

Planned UNESCO Science Programme Activities in Africa (2010-2011)

Covers only activities by UNESCO field Offices in Africa

PLANNED UNESCO SCIENCE PROGRAMME ACTIVITIES IN AFRICA (2010-2011)



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United Nations
Educational, Scientific and
Cultural Organization

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

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Foreword

Under UNESCO's decentralized programme arrangement, the Regional Office for Science and Technology in Africa, based in Nairobi (Kenya) has the responsibility for the coordination of the development, planning and implementation of UNESCO science programme in Africa. In exercising this responsibility the Regional Office works very closely with the Science Programme Officers located in the 10 Cluster (sub-regional) Offices in the region. During the process of programme development and planning, several consultations are held with the Science Programme Officers in the Africa region, who in turn bring into the discussions the inputs from various national planning documents from across the region. Through this consultative process, priorities are identified for regional, sub-regional and national activities.

This booklet provides information on the science programme activities that emerged from the consultations that were carried out in the last quarter of 2009. It is a set of activities that will be pursued in the 2010-11 biennium. The objectives of the activities are in line with those elaborated in the Regional Planning and Policy documents such as the African Union's Consolidated Plan of Action for Science, as well as national development policy papers and the various United Nations Development Assistance Framework (UNDAF) Documents. The document will enable member states to learn about the various programmes in the country or sub-region. Readers are particularly encouraged to look at the Annexes which summarise the regional and Cluster (sub-regional) workplans for 2010-11.

The "*UNESCO Regional Science Programme for Africa (2010-11)*" is more than just an information source on activities in the region. It presents the underlying strategy involved in the selection of projects especially regional ones. It provides a framework for discussion of joint programme activities at regional and sub-regional levels with various partners within and outside the UN and for the mobilization of extra-budgetary resources.

In this regard, it could serve as the Regional Counterpart of the *UNESCO Country Programming Document (UCPD)*.

It is my sincere hope that all who read this document will find it useful.



Joseph G.M. Massaquoi
Director

UNESCO Regional Office for Science and Technology in Africa.

List of Abbreviations

ACMAD	African Centre for Meteorology Application for Development
ADB	African Development Bank
AfriMAB	African Network of Biosphere Reserves
AGRHYMET	Centre Regional de Formation et d'Application en Agrométéorologie et Hydrologie Opérationnelle
AMCEM	African Ministerial Conference on environment
AMCOW	African Ministerial Conference on Water
ANSTI	African Network of Scientific and Technological Institutions
AU	Africa Union
AUC	Africa Union Commission
BR	Biosphere Reserves
BSP	Biennial Sectoral Priority
COVIDSET	Conference of Vice-Chancellors, Deans of Science, Engineering and Technology
CRES	Centre Recherche Energie Solaire, Research Centre in Solar Energy
CSIR	Council for Scientific and Industrial Research
CSIRO	Commonwealth Scientific and Industrial Research Organisation
DAAD	German Academic Exchange Programme
DWAF	Department of Water Affairs and Forestry
EO	Earth Observations
FRIEND	Flow Regimes from International and Experimental Network Data
GRAPHIC	Groundwater Resources Assessment under Pressure of Humanity and Climate Changes
G-WADI	Global Network for Water Information Development in Arid Lands
GWP	Global Water Partnership
GWP TAC	Global Water Partnership Technical Advisory Committee
HELP	Hydrology Environment Life and Policy
ICHARM	International Centre for Water Hazards and Risk Management

ICIWaRM	International Centre for Integrated Water Resources Management
ICSU	International Council for Science
IGRAC	International Groundwater Resources Assessment Centre
IHP	International Hydrology Programme
IICBA	International Institute for Capacity Building in Africa
IOC	Intergovernmental Oceanographic Commission
IOCEA	Intergovernmental Oceanographic Commission Regional Committee for Central and Eastern Atlantic Ocean Region
IOCWIO	Intergovernmental Oceanographic Commission Regional Committee for the Western Indian Ocean Region
IPCC	Intergovernmental Panel on Climate Change
IRD	L'Institut de recherche pour le développement
ISARM	Internationally Shared Aquifer Resources Management
IUCN	International Union for Conservation of Nature
IWRM	Integrated Water and Resources Management
IYoC	International Year of Chemistry
JIIHP	Joint International Isotope Hydrology Programme
LDCs	Least Developed Countries
LIMCOM	Limpopo Water Course Commission
MAB	Man and Biosphere
MAR	Managed Aquifer Recharge
MDG	Millennium Development Goals
MLA	Main Line of Action (UNESCO regular programme)
MoST	Ministry of Science and Technology
NABU	Nature And Biodiversity Union
NATCOM	National commission for UNESCO.
NEPAD	New partnership for Africa's Development
ODINAfrica	Ocean Data and Information Network for Africa
ORASECOM	Orange-Senqu River Commission
PCCP	Potential Conflict to Potential Cooperation
PRSP	Poverty Reduction a Strategy Paper
RBT	réserves de biosphère transfrontalières
S&T	Science and Technology
SADC	Southern Africa Development Community
SKKAB	Stampriet Kalahari / Karoo Artesian Basin

STI	Science , Technology and Innovation
TBA	Trans-Boundary Aquifers
TBR	Trans-Boundary Biospheres Reserves
UEMOA	Union Economique et Monetaire Ouest Africain, Monetary and Economic Union in West Africa
UNDAF	United Nations Development Assistance Framework
UNDP	United nations Development Programme
UNEP	United nations Environment Programme
UNU	United Nations University
UWMP	Urban water Management programme
WEGSA	Women Engineers and Girl Scientists in Africa
WH	World Heritage

Chapter 1

Introduction

1.1 Background

The UNESCO Science Programme in Africa continues to pursue the objectives mentioned in the UNESCO Medium Term Plan which was adopted in 2007 to cover the period 2008-13. The document, referred to as the 34 C/4¹, sets the world-wide long-term priorities of the Organization, and the objectives described in the document are to be pursued in three tranches corresponding to the three biennia of the plan period.

The *2008-09 science activities in Africa* was the first set of activities to address the objectives mentioned in the 34 C/4. The current document presents the second set of activities for the implementation of the 34 C/4. It is therefore a set of activities that will be pursued by Africa Field Offices for the 2010-2011 biennium. It contextualizes the UNESCO Medium Term Plan (34 C/4) and the UNESCO biennial programme and budget (the document 35 C/5²). Both documents 34 C/4 and 35 C/5 were developed to address universally agreed global priorities in UNESCO's areas of mandate. It is therefore necessary to domesticate the programmes resulting from the global agenda in order to address Africa's regional and national problems.

It should, however, be stressed that the activities presented in this book are only those implemented by the Field Offices in the region. It should therefore not be considered an exhaustive list of all UNESCO activities in Africa. The various science divisions / units at the Paris Headquarters also implements extra-budgetary projects but these are not covered or discussed in this Regional Programme book.

1.2 Development of the UNESCO Africa science programme

The programmes of activities outlined in this document have been developed through consultation of various planning and policy documents at national, regional and global levels. At the global level this book on science programmes reflects some of the objectives of the Internationally Agreed Development Goals (IADG) such as the Millennium Development Goals (MDGs), especially Goals 1 and 7. It is also aligned with UNESCO global priorities contained in the documents 34 C/4 and 35 C/5.

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1. Document 34 C/4 is the fourth document tabled in the 34th General Conference of UNESCO held in Paris in 2007. It provides the vision, mission and strategic objective of the organization for the period 2008-13.
 2. 35 C/5 is the fifth document presented at the 35th UNESCO General Conference held in Paris in October 2009. It provides the global priorities and budget for programme activities for the 2010-11 biennium

At the regional level, the UNESCO science programme in Africa addresses some of the programme actions contained in the African Union's Consolidated Plan of Action (CPA)³ for Science and Technology and the Environmental Plan of Action of the AU/NEPAD⁴. Furthermore, the programmes outlined in this book are aligned to the outcome paper of the Consultation in Paris between UNESCO and the African Ambassadors accredited to UNESCO.

At the national level, the UNESCO Science Programme Specialists in the Cluster Offices⁵ in the region have based the choice of programme activities on priorities from two categories of documents: the Poverty Reduction Strategy Paper (PRSP) or the equivalent national planning documents such as the Vision 2030, Economic Development and Poverty Reduction Strategy (EDPRS) or Poverty Eradication Action Plan (PEAP); the United Nations Development Assistance Framework (UNDAF).

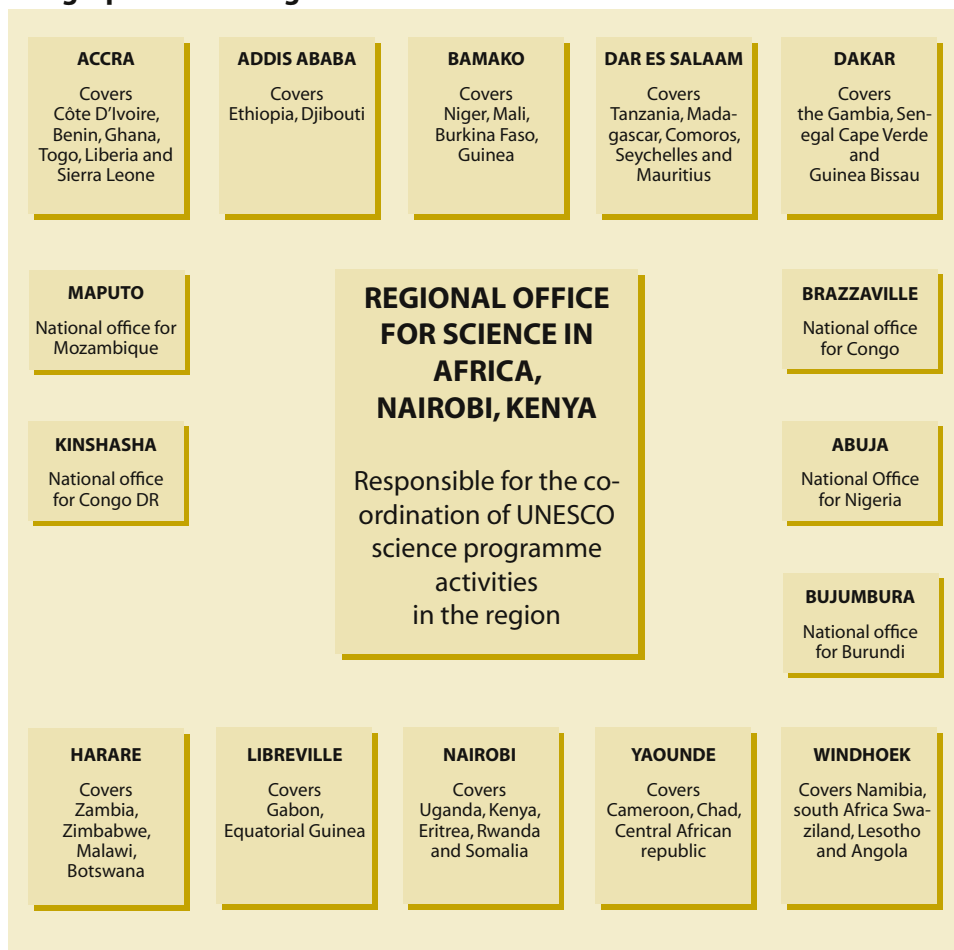
1.3 Responsibilities for programme development

The overall responsibility for the development and implementation of the science programme rests with the Assistant Director General for Natural Science, acting on behalf of the Director-General. Under the decentralized UNESCO structure, the platform for development and implementation of programmes are the Field Offices. The Natural Science Sector of UNESCO works through a network of field offices including five regional bureaux and several Cluster and National Offices. In Africa, the responsibility for development, planning and implementation of science programmes is assigned to the UNESCO Regional Bureau for Science and Technology based in Nairobi, Kenya. The Nairobi Regional Bureau discharges its responsibility through a network of ten Cluster Offices and five National Offices. The Cluster Offices which have "sub-regional" mandate are located in Accra, Addis Ababa, Bamako, Dakar, Dar es Salaam, Harare, Libreville, Nairobi, Windhoek and Yaoundé. Each cluster office covers any number of countries between 2 and 5.

There are also five Country (National) Offices which have mandate to implement UNESCO programmes only in the country where they are located. The National Offices are in Abuja, Bujumbura, Brazzaville, Kinshasa and Maputo. Figure 1 shows the network of UNESCO Field Offices in Africa and their geographical coverage. The UNESCO Office in Nairobi has double roles: It is both a Regional Office responsible for the coordination of science programme activities in the Africa region, and also a Cluster Office for implementation of programmes in Kenya, Eritrea, Uganda, Somalia and Rwanda.

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- 3 The Consolidated Plan of Action (CPA) for Science and Technology was adopted at the 2nd meeting of the African Ministerial Conference on Science and Technology (AMCOST) held in Dakar, Senegal in September 2005.
 - 4 The African Union New Partnership for Africa's Development (NEPAD) environmental plan was adopted by the African Ministerial Conference on the Environment (AMCEN) in June 2003 and endorsed by the AU Assembly in July 2003.
 - 5 Cluster Offices are "sub-regional" offices with mandate over 2-5 countries.

Figure 1:
Geographical Coverage of UNESCO Field Offices in Africa



1.4 Structure of the Book

The book presents three categories of UNESCO activities in Science in Africa. In the first category are Regional activities. These are activities which benefit several countries which are from various sub-regions. In the second category are activities undertaken by cluster and National Offices. Typically, the latter group of activities involves only one country or a small group of countries in a Sub-region (Cluster Countries). The third group of activities is those which will be carried out under the umbrella of Regional Networks.

The book has two tables in the Annex. The first one presents the workplan of regional activities, while the second provides a summary list of activities undertaken by the cluster/national offices.

Chapter 2

The Development of the Programme Framework

The formulation of programmes of activities presented in this book was derived from a process of extensive consultation and informed by several documents. In this chapter, we present the process, the documents used in preparing the programmes and the link between the programme activities and the relevant policies and planning documents in the region.

2.1 The Process

The process involved a series of consultations with representatives of member states, and reference to several planning and policy documents. The development of any UNESCO biennial programme starts with regional consultation meetings held in each of the five UNESCO regions (Africa, Arab States, Asia Pacific, Latin America and the Caribbean, North America and Europe). Thus the preparation of the inputs to the programmes presented in this Book started in 2008 with the Africa Regional Consultation for the UNESCO Programme and Budget (35 C/5) for the 2010-11. The meeting was held in Cotonou, Benin from 07-11 July 2008. The participants defined the priority issues for Africa in all of the areas of mandate for UNESCO, including Natural Science. The recommendations from this Africa region Consultation meeting together with those from the other regions were combined to define the overall global priorities for UNESCO programmes for 2010-11 (i.e. the document 35 C/5).

As should be expected, the global priorities in all the five major programmes of UNESCO (Education, Natural Science, Culture, Social and Human Sciences, and communication) were very broad because of the need to accommodate nearly all the regional group interests. This means that the Field Offices in Africa had the responsibility to select activities and narrow their scope so that they fit into the global priority as well as address the National Development Goals. The national / regional development objectives were identified, through consultation of the planning / policy documents such as the United Nations Development Assistance Framework (UNDAF), PRSP and the African Union's Consolidated Plan of Action (CPA). The number of priority issues identified in the region (several for each country) and the limited financial resources available means that choices had to be made. In essence, it is this latter exercise that led to the workplan for the region, the cluster countries and the national offices that are presented in this book.

2.2 UNESCO Science Sector Priorities 2010-11

The UNESCO 2010-11 Programme and Budget are the second set of building blocks in the pursuit of the objectives of the Medium Term Strategy 2008-13 (UNESCO document 34 C/4). The Science Sector priorities will therefore pursue the following overarching objective of the Medium Term Plan: *Mobilizing science, knowledge and policy for sustainable development.*

The above is a broad objective which is being pursued in tranches. For the 2010-11 biennium, the Sector will have two Biennial Sectoral Priorities (BSP). These are:

BSP 1: Policies and capacity building in science, technology and innovation for sustainable development;

BSP 2: Sustainable management of freshwater, ocean and terrestrial resources as well as disaster preparedness and mitigation.

In the Africa region, the programme activities embodied in the above-mentioned priorities will have three strategic thrusts:

- Creating an enabling environment to allow science and technology to flourish;
- Building human resource capacity in science, engineering and technology; and
- Facilitating the application of scientific knowledge to address the problems of poverty and environmental degradation.

Therefore, the programmes in all the scientific disciplines in the Nairobi Office include technical assistance for policy formulation and capacity building.

Within each of the Biennial Sectoral Priorities (BSP) there are two main lines of action:

Under BSP 1, UNESCO Nairobi Office will step up its STI policy advice, capacity building and monitoring. The following will therefore be the main lines of action:

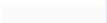
Main Line of Action 1: Enhancing the leverage of science through integrated science, technology and innovation (STI) policy.

Main Line of Action 2: Strengthening science education and capacity building in the sciences.

Under BSP 2, the following two main lines of action will be used to attain its objectives:

Main Line of Action 3: Promoting the sustainable management and conservation of freshwater, terrestrial resources and biodiversity as well as disaster resilience.

Main Line of Action 4: Improving governance and fostering inter-governmental cooperation to manage and protect oceans and coastal zones.



Chapter 3

**Regional Science activities
(2010-11)**

In this chapter we present the details of UNESCO Regional activities in Science that will be implemented in 2010-11, in Africa.

3.1 Basic and Engineering Science

3.1.1 *Support for Networks of Women Engineers and Scientists in Africa*

Support will be provided for the activities of the newly established Forum for Women Engineers and Girl Scientists in Africa (Forum-WEGSA) and those of existing women scientists' associations. Through Forum-WEGSA, scientific camps of excellence in science and technology will be organized for girls in Member States and women engineers and scientists will be used as key mentors and role models for the young girls. A clear mechanism will be developed for follow-up of the girls to assess impact of the camps.

Support will be provided to women scientists and engineers from existing networks to share their research findings with the wider scientific community through grants to conferences. This will enhance their knowledge in the area and increase their potential for advancement in their professions as scientists.

Support will be provided for gender mainstreaming in science and technology activities of Ministries of education as well as those of Ministries of science and technology.

3.1.2 *Support to activities to improve research capacity*

The objective of this activity is to facilitate collaboration and sharing of research knowledge/findings among scientists to improve research capacities in Africa

Research and Development is one of the weakest links in the African science, technology and innovation system. Researchers lack financial resources and institutional capacity to conduct quality research, share their findings with their peers and access to state-of-the-art equipments and knowledge. This activity is to contribute to break the isolation of researchers, through the facilitation of access to conferences/meetings/seminar/workshops and provide targeted support to the organization of important scientific research events at regional levels

The modality of actions will consist of providing small grants to researchers to attend important fora where they can share their research findings and build their capacity on key scientific issues. Funds can also be provided for the organization of important scientific events that would improve research capacity.

3.1.3 *Support to regional networks and centers of excellence in STI*

The objective of this activity is to support regional networking of institutions and centers

of excellence for improved training and research capacity in science, engineering and technology.

Regional networks, such as the African Network of Scientific and Technological Institutions bring together a large number of scientific institutions, such as Universities and research centers to pool resources in order to support capacity-building through training, award of small grants, exchange visits and the organization of important scientific events. Regional centers of excellence in various scientific disciplines are viewed by the African community as prime tools to harness skills and resources existing in some sub-regions/ countries on the continent to contribute to the spreading of knowledge and skills in a cost effective manner in other sub-regions.

Both regional centers of excellence and networks operate on very limited funds raised from their members or host organizations, and suffer from limited means to meet their objectives. Supporting networks and centers of excellence thus appears as a strategic and cost effective way to strengthen scientific capacities of scientists and institutions on the continent.

The modality of actions will consist of identifying relevant networks and centers of excellence with objectives effectively contributing to the regional priorities (e.g. AUC/ NEPAD CPA) in science and technology and aligned with UNESCO biennial priorities, and providing them with financial support for activities.

Their roles would consist in providing technical services for implementation and the raising the bulk of funds for all activities and ensure the visibility of UNESCO's action.

The main target groups are Regional Network and centers of excellence in STI such as African Network of Scientific and Technological Institutions (ANSTI), Association of African Universities (AAU), African Academy of Sciences (AAS), National Academies of Sciences, Women networks, various science thematic networks, New Partnership for Africa's Development (NEPAD) recognized centers of excellence and UNESCO chairs in Africa.

3.2 Science Policy

3.2.1 Training on STI policy and Innovation System

The objective of this activity is to enhance the capacities of regional officials for STI policy formulation and the design and implementation of Innovation systems in the region

African economies are faced with emerging challenges related to, inter alia, international trade, and energy and food security which makes it imperative to develop more and more competitive and resilient economies. On the continent, there is increasing recognition that STI would provide vital tools for addressing these challenges; thus reviewing or formulating a sound STI policy and implementation strategies is of general concern in

African states. This activity aims at providing training for key policy-makers on tools and options for formulating effective policies and strategies in STI.

The Policy Training Module developed by UNESCO in the previous biennium will be used, in one or two training workshops which will be organized for selected regional countries policy-makers. The training would consist of lectures and case studies that participants would provide on the STI policy frameworks in their countries. This activity may require the partnership of the African Technological Policy Studies (ATPS) which developed the UNESCO training module.

The main target groups for this activity are decisions-makers, legislators or STI activities planners in governmental or para-statal organizations in countries in the region.

3.2.2 Regional Mapping of STI policy status in Africa

The objective of this activity is to improve policy framework for science and technology through mapping of policy status in SSA.

Recognizing that the process of national policy-making in STI should be informed by national evidences and priorities, UNESCO is responding to recurrent requests to assist African countries acquiring and using pertinent tools for policy-making in STI. By going through this mapping exercise, countries collect statistical evidences on the state of the STI sector, so as to determine the opportunities, challenges and priorities to be addressed.

The modality of actions will consist in developing a questionnaire of key information/ indicators on the state and framework of STI policy and implementation in the country. The questionnaire is to be filled by a focal person, preferably in the government's department in charge of STI policy and planning after a consultations and validation process.

3.2.3 Report on Regional Assessment of STI systems and Governance in Africa

Strong growth and sustainability of African economies can be achieved by harnessing science, technology and engineering to launch and sustain an emerging production sector, including industrial and semi-industrial sectors. Doing so requires a good understanding of the various Science Engineering and Technology (SET) context in countries. However, Africa is a vast continent, and large development disparities exist among countries on the state of the science, engineering and technology system (SET), its governance and thus its impact or ability to impact on development. Therefore there is need to provide experts, investors, planners, legislators, decision-makers and development actors a comprehensive overview of the continent status in SET system and its governance so as to highlight strengths and weaknesses and facilitate best practices sharing toward the improvement of existing systems. This report aims at addressing this need.

The modality of actions will consist in seeking quality expertise to collect and analyze

pertinent information on the status of SET system and governance in key selected countries so as to draft a regional report. The report should be validated by an expert Group meeting before dissemination.

3.3 Ecological Sciences

The World Congress of Biosphere Reserves that took place in Madrid in February 2008 was a major step for the implementation of the Man and the Biosphere programme (MAB). More than 800 representatives from Governments, NGOs, Biosphere reserves managers, local communities, and international community discussed the content to be given to the programme for its relevance to the 21st century challenges. Delegates agreed on the Madrid Action Plan (2008-2013) which builds on the Seville Strategy (1995)* and its strategic advantage. The Madrid Action Plan intends to raise Biosphere reserves to be the principal internationally-designed areas dedicated to sustainable development. The Madrid Action Plan gives orientation to the MAB programme and its World Network of Biosphere Reserves activities during the 2008-2013 medium term strategy timeframe. The Madrid Action Plan defines 4 main action areas: Cooperation, management and communication; Zonation – linking functions to space; science and capacity enhancement; Partnership. The implementation of the Madrid Action Plan at appropriate level be it local, national, or international is guided by 31 targets and 67 actions.

The following 2010-2011 regional activities all falls under MLA 3. They will contribute to the implementation of the Madrid Action Plan.

3.3.1. Supporting AfriMAB capacity building and the development of regional action plan aligned with the Madrid Action Plan

AfriMAB was created in 1996 and participated actively to the 3rd Congress of Biosphere reserves in 2008. It was agreed that each region should contextualize the Madrid Action Plan regarding its own needs and priorities. AfriMAB has not met since 2008. The next regional meeting is scheduled in May 2010; the agenda will address both institutional and technical matters.

The institutional aspect will be related to the structure of the network and the issue of its sustainability. AfriMAB network exclusively benefitted from UNESCO /other donor

* Seville Strategy: The International Conference on Biosphere Reserves organized by UNESCO in Seville Spain from 20-25 March 1995 adopted a two pronged approach:

- To examine past experience in implementing the innovative concept of the biosphere reserves
- To look to the future to identify what emphases should now be given to their three functions of conservation, development and logistical support.

support, and it is a threat to its sustainability. In order to insure a financial sustainability in mid-term perspective, the network members agreed on a draft Charter and Statutes which define, among others, modality of resource mobilization. During the AfriMAB meeting decisions will be made for a further application of the charter and Statutes.

On the technical side, the AfriMAB members will acquire skills in carbon trading and other financial opportunities to benefit the Programme at regional level. It is also intended that the Network identify priority actions at regional level and develop a draft of Madrid Action plan for Africa.

3.3.2. Building capacity of African countries to access carbon trade market

In the recent years, climate change has held a lead position on the international development agenda and world political stage, and therefore the Madrid Action Plan has identified Climate Change and ecosystem services as major challenges to be addressed by the MAB programme. However, the 2009 Copenhagen Conference on Climate Change was unable to set an equitable framework addressing climate change challenges in developing countries

Although most African countries have played an insignificant role in causing climate change effects, they pay a heavy price for it (drought, floods, landslides...), being the least equipped to adapt to potential effects of climate change. The Kyoto protocol tries to balance this situation by allowing industrialized countries to offset their carbon emissions by investing in forestry projects in developing countries. The REDD Initiative* is one of the most powerful for the moment, but Africa's share of international carbon trade is very weak due to tenure insecurity, high transaction costs, governance and institutional capacity, but also lack of technical capacity to develop carbon trade market projects.

This activity aims at contributing to the overcoming of the human capacity barriers to access carbon trade market in Africa. The targeted groups for the activity project are YOUNG representatives of NGOs, local communities or scientists involved in the area of natural resources management in Biosphere reserves with a specific attention to gender issues.

3.3.3 Biosphere Reserves for sustainable development in Sub Saharan Africa

In Sub Saharan Africa, there is a need to reinforce in depth AfriMAB institutional, technical and financial capacity to be the main driver of MAB programme and Madrid Action Plan (2008-2013). Since it is a process, we will need time and additional resources to achieve this objective. This activity will rely on extra budgetary resources. The main interventions will be to: 1.) Develop the AfriMAB network into an autonomous entity, following the successful African Network of Scientific and Technological Institutions (ANSTI) model

* REDD Initiative: Reduce Emissions from Deforestation and forest Degradation

2) Build technical capacity by enabling the network to contextualize and implement the Madrid Action Plan for Africa.

3.3.4. Promoting transboundary ecosystem management in East Africa

Management of transboundary ecosystems is a key element of implementation of Convention on Biodiversity as well as African Union environment action plan. UNESCO World Network of Biosphere reserves counts 7 transboundary sites which have proved their value in terms of resolving policies, management and cultural issues/conflicts. In Africa transboundary initiatives exist that need to be supported. In East Africa, there is already collaboration between the countries through East African Community and it is an asset to foster the creation of Transboundary Biosphere Reserves (TBR). However, the initiatives have to be owned and driven by the countries; it is essential that UNESCO remain as a facilitator in the process. For their sustainability, it is important that these Transboundary initiatives lay under a sub regional perspective.

This activity, which will seek for extra budgetary resources, aimed at supporting the dialogue of EAC countries through a sub network of transboundary initiatives. The intended result will be an action plan for 2010-2011 which will address the burning issues affecting transboundary management. We hope that at the end of the biennium, one new TBR will be created in East Africa.

3.4 Earth Sciences

It is a fact that, despite its endowment in mineral resources, Geoscience is declining in Africa. In order to revitalize this sector, UNESCO proposed to launch an Earth Science Education Initiative in Africa (ESEIA) in 2008. The objective of the initiative is to develop the next generation of earth scientists in Africa who are equipped with the necessary tools, networks and perspective to apply sound science to solving and benefitting from the challenges and opportunities of sustainable development.

The Earth Science regional activities in Africa will support the implementation of the ESEIA.

3.4.1. Support for the study of geo hazards within the framework of the geosciences Initiatives

Africa is impacted by a multitude of natural hazards and disasters; such as drought, floods, landslides, volcanoes, and earthquakes. These claim thousands of lives, devastate homes and destroy livelihoods. With more than 40% of the population living below the poverty line, Sub-Saharan Africa is also the least-equipped and prepared continent to cope with the impacts of these events. In order to improve the awareness, the understanding and the preparedness of geo hazards, the topic has to be included and specifically addressed

in the study of Earth science in the Africa universities. This activity is intended to create awareness on geo hazards and build a large pool of scientist that can apply scientific knowledge for the preparedness and policies for mitigation of geo hazards. It will also strengthen geology departments in African universities to enable them address geo hazards matters.

3.4.2. Geo science Education Initiative in Africa.

In 2009, UNESCO organized two workshops in Africa (Senegal and South Africa) in order to assess regional capacities and needs in Earth science education, research and industry. The outcome of these workshops will be the backbone for a strategy document for UNESCO which will be used to guide the future of the Earth Science Education Initiative. This activity will follow up on the recommendations of the 2009 Africa workshops and will support the implementation of the Earth Science Education Initiative in Africa (ESEIA) through awareness raising among decision makers and focus groups (students, undergraduates, secondary and primary schools); strengthening the networks of institutions and geoscientists; providing award and administration of small grant to strengthen institutions and staff, in particular young researchers and female students.

3.5 Water Science

The water sciences activities for the biennium 2010-2011 at the regional office are essentially based on the Seventh International Hydrological Programme (IHP VII) and its cross-cutting and associated programs. The main theme of the seven phase of IHP (2008-2013) is water dependencies: systems under stress and societal responses. It covers the following themes (i) adapting to the impacts of global changes on river basins and aquifer systems, (ii) strengthening water governance for sustainability, (iii) ecohydrology for sustainability, (iv) water and life support systems, (v) water education for sustainable development. Activities at the regional office will focus for this biennium on the Climate change impacts on the hydrological cycle, and consequent impacts on water resources, managing groundwater systems' response to global changes, managing water as a shared responsibility across geographical and social boundaries and research and assessment of urban groundwater vulnerability.

3.5.1 Climate change impacts on the hydrological cycle, and consequent impacts on water resources

Support will be given to the Flow Regimes from International and Experimental Network Data (FRIEND) components in Africa for the planning and monitoring of their activities through the organization of steering committee meetings and technical seminars and training meetings. Apart the planning and monitoring of activities, steering committee meetings will be used to discuss and prepare research project proposals on priority

issues for fundraising. Funding of those projects will contribute to sustain the different FRIEND networks.

Training sessions on methodologies for climate change impacts assessment on river basins will be organized for each FRIEND network in partnership with UNESCO-IHE and water and climate regional training institutions. Support will be given to few scientists of the networks to present their results at scientific conferences related to climate change and water resources including the sixth international FRIEND conference to be held in Morocco in September 2010.

Regarding the Hydrology Environment Life and Policy (HELP) cross-cutting program, a Regional Coordination Unit for Africa HELP basins will be established and the development of the program in Africa will be strengthened. Capacity of HELP and FRIEND in term of research will be mobilized in Africa to address the issues related to the design and management of hydraulic infrastructures in the context of climate variability and global change. The norms used since 1970s particularly in Francophone countries need to be urgently reviewed. A technical experts working group will be established to analyze the issue and propose a way forward.

In close collaboration with the water division, contribution and assistance will be given for the testing and validation of the drought monitor in western Africa through Centre Regional de Formation et d'Application en Agrométéorologie et Hydrologie Opérationnelle (AGRHYMET) center and in eastern Africa with CAPC Nairobi center. Training workshops will be organized.

3.5.2 *Managing groundwater systems' response to global changes*

The activity offers the opportunity of action-oriented joint natural resources management and conservation to address inter-linked environmental threats, from risks and from uncertainty, to water and land resources and biodiversity resources over large sub-regional aquifer areas in Africa. The conservation benefits include protection and efficient utilization of the largely underused shared groundwater resources and putting in place mechanisms to address increased pressures and water conflict in the international water environment.

Initiatives will be taken to raise the attention for groundwater in Regional Economic Communities, River Basin organizations and the network of (GWP TAC) in Africa for a 'true' IWRM integrating surface and groundwater. This should be gone through participation to some statutory meetings and close partnership with the African network of river basin organizations.

Support will be given for the preparation of the GEF proposals with a focus on groundwater including the coastal aquifers of Gulf of Guinea and the Volta GEF project groundwater component.

The global changes impacting on groundwater systems will be identified. Study on Climate change impact on groundwater resources will be initiated through the GRAPHIC for some selected under pressure aquifer systems. The Africa GRAPHIC network will be strengthened. Pollutions and overexploitation will be also considered and their impact on groundwater systems management will be assessed for some specific aquifer systems. Contribution will be given for the extension of G-WADI network in Sub-Saharan Africa with a focus on groundwater management.

3.5.3 Managing water as a shared responsibility across geographical and social boundaries

Water is central to promoting socio-economic development, protecting the environment and achieving the MDGs. Poor management of freshwater resources is characterized by lack of integration, sectoral approaches, and institutional resistance to change by large public agencies in a context of increasing competition. A primary concern is the sharing of water resources, which is closely related to water governance issues. An important step towards better water governance is raising awareness, providing education and building capacity with regard to water issues. Behind these issues are questions of assessment of water resources and their vulnerability and the driving forces causing land use change. Answers to these questions will be addressed in the vulnerability assessment of water resources to environmental change in Africa.

Special alliances will be made with river basin organizations for providing appropriate knowledge and capacity for a better governance of shared water resources both surface and groundwater. Training documents produced within the framework of the PCCP project for southern Africa, will be through the collaboration with headquarters adapted for the West Africa and translated into French. In collaboration with PCCP project, training workshop on sustainable and peaceful management of transboundary water systems will be organized for water managers and river basin organizations in West Africa. Support will be given also for the follow up of the PCCP Mono case study and for another PCCP case study in eastern or southern Africa.

The policy briefing note prepared on mainstreaming cultural diversity in integrated water resources management will be adapted and disseminated in Africa in collaboration with headquarters. An experts group composed of water managers and specialists on culture will be set up and will be in charge of adapting and preparing of an approach for the mainstreaming of cultural diversity in IWRM within the Africa context. Awareness raising will be conducted in partnership with the four GWP TAC entities and national water partnership groups.

Inventory of transboundary aquifers will continue to be supported in the framework of ISARM in Africa by enhancing the capacity of ISARM networks.

3.5.4 Support to TIGER project

The TIGER project aims at developing sustainable earth observation information services for integrated water resources management in developing countries, with a particular focus on Africa. The second phase of the project is on climate change impact assessment and the contribution of EO information on that regard. After a competitive call for proposals, twenty project proposals have been selected to be supported during that phase. For this activity, the strategy will contribute to the capacity building and the sharing of knowledge among the principal investigators of the different selected proposals. Some investigators will be sponsored to attend international conferences on the topic of climate change impacts on water resources particularly the 2nd African Water Cycle Symposium which promotes the use of EO data and information for a better management of water resources in Africa.

3.6 Ocean and Coastal Science

Intergovernmental Oceanographic Commission (IOC)

The Intergovernmental Oceanographic Commission (IOC) of UNESCO implements activities in Africa through global programmes in coordination with regional subsidiary bodies (IOCEA - Central Eastern Atlantic Ocean Region; IOCWIO – Western Indian Ocean Region, and IOCINDIO - Central Indian Ocean Region). UNESCO/IOC's focus is to improve governance and foster intergovernmental cooperation through ocean sciences and services. IOC also provides scientific information for evidence-based policy recommendations on the management and protection of ocean and coastal areas, and contributes to the scientific knowledge base to understand global climate change. Activities in Africa are undertaken through following actions, programmes, and projects:

- **Ocean observing systems and data exchange standards enhanced:** The Global Ocean Observing System in Africa (GOOS-AFRICA); and the Ocean Data and Information Network for Africa (ODINAFRICA) funded by the Government of Flanders
- **Coordination of research on ocean ecosystems, marine habitats and biodiversity, and promotion of best practices in management of marine and coastal ecosystems:** The Adaptation to Climate Change in Coastal areas of West Africa (ACCC), and Harmful Algal Blooms Network
- **Risk of tsunami and other ocean and coastal-related hazards reduced:** Implementation of the Indian Ocean Tsunami Warning and Mitigation System (IOTWS)
- **Capacity Development driven by member states needs:** Training in scientific tools for coastal management decision making

The IOCWIO project office is hosted by the UNESCO Regional Bureau for Science in Africa, supporting the commission's activities including the Capacity Development activities for the region.

In the current biennium, The **Capacity Development** programme (www.ioc-cd.org) is assisting marine institutes in Kenya, Mozambique and Tanzania to prepare hydrodynamic models and Decision Support tools (DSTs) addressing management issues prioritised at coastal sites in each country. At the site in Zanzibar, Tanzania, management plans and best practices guidelines using DSTs will be produced as part of the project "Empowering Non State Actors in Tanzania to plan for sustainable coastal livelihoods using Decision Support Tools". Training in stakeholder participatory processes and development of DSTs will be undertaken with community groups, and local and national institutions and government agencies.

Activities to enhance **Ocean observing systems and data exchange standards** are implemented largely through **ODINAFRICA IV - Ocean Data and Information Network for Africa** (<http://www.odinafrica.org/>), now in its 4th phase. In the current biennium ODINAFRICA IV will strengthen its networks in over 25 countries assisting National Ocean Data Centers and scientists to: (i) improve web based portals and data and information services; (ii) develop national and regional mapping (www.africanmarineatlas.net), forecast, and scenario development products, and (iii) produce communication tools including policy and media brief for coastal management decision making. Other IOC activities supported in the region including the implementation of the IOTWS (<http://www.ioc-tsunami.org>), the development of regional centers for the Ocean Teacher Academy (<http://www.ioc-tsunami.org>), and GOOS Africa (www.ioc-goos.org/goosafrica).

Chapter 4

**Cluster Office Science activities
(2010-12)**

4.1 Activities in Abuja Cluster

4.1.1 Support for the Reform of the Nigerian Science and Innovation System

Science, technology and Innovation (STI) system play central role in alleviating poverty, over the years the application of STI knowledge to development has been a major factor in rapid and sustainable economic development. However, the explicit application of STI to socio-economic development requires expertise in science and innovation policy and management. In Nigeria, there is still the dearth of manpower in this field as here are very few universities offering educational and research programmes in this area. There is also lack of effective STI policy framework to strengthen science and technology systems in Nigeria. There is also the need to sensitize the legislators and other policy makers including academics in the universities and research institutes on the need for the development and implementation of effective science policy for sustainable development.

In order to address this issue, UNESCO will partner with relevant stakeholders to organize a national STI workshop for legislators and the academics to foster closer working relationship and to create an enabling environment for the development of appropriate policies to promote research and application of science and technology for sustainable development in Nigeria. The main target groups are the Legislators, academics from the various Universities and research Institutes, Federal Ministry of Science and Technology, relevant agencies and departments, NGOs and civil society.

4.1.2 Enhancing Gender mainstreaming in Science and Engineering courses for increased participation of female students in Nigeria.

Currently, there is a decline in the number of female students who offer science subjects in secondary schools. Consequently, the number of female students who offer science, technology and engineering courses in the Universities and polytechnics is also on the decline.

UNESCO will collaborate with other stakeholders to enhance gender mainstreaming in Science and Engineering courses for increased participation of female students in Nigeria. The activities will involve sensitizing and creating awareness amongst female students on the role of science and technology in sustainable development. Selected girls secondary schools will be targeted for the distribution of audio-visual scientific materials, science laboratory equipment and library materials to enhance the teaching of science and engineering subjects.

The main target groups will be selected girls secondary schools and colleges, Female science teachers who will serve as role models, Federal Ministry of Science and Technology, Female-led NGOs and organisations involved in the delivery of scientific and engineering activities.

4.1.3 Capacity building of local people on climate change and management of their natural environment for sustainable development in the Niger Delta region of Nigeria.

The social values and attitudes of the people of the Niger Delta region of Nigeria have historically and culturally been in harmony with the environment until the menace of environmental degradation caused by the exploration of oil and gas in the region. It has been and still will be the fundamental duty of the local people to protect, improve and depend on their natural environment.

Most of the initiatives and relief interventions intended to address the environmental problems in the Niger Delta region of Nigeria failed to incorporate the need to educate and build the capacity of the local people to become aware and concerned about the total environment and its associated problems. The various programmes also failed to build their knowledge, attitudes, commitments and skills to work individually and collectively towards the solution of current environmental problems and prevention of new ones. The failed intervention strategies could have been sustained by raising the local people's capacity and awareness of the need for natural resource conservation and environmental protection, and by making them stakeholders and the chief beneficiaries in their localities.

UNESCO will work in collaboration with other relevant stakeholders to build the capacity of local people in the Niger Delta to cope with climate change. Also to understand the interdependence of all life in the ecosystem as well as create awareness of the economic, political, social, cultural, technological and environmental forces which foster sustainable development. The envisaged activities will lay emphasis on sensitization and creating awareness on fundamental issues which will involve education on protection and conservation of the natural environment and coping with climate change. This would be achieved through developing environmental science education modules and capacity building training programmes which will be mainstreamed into educational curriculum for schools at all levels in the region as well as used for capacity building of the local people on climate change and environmental management.

4.2 Activities in Accra Cluster

For the biennium 2010-2011, the Accra office will implement the following six activities for the countries of the cluster namely Benin, Cote d'Ivoire, Ghana, Liberia, Sierra Leone and Togo.

4.2.1 Support for review, reform and capacity building on STI in the cluster countries with focus on post-conflict countries

Science Technology and Innovation (STI) is clearly recognized within the AU/ST consolidated action plan as vital for the development of African countries. Unfortunately,

many countries do not have a coherent and clear policy on STI which is generally due to the lack of capacity particularly in post conflict countries. There is therefore an urgent need to enhance the capacity and assist countries for the review and formulation of their policies and strategies on STI. The activity will support the review and/or formulation of STI policy for at least two member countries of the cluster with, priority to post-conflict countries. It will also enhance the capacity of planners and decision makers for the formulation and implementation of STI policy. The strategy will consist of working closely with national institutions in charge STI and support a consultation on the review and/or formulation of the policy and/or strategy. Regarding the capacity building on STI (formulation and implementation), few planners will be sponsored to attend regional training on STI policy formulation and implementation. The expected results are:

- Review and/or formulation of STI policy/strategy supported in at least two of the cluster;
- Capacity of planners and decision makers on STI policy formulation and implementation enhanced within the cluster

The activity will be implemented in Liberia and Sierra Leone in close collaboration with the national institutions in charge of science policy and universities and research centers.

4.2.2 Promotion for the prevention of hydro-hazard disasters in the cluster countries

In many of the West African countries, flooding is frequently recorded during the rainy season with unfortunately sometimes losses in human lives and important damages. The flooding is mainly due to the fact that the populations live in areas that are not suitable for habitation. With the strong urbanization, the lack of drainage systems and anarchical occupation of the floodplains of the rivers, if nothing is done, we will continue to support to an increasing number of inhabitants vulnerable to floods. In order to reduce the number of persons that are vulnerable to floods, there is an urgent need for a sustainable management of floodplain areas. This activity is a follow up to the activity initiated during the last biennium on that issue in partnership with AGRHYMET and ICHARM. A methodology for floodplain area mapping has been produced and sub-regional capacity building workshop was held in AGRHYMET where there were participants from six countries of the sub-region. Also a sub-regional project proposal was drafted.

The office will support at least two countries in the sub-region for the review and/or preparation of strategy on hydro-hazard disaster management and also promote the use and adaptation of the regional rainy season seasonal forecast produced each year for the sub-region. This activity will be implemented in close collaboration with the regional centres ACMAD and AGRHYMET, national institutions on hydrology, meteorology and the ministries in charge of disaster preparedness in the different countries. The expected results:

- Disaster risk reduction Policy and strategy reviewed with explicit mention of hazard disaster (prevention, mitigation and management) in at least two countries of the cluster
- Decision makers are aware of and use the regional seasonal forecast outlook information to take decisions on climate risk management in at least two countries

This activity will be implemented in Cote d'Ivoire, Ghana and Benin and will contribute to the UNDAFs in the three countries for the outcomes related to the prevention and disaster preparedness.

4.2.3 Support for the identification and characterization of biosphere reserve sites with a focus to transboundary and coastal sites and post-conflict countries

The NEPAD/AU CPA on Science and Technology stressed the need to preserve and to conserve biodiversity in Africa. This could be done through the biosphere reserves concept by increasing their number. For more than three decades, UNESCO through the MAB program has promoted the management of ecosystem within the concept of biospheres reserves. A Global network of biospheres reserves has been created. In the cluster countries of the Accra Office, the number of biospheres reserves is very limited and apart from the W, there is no transboundary biosphere reserve. Despite the potential of the coastal region of the different countries of the cluster, there is no biosphere reserve in the coastal area. On the basis of the biodiversity and the ecological conditions in the cluster countries there is a potential for an increase in the number of biospheres reserves in the sub-region. An ecological mapping assessment with a focus on transboundary areas and coastal areas will be conducted in order to suggest new potential areas for biospheres reserves. The activity started during the last biennium with three countries of the cluster namely Ghana, Benin and Togo. For this biennium the three other countries of the cluster will be supported. The strategy will consist of support for the national MAB committees for the mapping and the proposition of potential sites for biosphere reserves. It will also involve all the key stakeholders for the validation of the findings during a one day stakeholder workshop. The findings will be widely disseminated and used for the sensitization of the different stakeholders and decision makers on the need for a sustainable management of ecological sites. The expected results are:

- National ecological mapping conducted with a list of potential ecological sites for biosphere reserves nomination identified in Sierra Leone and Liberia;
- Awareness for sustainable management of ecosystems in the post conflict countries of the cluster improved

This activity will be implemented in the three post-conflict countries of the cluster namely Côte d'Ivoire, Sierra Leone and Liberia in close collaboration with all the national institutions in charge of environment and natural resources.

4.2.4 Global change impacts on two biospheres reserves in the cluster

In the NEPAD/AU Consolidated Plan of Action on S&T, the need for a better understanding of biodiversity loss mechanism has been stressed in order to propose appropriate adaptation strategies. Climate variability recorded in the sub-region combined with human activities has impacted biodiversity in the different cluster countries. The biosphere reserves were also concerned. Biosphere reserve within its three distinct zones is a good instrument to monitor and to assess the impact of climate variability and change on the ecosystem. The core area constitutes a natural conserved zone where modifications are mostly associated with natural climate variability. Inside the buffer and the transition zones, the modifications are due to both climate variation and human intervention. Research was initiated during the last biennium on the Pendjari biosphere reserve in Benin to characterize the changes and to propose potential adaptation strategies. During this biennium, two other biosphere reserves, Bia in Ghana and Tai in Cote d'Ivoire will be considered. The activity will be implemented in close collaboration with the national MAB committees and the universities. The outcomes of the research will be validated and disseminated through a one day national workshop and will be used for the awareness raising campaign on the impact of climate variability and change on ecological systems and the need for urgent actions. The expected results are:

- Stakeholders are fully aware of the changes and future impact within Tai biosphere reserves due to climate variability and change and agreement on the proposed adaptation measures
- Stakeholders are fully aware of the changes and future impact within Bia biosphere reserves due to climate variability and change and agreement on the proposed adaptation measures

This activity will be implemented in Cote d'Ivoire for Tai BR and in Ghana for Bia BR in close collaborations with the national MAB committees and the managers of the reserves and other stakeholders involved in the management of the reserves.

4.2.5 Climate change impacts on hydrological cycle, and consequent impact on water resources

Climate variability and change has had negative impacts on the water resources within the sub-region. The IPCC fourth report released in 2007 has clearly indicated that Africa is the most vulnerable continent due to the high level of poverty and the place of natural resources for the population's livelihood. The importance of the impacts is not well known. Also the level of awareness among decision makers regarding climate needs to be improved in the sub-region for an urgent action on the issue. The activity initiated during the last biennium and implemented in three countries of the cluster (Cote d'Ivoire, Ghana and Benin) will be extended during this biennium to the other three remaining countries of the cluster (Sierra Leone, Liberia and Togo). A national report will be produced in each country on the climate variability and change and its

impacts on water resources in the country. The findings of the study will be discussed and disseminated during a national workshop and will be used to sensitize decision makers on the urgent need to act now in order to adapt to the impacts of future climate change on water resources. Also a sub-regional workshop will be organized on the methodologies of climate change impacts assessments for water scientists of the cluster countries. The activity will be implemented in partnership with the IHP national committees. The expected results are:

- Awareness of decision makers regarding climate change and its impacts on water resources is improved through the production and dissemination of a national document on the evidence of climate variability and change and its impacts on water resources in Sierra Leone, Liberia and Togo
- Capacity of Scientists in Liberia, Sierra Leone and Togo enhanced on the methodologies for the assessment of climate change impacts on water resources

This activity will be implemented in Liberia, Sierra Leone and Togo in close collaboration with the national IHP committees or focal points and the institutions and stakeholders dealing with climate change issues will be fully involved.

4.2.6 Managing water as a shared responsibility across geographical and social boundaries by promoting IWRM in the cluster countries

This activity started during the last biennium will continue during this biennium by supporting the ISARM focal of Cote d'Ivoire, Benin, Togo and Ghana to produce comprehensive reports on the Tano and eta hydrogeological systems on the basis of the agreed ISARM Action Plan for the sub-region. In this regard activities on data collection and analysis within the Tano and Keta hydrogeological basins started during the last biennium will continue during this biennium. The data and information collected and analyzed will be used to produce a report on each basin. A sub-regional workshop will be organized to discuss the different findings and to validate the two reports on Tano and Keta. As a follow up to the PCCP case study on mono basin, a support will be given to national IHP committees of Togo and Benin to initiate a process on the preparation of an IWRM action plan on the mono basin. The target groups of the activity are the water scientists, the national institutions in charge of water and decision makers. The activity will be implemented in close partnership with the IHP national committees of the different countries and in collaboration with others water related institutions such as the national water partnerships in the different countries. The expected results are:

- knowledge base on the Tano and Keta groundwater systems improved towards their sustainable management
- water managers and policy makers adopt Integrated management of water resources (IWRM) approach for the management of the water resources of the Mono basin

This activity will be implemented in Cote d’Ivoire, Ghana, Togo and Benin for the Keta and Tano study in close collaboration with the ISARM focal points of the different countries and in Benin and Togo for the Mono basin component in close collaboration with the national IHP committees and all stakeholders involved in the management of the resources of the basin.

4.3 Activities in Addis Ababa Cluster

4.3.1 Operationalization of STI Policy in Ethiopia:

The extent to which Africa is going to harness, develop and apply science, technology and innovation to achieve economic change and sustainable development will depend on the nature of policies and institutions that its countries will put in place at national, regional and continental levels. Science, technology and innovation policies are instruments for determining how, where and why financial, physical and human resources are committed to R&D.

Many African countries do not have explicit national science, technology and innovation policies; when they do, these policies do not reflect realities of the globalizing world and national economic imperatives of this new millennium. The development and use of science and technology is the road leading to the socio-economic transformation of the African continent and its integration into the world economy. Ethiopia has a newly established Ministry of Science and Technology and a new Policy. It is imperative that a strategy for the policy’s implementation is developed. It is equally important to have trained personnel that is able to measure the capacity of the country and provide tools for the decision making process.

The expected results of this activity:

- A strategy for the implementation of the STI Policy is developed
- 20 scientists and/or civil servants trained on STI indicators

4.3.2 Assessment and strengthening of the S&T institutional and human resources capacity in Ethiopia and Djibouti:

NEPAD has identified the development and use of science and technology as the road leading to the socio-economic transformation of the African continent and its integration into the world economy. It is erected on three interrelated conceptual pillars. These are: (a) capacity building (b) knowledge production, and (c) technological innovation. It is of primary importance to respond to these identified needs in order to contribute to the development of the Member States. UNESCO has been advocating on the establishment of baselines before any action is to take place. Furthermore, part of capacity building is establishing and strengthening existing Scientific networks in order to promote

Regional cooperation and free flow of ideas. The activity will be focusing on drawing a baseline of the institutional arrangements and human resources on S&T for Djibouti and Addis Ababa. Furthermore, Science and Technology events will be planned with IICBA and Ethiopian Universities for the celebrations of the IYoC (2011). Finally, existing Regional Scientific network like ANSTI and the COVIDSET meeting will be strengthened by supporting the participation of new Members (Djibouti) and existing Members to the meeting

The expected results are:

- A baseline for Human Resource in S&T is established for Ethiopia and Djibouti
- Scientific networks in Africa strengthened

4.3.3 Assessment of Potential Biosphere Sites in Ethiopia

Environmental degradation is one of the factors hindering development; this is true especially in Africa where the livelihoods of people rely on their environment. NEPAD's Consolidated Plan of Action, Programme 1.1: Conservation and sustainable use of biodiversity captures this connection and advocates for it. Biosphere Reserves (BR) have been identified as a vehicle to protect the environment while promoting sustainable development. Ethiopia has decided that BRs will be the lead programme for conservation of the environment and sustainable development. A tripartite agreement has been signed between UNESCO - MoST and NABU, which calls for UNESCO to support National efforts in assessing the potential of BRs at the Lalibela and Dire Sheik Hussein sites. The expected result of the activity is that at least two BR potential sites have been assessed

4.3.4 Internationally Shared Aquifer Resources Management (ISARM) - IGAD

Water scarcity in a number of East African countries is a well documented fact. Climate Change worsens the situation and draughts are more frequent and for longer periods. There is a need to investigate transboundary aquifers (TBAs) in order to enhance regional development and avoid any conflicts. Furthermore, the activity will be contributing to the needs identified at NEPAD's Consolidated Plan of Action, Programme 2.2: Securing and sustaining water.

A meeting will take place and the invitees will present information they have on TBA of their respective countries with a view to create an internet base tool for the viewing and sharing of information. IGRAC will be invited to lead the latter efforts.

The expected results of this activity are:

- A network of experts is formed
- A network of Parliamentarians is formed

Inventory efforts for the mapping of TBAs in IGAD Region have been initiated.

4.4 Activities in Bamako Cluster

4.4.1 Burkina Faso, Guinea, Mali and Niger transboundary aquifers case study

Fresh water is a scarce resource in Bamako Cluster office countries specifically in the desert neighboring countries like Mali, Niger and Burkina Faso. Indeed, increasing access to freshwater is of prime priority as outlined in all these countries' strategic Development plan Documents (CSLP or DSRP). Unfortunately, data on groundwater, the component which can provide the major part of fresh water, are sometimes not available because the research was carried by many different data collectors and NGOs. In addition, aquifers like Iliumedan Aquifer System are sometimes shared between many countries each having his own assessment method and his own data collection. Thus, the first step of promoting the use of that resource particularly when it comes from a transboundary aquifer will be a consolidation and harmonization of data from different sources.

We have already carried out a case study consisting of collecting data for transboundary aquifers in Mali in 2008. The actual activity is a continuation of this earlier study. It aims to collect data already existing on transboundary aquifers of Burkina Faso, Mali, Niger and Guinea and if possible, obtain a mapping system so as to get a more visibility in this field.

Three consultants will be contracted to conduct 3 studies respectively in Burkina Faso, Guinea and Niger. These 3 country reports will be consolidated and harmonized with the fourth one already done for Mali transboundary aquifer systems during a sub region workshop. As a consolidated result, a sub-regional detailed map of transboundary aquifers will be provided.

These results will be of great interest for Ministries and other stakeholders and authorities responsible of water management and assessment, Sub-regional organization in charge of economic integration (UEMOA ECOWAS), all the local communities around the boarder of the 4 countries, NGOs and other members of water partnership.

4.4.2 Support for a Transboundary Biosphere Reserve nomination in the protected area of Bafing Falémé between Guinea, Mali and Senegal

West African sub-Saharan countries are well known for their poverty, their fragile ecosystems and Madrid Action plan (2008) has targeted Transboundary Biosphere Reserves creation as a good strategy in promoting regional cooperation and sustainable Development based on natural resources conservation/management. In this context

an international workshop for TBR promotion in West Africa was held in Bamako in February 2009. The workshop put emphasis on protected areas of Bafing Falémé between Guinea, Mali and Senegal and Gourma-Sahel between Burkina faso and Mali. A memorandum of understanding (MOU) has been signed between UNESCO Bamako cluster Office and the Ministry of Environment of Mali for a good follow up on the recommendations of the workshop. This activity has been proposed in the framework of these recommendations.

Modalities of action: On the basis of the outcome document of the Bamako 2009 sub-regional workshop on TBR in West Africa, a workplan will be elaborated in a participatory approach, research will be conducted and TBR nomination forms will be prepared from updated and zonation data

Target Groups: Local Communities from Guinea, Mali and Senegal around the proposed TBR; national and international scientific community and tourism sector in the 3 countries will benefit from the proposal as well.

4.4.3 2nd Regional Summer School on solar energy for African French speaking countries

The first session of this regional activity took place in 2009 at Bamako ex-CRES with the joint support of UNESCO, ISESCO and UEMOA. It was very successful and participants recommended yearly sessions with more emphasis on experimentation and longer time.

Thus, this second session will focus on pilot systems installation, monitoring and maintenance with training in classroom, lab experimentations and visit to existing equipments in the field for a total activity time of 2 weeks. More than 30 participants coming from UEMOA countries and other French speaking countries in Africa are expected to attend this workshop.

4.4.4 Support to Bamako Women groups of textile dyeing

Bamako is the capital city of textile called Bazin dyeing technique for West Africa. In this city more than 300 small scale textile dyeing units, mainly for women groups, are disseminated. The most important part of these units' effluents are directly thrown into the river via slurry channels or collector/cesspool, thus being a high level source of pollution for the Niger River.

In addition, the workers are exposed to health problems because of the used synthetic dyestuffs' toxicity. This activity aims to strengthen the groups' capacity by training them to rationalize the process, sensitize them for environment protection and gather some of them on a pilot site so that the wastewater can pass through a small scale treatment plant before going to the river.

4.5 Activities in Dakar Cluster

4.5.1 *Popularization and Strengthening of Science Education*

AU and NEPAD has stressed the importance of building Africa's scientific and technological capacities as part of meeting the MDGs. Science and technology education, play an important role in attaining this objective because it effectively contributes to the development of a country's economy, environment, social relations, and other sectors. African countries recognize this role and many have committed considerable resources to the development of science and technology and their educational systems.

As the communiqués of divers conferences on Science and Technology teaching in Africa show, there is an urgent need to develop suitable instructional materials and methods for improved science lessons delivery. In general, the very small number of research scientists and technologists in Africa contrast sharply with the relatively large numbers in Europe and America. African countries have recognized the need to promote, develop, and sustain a relevant science and technology culture, which includes problem solving and indigenous aspects, in order to narrow the gap between them and industrialized countries.

This activity aims to groom young people with knowledge and skills in the application of Science and Technology through popularization and strengthening of science education. The activity will target students from primary to secondary schools and will aim to bring out their best and exposing them to opportunities available for them in the areas of Science and Technology.

4.5.2 *Raising Awareness for Preparedness and Mitigation of Natural Disasters*

As defined by United Nations office for the Coordination of Humanitarian Affairs (UNOCHA), disaster preparedness are pre-disaster activities that are undertaken within the context of disaster risk management and are based on sound risk analysis. This includes the development/enhancement of an overall preparedness strategy, policy, institutional structure, warning and forecasting capabilities, and plans that define measures geared to helping at-risk communities safeguard their lives and assets by being alert to hazards and taking appropriate action in the face of an imminent threat or an actual disaster. In recent months, West African nations, including member states of Dakar cluster, have been severely hit by natural disasters such as floods and droughts. In most instances communities have difficulties in responding to disaster because of lack of awareness or understanding of the hazards they face. Therefore, this activity aims to conduct an awareness campaign throughout the cluster countries in the form of workshops, distribution of printed or digital material, showing of disaster movies or documentaries. This activity will target most vulnerable communities such rural communities, peri-urban communities urban slums, and large river riparian dwellers. The activity will mainly focus natural disasters induced by flooding.

4.5.3 Study on Establishment of Biosphere Reserves in Cluster Countries

According to the Africa's Science and technology Consolidated Plan of Action (CPA), Africa's biodiversity holds an enormous potential of transforming the continent's agricultural and industrial systems to contribute to economic growth and poverty reduction.

The unique species of plants and animals as well as ecosystems constitute the continent's natural wealth. However, this diversity is underutilized and is being lost at alarming rates. Conserving and promoting sustainable use of biodiversity is one of the challenges that African countries have committed themselves to addressing. These resources, if properly exploited, should contribute significantly to the development of the local communities, as well as the National Economy. In this process effective and appropriate management of these natural resources is cardinal. The establishment of Biosphere Reserves should facilitate the exploitation of natural resources cognizant of the need to ensure protection and sustainability of genetic resources.

This activity aims to promote the creation of Biosphere Reserves in cluster countries, with view to educate local communities on the importance of Biosphere Reserves. Emphasis will be placed on identifying Transboundary Biosphere potential in the cluster.

4.5.4 Managing groundwater systems' response to global changes

Groundwater is extremely important in Africa. According to the Africa Water Vision 2025, it is estimated that more than 75 percent of the African population uses groundwater as its main source of drinking water. Effects of Climate change on water resources are dictating needs to find innovative solutions for water resources management including aquifers. This activity is aimed at raising awareness and increasing knowledge on the effects of climate change on groundwater resources. It will also contribute to the knowledge of adapting to the impacts of global changes on river basins and aquifer systems.

Managed Aquifer Recharge (MAR) is becoming a choice of solution for groundwater resources management for arid and semi-arid regions but the idea is new in Sub-Saharan Africa. A Regional workshop will be organized to engage the cluster countries in Managed Aquifer Recharge (MAR) implementation in cooperation with the UNESCO Chair in hydrogeology based at the University of Western Cape, Cape Town, South Africa. The proposed workshop will be aimed to provide a training opportunity that will contribute towards capacity building on the application of Manage Aquifer Recharge (MAR) principles for integrated management of water resources in cluster countries. It is aimed at:

- Water resources managers
- Environment protection authorities
- Water supply authorities

- Health Commissions
- Universities

4.5.5 *Water education for communities, stakeholders and mass-media professionals*

As water scarcity becomes alarming with the effect of climate change and water is largely misused, there is a need for communities to develop skills for efficient water usage. As outlined in the Africa Water Vision 2025, attaining equitable and sustainable use of water for socio-economic development requires awareness, consensus-building, creating frameworks for integrated water resources management, and capacity building. This activity aims to organize awareness sessions for Water Use efficiency to increase stakeholder's knowledge base in managing water as a scarce resource. Target groups include.

- Local communities;
- Urban and rural populations;
- Mass media professionals;
- Water relation institutions
- NGOs.

4.6 Activities in Dar es Salaam Cluster

The new biennium presents tremendous but yet very challenging opportunities for the Dar es Salaam Cluster Office in both the Regular and Extrabudgetary activities that have to be undertaken to meet the demands of member states. This biennium, the office finds itself in the midst of the development and/or conclusion of UNDAP/UNDAF documents, the design of new development strategies by some member states and the beginning of new Joint Programmes in some members states such as Tanzania, Comoros and Madagascar. This has placed a lot of pressure on the office and calls for closer alignment of activities and plans with national agendas and UN assistance frameworks. UNESCO is being called upon more and more to participate and provide inputs into development strategies in all its areas of mandate and also in the UNDAP in areas such as Science and technology which hitherto were usually ignored. Unfortunately, the biennial programmes of UNESCO have not generally been aligning properly with these cycles of government development strategies and also with the UN assistance strategies. With the recent need for greater coherence within the UN the work of the cluster is more and more challenged and the demand on the science sector has never been as high in the design of responses by the UN to development issues in member

states. It is an encouraging development but also calls for some caution in ensuring that the office is not overstretched beyond its capabilities.

4.6.1. *Strengthening science, technology and innovation systems and networks of knowledge production*

In view of the strategic importance of the Dar es Salaam cluster office in the service of 4 small island developing states (SIDS), the activity to be undertaken in the biennium would focus on the strengthening of the science systems and networks of knowledge on these islands. For example, the office will assist the Seychelles to produce a functional science policy document following the draft of a policy document early 2009. This hopefully would place Seychelles in a position to utilize science to enhance economic recovery and growth in the coming years.

An important activity within the SIDS is the strengthening of the Sandwatch Programme and also increasing the knowledge base for climate change adaptation in the Indian Ocean Islands. UNESCO Dar es Salaam and the SIDS platform at the HQ in Paris will in June 2010 organise a regional Sandwatch activity furthermore, the office and the SIDS Platform leaders in Paris will undertake the strengthening of the knowledge base of women for development in the small islands and the publication of the results for the Seychelles workshop on Islands as Cultural Crossroads

4.6.2. *Renewable energies for sustainable national development in Small Island developing states (SIDS)*

UNESCO Dar es Salaam will this biennium continue with the response to the request from the Mauritius for assistance for strengthening the use of renewable energies on the island. In view of this the Office will undertake an activity to enhance the utilization of renewable energies as part of national strategy for climate change adaptation on the island of Rodrigues in the Mauritius.

4.6.3. *Enhancing the role of biosphere reserves in national strategies for climate change adaptation*

Within the limits of the available funds, the Natural Sciences Sector will support the participation of member states in the AfriMAB meeting that will be held in Madagascar and will also carry out further climate change impact coping strategies studies for at least two of the islands including the Comoros and Zanzibar. These studies will contribute towards the strengthening of national plans for climate change adaptation and would be carried out utilizing existing biosphere reserves as learning laboratories or similar nature reserves where there are no biosphere reserves to be used for the studies.

4.6.4. Capacity development for improved management of fresh water resources for sustainable development.

With the impact of climate change becoming clearer there is a need to enhance further the knowledge and technical capacities of urban water systems managers especially on the Indian Ocean Islands using the Integrated Water Resources Management Approach for sustainable management of fresh water resources which will include how to organize to respond to climate change impacts on the resources. Focus will be on Madagascar, Comoros and Zanzibar.

4.6.5 Extrabudgetary and UN Joint Programmes

Within the coming biennium there will be many activities within the Joint Programmes of the UN system in the member states belonging to the Cluster. The Dar es Salaam Cluster has and is contributing to the Joint Programming in Tanzania, Madagascar and Comoros. Below we describe briefly some of the planned programmes for Tanzania and the Comoros. The activities reported below are only those which have either been approved or have been submitted to the UNCT for approval hence, the scenario may change before the end of the biennium as for example, the current Joint Programming in Tanzania comes to an end in mid-2011 and the UNDAP becomes operative.

4.7 Activities in Harare Cluster

4.7.1 Capacity building in science, technology and innovation policy

The vision and objective of the AU/NEPAD Science and Technology Consolidated Plan of Action is that of Africa that is free of poverty and well integrated into the global knowledge economy. The overall goals of this consolidated plan are:

- a) To enable Africa to harness and apply science, technology and related innovations to eradicate poverty and achieve sustainable development; and
- b) To ensure that Africa contributes to the global pool of scientific knowledge and technological innovations

It is this vision that underpins this activity that will be implemented within the framework of the Joint UNESCO-SADC implementation strategy and will focus on policy training for senior officials in the cluster countries. Specific emphasis will be placed on:

- National Systems of Innovation (NSIs)
- Innovation policy analysis
- International lessons on policies development

- Technology transfer and management thereof
- Intellectual property management policy for STI

4.7.2 Study on Establishment of Biosphere Reserves Cluster Countries

According to the Africa's Science and technology CPA, Africa's biodiversity holds an enormous potential of transforming the continent's agricultural and industrial systems to contribute to economic growth and poverty reduction.

The unique species of plants and animals as well as ecosystems constitute the continent's natural wealth. However, this diversity is underutilized and is being lost at alarming rates. Conserving and promoting sustainable use of biodiversity is one of the challenges that African countries have committed themselves to addressing. These resources, if properly exploited, should contribute significantly to the development of the local communities, as well as the National Economy. In this process effective and appropriate management of these natural resources is cardinal.

The establishment of Biosphere Reserves should facilitate the exploitation of natural resources cognizant of the need to ensure protection and sustainability of genetic resources. This activity aims to promote the creation of Biosphere Reserves in cluster countries, with view to educate local communities on the importance of Biosphere Reserves. Emphasis will be placed on the Transboundary Biosphere activity undertaken between Zambia and Zimbabwe.

4.8 Activities by Kinshasa National Office

4.8.1 Support for the participation of DRC in the Albertine Rift centre of excellence for biodiversity and natural resources management.

Democratic republic of Congo lies in the Albertine Rift valley, and for this Biennium UNESCO will facilitate the country participation to the process of creation of the Albertine Rift Centre of Excellence for biodiversity and natural resources management.

4.9 Activities in Libreville Cluster

4.9.1 Support to the implementation of Madrid Action Plan in Libreville Cluster office countries

Participation of Gabon, Equatorial Guinea and Sao Tome and Principe, in the MAB programme needs to be enhanced. In 2010-2011, the Office will to raise visibility and the understanding of the programme in these 3 countries.

This activity will result in the establishment of an interim MAB National Committee and development of a National Action Plan for the implementation of the Madrid Action Plan at country level. Information Materials will also be produced.

4.10 Activities in Nairobi Cluster

4.10.1. Support the creation in Rwanda of Albertine Rift regional centre of excellence for biodiversity and natural resources management

Upon request of the Government of Rwanda, UNESCO Office in Nairobi explored the feasibility of Albertine Rift Regional Centre of Excellence. The study was welcomed and endorsed during a validation meeting in Kigali in 2009. The concept of the Centre of Excellence has been widely discussed. Albertine Rift Centre of excellence for Biodiversity (ARCOEB) and natural resource management is proposed as an intergovernmental centre of excellence of the Albertine Rift Countries that will serve as the central locus for collaboration in biodiversity conservation in a comprehensive regional context. Networking, between the member countries and between them and international partners, will be a key function of the Centre in order to build-up institutional capacity in biodiversity conservation through exchange of knowledge and experience

To follow up on this result, UNESCO will support Rwanda to create an enabling environment for the creation of the ARCOEB. UNESCO will support Rwanda's advocacy strategy towards the five other Albertine Rift countries (Burundi, Democratic republic of Congo, Tanzania, Uganda and Zambia) to have their agreement and total commitment and facilitate mobilization of financial and scientific resources for the creation of the Centre Excellence.

4.10.2. Support the implementation of Madrid Action Plan in Rwanda

Rwanda is one of the world's hotspot for Biodiversity and it has been recognized with the designation of the Volcanoes Biosphere Reserve (BR) in 1983. However, the MAB programme didn't have enough visibility in the country and thus, during the last biennium (2008-2009), the UNESCO office in Nairobi fostered the knowledge and understanding of the MAB programme in Rwanda. As a result, the interim Rwandese MAB national committee has been set up, headed by the Rwanda Environment Management Authority, which will be in charge of developing a MAB action plan for Rwanda. UNESCO will technically support the development of the action plan and will contribute to its implementation. To illustrate the relevance of MAB principles, funds will be requested to implement priority activities of the MAB action plan for Rwanda. These activities will be included in the One UN workplans for 2010 and 2011. The nomination of new sites as well as rehabilitation of degraded areas is foreseen.

4.10.3. Supporting community led sustainable management of Mt Kulal biosphere reserve

Mt Kulal, located in Northern Kenya is one of the six Biosphere Reserves (BR) in Kenya. It was established in 1979. During the 70's and 80's, the Biosphere Reserve was kept alive with activity including scientific research and community development projects under the UNESCO-MAB Integrated Project in Arid Lands. When the international support ended, for almost two decades now there has not been any major activity on the management of the reserve, save for the meager efforts of the local communities. The Mount Kulal BR is one of the so called 'pre Seville' BR which didn't benefit from the guidelines provided by the Seville strategy and the statutory framework of Biosphere Reserve (1995) prior to its designation. In December 2006, UNESCO/Ecological Science unit and Kenyan partner institutions held a stakeholder meeting in Nairobi to develop a plan of action for achieving a community-led sustainable management of Mt. Kulal Biosphere Reserve in northern Kenya. In 2009, the periodic review of the BR was undertaken. Based on the last four years of work, a project document was developed in 2009 that will be used to raise financial support in order to achieve a sustainable use of the BR through a community led management. This activity is a joint activity with the Culture Unit in the Nairobi office.

4.10.4 Research and assessment of urban groundwater vulnerability

Most of the water supply systems in African mega-cities are based on groundwater which becomes a significant source of water. However, unplanned urban expansion and rapid population growth in urban areas have put enormous pressure on this natural resource, which becomes polluted from excessive use of fertilizers, pesticides and herbicides as well as effluents from leaky sewerage systems, septic tanks, leaky fuel tanks, factories or pollutants from solid waste (garbage) dumps. The strategy will be to develop methodologies for optimal monitoring of the contamination of groundwater aquifers in urban areas.

The activity will consist for some selected urban areas to map the different sources of potential pollution for groundwater with a particular focus on the recharge areas. The water quality of at some critical points will be characterized. The mapping of potential pollution sources and the water quality identified will be analyzed in order to present approach for the monitoring of groundwater pollution in cities. A partnership will be established with key stakeholders in each selected urban area. The activity will be implemented in close collaboration with national IHP committees, universities and key stakeholders in the different countries.

4.10.5 Technical Assistance to member States for STI Policy and legislation

Most African Countries have adopted some forms of strategies and policies related to selected sectors of science and technology. However, few have a holistic and up-to-date

science and technology policy and strategies that are conducive to harnessing the benefits of STI for poverty reduction and sustainable development. Also, member parliaments are requested to debate and adopt more and more sensitive laws and international agreements related to science, technology and development. Thus, increasing the capacities of policy-makers and parliamentarians to address these various challenges is of general concern in African States.

This activity aims at improving the outcomes of policy-making and legislation on STI related issues in the sub-region through targeted technical assistance.

4.10.6 Sub-Regional Assessment of biofuel science and technological development.

Liquid biofuel has attracted increasing attention from public and private investors in recent years due to volatility of oil prices and threats on its long term availability, as well as growing pressure for economies to adopt cleaner energy options. African governments are pressed to plan and develop strategies that will address options related to the development of biofuels. Unfortunately, existing information is scarce and fragmented. This activity will address this challenge by conducting an assessment of science and technology capabilities for the development of biofuel in a sustainable manner in the sub-region.

4.11 Activities in Windhoek Cluster

4.11.1 Support to implementation of STI policies in cluster countries

This activity will be carried out in the framework of MLA II.1.1. "Enhancing the leverage of science through integrated science, technology and innovation (STI) policy".

Identified STI policy needs in the cluster will be addressed through three complementary actions:

- a) Based on the joint programme between UNESCO and SADC agreed for 2010, a workshop aimed at training senior officials in SADC countries in formulating national STI policies, as well as striving towards a harmonised regional policy on STI, will be conducted. The other SADC Cluster Offices will be invited to participate.
- b) Continued support will be provided to Swaziland in the process of drafting a National Science, Technology and Innovation Policy document. It is expected that this process will yield an agreed policy document during the biennium 2010-2011.
- c) The first Namibian STI statistics survey will be supported through Technical Advice.

4.11.2 Promoting Women in Science and Engineering in cluster countries

This activity will be carried out in the framework of MLA II.1.2. "Strengthening science education and capacity-building in the sciences":

- a) In collaboration with the SADC Secretariat, a workshop in "Women in Science and Engineering" will be organized. The expected result of this workshop is a roadmap for further activities in the cluster, including needs and potential approaches to improving women participation in science and engineering in SADC countries
- b) In collaboration with higher education institutions in Namibia, visits of successful women scientists and engineers will be organized to schools in peripheral regions of Namibia, in order to present role models to girls, parents and elders. It is expected to raise the profile and awareness of engineering and science as a profession with girls throughout the country.

4.11.3 Managing water as a shared responsibility across geographical and social boundaries

This activity will be carried out in the framework of MLA II.2.1. "Promoting the sustainable management and conservation of freshwater, terrestrial resources and biodiversity as well as disaster resilience"; as well as the International Hydrological Programme (IHP VII) Theme 2 "Strengthening water governance for sustainability"; Sub-theme 2.4 "Managing water as a shared responsibility across geographical and social boundaries"; in support of the Internationally Shared Aquifer Resources Management project ISARM-SADC.

- a) A meeting with all partners that agreed to take part in the project will be organized in early 2010 to kick start the activities of a project aimed at establishing a comprehensive strategy and mechanisms for the management of transboundary groundwater in 2 pilot areas. UNESCO will engage in supporting a component of this project, namely on the establishment of a harmonized information system, in cooperation with IGRAC (TBC).
- b) The UNESCO Chair for Geohydrology will be supported to produce a "position paper" on Transboundary Aquifers in SADC. This report will provide evidence-based guidance for future activities of ISARM-SADC, and the basin management committees.

4.11.4 Framework Programme for Research Education and Training in Water (FETWater)

This activity will be carried out in the framework of MLA II.2.1. "Promoting the sustainable management and conservation of freshwater, terrestrial resources and biodiversity as well as disaster resilience"; IHP Theme 5 "Water education for sustainable development";

Subtheme 5.1 “Tertiary water education and professional development”

FETWater, the Framework Programme for Research, Education and Training in Water (www.fetwater.co.za), is carried out with financial support from the FUST (Flemish UNESCO Trust Funds for Science), and the South African Government. FETWater addresses the needs of practitioners in the South African water sector, through effective cooperation between universities, government departments, research institutions and the public and private sector. The second phase of the programme will finish in 2010.

4.11.5 Water education for communities, stakeholders and mass-media professionals

This activity will be carried out in the framework of MLA II.2.1. “Promoting the sustainable management and conservation of freshwater, terrestrial resources and biodiversity as well as disaster resilience”; IHP Theme 5 “Water education for sustainable development”, Subtheme 5.4 “Water education for communities, stakeholders and mass-media professionals”

- a) In Swaziland, capacity building activities will be carried out based on the training needs assessment conducted in late 2009 with the support of UNESCO. This will include training of the board members of the Catchment Management Agencies, as well as staff from the Department of Water Affairs. Cooperation with the FETWater Programme (see above) will be sought.
- b) In Lesotho, a Training Needs Assessment will be conducted to identify needs and develop a proper training strategy for Catchment Management Agencies and other water resources management stakeholders. For its implementation, cooperation with the FETWater Programme (see above) will be sought.

4.11.6. Research and Policy at identified BRs for Angola

This activity will be carried out in the framework of MLA II.2.1. “Promoting the sustainable management and conservation of freshwater, terrestrial resources and biodiversity as well as disaster resilience”; as well as the Man and the Biosphere (MAB) programme.

- a) UNESCO Windhoek will support further actions necessary within the process of nominating the Iona National Park area as a Biosphere Reserve, including the preparation of the nomination to be part of the World Network of Biosphere Reserves.
- b) The establishment of MAB Committees in the Cluster countries will be promoted.

4.12 Activities in Yaoundé Cluster

4.12.1 *Strengthen education and research in science and technology for girls/women.*

Cameroon has set ambitious targets in its second PRSP (growth and employment strategy). A relatively high proportion of tertiary students (around 15%) are enrolled in sciences, but only 5% in engineering. Enrolment of women is low in sciences, very low in engineering (although exact data is not available). Secondary education in sciences has seen some progress, including the impact of the microscience centre that UNESCO has supported.

In partnership with the UNESCO Institute of Statistics (UIS) specialists in the region, the activity will support identification of exact figures for enrolment in science and engineering, particularly access and retention of women. The polytechnic institute and ministry of science will be supported to determine a strategy to attract more women in engineering.

In cooperation with the education sector, the activity will also support secondary science education for girls, in particular in the Millennium Village (MV) clusters that are part of the Joint Programme of the UN system.

4.12.2 *Support for implementation of the Madrid Action Plan in the cluster.*

The Cluster has 5 Biosphere Reserves, 3 in Cameroon and 2 in CAR, that predate the Seville Congress (1995). The Madrid Action Plan has been formulated in 2008 and needs to be contextualized. The 2009 ICC meeting has indicated the importance to assess the functionality of pre-Seville BR in terms of the three required functions. Initiatives will be supported to integrate communities with the BR, particularly those involved with the two Millennium Villages situated adjacent to Waza and Dja BR, where activities promoting resource conservation and supporting environmental education and awareness will be supported. This will continue the 2009 activity that has trained 30 indigenous women trainers from northern Cameroon (adjacent to Waza) in construction of fuel-efficient mudstoves and manufacturing of fuelless cooker bags.

Existing BR will be supported to strengthen (update) or draft their management plans and determine a plan of action. This could include upgrading management plans towards the 3 functions (particularly research, education, the role as model for sustainable development) and could also include consideration of delisting current BR that are only conservation areas. Potential opportunities are the TRIDOM transboundary initiative that includes the Dja Faunal Reserve (currently a BR but mainly as a conservation area), the Millennium Village projects with communities of 25000 people around Dja and Waza BR in potential buffer or transition zones, and the Ecofac ZCV project in northern CAR in and around Bamingui-Bangoran.

The activity will also support involvement of the cluster countries in the AfriMAB subregional network.

4.12.3 Support to water management in Cameroon and Chad

This activity was initiated during the last biennium and will continue during this biennium by supporting communities in the government/UN Millennium Villages project in Cameroon to build capacity for sustainable water management.

The Millennium Villages (MV) are situated in the arid extreme north of Cameroon and in the rainforest area in the south, providing different conditions to develop models for good practice. The village clusters target 2x25000 inhabitants and are situated adjacent to 2 biosphere reserves, thereby also strengthening the MAB programme activities. During the biennium, which will be the first 2 years of the 5 year MV project, 40% of the households (4000HH) will be targeted with awareness and demonstration of appropriate water management techniques such as rainwater utilisation, groundwater management, water efficiency. More than half the participating households should have women attending the activities. Schools in the MV will be involved as promoters and sites of demonstration. It is expected that 20% of the exposed HH will adopt improved water management practice (800 HH)

Partners from Chad will be involved with the Millennium Village situated in northern Cameroon to allow capacity building.

The results are based on the assumption that the activity will target matching EXB funds provided for the MV project by Japan, and seek to establish UNESCO as the lead UN organization in the 5-year project.

4.12.4 Support for water research and protection of vulnerable water resources

Despite being one of the countries with the highest renewable water availability per capita, less than 25% of the population in the Central African Republic has access to clean drinking water. Less than 25% also has access to improved sanitation. Neither of these Millennium Goals will be achieved. Women are highly underrepresented in the hydrology sector, although their needs are the highest.

The activity will support a minimum of 5 hydrology research projects in the Central African Republic and Cameroun, undertaken by hydrologists or hydrology students. At least half the projects will be undertaken by women.

The water quality Chair in Bangui will be supported to build its capacity and liaise with other chairs and universities, and participate in at least one international hydrology activity. A minimum of 5 women students in the cluster will be supported to identify appropriate postgraduate programmes in hydrology with potential scholarships and prepare candidatures. At least 2 should obtain a scholarship.

Chapter 5

Regional Networks

5.1 The African Network of Scientific and Technological Institutions (ANSTI)

The African Network of Scientific and Technological Institutions (ANSTI), is an organ of cooperation that embraces African institutions engaged in University level training and research in the fields of science and technology. It was founded in January 1980, with support of UNESCO and the German Government at the request of the first Conference of African Ministers responsible for science and Technology (CASTAFRICA 1). It is hosted by the UNESCO Nairobi office. The network has grown over the years to become an effective institution for the development of human resource capacity in the fields of Basic and Engineering Sciences. To-date it has 110 member institutions in thirty-four (36) countries in sub-Saharan Africa. The Network is an important partner in the implementation of the Nairobi office's regional programme in basic and engineering Sciences.

The Overall goal of ANSTI to develop active collaboration among African scientific institutions so as to pool together their resources for capacity building in training and research in areas of relevance to the development of the region.. The Network's five strategic objectives for the period 2010-11 are:

- To facilitate and enhance interactions among member institutions.
- To facilitate training and research in science, engineering and technology.
- To promote the use of ICT in teaching and research in science, engineering and technology.
- To promote gender equity in access to science, engineering and technology training.
- To develop and disseminate scientific and technical information to address major socio-economic problems.

In order to achieve these objectives ANSTI is engaged in numerous activities which can be grouped into five programme areas:

- i. Training, including administration of Fellowships
- ii. Seminars & Workshops
- iii. Award and administration of conference grants
- iv. Publications and Promotion of Research
- v. Dissemination of information on issues relating to capacity building in science and technology

More specifically, the following are some of the activities that will be implemented in 2010-11:

- The fourth conference of university leaders responsible for science and technology in Africa (COVIDSET 2011), Abuja Nigeria November 2011.
- Dissemination of E-courses in Science and engineering
- Contribution to Universities' staff development- Award and administration of 10 postgraduate fellowships each year.
- The biannual Publication of the *African Journal of Science and Technology*
- Annual award of the L'Oreal/ UNESCO/ANSTI regional fellowship for Women in Science

5.2 The International Hydrological programme (IHP)

In Sub-Sahara Africa, the IHP network comprises National IHP committees and the different networks related to cross-cutting and associated IHP programs. The proposed activities for different networks for the next biennium are the following.

IHP National Committees

In coordination with the water division at headquarters and Accra office, a contribution will be provided for the organization of the 3rd meeting of National IHP Committees to be held in Cotonou from 15-17 February 2010 jointly with a seminar on water resources and climate change in Africa. Core interventions areas for IHP VII in Africa region will be identified and priorities for IHP VIII for which the preparation process will start in 2010 will also be discussed. Strategies on how to revitalize and sustain the national IHP committees will be discussed.

Flow Regimes from International Experimental and Network Data (FRIEND)

A support will be provided to the existing two networks, FRIEND-AOC for West and central Africa and FRIEND-SA for Southern Africa for the organization of the steering committee meetings and also for training and research. Partnership with the FRIEND-Nile will continue. A feasibility study for the establishment of a new FRIEND network for the basin of Congo in Central Africa will be conducted and the network will be probably launched at the end of the biennium or at the beginning of the next biennium. Around ten scientists of the different FRIEND networks will be sponsored for the 5th International FRIEND Conference to be held in Fez, Morocco from 25-29 October 2010.

Hydrology for the Environment, Life and Policy (HELP)

In Sub-Sahara Africa, the HELP network comprises twelve hydrological basins: Atbara basin (Ethiopia, Eritrea and Sudan), Blue Nile (Sudan and Ethiopia), Gash basin (Ethiopia-Eritrea-Sudan), Ewaso Ng'iro Basin (Kenya), Greater Ruaha basin (Tanzania), Lake

Navaisha basin (Kenya), Mandaratsy basin (Madagascar), Nakambe basin (Burkina), Olifants basin (South Africa), Thukela basin (South Africa), Upper Oueme basin (Benin). Research on IWRM has been conducted within those basins following the principles of HELP program. A support will be provided for the organization of the first HELP Africa regional workshop and for the establishment of a Regional Coordination Unit for the HELP basins in Sub-Saharan Africa.

International Shared Aquifer Resources Management (ISARM)

Two ISARM networks of experts have been established in West and Southern Africa for the inventory and study of transboundary aquifers in the different sub-regions. In coordination with the cluster offices in Bamako, Accra and Windhoek a support will be provided to the networks to continue the data collection and inventory activities within the different sub-region. A second sub-region workshop will be envisaged in 2011 for West Africa network in order to take stock and share the different findings on the activities implemented so far by the network. In coordination and support of the Addis office, the IGAD ISARM network will be established in 2010.

Groundwater Resources Assessment under the Pressure of Human and Climate (GRAPHIC)

During the Kampala international conference on climate and groundwater in Africa held in 2008, an Africa GRAPHIC network was launched during which more than fifty scientists attended. This network will be promoted and revitalized.

Global Network – Water and Development Information for Arid Lands (G-WADI)

In coordination with the water division at headquarters, a contribution will be provided for the establishment of a sub-Saharan component of G-WADI network for the sustainable management of water resources in arid and semi-arid areas in Africa with a focus on sustainable management and integration of surface and groundwater.

5.3 The Man and Biosphere network in Africa (AfriMAB)

The Man and the Biosphere Programme (MAB), proposes an interdisciplinary research agenda and capacity building aiming to improve the relationship of people with their environment globally. Launched in the early 1970s, it notably targets the ecological, social and economic dimensions of biodiversity loss and the reduction of this loss. It uses its World Network of Biosphere Reserves as vehicles for knowledge-sharing, research and monitoring, education and training, and participatory decision-making. In January 2010, the World network of Biosphere Reserve counts 553 sites in 107 countries. The World network of Biosphere reserves is organized in regional network. AfriMAB is the regional network for Sub-Saharan countries Biosphere reserves, which are 53 in 24 countries. The

AfriMAB network was established in October 1996.

The AfriMAB Network aims at providing an organized framework that will facilitate the following objectives:

- Promote the implementation of the MAB Programme for sustainable development in sub-Saharan Africa ;
- Promote the implementation of national and regional policies for the sustainable use of Biosphere Reserves ecosystems in African countries ;
- Provide a regional and international framework for dialogue and cooperation for developing biosphere reserves management policies ;
- Promote the conservation of biological diversity through the sustainable management, restoration and rehabilitation of various ecosystems ;
- Create greater awareness on ecological, cultural, recreational, scientific and social values of Biosphere Reserves in Africa, especially with regard to policy makers, local communities and other stakeholders ;
- Participate in building institutional capacities in the African region in order to face the challenges of conservation and long-term use of Biosphere Reserves ecosystems in Africa and ;
- Contribute to the sustainable management of Biosphere Reserve ecosystems.

The membership of the network is the MAB national committees represented by their focal points, biosphere reserves represented by their managers and local community representatives. The network is in the process of formalizing its membership by the adoption of a Charter and Statutes.

The network scientific activities cover the following six thematic areas:

- **Thematic Commission 1:** Managing, zoning and enhancing the functioning of biosphere reserves ;
- **Thematic Commission 2:** Participation of partners and social stakeholders; equitable benefit-sharing of income ;
- **Thematic Commission 3:** Scientific research and capacity building ;
- **Thematic Commission 4 :** Transboundary biosphere reserves ;
- **Thematic Commission 5:** Biosphere reserves in conflict or post-conflict situations ;
- **Thematic Commission 6:** Adaptation to climate change.

5.4 Ocean Data and Information Network for Africa (ODINAFRICA)

The current phase of Ocean Data and Information Network for Africa (ODINAFRICA IV) brings together more than 40 marine related institutions from twenty-five countries in Africa (Algeria, Angola, Benin, Cameroon, Comoros, Congo, Cote d'Ivoire, Egypt, Gabon, Ghana, Guinea, Kenya, Madagascar, Mauritania, Mauritius, Morocco, Mozambique, Namibia, Nigeria, Senegal, Seychelles, South Africa, United Republic of Tanzania, Togo, and Tunisia). With the support of the Intergovernmental Oceanographic Commission of UNESCO and the Government of Flanders (Kingdom of Belgium) the network strives to address the challenges faced in ensuring that ocean and coastal data and information generated in national, regional and global programmes are readily available to a wide range of users in an easily understandable format (<http://www.odinafrica.net/>).

The earlier phases of ODINAFRICA enabled the participating member states to get access to data available in other data centres worldwide, develop skills for manipulation of data and preparation of data and information products, and develop infrastructure for archival, analysis and dissemination of the data and information products. The member states also developed further the African network of sea level stations, bringing the number of operational tide gauges along the African coast to more than 40.

ODINAFRICA-IV will dedicate substantial energies to development of products for integrated marine and coastal management, especially at the local and national level. The planned activities under each of the following "products clusters" are as follows:

Web-based data services (including catalogues and archives)

Expanding the existing ODINAFRICA networks at national level and their national data collections and catalogues; providing training to institutions that cover a wider range of data types relevant to integrated coastal management. This will include: base maps, geosphere, hydrosphere, atmosphere, biosphere, and the human-environment. The services considered would encompass data extraction and conversion to specific formats, online trend generation, and plotting and printing of maps and figures from databases. Data will be mined from a wide range of national, regional and international sources.

Web-based Information Services (including literature catalogues and repositories, institution and experts directories, inventories of projects)

Already considerable work was carried out to develop web-based information services through the previous phases. ODINAFRICA-IV will build on these, and in particular:

- An interface will be developed to access the records of African experts and institutions in the OceanExperts (www.oceanexperts.org) database.
- The database of ongoing/completed marine related projects developed in collaboration with NEPAD/COSMAR will be updated and availed through the ODINAFRICA website.

- Library catalogues developed in earlier phases will be updated, quality controlled and merged to create an updated union catalogue of the libraries of the ODINAFRICA institutions [AFRILIB].
- The catalogue of marine related publications from/about Africa will be updated and availed online.
- Electronic repository of marine publications and grey literature from Africa (OceanDocs-Africa – <http://iodeweb1.vliz.be/odin/handle/1834/1337> , will be improved with new partners recruited and trained to ensure broader coverage.
- Development of journal view, already implemented Egypt, Mauritania, and Tunisia, will be extended to cover other institutions that produce their own publications.

Mapping, Forecasts (and predictions), and Scenario Development

The African Marine Atlas (AMA - www.africanmarineatlas.net) will be developed as an online mapping application based on Web Map Services (WMS). The use of a standards compliant web mapping application will ensure interoperability with other atlas development projects in Africa. AMA will provide an overview of topics related to African marine and coastal areas, as well as an interactive atlas where the user can select map layers from various organisations to view and query. The following were identified as some of the issues that may be considered: shoreline changes (erosion and accretion rates, tidal charts and bathymetry, non-tidal sea level anomalies which reflect upwelling or storm surges, evaluation of sea level rise trends along the African coasts), marine related hazards and disaster management (coastal flooding and inundation maps, storm surge predictions, pollution and extreme events), management of key ecosystems, and sustainable use of resources (productivity of coastal waters, biodiversity status and assessments, dynamics of upwelling based on remote sensing data and insitu SST measurements).

National and regional portals, as well as project websites and national NODC websites

Within the framework of ODINAFRICA-IV the National Ocean Data Centers (NODCs), will be enhanced, able to “plug-in” their databases into OceanDataPortal as data providers. NODCs with web-serving capability (and permanent internet connection of sufficient bandwidth) will be able to directly connect to Ocean Data Portal. NODCs without a permanent internet connection and/or web-server capability will be able to use the central node at the IOC Project Office for IODE and serve their data sets through that facility.

ODINAFRICA will collaborate with other initiatives which also have portal projects covering parts of Africa, such as the UNEP Nairobi Convention Clearing House Mechanism and SeaDataNet.

Communication tools: newsletters, policy and media briefs, African Oceans and Coasts books series

Different tools, methodologies and media will be utilised to facilitate interactions with stakeholders and assure greater exposure to the institutions and the services that they can provide.

- Policy and media briefs provide tangible advice for decision-making, priority issues and resource deployment.
- Conceptual diagrams: Coastal resource mapping can indicate the location and relative loading of point source pollution within an enclosed bay or harbour of interest.
- Posters and brochures produced at national level will be decided on by the countries.
- WINDOW project newsletter focusing on project activities, and will be published and distributed half yearly in electronic version.
- The following ODINAFRICA Books are foreseen: The African Marine Atlas, and Managing the African Coasts.

National Open days and exhibitions, targeting schools and the general public, could be held together with one of the two National Coordination meetings planned annually. These could be coordinated Africa wide for greater impact, held together with the World Ocean Day, the IOC's 50th Anniversary celebration.

Chapter 6

**Participation in UNESCO Science
Programme activities in Africa**

There are several levels of participation by member states: Regional, sub-regional and national levels. Activities that are specific to a country are handled through the cluster offices. Regional activities are organized from the Regional Bureau in Nairobi. UNESCO field offices use various means (including this publication) to advertise their science programme activities. Member states should therefore examine the various work plans presented in this document by regional and cluster offices to identify those which may interest them. Once you become familiar with the objectives of the programme activity which may interest you, the next step is to contact the programme officer in the UNESCO field office that covers your country.

To enable each member state to identify where to seek assistance, figure 1 which shows the geographical coverage of each UNESCO Cluster office was earlier presented in chapter 1. In figure 2 below a chart showing the names of the contact person in each cluster office is presented. Both figures 1 and 2 will enable the reader to identify who to contact for assistance when needed. If there is any doubt one can always contact the regional office in Nairobi

Participation in any activity can be through invitation or request from a member state. Normally technical assistance for activities such as the review of policy or studies leading to the development of projects is provided upon request from a member state. For other activities such as regional training workshops member states are usually invited to nominate candidates to join the workshop.

Figure 2: List of Science programme Specialists in Africa

	Regional/ Cluster /National Office	Science programme Officers	Email Contact
1	Abuja (National Office)	Osu Inya Otu	Oi.otu@unesco.org
2	Accra	Vacant	
3	Addis Ababa	Alex Makarigakis	a.makarigakis@unesco.org
4	Bamako	Mama Plea	m.plea@unesco.org
5	Dakar	Marcel Tchaou	m.tchaou@unesco.org
6	Dar Es Salaam	Anthony Maduekwe	a.maduekwe@unesco.org
7	Harare	Vacant	
8	Libreville	(No Science Programme Staff)	m.bachiri@unesco.org
	Maputo	Noel Chicuecue	n.chicuecue@unesco.org

9	Nairobi (Regional and Cluster office)	Abou Amani Programme Specialist in Basic and engineering Sciences Programme Specialists in earth Sciences	a.amani@unesco.org
		Ms. Noeline Rakotoarisoa Stefano Mazzilli Ms. Alice Ochanda	n.raondry@unesco.org s.mazzilli@unesco.org a.ochanda@unesco.org
10	Windhoek	Ernesto Fernandez Polcuch	e.fernandez-polcuch@unesco.org
11	Yaounde	Guy Broucke	g.broucke@unesco.org



Annexes

Table 1 – Workplan for regional activities

Programme area	Title of Activity	Description	Expected Output	Participating Countries
Basic and Engineering Science	Support for Networks of women engineers and scientists in Africa	<p>This is a regional programme that aims at enhancing the participation of women and girls in science, engineering and technology.</p> <p>The programme focuses on supporting activities that are aimed at ensuring that gender is mainstreamed in science, technology and innovation in African Member States.</p> <p>Target areas are the development of gender in science and Technology sectoral policies, generation of sex disaggregated data in STI learning and research institutions.</p>	<ul style="list-style-type: none"> Support for gender in STI sectoral policy development workshop. Mentoring activities in the form of scientific camps of excellence organized to nestle secondary school girls in STI. Organization of career development seminars/workshops. Encouragement of involvement of women scientists and engineers in research and sharing of research findings. 	<ul style="list-style-type: none"> Regional
	Support to activities to improve research capacity	<p>The objective of this activity is to facilitate collaboration and sharing of research knowledge/findings among scientists to improve research capacities in Africa</p>	<ul style="list-style-type: none"> Organization of seminars and workshops Encouragement of involvement of scientists, with emphasis on women in research and sharing of research findings. 	<ul style="list-style-type: none"> Region
	Support to regional networks and centers of excellence in STI	<p>The objective of this activity is to support regional networking of institutions and centers of excellence for improved training and research capacity in science, engineering and technology.</p>	<ul style="list-style-type: none"> Enhanced capacity of regional networks and centers of excellence Collaborative activities to increase the sharing of scientific knowledge implemented Partnership with scientific community in Africa enhanced 	<ul style="list-style-type: none"> Region

Programme area	Title of Activity	Description	Expected Output	Participating Countries
Science Policy	Training on STI policy and Innovation System	The Policy Training Module developed by UNESCO in the previous biennium will be used, in one or two training workshops which will be organized for selected regional countries policy-makers. The training would consist of lectures and case studies that participants would provide on the STI policy frameworks in their countries. This activity may require the partnership of the African Technological Policy Studies (ATPS) which developed the UNESCO training module.	<ul style="list-style-type: none"> At least one sub-regional workshop organized in Africa for training policy makers A large number of officials in charge of decision and policy making in various relevant sectors of S&T are trained in policy formulation 	Regional
	Regional Mapping of STI policy status in Africa	<p>The objective of this activity is to improve policy framework for science and technology through mapping of policy status in SSA.</p> <p>By going through this mapping exercise, countries collect statistical evidences on the state of the STI sector, so as to determine the opportunities, challenges and priorities to be addressed.</p>	<ul style="list-style-type: none"> Key information on national S&T system collected Key information of the policy framework for designing and implementing STI collected Analysis and recommendation on ways to improve STI policy framework developed. 	Regional
	Report on Regional Assessment of STI systems and Governance in Africa	There is need to provide experts, investors, planners, legislators, decision-makers and development actors a comprehensive overview of the continent status in SET system and its governance so as to highlight strengths and weaknesses and facilitate best practices sharing toward the improvement of existing systems. This report aims at addressing this need.		

Programme area	Title of Activity	Description	Expected Output	Participating Countries
Ecological Sciences/Man And Biosphere programme	Supporting AfriMAB capacity building and the development of regional action plan aligned with the Madrid Action Plan	Capacity development of AfriMAB is foreseen through regular meetings. AfriMAB will hold his biennial meeting in May 2010.	<ul style="list-style-type: none"> The objective of the meeting is to strengthen institutional and technical capacity of the network. A special emphasis will be given to sustainability issues and financial opportunities given by carbon trade market. 	At least the 24 countries of sub Saharan Africa with Biosphere reserves
	Building capacity of African countries to access carbon trade market	Although most of African countries have played an insignificant role in causing climate change effects, they pay a heavy tribute to it (drought, floods, landslides . . .), being the least equipped to adapt to potential effects of climate change. Africa's share of international carbon trade is very weak due to tenure insecurity, high transaction costs, governance and institutional capacity, but also lack of technical capacity to develop carbon trade market projects. This activity aims at contributing to the overcoming of the human capacity barriers to access carbon trade market in Africa.	<ul style="list-style-type: none"> Young experts trained in accessing carbon trade market and payment for ecosystems services. 	SSA countries
	Biosphere Reserves for sustainable development in Sub Saharan Africa	This activity will be the follow up of the AfriMAB meeting in May 2010. It will contribute to the implementation of the Madrid Action Plan for Africa.	AfriMAB network will be reinforced and will implement a regional plan of action in 10 selected Biosphere Reserves focusing in development of sustainable models	SSA countries
	Promoting networking for transboundary ecosystem management in East Africa	This activity will build on the cooperation which already exist within the East African Community to foster the transboundary management of natural resources and shared ecosystems.	A network of East African Countries sharing ecosystems will be set up and an action plan for its operationalization will be developed.	Tanzania, Kenya, Rwanda, Burundi and Uganda

Programme area	Title of Activity	Description	Expected Output	Participating Countries
Earth Sciences	Support for the study of geo hazards within the framework of the Geosciences Initiatives	Africa is impacted by a multitude of natural hazards and disasters; such as drought, flooding, landslides, volcanoes, and earthquakes. This activity will create awareness on geo-hazard among a large range of decision makers and focus group and will insure that geo hazards are taught in geology department at Universities.	<ul style="list-style-type: none"> The human resource capacity for geo hazard preparedness is increased and knowledge in geo hazard is improved. 	SSA countries
	Geo science Education Initiative in Africa	It is a fact that, despite its endowment in mineral resources, Geoscience is declining in Africa. This activity aims at revitalizing this sector through the implementation of Earth Science Education Initiative in Africa (ESEIA) launch in 2008. The objective of the initiative is to develop the next generation of earth scientists in Africa who are equipped with the necessary tools, networks and perspective to apply sound science to solving and benefiting from the challenges and opportunities of sustainable development.	<ul style="list-style-type: none"> Universities equipment will be enhanced Networking of geoscientists is strengthened Knowledge production by research activities and shared through a data base 	SSA countries

Programme area	Title of Activity	Description	Expected Output	Participating Countries
Water Science (Hydrology)	Climate change impacts on the hydrological cycle, and consequent impacts on water resources	<p>Support will be given to FRIEND and HELP networks in Africa to identify research priorities and to attend scientific fora including the international FRIEND conference to be held in Fez Morocco. Working group will be set up on the hydrological norms particularly in West and central Africa; Assistance will be given for the feasibility study for a FRIEND component on Congo basin. Training workshop on climate change impacts on water resources will be also held in partnership with UNESCO-IHE.</p> <p>Contribution will also be given in collaboration with HQ for the testing and validation of the drought monitor</p> <p>Assistance for the preparation and fund mobilization for the floods management project in west Africa</p>	<p>Scientists of the FRIEND and HELP networks supported to attend FRIEND and HELP international conferences</p> <p>Networks steering committees organized and research priorities identified and discussed</p> <p>Africa HELP coordination unit established</p> <p>Roadmap on the hydrological norms review produced by a group of experts</p> <p>Scientists trained on the methodologies of climate change impacts assessment</p> <p>Drought monitor tested and validated by at least two sub-regional centered in west and eastern Africa</p> <p>Support for the preparation of the project on floods management in West Africa</p>	Sub-Saharan Africa

Table 2 Summary List of Activities by Cluster/ National Offices

Name of responsible Office	Title of Activity	Description
ABUJA	Support for the Reform of Nigerian Science Innovation System	Organize 4 Stakeholders consultative meetings Collaborate with major stakeholders to organize Science Policy Advocacy workshop for Legislators, Academics from University/Research Institutes and STI Managers from relevant State/Federal Ministries Produce STI Workshop report
ABUJA	Enhancing Gender Mainstreaming in Science and Engineering Courses for increased participation of Female students in Nigeria	Identify and contact 12 selected Female Secondary schools (2 each from the 6 Geo-political zones of Nigeria) Develop and distribute audio-visual science teaching aid materials Organize awareness and sensitization workshop for students and science teachers on the role of S&T Evaluate the performance of students on major Science subject examinations (WASCE, NECO, JAMB, etc) Produce project final report
ABUJA	Capacity building of local people on climate change and management of their natural environment in the Niger Delta	Identify and contact beneficiaries (schools and local communities) and stakeholders Identify consultants to develop awareness and sensitization materials Organize training workshop for beneficiaries (selected local communities and schools)
ACCRA	Support for review, reform and capacity building on STI in the cluster countries with focus on post-conflict countries	The activity will support the review and/or formulation of STI policy in Liberia and Sierra Leone and to contribute to enhance the capacity of planners and decision makers for the formulation and implementation of STI policy. National institutions in charge STI will be involved and a consultation on the review and/or formulation of the policy and/or strategy will be supported.
ACCRA	Promotion for the prevention of hydro-hazard disasters in the cluster countries	This activity is a follow up to the activity initiated during the last biennium on that issue in partnership with AGRHYMET and ICHARM. Waiting for the funding of the project proposal, the office will support at least two countries in the sub-region for the review and/or preparation of strategy on hydro-hazard disaster management and also promote the use and adaptation of the regional rainy season seasonal forecast produced each year for the sub-region.
ACCRA	Support for the identification and characterization of biosphere reserve sites with a focus to transboundary and coastal sites and post-conflict countries	This activity started during the last biennium will continue for the post-conflict countries of the cluster. The national MAB committees will be supported to identify and characterize new potential sites for biosphere reserve with a priority to transboundary and/or coastal sites.

Name of responsible Office	Title of Activity	Description
ACCRA	Global change impacts on two biospheres reserves in the cluster	A research will be conducted in Bia and Tai biosphere reserves on the impact of climate variability and change. The link between the modifications observed and climate variability will be characterized. National MAB committees in close collaboration with the universities will undertake this activity. The findings will be shared and disseminated during workshops.
ACCRA	Climate change impacts on hydrological cycle, and consequent impact on water resources	National IHP committees will be supported to document the evidence of climate change and variability and its impacts on water resource. A national workshop for sharing and disseminating the findings will be organized
ACCRA	Managing water as a shared responsibility across geographical and social boundaries by promoting IWRM in the cluster countries	This activity started during the last biennium will consist to collect the remaining hydrogeological data and information within the Keta and Tano system in order to produce a global report for each system. ISARM focal points will be supported through the national IHP committees. For the Mono basin, stakeholders consultations will be supported for the adoption of IWRM and preparation of an Action Plan.
ADDIS ABABA	Operationalization of the STI policy in Ethiopia	Based on discussions with the MoST, training on Science Technology and Innovation Indicators (STI) will take place targeting the Ethiopian Academy of Science and other civil servants
ADDIS ABABA	Assessment and strengthening of the STI institutional and human resources capacity in Ethiopia and Djibouti	Contacts will be made with the Ministry of Science and Technology, the Office for central statistics and the Ministry of Education, and a consultant will be contracted to collect information so that a baseline of the institutional arrangements and human resources on S&T will be created.
ADDIS ABABA	Assessment of Potential Biosphere Sites in Ethiopia	Following a tripartite agreement between MoST, NABU and UNESCO, a number of sites have been identified to be assessed for their potential to become a BR in order to support sustainable development while preserving the environment
ADDIS ABABA	ISARM IGAD (Internationally Shared Aquifer Resources Management)	UNESCO has initiated its ISARM programme (Internationally Shared Aquifer Resources Management), in order to promote regional cooperation on shared natural resources and prepare an inventory of such resources. The activity will focus on the IGAD Member States and its expected outputs are: <ol style="list-style-type: none"> 1. To establish a network of experts and decision and a network-makers and Parliamentarians' network on transboundary aquifers at the Horn of Africa 2. To prepare a work plan for ISARM IGAD. 3. To prepare the first inventory of the TBA in IGAD

Name of responsible Office	Title of Activity	Description
BAMAKO	Burkina Faso, Mali and Niger transboundary aquifers case study	<p>Fresh water is a scarce resource in Bamako Cluster office countries specifically in the desert neighboring countries like Mali, Niger and Burkina Faso. Indeed, increasing access to freshwater is of prime priority as outlined in all these countries strategic Development plan Documents (CLIP or DSP). Unfortunately, data on groundwater, the component which can provide the major part of fresh water, are sometimes not available because the research was carried by many different data collectors and NGOs. In addition, aquifers like Ilimeden Aquifer system, are sometimes shared between many countries each having his own assessment method and his own data collection. Thus, the first step of promoting the use of that resource particularly when it comes from a transboundary aquifer will be a consolidation and harmonization of data from different sources.</p> <p>We have already carried a case study consisting in collecting data for transboundary aquifers in Mali in 2008. The actual activity is a continuation of this earlier study. It aims to collect data already existing on transboundary aquifers of Burkina Faso, Mali, Niger and Guinea and if possible, obtain a mapping system so as to get a more visibility in this field.</p>
BAMAKO	Support for a Transboundary Biosphere Reserve nomination in the protected area of Baïling Falémé between Guinea, Mali and Sénégal	<p>West African sub-Saharan countries are well known for their poverty, their fragile ecosystems and Madrid Action plan (2008) has targeted Transboundary Biosphere Reserves creation as a good strategy in promoting regional cooperation and sustainable Development based on natural resources conservation/management. In this context an international workshop was held in Bamako in February 2009 for TBR promotion in West Africa with emphasis on 02 protected areas: Baïling Falémé between Guinea, Mali and Senegal and Gourma-Sahel between Burkina Faso and Mali. A MOU has been signed between UNESCO Bamako cluster Office and the Ministry of Environment of Mali for a good follow up of the recommendations of the workshop. This activity was proposed in the framework of the follow up of these recommendations</p>
BAMAKO	2nd summer solar energy school for West African countries.	<p>Access to energy, a generally accepted indicator for overall socio-economic development of any country or region, is low in sub-Saharan Africa. For sustainable development, renewable energy technologies have demonstrated a growing potential to meet energy needs where conventional energy supply options have failed. However, in the field of solar energy, human resources, installation and maintenance issues specifically in rural areas have been really challenging for African countries. On another hand, UNESCO has a long term experience (more than 30 years) in organizing at Paris summer solar schools. A first solar school gathering participants from 7 west African countries in 2009 jointly organized by UNESCO, UEMOA and the Government of Mali has been a great success. The second school will capitalize recommendations from the first one and try to be more focused on practical skills awareness.</p>
BAMAKO	Support for women groups in small scale textile dyeing units in Bamako	<p>Dyeing on basin-textile using modern chemical compounds is a high income activity for Bamako women groups since 10 to 15 years. However these chemicals are not biodegradable and are sometimes toxic. The workers, mainly women, are not aware of the chemicals properties and don't use them properly regarding quality, quantities and the convenient process of dyeing technique. Indeed, there is a real need of training on optimization of the process, sensitization on danger for the workers' health and for environmental pollution. This activity aims at gathering around 50 to 100 women doing this activity on a pilot site were a pretreatment disposal of wastewater will be settled and training session on proper use of chemicals, self protection and environmental protection from pollution will be organized.</p>
DAKAR	Popularization and strengthening of Science Education	<p>AU and NEPAD has stressed the importance of building Africa's scientific and technological capacities as part of meeting the MDGs. Science and technology education play an important role in attaining this objective because it effectively contributes to the development of a country's economy, environment, social relations, and other sectors. African countries recognize this role and many have committed considerable resources to the development of science and technology and their educational systems. As the communiqués of several conferences on Science and Technology teaching in Africa show, there is an urgent need for the devising of suitable instructional materials and methods for improved science lessons delivery. In general, the very small number of research scientists and technologists in Africa contrast sharply with the relative large numbers in Europe and America. African countries have recognized the need to promote, develop, and sustain a relevant science and technology culture, which includes problem solving and indigenous aspects, in order to narrow the gap between them and industrialized countries. This activity aims to groom young people with knowledge and skills in the application of Science and Technology through popularization and strengthening of science education. The activity will target students from primary to secondary schools and will aim to bring out their best and exposing them to opportunities available for them in the areas of Science and Technology.</p>

Name of responsible Office	Title of Activity	Description
DAKAR	Raising awareness for preparedness and Mitigation of natural Disasters	As defined by OCHA, disaster preparedness are pre-disaster activities that are undertaken within the context of disaster risk management and are based on sound risk analysis. This includes the development/enhancement of an overall preparedness strategy, policy, institutional structure, warning and forecasting capabilities, and plans that define measures geared to helping at-risk communities safeguard their lives and assets by being alert to hazards and taking appropriate action in the face of an imminent threat or an actual disaster. In recent months, West African nations, including member states of Dakar cluster, have been severely hit by natural disasters such as floods and droughts. In most instances communities have difficulties in responding to disaster because of lack of awareness or understanding of the hazards they face. Therefore, this activity aims to conduct an awareness campaign throughout the cluster countries in the form of workshops, distribution of printed or digital material, showing of disaster movies or documentaries. This activity will target most vulnerable communities such rural communities, peri-urban communities, urban slums, and large river riparian dwellers. The activity will mainly focus natural disasters induced by flooding.
DAKAR	Study on Establishment of biosphere reserves in Cluster countries	According to the Africa's Science and technology CPA, Africa's biodiversity holds an enormous potential of transforming the continent's agricultural and industrial systems to contribute to economic growth and poverty reduction. The unique species of plants and animals as well as ecosystems constitute the continent's natural wealth. However, this diversity is underutilized and is being lost at alarming rates. Conserving and promoting sustainable use of biodiversity is one of the challenges that African countries have committed themselves to addressing. These reserves, if properly exploited, should contribute significantly to the development of the local communities, as well as the National Economy. In this process effective and appropriate management of these natural resources is cardinal. The establishment of Biosphere Reserves should facilitate the exploitation of natural resources cognizant of the need to ensure protection and sustainability of genetic resources. This activity aims to promote the creation of Biosphere Reserves in cluster countries, with view to educate local communities on the importance of Biosphere Reserves. Emphasis will be placed on identifying Transboundary Biosphere potential in the cluster. Target groups include local communities; stakeholders such as Chiefs, Fisheries Departments, Forestry Departments, Fishermen.
DAKAR	Managing groundwater systems' response to global changes	Groundwater is extremely important in Africa. According to the Africa Water Vision 2025, it is estimated that more than 75 percent of the African population uses groundwater as its main source of drinking water. Effects of Climate change on water resources are dictating needs to find innovative solutions for water resources management including aquifers. This activity is aimed at raising awareness and increasing knowledge on the effects of climate change on groundwater resources. It will also contribute to the knowledge of adapting to the impacts of global changes on river basins and aquifer systems. Managed Aquifer Recharge (MAR) is becoming a choice of solution for groundwater resources management for arid and semi-arid regions but the idea is new in Sub-Saharan Africa. A Regional workshop will be organized to engage the cluster countries in Managed Aquifer Recharge (MAR) implementation in cooperation with the UNESCO Chair in hydrogeology based at the University of Western Cape, Cape Town, South Africa. The proposed workshop will be aimed to provide a training opportunity that will contribute towards capacity building on the application of Managed Aquifer Recharge (MAR) principles for integrated management of water resources in cluster countries. It is aimed at:
DAKAR	Water Education for Communities, stakeholders and mass-media professionals.	<ul style="list-style-type: none"> • Water resources managers • Environment protection authorities • Water supply authorities • Health Commissions • Universities <p>As water scarcity becomes alarming with the effect of climate change and water is largely misused, there is a need for communities to develop skills for efficient water usage. As outlined in the Africa Water Vision 2025, attaining equitable and sustainable use of water for socio-economic development requires awareness, consensus-building, creating frameworks for integrated water resources management, and capacity building. This activity aims to organize awareness sessions for Water Use efficiency to increase stakeholders' knowledge base in managing water as a scarce resource. Target groups include:</p> <p>Local communities; Urban and rural populations; Mass media professionals; Water relation institutions NGOs</p>

Name of responsible Office	Title of Activity	Description
DAR ES SALAAM	Strengthening science, technology and innovation systems and networks of knowledge production	In view of the strategic importance of the Dar es Salaam cluster office in the service of 4 small island developing states (SIDS), the activity to be undertaken in the biennium would focus on the strengthening of the science systems and networks of knowledge on these islands. For example, the office will assist the Seychelles to produce a functional science policy document following the draft of a policy document early 2009. This hopefully would place Seychelles in a position to utilize science to enhance economic recovery and growth in the coming years.
DAR ES SALAAM	Renewable energies for sustainable national development in Small Island development (SIDS)	UNESCO Dar es Salaam will this biennium continue with the response to the request from the Mauritius for assistance for strengthening the use of renewable energies on the island. In view of this the Office will undertake an activity to enhance the utilization of renewable energies as part of national strategy for climate change adaptation on the island of Rodrigues in the Mauritius.
DAR ES SALAAM	Enhancing the role of biosphere reserves in national strategies for climate change adaptation	Natural Sciences Sector will support the participation of member states in the AfriMAB meeting that will be held in Madagascar and will also carry out further climate change impact coping strategies studies for at least two of the islands including the Comoros and Zanzibar. These studies will contribute towards the strengthening of national plans for climate change adaptation and would be carried out utilizing existing biosphere reserves as learning laboratories or similar nature reserves where there are no biosphere reserves to be used for the studies.
DAR ES SALAAM	Capacity development for improved management of fresh water resources for sustainable development.	With the impact of climate change becoming clearer there is a need to enhance further the knowledge and technical capacities of urban water systems managers especially on the Indian Ocean Islands using the Integrated Water Resources Management Approach for sustainable management of fresh water resources which will include how to organize to respond to climate change impacts on the resources. Focus will be on Madagascar, Comoros and Zanzibar.
HARARE	Capacity building in science, technology and innovation policy	<p>The overall goals of the AU/NEPAD consolidated plan are:</p> <p>a) To enable Africa to harness and apply science, technology and related innovations to eradicate poverty and achieve sustainable development; and</p> <p>b) To ensure that Africa contributes to the global pool of scientific knowledge and technological innovations</p> <p>It is this vision that underpins this activity that will be implemented within the framework of the Joint UNESCO-SADC implementation strategy and will focus on policy training for senior officials in the cluster countries.</p>
HARARE	Study on Establishment of Biosphere Reserves Cluster Countries	This activity aims to promote the creation of Biosphere Reserves in cluster countries, with view to educate local communities on the importance of Biosphere Reserves. Emphasis will be placed on the Transboundary Biosphere activity undertaken between Zambia and Zimbabwe.
KINSHASA	Support for the participation of DRC in the Albertine Rift centre of excellence for biodiversity and natural resources management.	Democratic republic of Congo lies in the Albertine Rift valley, and for this Biennium UNESCO will facilitate the country participation to the process of creation of the Albertine Rift Centre of Excellence for biodiversity and natural resources management.
LIBREVILLE	Support to the implementation of Madrid Action Plan in Libreville Cluster office countries	This activity will result in the establishment of an interim MAB National Committee and development of a National Action Plan for the implementation of the Madrid Action Plan at country level. Information Materials will also be produced.

Name of responsible Office	Title of Activity	Description
NAIROBI	Support the creation in Rwanda of Albertine Rift regional centre of excellence for biodiversity and natural resources management	UNESCO will support Rwanda to create an enabling environment for the creation of the Albertine Rift Centre of excellence for Biodiversity. UNESCO will also support Rwanda's advocacy strategy towards the five other Albertine Rift countries (Burundi, Democratic republic of Congo, Tanzania, Uganda and Zambia) to have their agreement and total commitment and facilitate mobilization of financial and scientific resources for the creation of the Centre Excellence.
NAIROBI	Support the implementation of Madrid Action Plan in Rwanda	UNESCO will technically support the development of the action plan and will contribute to its implementation. To illustrate the relevance of MAB principles, funds will be requested to implement priority activities of the MAB action plan for Rwanda. These activities will be included in the One UN workplans for 2010 and 2011. The nomination of new sites as well as rehabilitation of degraded areas is foreseen.
NAIROBI	Supporting community led sustainable management of Mt. Kulal biosphere reserve	Based on the last four years of work, a project document was developed in 2009 that will be used to raise financial support in order to achieve a sustainable use of the BR through a community led management. This activity is a joint activity with the Culture Unit in the Nairobi office.
NAIROBI	Research and assessment of urban groundwater vulnerability	The activity will consist of selected urban areas to map the different sources of potential pollution for groundwater with a particular focus on the recharge areas. The water quality of at some critical points will be characterized. The mapping of potential pollution sources and the water quality identified will be analyzed in order to present approach for the monitoring of groundwater pollution in cities. A partnership will be established with key stakeholders in each selected urban area. The activity will be implemented in close collaboration with national IHP committees, universities and key stakeholders in the different countries.
NAIROBI	Technical Assistance to member States for STI Policy and legislation	This activity aims at improving the outcomes of policy-making and legislation on STI related issues in the sub-region through targeted technical assistance.
NAIROBI	Sub-Regional Assessment of biofuel science and technological development.	Liquid biofuel has attracted increasing attention from public and private investors in recent years due to volatility of oil prices and threats on its long term availability, as well as growing pressure for economies to adopt cleaner energy options. African governments are pressed to plan and develop strategies that will address options related to the development of biofuels. Unfortunately, existing information is scarce and fragmented. This activity will address this challenge by conducting an assessment of science and technology capabilities for the development of biofuel in a sustainable manner in the sub-region.
WINDHOEK	Support to implementation of STI policies in cluster countries	In the framework of the 2010 SADC-UNESCO joint programme regarding Capacity building on science, technology and innovation policy, policy training activities for senior officials in the region will be conducted. Complementary, UNESCO will continue its support to Swaziland in the process of drafting a National Science, Technology and Innovation Policy document. The first Namibian STI statistics survey will be supported through Technical Advice.
WINDHOEK	Promoting Women in Science and Engineering in cluster countries	A meeting of the different networks working in "Women in Science and Engineering" issues in the cluster countries will be organized, in collaboration with SADC and WEGSA, in order to draw a roadmap for the cluster. Concurrently, an agreement with universities in Namibia will be established for women scientists and engineers to visit schools in peripheral regions of Namibia, in order to present role models of successful women scientists and engineers to girls, parents and elders.

Name of responsible Office	Title of Activity	Description
WINDHOEK	Managing water as a shared responsibility across geographical and social boundaries	<p>This activity in support of ISARM-SADC is a continuation of the one started during the last biennium.</p> <p>During 2009 a Project Concept Note was prepared for 2 pilot areas to establish a comprehensive strategy and mechanisms for the management of transboundary groundwater.</p> <p>A meeting with all partners that agreed to take part in the project will be organized in early 2010 to kick start the activities. In its first phase, UNESCO will also support a component on the establishment of a harmonized information system in cooperation with IGRAC (TBC).</p> <p>Complementary, the UNESCO Chair for Geohydrology will be supported to produce a "position paper" on Transboundary Aquifers in SADC. This report will provide evidence-based guidance for future activities of ISARM-SADC, and the basin management committees.</p>
WINDHOEK	Framework Programme for Research Education and Training in Water (FET Water)	<p>FET Water, the Framework Programme for Research, Education and Training in Water (www.fetwater.co.za), is carried out with financial support from the FUST (Flemish UNESCO Trust Funds for Science), and the South African Government. FET Water addresses the needs of practitioners in the South African water sector, through effective cooperation between universities, government departments, research institutions and the public and private sector. The second phase of the programme will finish in 2010. The third phase, under development, will include specific outreach activities to Namibia, Lesotho and Swaziland.</p>
WINDHOEK	Water education for communities, stakeholders and mass-media professionals	<p>In Swaziland, capacity building activities will be carried out based on the training needs assessment conducted in late 2009 with the support of UNESCO.</p> <p>In Lesotho, a Training Needs Assessment will be conducted.</p>
WINDHOEK	Research and Policy at identified BRs for Angola	<p>UNESCO will support further actions necessary within the process of nominating the Iona National Park area as a Biosphere Reserve, including the preparation of the nomination for the Iona Biosphere Reserve in Angola.</p>
YAOUNDE	Strengthen education and research in science and technology for girls/women.	<p>In partnership with the UNESCO Institute of Statistics (UIS) specialists in the region, the activity will support identification of exact figures for enrolment in science and engineering, particularly access and retention of women. The polytechnic institute and ministry of science will be supported to determine a strategy to attract more women in engineering.</p> <p>In cooperation with the education sector, the activity will also support secondary science education for girls, in particular in the Millennium Village (MV) clusters that are part of the Joint Programme of the UN system.</p>
YAOUNDE	Support for implementation of the Madrid Action Plan in the cluster	<p>Initiatives will be supported to integrate communities with the BR, particularly those involved with the two Millennium Villages situated adjacent to Waza and Dja BR, where activities promoting resource conservation and supporting environmental education and awareness will be supported. This will continue the 2009 activity that has trained 30 indigenous women trainers from northern Cameroon (adjacent to Waza) in construction of fuel-efficient mudstoves and manufacturing of fuelless cooker bags.</p>
YAOUNDE	Support to water management in Cameroon and Chad	<p>This activity was initiated during the last biennium and will continue during this biennium by supporting communities in the government/UN Millennium Villages project in Cameroon to build capacity for sustainable water management</p>

Name of responsible Office	Title of Activity	Description
YAOUNDE	Support for water research and protection of vulnerable water resources	<p>The activity will support a minimum of 5 hydrology research projects in the Central African Republic and Cameroun, undertaken by hydrologists or hydrology students. At least half the projects will be undertaken by women.</p> <p>The water quality Chair in Bangui will be supported to build its capacity and liaise with other chairs and universities, and participate in at least one international hydrology activity.</p> <p>A minimum of 5 women students in the cluster will be supported to identify appropriate postgraduate programmes in hydrology with potential scholarships and prepare candidatures. At least 2 should obtain a scholarship.</p>