provided to the organization of a “Solar Day” in Niger • Collaboration with United Nations entities through UN Energy group		Launching of regional networks based on the model of EURONETRES to be actively supported Implementation of pilot solar villages has a great impact on improvement of living conditions of rural people in developing countries and has an important catalytic role Partnership with regional initiatives and international collaborative frameworks such as UN Energy to be developed further

Title of element/unit

32 C/5 paragraph 02214 **MLA 4 - Promoting education and capacity-building in science and technology**

Inputs/Funding

32 C/5 Approved – Regular budget: $200,000; Extrabudgetary resources: $3,130,000

Justification/Identification of needs/Background

(This MLA is conceived as a joint intersectoral initiative involving the Natural Sciences Sector and the Education Sector: see also MP I, para. 01212.)

Promoting capacity-building and education in science and technology, at every educational level, constitutes an indispensable part of every country's efforts to achieve sustainable development. As emphasized at the World Conference on Science (Budapest, 1999), all citizens, young and old, should possess adequate scientific knowledge and skills in the twenty-first century. Given the noticeably diminishing interest of both youth and adults in the basic sciences, technology and engineering studies and careers, it is imperative to make education in science and technology more attractive and relevant.

Strategies/Implementation

This intersectoral initiative will focus on strengthening Member States' capacities in policy-making, planning and monitoring of national programmes at school and higher education levels. UNESCO will continue to encourage and assist Member States in developing effective programmes in line with EFA goals in the formal and non-formal sectors, focusing on gender-sensitive, socioculturally and environmentally relevant policies, curricula, training, teaching/learning materials, methods and good practices. Special emphasis will be laid on motivation and the provision of basic knowledge, life skills (including ethics), preparation for scientific and technological careers and the world of work in the interest of poverty reduction, environmental protection and sustainable development. Education for sustainable development with special emphasis on environmental education and increased use of ICTs will be key components of this strategy.

A four-pronged strategy will first strengthen the capacity and the knowledge base of decision- and policy-makers, curriculum planners and developers, specialists and teachers by providing policy, training and curricula guidelines. This will focus particularly on the transition from secondary to higher education, the role of student mentoring and the strengthening of regional networks for higher education in basic sciences and engineering. Second, one strategy will promote the adaptation of existing programmes to local contexts through national pilot projects involving local institutional and human resources, especially in developing countries. Special attention will be paid to increasing girls' participation and a special award will be created to stimulate teachers. Third, it will encourage science researchers/specialists to share information with science educators through, *inter alia*, INGOSTE and *Connect*. Clearing-house services will be enriched with exemplary teaching/learning materials and best practices. Finally, the strategy will also promote public awareness and understanding of science and technology, as well as making it more attractive through strengthened partnerships with science journalists and science museums, and non-formal modes such as contests, fairs, exhibitions and camps.

Expected results *(and performance indicators)*	**Results achieved**	**Results not achieved**	**Lessons/Challenges**
National capacities for policy-making implementation plans and curriculum planning strengthened as regards the development and management of science, technology and engineering education – *number of countries where UNESCO is an active partner in the strengthening and implementation of STE programmes and policies* – *number of countries where policy-makers and curriculum planners in STE are trained*	• Results to be achieved by the Education Sector in the framework of this joint SC-ED MLA (32 C/5, para. 01212)		
Teachers trained and empowered to better adapt national programmes to local needs – *examples of new methodologies/approaches as a result of pilot projects* – *number of teachers trained to better adapt national programmes to local needs*	• About 100 scientists and science educators participated and shared ideas and experiences in four regional workshops on bridging the gap between scientists and science educators held in Lima, Shanghai, Maseru (Lesotho) and Cairo		Good example of joint effort by the Natural Sciences and Education Sectors with active involvement of five UNESCO field offices
More extensive exchange of information and experiences among the science and technology education community at all levels – *number of users of INGOSTE,* Connect *and other facilities/networks* – *number and range of documents available on the networks* – *number of access hits on the networks*	• Results to be achieved by the Education Sector in the framework of this joint SC-ED MLA (32 C/5, para. 01212)		
Increased understanding of and interest in science, technology and the environmental issues among students – especially girls and young women – and the general public – *number of students, disaggregated by gender; in science and technology disciplines in target countries* – *number of countries where UNESCO has strengthened gender-sensitive approaches in STE* – *number and type of initiatives aimed at popularizing science and technology disciplines in target countries*	• Pilot toolkit for communication and education on GMOs developed, in collaboration with the Education Sector, and working group for piloting the kit organized in conjunction with the Global Biotechnology Forum • Development of a teaching tool on emerging transdisciplinary sciences under way		The very limited regular programme budget allowed for development of these two projects but was not sufficient for further implementation; extrabudgetary resources to be mobilized in order to implement the projects fully

Title of element/unit

32 C/5 paragraph 02221 **MLA 1 - Capacity-building and management of science, technology and innovation policies**

Inputs/Funding

32 C/5 Approved – Regular budget: $1,090,300; Extrabudgetary resources: $20,080,400

Justification/Identification of needs/Background

UNESCO has developed, in the past, a set of decision-making instruments for science and technology policy, as well as methodologies which were published in the series “Science Policy Studies and Documents” and in several books. The General Conference at its 31st session committed UNESCO to address, through its programmes relating to science, the recommendations and expressions of intent embodied in the principal documents adopted by WCS, the Declaration on Science and the Use of Scientific Knowledge (Declaration) and the Science Agenda: Framework for Action (Science Agenda) which recommended that national policies be adopted that imply consistent and long-term support for science and technology in order to assure the strengthening of the human resource base and scientific infrastructure, the integration of science into the national culture, and the promotion of science education and technological innovation capacities, with due attention to ethical concerns. The WSSD also emphasized the importance of science policies and recommended that assistance be provided to developing countries in formulating their national science, technology and innovation policies.

Strategies/Implementation

UNESCO will promote research and methodological studies in science and technology policy, and provide advisory services to governments for the development and reform of their national science and innovation systems, to take into account several new factors. Such factors include the shift of emphasis in the governance of S&T efforts, the impacts of information and communications technologies (ICTs), and the process of globalization. The Organization will promote cooperation among university, science and industry through national and regional partnerships (UNISPAR) as well as virtual networks of laboratories and universities. Particular attention will be paid to capacity-building, especially through the establishment of new UNESCO Chairs in science and technology policy including specific Chairs for women in science.

The development of updated or new instruments, methodologies and norms for science policy-making will be encouraged, in particular for the development of improved science statistics and indicators at the international level, taking into consideration the gender dimension (in cooperation with the UNESCO Institute for Statistics). Studies will be promoted and conducted in economics of research and innovation, on funding methods to support and promote research, on the trends of brain-drain and the measures to benefit from expatriate nationals, on technology forecasting and assessment. The exchange of experience and data on science policy between developed and developing countries will be encouraged through networks, publications, terminological tools for information processing, databases and websites.

The Natural Sciences Sector will cooperate with the Social and Human Sciences Sector and with the World Commission on the Ethics of Scientific Knowledge and Technologies (COMEST) in promoting UNESCO’s leading role in the ethics of science and technology through actions in the areas of ethical studies and norms related to national science and innovation systems (conduct of scientific researchers and institutions), as well as multidisciplinary studies on the interactions of science and technology on social and cultural systems and of science-based industries and service providers.

Advisory and support services will be provided to foster the public understanding and appreciation of science. UNESCO will encourage more participatory process in science activities, among others the formation of an international forum of parliamentary science committees, scientists, private and public sectors, representatives of the media and members of civil society. Activities for the promotion of scientific and technological education of girls and for support to and recognition of women engaged in science and engineering will be pursued.

Expected results *(and performance indicators)*	**Results achieved**	**Results not achieved**	**Lessons/Challenges**
National capacities to evaluate and formulate science, technology and innovation policies and programmes improved – *policy briefs and methodological guidelines developed* – *methodology for surveying national scientific and technological potential elaborated and disseminated* – *number of local personnel trained* – *number of UNESCO Chairs established and/or reinforced*	• Member States supported for formulation of national science and technology policies and strategies, as well as for reform of science, technology and innovation systems: 150 senior officials from Nigeria and 40 policy-makers from the Republic of Congo trained in science policy • National Conference on the Reform of the Nigerian Science and Innovation System attended by about 500 public and private S&T stakeholders (20 federal and provincial ministers, vice-chancellors and rectors of universities and polytechnics, parliamentarians, directors-general of research institutes, union leaders) • Support and advice provided to strengthen capacities of the Congolese Ministry of Scientific Research and Technological Innovation, and specific recommendations concerning the management of the science system human and financial resources submitted to the Congolese authorities in January 2006 • Fact-finding mission conducted in Namibia and specific recommendations for pilot projects and development of a strategic plan addressed to the Namibian authorities • Activities promoted and assistance provided to set up science and technology parks in two Member States; 30 future technology park and incubator managers trained in cooperation with UN/DESA and the International Association of Technology Parks • 60 specialists from African countries trained through a regional workshop on technological entrepreneurship and outreach programmes in higher education institutions; informal network established • UNESCO Chair in Technological Entrepreneurship established at Tshwane University of Technology (South Africa)	Assistance not provided to Sudan and Swaziland due to lack of funds	Very high expectations from African Member States in this area. UNESCO cannot cover such needs from its regular budget and at the same time it is very difficult to mobilize extrabudgetary funds for the formulation of national strategies
Science and technology investment programmes for the alleviation of poverty in least developed countries developed – *number of countries for which such programmes have been developed* – *number of programmes submitted to funding sources*	• Lesotho, Namibia, Nigeria, Congo, Kenya and RDC benefited from UNESCO's assistance	Only Nigeria and Congo programmes received external funding	More time needed to develop programmes to a level suitable for submission to donors

Governance of science, technology and innovation systems improved – *international science policy forum established and functioning* – *a related website and newsletter created*	• Regional science policy forums for policy-makers, scientists, parliamentarians, industry leaders, civil society and the specialized media established in the Arab States, South Asia, Latin America and Central Asia, with a view to improving the governance of science, technology and innovation systems; additionally, World Science Forum – Budapest created by the Hungarian Government • Existing networks and UNESCO Chairs of women scientists in Latin America and Africa supported, new regional network for Arab women scientists created (Bahrain, 2005) and international study on science, technology and gender carried out • World Academy of Young Scientists (WAYS) established with the help of the Hungarian and Moroccan Governments	Establishment of forums in Africa and South East Europe postponed to 2006	A very useful and effective way of improving international cooperation on science policy issues; to be pursued
Better understanding of the respective ethical challenges of science and technology for the scientific researchers and for the knowledge society promoted – *study on the foundations of ethics of scientific research and technological innovation published and disseminated*	• Active participation in the work of COMEST through specific contributions in the area of ethics of water, space and the environment • Dialogue between Israeli and Palestinian scientists promoted through the establishment of the Israeli-Palestinian Science Organization (IPSO), and a science centre established as a cooperative project between Al-Quds University and the Hebrew University (supported by the European Union, the Science City in Naples and the Campania region in Italy)	Study on the foundation of ethics postponed to 2006	Specific roles of SHS and SC need to be clarified
International collaboration on the area of policy-relevant S&T indicators enhanced – *study on revised sets of internationally accepted S&T indicators conducted, published and disseminated*	• International reviews of policy priorities and information needs in the fields of science and technology conducted, current and emerging information needs and priorities identified and a strategy for improving the relevance, availability and quality of S&T statistics elaborated through a joint effort with ROSTLAC, UIS, OECD, Eurostat, the US National Science Foundation, ALECSO, and the ministries of science and technology of several countries; international survey completed and results analysed and published		

Science policies and investment programmes for poverty reduction in Africa

Justification/Identification of needs/Background

WSSD recommended that assistance be provided to developing countries in formulating their national S&T policies, strategies and programmes. The recommendations of international conferences, such as the Third United Nations Conference on the Least Developed Countries and WSSD, have emphasized the important role of science and technology in the reduction of poverty, and the promotion of economic growth in African countries. UNESCO has in the past developed and published a prospectus for the conduct of science and technology policy reviews and has assisted individual countries in the formulation of their national strategic frameworks for science for development.

Strategies/Implementation

Efforts will be made to develop, in close cooperation with the NEPAD Secretariat, a regional action plan for science and technology for the development of African Member States. UNESCO will also foster the launching, in the context of the NEPAD Action Plan, of a Pan-African initiative in science and technology policy with the aim of mobilizing the international community. The major elements of this initiative will be (a) capacity-building in the evaluation and formulation of science policies and programmes to be done through training, which will be conducted mainly in the region, in cooperation with science policy centres in Europe and Asia; (b) design of investment programmes aimed particularly at employment creation; and (c) building and strengthening partnerships between universities and institutes with the production sector. Specific projects will be formulated and integrated into the national budgets and the external aid programmes. The project will involve collaboration with the NEPAD Secretariat, the African Development Bank (AfDB) and the Millennium Science Initiative of the World Bank as well as selected science agencies, such as the International Development Research Centre (IDRC).

Expected results *(and performance indicators)*	**Results achieved**	**Results not achieved**	**Lessons/Challenges**
Capacities in African Member States to evaluate, formulate and implement science and technology policies, programmes and projects enhanced – *a regional S&T action plan developed and approved by Member States* – *number of policy-makers trained* – *number of countries benefiting from capacity-building programmes*	• African Plan for Science and Technology finalized and approved by the African Ministerial Conference on Science and Technology (Dakar, September 2005), which created an AU-NEPAD-UNESCO High-Level Working Group to prepare implementation plan		
Concept of a national system of innovation, including a culture of innovation promoted – *publications on the subject widely disseminated* – *number of training workshops organized*	• Publication in English and French of “Future Directions for National Reviews of Science, Technology and Innovation in Developing Countries”		

Public awareness and participation in science raised – *African network of parliamentary science committees established and operational*		Workshop on "Developing an S&T Governance Framework for the ECOWAS Subregion: the Role of Parliamentarians", planned to take place in Accra in February 2005, postponed due to shortage of funds	