



United Nations
Educational, Scientific and
Cultural Organization

Natural
Sciences
Sector

NATURAL SCIENCES SECTOR 2020 ANNUAL REPORT

UNESCO REGIONAL OFFICE FOR EASTERN AFRICA



UNESCO

Science for
Sustainable
Development in Africa

Table of Contents

| | |
|--|----|
| List of abbreviations | iv |
| Executive Summary | vi |
| 1. Background and Introduction | 1 |
| 2. Science Policy and Capacity Building | 2 |
| 2.1 Science Technology and Innovation | 2 |
| 2.1.1 Development of a Regional Science, Technology and Innovation Database for evidenced-based policies in Eastern Africa..... | 2 |
| 2.1.2 Towards a UNESCO support strategy for STI Investments in Eastern Africa..... | 3 |
| 2.1.3 UNESCO signs Letter of Intent with NACOSTI and ACTS for Collaboration in Science, Technology and Innovation | 4 |
| 2.1.4 Strengthening STI systems and governance structures in South Sudan..... | 7 |
| 2.2 Basic and Engineering Sciences | 8 |
| 2.2.1 UNESCO-Huawei Partnership Fosters Training on Artificial Intelligence Programming in Eastern Africa | 8 |
| 2.2.2 UNESCO-Huawei Partnership Training for TVET Teachers in routing/ switching and network security for Kenya (21 Sep - 02 Oct 2020)..... | 9 |
| 2.2.3 UNESCO is working with Huawei Ethiopia to organize virtual AI training..... | 9 |
| 2.2.4 Supporting continuing science education and learning in the advent of COVID-19..... | 9 |
| 2.3 Women in Science and STEM | 10 |
| 2.3.1 Supporting Governments to keep students connected to STEM education through digital mentorship programme in the face of COVID-19 | 10 |
| 2.4 Local and Indigenous Knowledge System and SIDS | 11 |
| 2.4.1 Fostering climate change adaptation through SANDWATCH | 11 |
| 2.4.2 Prepared a concept paper on “Restoration of Mangroves following MV Wakashio oil spill in July 2020 | 12 |
| 2.5 Lessons Learnt | 12 |
| 2.6 Challenges | 12 |
| 2.7 Opportunities | 13 |
| 3. Ecology & Earth Sciences - MAB - IGPP-DRR | 14 |
| 3.1 Man and Biosphere Programme | 14 |
| 3.1.1 Biosphere Reserve Nominations: Comoros, Rwanda, Mauritius and South Sudan | 14 |
| 3.1.2 Webinar on Biodiversity and Preventing Future Pandemics in Africa | 15 |

| | |
|---|----|
| 3.1.3 Policy guidelines on biodiversity conservation to prevent future pandemics .. | 16 |
| 3.1.4 Biodiversity Conservation and Sustainable Natural Resource Management for Integrated Community Development in National Parks of Madagascar – (BIOCOM) | 16 |
| 3.1.5 Advocacy for the conservation of endangered species (Mountain Gorillas) from pandemics at Great Virunga landscape..... | 17 |
| 3.1.6 Development of a Training Manual on Environmental Communication for Science Journalists in Africa | 18 |
| 3.1.7 Webinar on the COVID-19 Pandemic and Lessons for Science Journalism in Africa | 19 |
| 3.1.8 Nomination of the Sudd Wetland as Biosphere Reserve under UNESCO Man and Biosphere Reserves | 19 |
| 3.2 Geology | 20 |
| 3.2.1 Development of educational curriculum and policy guidelines on Artisanal and Small-Scale Mining for formal and non-formal education in Eastern Africa in partnership with AMDC and Inter-University Council for East Africa – A team of consultant from East Africa and British Columbia University of Canada | 20 |
| 3.2.2 First International Conference on GEOPARKS | 21 |
| 3.3 Disaster Risk Reduction | 21 |
| 3.3.1 Strengthening Disaster Prevention Approaches in Eastern Africa | 21 |
| 3.3.2 Know DRR – A Smart Phone application to import education and awareness on Disaster Risk Reduction. Through application the concept of DRR and the full disaster management cycle: prevention, mitigation and preparedness to response, recovery and rehabilitation to educate school children on DRR | 22 |
| 3.3.3 Project launch: “Strengthening Disaster Prevention Approaches in Eastern Africa”..... | 23 |
| 3.3.4 Ghana quiz competition to celebrate the 2020 International Day for Disaster Risk Reduction (IDDRR) | 23 |
| 3.3.5 Webinar on Youth engagement on COVID-19 for ‘the Africa We Want’ | 24 |
| 3.3.6 Survey on Youth Engagement on COVID-19 for the Africa We Want | 25 |
| 3.4 Lessons Learnt | 25 |
| 3.5 Challenges | 26 |
| 3.6 Opportunities | 26 |
| 4. Water Sciences – IHP | 27 |
| 4.1 UNESCO Nairobi office provides Regional Coordination Function for Africa under IHP | 27 |
| 4.2 Turkana Water Security Project – working with county Government and other NGO in developing capacity of the local community in managing the water resources – Funded project under FIT agreement with Government of Slovakia..... | 27 |

| | |
|---|----|
| 4.3 Worked jointly with UNDP Kenya in developing a proposal for Hydrological, Geological and Socio-Economic study of the Kenya Rift Valley Lakes..... | 28 |
| 4.4 UN Strategic Partnership for Water Security in the ASAL counties of Kenya – UNESCO as a co-lead has been instrumental in developing the project on Rapid Assessment of Water Resources in Arid and Semi-Arid Counties (ASAL) of Kenya. | 29 |
| 4.5 Development of a training manual on Water-Food-Energy nexus exclusively for Africa in collaboration with GIZ | 30 |
| 4.6 Groundwater (Hydrogeology) Map of Africa..... | 30 |
| 4.7 Working with Kenyan National Academy of Sciences on a research project on the effectiveness of a water hyacinth bio-filtration wetland system in wastewater treatment | 31 |
| 4.8 Working with IGAD to prepare a proposal for transboundary aquifer mapping for member countries through the Global Environment Facility (GEF) funding in partnership with Executing Agency accredited by GEF | 31 |
| 4.9 UNESCO and China Institute of Water Resources and Hydropower Research (IWHR) developed learning materials for Water Education for Schools in Chinese and currently being translated into English for the benefit of African countries | 31 |
| 4.10 Catalysing Sustainable Water Security in Africa through new technology and Innovation for three REC-specific comprehensive and detailed policy reports | 32 |
| 4.11 Africa Regional Web Launch of the World Water Development Report 2020 | 33 |
| 4.12 Youth and Water Security for Africa | 34 |
| 4.13 UNESCO and partners train African young professionals on scientific writing | 34 |
| 4.14 UNESCO is supporting AMCOW to set up a Youth Network for Water and Sanitation in Africa | 35 |
| 4.15 Pilot Project on Nature-based flood adaptation measures in informal settlements, Mpazi Sub-Catchment, City of Kigali (CoK), Rwanda | 35 |
| 4.16 Lessons Learnt | 35 |
| 4.17 Challenges | 35 |
| 4.18 Opportunities | 36 |
| Sector Staff | 40 |

List of abbreviations

| | |
|----------|--|
| ACTS | African Centre for Technology Studies |
| AI | Artificial Intelligence |
| ANSTI | African Network of Scientific and Technological Institutions |
| ASAL | Arid and Semi-Arid Lands |
| ASM | Artisanal and Small-scale Mining |
| ASTII | African Science Technology and Innovation Indicators |
| ATPS | African Technology Policy Studies Network |
| AUC | African Union Commission |
| AUC-AMDC | African Union Commission- Africa Minerals Development Centre |
| AYAB | African Youth Advisory Board |
| BR | Biosphere Reserve |
| CoEB | Centre of Excellence in Biodiversity and Natural Resource Management |
| CRIDA | Climate Risk Informed Decision Analysis |
| DRR | Disaster Risk Reduction |
| GAYO | Green Africa Youth Organization |
| GEF | Global Environment Facility |
| GO-SPIN | Global Observatory of Science, Technology and Innovation Policy Instrument |
| GVTC | Greater Virunga Transboundary Collaboration |
| EAC | East Africa Community |
| EASTECO | East African Science and Technology Commission |
| EES | Ecological and Earth Sciences |
| FAO | Food and Agricultural Organization |
| GIZ | Deutsche Gesellschaft für Internationale Zusammenarbeit GmbH |
| IBSP | International Basic Sciences Programme |
| ICC | International Co-ordinating Council |
| ICT | Information and Communications Technology |
| IDDRR | International Day for Disaster Risk Reduction |
| IGAD | Intergovernmental Authority on Development |
| IGCP | International Gorilla Conservation Programme |
| IGGP | International Geoscience and Geoparks Programme |

| | |
|---------|--|
| IHP | Intergovernmental Hydrological Programme |
| IOC | Intergovernmental Oceanographic Commission |
| ISC ROA | International Science Council Regional Office for Africa |
| ISP | International Science Programmes |
| IWHR | Institute of Water Resources and Hydropower Research |
| KOICA | Korean International Cooperation Agency |
| MAB | Man and Biosphere |
| NACOSTI | National Commission for Science, Technology and Innovation |
| NAPSTI | National Policy Platform on Science, Technology and Innovation |
| NWBL | Non-formal Work-Based Learning |
| PCB | Policy and Capacity Building |
| SC | Science |
| SFDRR | Sendai Framework for Disaster Risk Reduction |
| SHS | Social and Human Sciences |
| STEM | Science, Technology, Engineering and Mathematics |
| STI | Science, Technology and Innovation |
| TVET | Technical and Vocational Education and Training |
| UNDAF | United Nations Development Assistance Framework |
| UNDRR | United Nations Office for Disaster Risk Reduction |
| UNDP | United Nations Development Programme |
| UNESCO | United Nations Educational, Scientific and Cultural Organization |
| UNICEF | United Nations Children's Fund |
| UNOPS | United Nations Office for Project Services |
| UIS | UNESCO Institute for Statistics |
| UNECA | United Nations Economic Commission for Africa |
| UNRC | United Nations Resident Coordinator |
| USAID | United States Agency for International Development |
| WASH | Water, Sanitation and Hygiene |
| WHO | World Health Organization |
| WWAP | World Water Assessment Programme |
| WWDR | World Water Development Report |

Executive Summary

The year 2020 has undoubtedly left a lasting mark on recent human history. The COVID-19 pandemic presented Africa with unprecedented challenges, requiring us to confront with creating and adapting to new ways of working and living our lives that we have never experienced before.

Africa's Agenda 2063 in line with the United Nations (UN) Sustainable Development Goals seeks to combat water scarcity, climate change, destruction of natural resources, biodiversity loss, food insecurity, natural hazard and disasters, rising human population etc. To address all these challenges in Africa, activities have been designed and implemented by covering diverse fields: freshwater resource management, geodiversity conservation, natural disaster reduction, capacity building in science, technology and innovation (STI) and Science, Technology, Engineering and Mathematics (STEM) Education. The implementation of activities is supported by the mobilization of resources and effective partnership with our extensive national and international networks.

In this report, we highlight significant results, lessons learnt, challenges and opportunities emanating from activities implemented between 2019 and 2020. Some of the results obtained from these activities include: A GO-SPIN training was conducted for STI stakeholders in Kenya for the establishment of STI baselines that support the development and implementation of evidence-based policies; an online training course on artificial intelligence for university faculty members in Eastern Africa; digital mentorship of students on STEM education in the face of COVID-19 and engaging them in discussions through the UNESCO ASK A STEM MENTOR PLATFORM; development of educational curriculum and policy guidelines on artisanal and small-scale mining for formal and non-formal education in Eastern Africa; development of Know DRR – a smart phone application to import education and awareness on disaster risk reduction; development of learning materials for water education for schools in Chinese to be translated into English. The greatest challenge experienced was the outbreak of the COVID-19 pandemic that grounded many activities and forced a shift in the way things are conducted. The lesson learnt is that flexibility and adaptability is key when designing projects.

1. Background and Introduction

The Natural Science Sector of the UNESCO Regional Office in Nairobi serves as a Multi-Sectoral Regional Office responsible for 13 Member States in Eastern Africa and the adjacent Indian Ocean Islands. Countries covered include: Comoros, Djibouti, Ethiopia, Eritrea, Kenya, Madagascar, Mauritius, Rwanda, Seychelles, Tanzania, Somalia, South Sudan and Uganda. The Sector design and implements its activities in relation to the International Science Programmes (ISP) of UNESCO: Intergovernmental Hydrological Programme (IHP); Man and the Biosphere Programme (MAB); International Geoscience and Geoparks Programme (IGGP); and International Basic Sciences Programme (IBSP). For activities pertaining to IHP; Ecological and Earth Sciences; and Disaster Risk Reduction, this office has a coordination role for all sub-Saharan African countries with other Regional Offices. The Science Policy and Capacity Building programme caters for its regional countries in addition to handling the African Network of Scientific and Technological Institutions (ANSTI).

In 2020, a number of activities were conducted to spearhead the advances and application of science in confronting development challenges in Eastern Africa. The following are the cluster of activities implemented by the office under the ISP.

- Science Policy and Capacity Building (IBSP)
- Ecological and Earth Sciences (MAB and IGGP)
- Water Science (IHP)

The objective of this report is to highlight key achievements and lessons learnt from the activities implemented in 2020.

2. Science Policy and Capacity Building

2.1 Science Technology and Innovation

2.1.1 Development of a Regional Science, Technology and Innovation Database for evidenced-based policies in Eastern Africa

EASTECO in collaboration with key stakeholders including UNESCO developed the EAC Regional STI Policy for adoption by Member States. However, the lack of reliable up-to-date data and indicators on the current status of STI at the country-level may hamper the realisation of the policy's objectives and expected outcomes. The establishment of national and regional STI baselines that enable the monitoring of STI indicators and the support for learning and policy decisions at multiple scales is the mainstream opportunity. UNESCO's GO-SPIN methodology offers the platform to address these gaps.



In relation to this:

(a) Kenyan Stakeholders receive training on UNESCO's Global Observatory of Science, Technology and Innovation Policy Instruments (GO-SPIN). The virtual training was held from 28 September to 2 October 2020, to support the establishment of STI baselines and the development and implementation of evidence-based policies and investment plans. The training was jointly organized by UNESCO and the National Commission for Science, Technology and Innovation (NACOSTI) of Kenya. Similar trainings are planned for Uganda, South Sudan and Tanzania for the 2020-2021 biennium.



<https://en.unesco.org/news/kenyan-stakeholders-receive-training-unescos-global-observatory-science-technology-and>

(b) A concept note was developed in collaboration with UNESCO Institute for Statistics (UIS) for the establishment of STI baselines covering 13 Eastern African countries to support evidence-based policy decisions. The study focuses on three thematic areas: Investments and human capital for STI, STI infrastructure, and STI frameworks and governance. Within each thematic area, a few sub components are considered.

(c) Stakeholder mapping completed for the establishment of a National Policy Platform on Science, Technology and Innovation (NAPSTI) for STI database management and policy dialogue

Given the cross-sectoral nature of STI and a multitude of development actors emerging in the field, maximizing the impacts of STI on economic transformation and sustainable

development of African countries would require an inter-disciplinary approach. There will be the need to transform the ways by which the different STI stakeholders (researchers, policymakers, civil society, NGOs, the private sector etc.) interact to properly develop, package and apply technological innovations and solutions that are viable for addressing development challenges. Arguably, the coordination, communication and exchange of information on STI among stakeholders has been very weak due to the lack of appropriate strategies to establish a fruitful dialogue between researchers (producers of STI knowledge) and decision-makers. Very often, the lack of spaces for meetings between stakeholders, or the adequate instruments for disseminating research results do not allow "uninitiated people" to have a quick access and clear understanding to use them.

To address this problem, establishment of a multi-stakeholder STI-policy dialogue platform is considered an opportunity to improve interaction among stakeholders to foster the development and strengthening of STI policies and investment plans that benefit all sectors. As a multi-stakeholder platform, they represent the larger socioecological system and innovation ecosystem of any country. The establishment of such networks of STI stakeholders is already captured in the adopted 10-year Science, Technology and Innovation Strategy for Africa (STISA-2024) as one mainstream for achieving thematic areas of the strategy. African Union Heads of State and Government have called for all the African Scientific and Technical community, (researchers, development partners, academics, engineers and other innovators) from the continent and the Diaspora, to mobilize into networks for joint actions that foster the realization of the goals of STISA-2014. The Commissioner for Human Resources, Science & Technology of the Africa Union Commission has also stressed the need to forge strong partnerships, driven by African shared values and policy objectives to deliver impact on the ground.

In Kenya, the National Commission for Science, Technology and Innovation (NACOSTI) conducted a comprehensive institutional mapping towards the establishment of NAPSTI. The composition of NAPSTI is still being discussed for finalization and institutionalization within NACOSTI. Similar activities are on-going in Uganda and Tanzania.

2.1.2 Towards a UNESCO support strategy for STI Investments in Eastern Africa

The AU Agenda 2063 and STISA-2024 emphasizes that Africa's sustained growth, competitiveness and economic transformation requires sustained investment in new technologies and continuous innovation in areas such as agriculture, clean energy, education and health. Presently, STI receives limited investments in Africa. Recent statistics from UNESCO and African Science Technology and Innovation Indicators (ASTII) show that the current level of investment in R&D by Africa as a continent (of which more than half is internationally funded) puts Africa at a strategic disadvantage. The African Development Bank recommends the need for Sub-Saharan Africa to increase its current 0.41% share of gross domestic product (GDP) devoted to STI, by a whopping 400%, if it is to catch up with the 1.7% global average. Most STI activities are not sustainable as they are over reliant on short-term project funding often linked to events such as workshops and consultancies. The relative lack of weight of STI policies among mainstream public policies, further hinders the abilities to stimulate STI and direct it towards national development. By and large, this reflects the gap in achieving the 1% of GDP target agreed by AU Member States as desired minimum expenditure on R&D. To address this:

(a) The UNESCO Office in Nairobi is working with the African Centre for Technology Studies (ACTS) for a comprehensive analysis of the enabling Institutions, Policies and Financial Mechanisms for STI in Eastern Africa. The exploratory study should contribute to understanding:

- the status of STI investments in the beneficiary countries.
- the state of STEM education and human resource capacity in STI.
- the digital readiness and ICT usage in the beneficiary countries.
- the national capabilities on the collection of STI indicators and the STI measuring and monitoring landscape.
- the availability of centres of excellence, digital innovation hubs and technology parks to drive innovation.
- the characteristics of national/regional innovation systems and enabling institutions for STI.
- the legal frameworks, STI development initiatives and STI supporting policies; and the challenges and opportunities for accelerating digital & technology scale up and support the development of a portfolio of science, technology and innovation catalytic programmes.

(b) A concept note has been developed in collaboration with African Technology Policy Studies Network (ATPS) and UNESCO Social and Human Sciences (SHS) sector to



analyse the Opportunities and Challenges for Youth Empowerment and Transformative Change through Science, Technology and Innovation.

This will enable the mainstreaming of youth considerations into the development of STI investment plans. The premise of this study underpins Axis 2 of the UNESCO Operational Strategy on Youth (2014-2021). The underlying

theory of change is that by deploying a portfolio of STI-based interventions for the youth through proper understanding of the STI policy and institutional landscape, the youth in the region will be adequately empowered in skills for employability, productivity, and sustained transformative change that improve their livelihoods.

2.1.3 UNESCO signs Letter of Intent with NACOSTI and ACTS for Collaboration in Science, Technology and Innovation

UNESCO Office for Eastern Africa, NACOSTI and ACTS recognise that the achievement of the United Nations Sustainable Development Goals (the “SDGs”) requires a concerted alliance between inter-governmental organisations, governments, non-governmental organisations and private sector entities. UNESCO, NACOSTI and ACTS wish to combine forces and actively collaborate, so that each party brings its particular competencies and skills to contribute, in an effective manner, to the achievement of the SDGs.

Over the years, UNESCO has provided Eastern African countries (EAC) with guidance in developing or revising their national STI policies; promoting the development of science governance structures and mechanisms; and fostering closer linkages between Technical

and Vocational Education and Training (TVET), universities and industry within its longstanding University–Industry Partnerships programme and through the African Network of Scientific and Technological Institutions (ANSTI) which was established in 1980 to facilitate the active collaboration among African Scientific Institutions for the purpose of training and research in science, engineering and technology. UNESCO has also supported Ministries of Education, Science and Technology in developing Science, Technology, Engineering and Mathematics (STEM) programs to empower and enhance girls’ participation in STEM education programs. Via the UNESCO Institute for Statistics, the organization also accompanies developing countries desirous to measure their level of investment in STI in terms of both human and financial resources. Every five years, the UNESCO Science Report monitors the status of the support system for STI around the world and analyses emerging trends. Moreover, UNESCO’s GO-SPIN published a series of country profiles as a precursor to the establishment of an international, open access database that will enable countries to monitor and evaluate their innovation ‘ecosystems’ and compare best practices.



The Government of Kenya established NACOSTI to assure quality in the research, science, technology and innovation sector through regulation, coordination, promotion and provision of advisory services. This is in line with efforts to contribute to realization of the Kenya Vision 2030, the Big Four Agenda and other national development goals, which aspires to transform Kenya into a globally competitive, newly industrialized, middle income country founded on a strong foundation on Science and Technology and Innovation with Research playing a key role in generating critical mass of technical and skilled human resource.

As a successor to the National Council for Science and Technology, NACOSTI has provided leadership in the STI sector through development of the National Research Priorities (2018-2022) to guide local and international researchers, universities and research institutions on the research areas which are aligned to the national development agenda. The Commission has also been working jointly with the Ministry of Education, UNESCO and other public and private agencies to enhance provision of STEM education with the aim of addressing gender disparities and inequalities which are skewed against girls. NACOSTI serves as a focal point for numerous international conventions and protocols related to STI such as the Africa Regional Cooperative Agreement for Research, Development and Training related to Nuclear Science and Technology (AFRA), Comprehensive Nuclear-Test Ban Treaty Organization (CBTO) and International Centre for Genetic Engineering and Biotechnology (ICGEB) among others. Further, the Commission

As a successor to the National Council for Science and Technology, NACOSTI has provided leadership in the STI sector through development of the National Research Priorities (2018-2022) to guide local and international researchers, universities and research institutions on the research areas which are aligned to the national development agenda. The Commission has also been working jointly with the Ministry of Education, UNESCO and other public and private agencies to enhance provision of STEM education with the aim of addressing gender disparities and inequalities which are skewed against girls. NACOSTI serves as a focal point for numerous international conventions and protocols related to STI such as the Africa Regional Cooperative Agreement for Research, Development and Training related to Nuclear Science and Technology (AFRA), Comprehensive Nuclear-Test Ban Treaty Organization (CBTO) and International Centre for Genetic Engineering and Biotechnology (ICGEB) among others. Further, the Commission

As a successor to the National Council for Science and Technology, NACOSTI has provided leadership in the STI sector through development of the National Research Priorities (2018-2022) to guide local and international researchers, universities and research institutions on the research areas which are aligned to the national development agenda. The Commission has also been working jointly with the Ministry of Education, UNESCO and other public and private agencies to enhance provision of STEM education with the aim of addressing gender disparities and inequalities which are skewed against girls. NACOSTI serves as a focal point for numerous international conventions and protocols related to STI such as the Africa Regional Cooperative Agreement for Research, Development and Training related to Nuclear Science and Technology (AFRA), Comprehensive Nuclear-Test Ban Treaty Organization (CBTO) and International Centre for Genetic Engineering and Biotechnology (ICGEB) among others. Further, the Commission



registers and accredits research institutions and Institutional Ethics Review Committees (IRECs) across the country to uphold ethical standards in research and innovations.

ACTS is an intergovernmental organization founded in 1988 to pursue policy-oriented research towards strengthening the capacity of African countries and institutions to harness science and technology for sustainable development. It is a pioneering development research think tank on harnessing applications of science, technology and innovation policies for sustainable development in Africa. Since its founding, ACTS has been instrumental in enlarging the range of policy choices for sustainable development in Africa. For example, ACTS' work influenced patent industrial property legislation and policy (Kenya); environmental impact assessment standards (Eastern and Southern Africa); bio-energy and biofuels policy (Eastern and West Africa); agricultural policy, bio-diplomacy, biotechnology and biosafety (Africa-wide); and climate change adaptation and mitigation (Africa-wide). ACTS was the first to organize an international conference to discuss options that African countries could adopt to mitigate the impact of climate change and also played a major role in the negotiation for the Convention on Biological Diversity. For these and other achievements, ACTS has earned top ratings among the Environment Think Tanks in Africa and the world. In 2016, ACTS was rated (by the Intergovernmental Panel on Climate Change) among the top three most influential think tanks on Climate Change globally, and number one in Africa.

Following discussions held between the Natural Science Sector Team of the UNESCO Field Office in Nairobi and the senior leadership of NACOSTI and ACTS around a possible collaboration on advancing the use and application of science, technology and innovation in Kenya's sustainable development agenda, this Letter of Intent highlights the opportunities to be explored by the Parties. The letter of intent came into effect on 20 November 2020.

The Parties have identified the following areas as initial priorities to build a strong partnership:

- Collaborate in establishing national STI baselines and database platform.
- Promote capacity building on STI indicators and development of STI policy instruments.
- Collaborate in the development of national STI policies, STI Priority activities, and investment plans.
- Coordinate the establishment and sustenance of a National Policy Platform on STI (NAPSTI).
- Collaborate in research on STI.
- Promote the adoption of STI in driving key sectors of Kenya's economy.
- Coordinate efforts to promote STI catalytic programmes on gender and youth empowerment.
- Coordinate efforts to promote STEM education.
- Coordinate STI policy development and implementation efforts.
- Collaborate in STI awareness creation.
- Collaborate in resource mobilization.
- Coordinate monitoring and evaluation exercises.
- Expert collaboration and exchange.

<https://en.unesco.org/news/unesco-signs-letter-intent-nacosti-and-acts-collaboration-science-technology-and-innovation>

2.1.4 Strengthening STI systems and governance structures in South Sudan



The Republic of South Sudan emerged on 9 July 2011, as the world's youngest country, amidst widespread optimism from both within and beyond its borders. The aspirations and prospects of the new nation hit major roadblocks when the country descended into a civil war in 2013. Ever since, the earlier peace process broke down, South Sudan has suffered acute economic decline, and widespread domestic conflicts and instability arising from ethnic tensions. This has resulted in an enormous humanitarian crisis, depriving the country of peace, progress and prosperity. With a new peace agreement in place, the country is hoping to accelerate progress towards sustainable development. Harnessing STI in the development process is crucial to reorient education and training systems to meet the

knowledge, competencies, skills, innovation and creativity required to nurture country's core values and promote sustainable development. The results framework for the education sector as defined in the South Sudan National Development Strategy (2018-2021) speaks to this and aim to promote and improve research, science, technical and technological innovation and skills transfers for a peaceful, just and prosperous nation.

Following an expression of interest from the Government of South Sudan, a concept note has been developed in consultation with the UNESCO and UNDP Offices in South Sudan to strengthen STI systems and governance structures in South Sudan as a means to promoting the use of STI in driving socioeconomic development.

Specifically, this activity will support the government of South Sudan by:

- identifying the entry points for planning and implementing impactful STI interventions in key sectors.
- establishing a national database platform for STI based on internationally comparable and nationally relevant indicators to monitor the use and contribution of STI to sustainable development.
- developing a national policy and investment plan for STI to enable the use of STI as a driver to economic transformation and social development.
- establishing a national policy dialogue platform on STI to provide strategic directions and policy recommendations for multiscale application of STI in development processes.
- building the capacities of relevant institutions to maximize the impacts of STI investments in socioeconomic transformation processes.

2.2. Basic and Engineering Sciences

2.2.1 UNESCO-Huawei Partnership Fosters Training on Artificial Intelligence Programming in Eastern Africa



In the quest to improving Africa's readiness to fully embrace digital transformation, UNESCO partnered with Huawei to organize an online training course on Artificial Intelligence for University Faculty Members in Eastern Africa from 17-21 August 2020.

Building the capacities and skills of a critical mass of human resources in technologies underpinning the fourth industrial revolution is crucial for Africa to fully embrace digital transformation and drive sustainable development on the continent. The UNESCO Regional Office for Eastern Africa therefore joined hands with Huawei Technologies (Kenya) Company Limited to organize an online training course on Artificial Intelligence (AI) for university faculty members from ten countries in Eastern Africa.

This training is deemed a step in the right direction, as the World Bank has estimated that digital transformation will increase growth in Africa by nearly 2 percentage points per year and reduce poverty by nearly one percentage point in Sub-Saharan Africa. Also, UNESCO believes if young Africans are to compete for high-tech, higher-paying jobs and take advantage of increasing opportunities on the continent, then digital literacy, innovation and entrepreneurship must be at the core of continued education and training.

The week-long training (17-21 August 2020) was part of the priority areas of collaboration defined in a letter of intent signed between UNESCO and Huawei at the TECH4ALL Summit held in 2019 at Huawei Connect in Shanghai, China. The joint training program on enhancing digital skills and the application of AI should contribute to SDGs, which is an integral part of the program of equalling quality education in Huawei's digital inclusion initiative, TECH4ALL.

The trainees, totalling 39 university/college faculty members (including 12 women) from ten Eastern African countries were nominated by the UNESCO National Commissions of their countries. The training was designed to provide the most fundamental knowledge to the university/college teachers who will in turn, be able to introduce AI to their students.

Topics covered in the training include:

- Overview of AI Python Programming
- Maths
- Tensor Flow Programming Basics Experiment
- Propaedeutics of Deep Learning
- Image Recognition Programming
- Speech Recognition Programming Experiment
- Human Machine Dialogue Programming Experiment

Trainees who completed the full course and cleared the online certification exam received

a Huawei HCIA-AI certification to become certified professionals in AI.

<https://en.unesco.org/news/unesco-huawei-partnership-fosters-training-artificial-intelligence-programming-eastern-africa>

2.2.2 UNESCO-Huawei Partnership Training for TVET Teachers in routing/ switching and network security for Kenya (21 Sep - 02 Oct 2020).

UNESCO in collaboration with ICT Academy of Huawei Kenya completed a two-week training programme on Routing, Switching and Network Security. The training course was meant for TVET college teachers in Kenya willing to formulate and integrate Routing, Switching and Network Security course into their Computer Sciences/Electronics and Communications teaching subjects. Following nomination by the Kenyan National Commission for UNESCO and passing the Huawei mock exam, 25 qualified faculty members (including 10 women) from 13 educational institutions were eligible to participate in the ICT training. All the trainees were given the opportunity to undertake the Huawei Certification exams and those who completed the exams and obtained the required pass mark were awarded an HCIA-R&S v2.5 and HCIA-Security v3.0.

2.2.3 UNESCO is working with Huawei Ethiopia to organize virtual AI training

UNESCO is working with Huawei in expanding partnership with all countries to build expertise in AI and its introduction at various levels of teaching in schools and universities. Following an expression of interest from Ethiopia's Addis Ababa Science and Technology University and the Ministry of Science and Higher Education, UNESCO is working with the Huawei office in Ethiopia to organize AI training programme for universities. Expert consultative and planning meetings have been held among experts in the Ministry of Science and Higher Education, Addis Ababa Science and Technology University and Huawei Ethiopia. In addition, an experience sharing meeting has been held with Huawei offices in Kenya and Ethiopia. A concept note is being developed by Huawei-Ethiopia for further action.

2.2.4 Supporting continuing science education and learning in the advent of COVID-19

UNESCO estimates that 1.37 billion students are home as a result of COVID-19 school closures with the figures likely to increase if the pandemic continues to spread. For continuity of learning, the Science Sector under the overall coordination of the Director of the UNESCO Nairobi Office compiled a variety of educational resources to assist students in Africa especially from vulnerable and poor communities.




These resources are available online for free access to anyone. Some of the courses require the users to register with institutional email to gain access. These educational resources cover many subject areas including natural sciences, mathematics, engineering, arts, social sciences etc. to meet the needs of the wider student population. The edX and

NDLI are focused on university education on specific subject areas where it was classified based on the thematic areas. These educational resources will be updated from time to time.

<https://en.unesco.org/news/unesco-nairobi-science-sector-compiles-variety-educational-resources-assist-students-africa>

2.3. Women in Science and STEM

2.3.1 Supporting Governments to keep students connected to STEM education through digital mentorship programme in the face of COVID-19

- i. The Digital STEM Mentorship programme was officially launched on 15 June 2020 by the Chief Administrative Secretary in the Ministry of Education in the presence of the UN Resident Coordinator Mr. Siddharth Chatterjee, the Advisor in the office of the President Dr. Ruth Kagia and the UNESCO Regional Director Ms. Ann Therese Ndong-Jatta. Also invited were Heads of UNICEF and UN Women Country offices.
 
- ii. The airing of the audios by the STEM role models and mentors started on 11 July 2020 through the Kenya Broadcasting Corporation (KBC) and on 16 July by the 38 Community radios.
- iii. All the 13 audios on STEM had been aired by 3rd October which was the month the programme was planned to end. The programme reached the very remote areas of Kenya such as Wajir, Turkana, Samburu, Kajiado, Tana River, etc. with information from basic sciences to their applications in STEM professions. The community radios recorded many calls from students, parents and teachers in appreciation of the programme. Due to high public demand, a request was made to UNESCO by the Community FM stations through the Association of Kenya Community Media Practitioners to allow them to continue airing the audios at no cost at the end of the programme period. The KBC producer also informed UNESCO of the high interest of the programme from students, parents and teachers who had been following the digital presentations.
- iv. Students have continued to engage the STEM role models in discussions through the UNESCO ASK A STEM MENTOR PLATFORM that was established by Safaricom in partnership with the ENEZA EDUCATION FOUNDATION for this purpose.
- v. The ministry of Education, KNATCOM, NACOSTI, Safaricom and the Generation Unlimited (GenU) Coordinator at the Office of the President and at UNICEF appreciated the programme and its impact and are an integral part of it.
- vi. Because of the impact of the digital STEM mentorship programme, UNICEF GenU coordinator introduced the New York Academy of Sciences to UNESCO to discuss how this can be upscaled. A meeting was held to this effect and report shared with

Science team and the Director.

- vii. The digital mentorship programme was able to introduce Architecture to the students as a subject which is both an Arts and STEM-based career.
- viii. In the same context, UNESCO joined hands with the Little Einsteins East to organize the Science Fair 2020 as a digital event. The STI programme specialist participated in the event as a panellist in one of the sessions moderated by a young scientist and talked to the 3-12-year olds about climate change education. The week-long event was also supported by other partners such as Safaricom, ABSA bank among others.
- ix. In the month of September, UNESCO became a key member of the team of experts who are working closely with EASTECO for the development of a STEM Education Strategy for the EAC region. UNESCO was able to guide EASTECO to focus on developing a "Gender Responsive STEM Education Strategy" to reorient the document to make it more inclusive and aligned to the requirements of the global agenda 2030 and AU Agenda 2063.



<https://en.unesco.org/news/stem-kenya-digital-programme-launch>

2.4. Local and Indigenous Knowledge System and SIDS

2.4.1 Fostering climate change adaptation through SANDWATCH

The Sandwatch programme is an educational process through which the local community works together with students and teachers to monitor their coastal environments, identify problems facing them, design and implement sustainable approaches to address these problems.

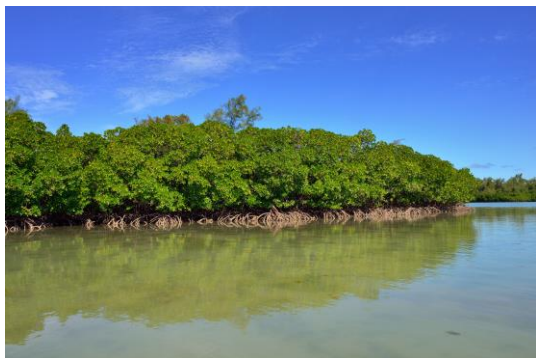
Technical support has been given to UNESCO partners in implementing Sandwatch in the Indian Ocean Countries. The “Association pour le Développement Durable (ADD)” in Mauritius was supported to continue their work on Sandwatch Training for schools in Madagascar. ADD Mauritius provided Sandwatch Training for three schools. These were: (i) For the Second time at France Boyer de la Giroday State Secondary School (FBGSSS) at Blue Bay Beach in the south of Mauritius; (ii) First time at (a) Sir Leckraz Teelock SSS (SLTSSS) at the Belle Mare Beach in the east, and (iii) Dr. Regis Chaperon SSS (DRCSSS) at Flic en Flac in the west.

Following meetings with the respective Rectors of the three schools, a tentative programme was prepared for the period January to July. In each school, four in-class sessions were held to introduce Sandwatch and provide training in observation, measurement and analysis of beach data and in data entry in the International database. Four outdoor activities were planned to collect data on the beach representing summer and winter conditions. A closing ceremony at a venue with the presentation of results and findings from the three schools was also scheduled. The Covid-19 pandemic, however,

with lockdown at the end of March disrupted the programme. When schools resumed on 1 July, restrictions imposed by the Authorities enabled only one outdoor field work to take place at SLTSSS at Belle Mare on 23 July. The Blue Bay public beach was closed due to the spread of oil spill from the MV Wakashio, which ran aground on 25 July off Pointe d'Esny threatening the Blue Bay national park. Access to the beach remained banned for a long period, precluding any outdoor activities. At DRCSSS, instruction from the Authorities was strictly followed and all outdoor activities at Flic en Flac were cancelled.

Nonetheless, several in-class activities at the three schools were organized to consolidate knowledge of students in data entry in the Database and prepare them for presentation of their findings. The Ministry of Education permitted only a school-wise closing ceremony, instead of one ceremony for the three schools as originally planned. This took place on 28 October at SLTSSS, 5 November at FBGSSS and 26 November at DRCSSS.

2.4.2 Prepared a concept paper on “Restoration of Mangroves following MV Wakashio oil spill in July 2020



UNESCO worked with the local NGO to develop a concept note for the restoration of mangroves after an oil spill spread into the coastal zone in the south of Mauritius. The Intergovernmental Oceanographic Commission (IOC) of UNESCO was also willing to join in this study. The possibility of funding for the activity will be explored further with UN Resident Coordinator (UNRC).

2.5 Lessons Learnt

- The need for flexibility is important when designing projects in order to ensure the project does not halt to a stop. Covid-19 has resulted in innovative ways in which activities are conducted. It has also enabled coordinators to evaluate projects based on priority and to cut down on unnecessary expenditures.
- The involvement of the national institutions and their ownership of the programme is critical for its success. Moreover, UNESCO can tap into the financial resources of the National Commissions for the success of its national-level activities.

2.6 Challenges

- The outbreak of the Covid-19 pandemic in 2020 delayed implementation plans across all sectors of the SC. However, quickly adapting to the situation, most activities were conducted on a virtual platform thus ensuring continuity of the activities. Nevertheless, there is still a backlog of activities that had to be carried forward to 2021.
- There is need to reduce the technology gap between the member countries before they can effectively cooperate on STI issues. An imbalance in the level of

technological advancement among the regions means that some countries will be left behind and may not be able to catch up with the rest.

- There is also the underfinancing of innovation efforts. Financing innovation is key in promoting technological change, which supports structural diversification and reduces the dependence of countries and economies on commodity boom/bust cycles. As such, there is need to develop structural avenues for mobilizing such financial resources for technological development.

2.7 Opportunities

- UNESCO collaborating with other partners and stakeholders ensures a combined multi-sectoral approach to problem solving and/or challenges affecting the region and a successful implementation of its activities as well as the achievement of the SDGs.
- The mentorship of students on STEM education by STEM career role models through the digital platform during the Covid-19 pandemic when schools had closed provided the opportunity to keep students learning at home as well as ignite the interest of female students to engage in the science subjects.
- The mentorship programme also provided an opportunity for students in remote areas to engage with the STEM role models, share their experiences and received valuable advice that would inform their future career choices. This helped to bridge the gap of inclusivity whereby sometimes students from remote areas are left out.

3. Ecology & Earth Sciences - MAB - IGGP-DRR

3.1 Man and Biosphere Programme

3.1.1 Biosphere Reserve Nominations: Comoros, Rwanda, Mauritius and South Sudan

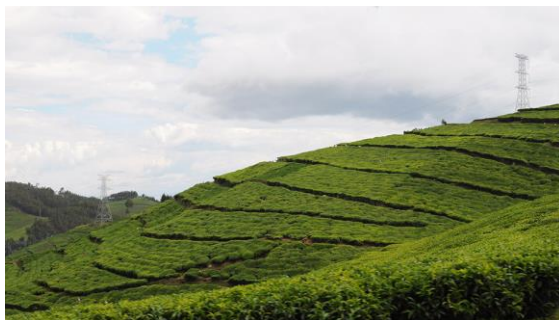


Through the UNDP / GEF project 'Development of a national network of terrestrial and marine protected areas', representative of the unique natural heritage of Comoros and co-managed with local village communities (RNAP), the Union of the Comoros aims to conserve its biodiversity. UNESCO provided technical assistance for the preparation of a

nomination of the island of Mohéli (also known as Mwali) as a biosphere reserve, capacity building of actors and the establishment of inclusive and participatory governance in accordance with the management of biosphere reserves. Mohéli Island is recognized as an area of high conservation priority being home to an exceptional biodiversity of regional and global significance with high rates of endemism among different groups of flora and fauna. The nomination has been positively evaluated and MAB ICC approved the same in 2019 and added it among the list of World Network of BRs in 2020.

Black River Gorges - Bel Ombre Biosphere Reserve, formerly known as Macchabee/Bel Ombre BR was the first-generation Biosphere Reserve (BR) nominated in 1977. However, periodic review was not carried out to meet the current requirement for a BR. Based on the recommendation from Lima Strategy, Mauritius authorities were approached to either withdraw the BRs or modify the nomination, which they agreed to modify. UNESCO provided technical assistance and the proposal re-submitted. MAB ICC approved the nomination in 2019. Identified as an important bird area, the biosphere reserve's surface area will be increased from 3,594 ha to 8,582.21 ha.

With support from the World Bank, UNESCO in collaboration with stakeholders in Rwanda initiated the nomination of Gishwati Mukuru Landscape BR reserve in the Albertine Rift in Rwanda. UNESCO provided technical assistance for the preparation of nomination of the site, capacity



building of actors and the establishment of inclusive and participatory governance in accordance with the management of biosphere reserves. The nomination was accepted and the site approved and designated as a BR in 2020. It hosts a variety of endemic and endangered species such as the Eastern chimpanzee and the Golden monkey.

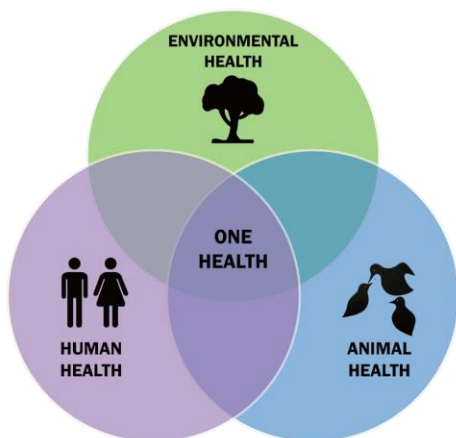
Currently we are working with South Sudan, Djibouti, Eritrea and Somalia on a feasibility for new biosphere reserves nomination.

<https://en.unesco.org/news/twenty-five-sites-join-unescos-world-network-biosphere-reserves>

3.1.2 Webinar on Biodiversity and Preventing Future Pandemics in Africa

On 5th June of every year, World Environment Day is celebrated. The theme for this year was biodiversity. Some of the key messages were: Protect the environment, prevent pandemics, 'nature is sending us a clear message'. As a follow up to the World Environment Day, UNESCO MAB in Africa joined hands with the UN Environment Africa, the African

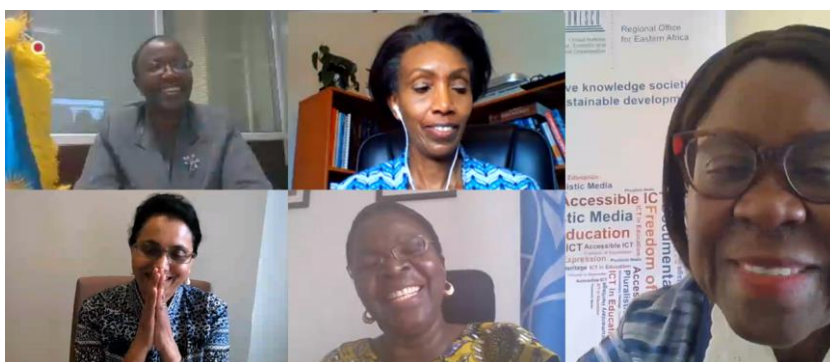
Union Commission, the International Science Council Regional Office for Africa (ISC ROA) and the Centre for Excellence in Biodiversity and Natural Resource Management (CoEB) at the University of Rwanda to organize a webinar on “Biodiversity and Preventing Future Pandemics in Africa” held on 17 June 2020.



Experts working in biodiversity and environmental conservation, government ministries, university professors, lecturers and youth communities from Africa discussed a wide range of topics within this theme to:

explore the reasons for protecting the remaining natural habitats in Africa, understand the relationship between ecosystem integrity, functioning and balance human interaction with the ecosystem, safeguard natural species diversity and ensure the sustainable, legal, and safe wildlife trade and appreciate the role of the post-2020 Global Biodiversity Framework.

Over 70% of infectious diseases originate from wildlife and the spread of diseases is exacerbated by wildlife trafficking, wildlife markets, habitat destruction and climate change. Climate change is also amplifying the spread of infectious diseases beyond their natural geographic ranges. UNESCO has a significant role to play in negotiating actions to prevent infectious disease spread through stimulating trans-boundary action and collaborative efforts across the region, building capacity within governments and organizations active in sustainable development and environmental conservation.



Following the Opening Ceremony, a scientific session was held encompassing an array of presentations from biodiversity experts and conservation biologists. The presentations included:

- Biodiversity and Preventing Future Pandemics in Africa by Dr. Aida Cuni-Sanchez, Postdoctoral Researcher from the University of York, UK.
- The Role of Community Conservation in Avoiding the Next Pandemic by Dr. Fola Babalola, Senior Lecturer and Researcher from the University of Ilorin, Nigeria.

- COVID-19 and its impact on endangered species (Great Apes) – what can be done to manage for the future pandemic by Dr. Julius Nziza from Gorilla Doctors, Rwanda.
- Integration of land use planning, climate change resiliency and adaptation planning and policy for the future pandemic preparedness by Dr. Jane Olwoch, the Executive Director of the Southern African Science Service Centre for Climate Change and Adaptive Land Management, South Africa.
- Preventing the Next Pandemic by Prof. Beth A. Kaplin, the Acting Director of CoEB, and University of Rwanda.

The meeting recommended that African communities and Governments must come forward to nominate more BRs so that the coexistence of nature and society could be maintained. BRs are the sites we can pilot and practice interdisciplinary approaches to understand and manage changes and interactions between social and ecological systems, including conflict prevention and management of biodiversity. Following this webinar, UNESCO in collaboration with the CoEB, University of Rwanda and ISC ROA will prepare a policy brief for Africa and make recommendations on how biodiversity conservation can protect humanity from future pandemics.

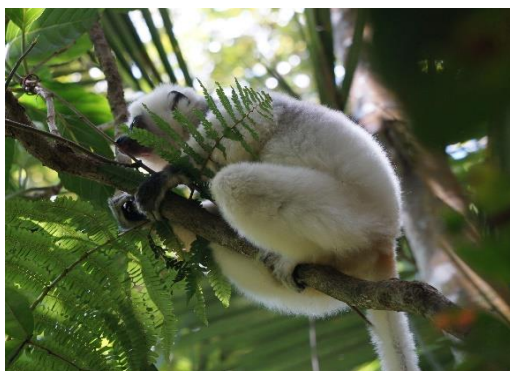
<https://en.unesco.org/news/biodiversity-and-preventing-future-pandemics-africa>

3.1.3 Policy guidelines on biodiversity conservation to prevent future pandemics

As a follow up to the recommendation made during the workshop on biodiversity and preventing future pandemics in Africa, UNESCO is working with CoEB, Rwanda and ISC ROA to develop a policy brief for African governments on protecting biodiversity to save humanity from future pandemics. Further, UNESCO is working with relevant governments to ensure the realisation of one of the workshop’s recommendations that encourages African communities and governments to come forward to nominate more biosphere reserves so that the coexistence of nature and society could be maintained.

3.1.4 Biodiversity Conservation and Sustainable Natural Resource Management for Integrated Community Development in National Parks of Madagascar – (BIOCOM)

The Korean Government supports the 2020-2024 project ‘Biodiversity Conservation and Sustainable Natural Resource Management for Integrated Community Development in National Parks of Madagascar - (BIOCOM)’, through the Korea International Cooperation Agency (KOICA). Under this project, three National Parks under Rainforests of Madagascar have been selected for implementation.



An on-line signing ceremony was held on 24 August 2020 between the Korean Embassy in Madagascar and UNESCO, in the presence of the Malagasy Minister of Environment and Sustainable Resources, for the BIOCOM project. The Korea International Cooperation Agency (KOICA) will be providing 5.5. Million USD over the course of the next five years to fund this project. The goal of the project is to preserve the biodiversity of Marojejy, Andohahela and Montagne des Français protected areas– and improve the well-being of

local communities through the development of alternative and sustainable income generating activities.

The Rainforests of Atsinanana provide local community with crucial ecosystem services. The forest landscape from northeastern, Marojejy Park, to southeastern Madagascar, Andohahela Park, consist of over 136,300 ha (distributed across a Category II protected area and its surrounding buffer zone), which represents both a key biodiversity stronghold and a vital bridge maintaining the long-term connectivity between the largest remaining intact rainforest in the country's biologically rich Eastern Rainforest Biome.



The Montagne des Français forests represents a dry deciduous forest and covers 6,141 ha. Vegetation structure on the upper portion of Montagne des Français is a flat karstic habitat with a specific vegetation type including a mixture of dry forest, short thicket, and rupicolous vegetation. This protected area faces many threats such as the extensive conversion of forest trees to charcoal.

The project activities will be carried out with Madagascar National Park and the “Service d’Appui à la Gestion de l’Environnement”. These activities are expected to achieve the following outcomes: (i) reduced deforestation and an increased area of ecologically intact forest, (ii) long term conservation of effectively managed and protected areas, (iii) sustainable livelihoods of local communities achieved through the development of alternative income generating activities, and (iv) increased engagement of youth and women in natural resources governance through awareness, training and capacity building activities.

<https://en.unesco.org/news/korean-government-support-biocom-project-madagascar-2020-2024>

3.1.5 Advocacy for the conservation of endangered species (Mountain Gorillas) from pandemics at Great Virunga landscape

UNESCO supported the development of a regional contingency plan for protecting mountain gorillas, conservation personnel, tourists and park adjacent communities from SARS CoV-2. As the emerging SARS CoV-2 virus (causing COVID-19 disease in humans) spread and declared a global pandemic by the World Health Organisation, there was an expression of concern by conservation organizations and institutions on the potential impact of this disease on captive and wild great apes.

The Greater Virunga Landscape is one of the most biodiverse landscapes in the World, if not the most biodiverse. It contains two UNESCO Biosphere Reserves sites; Volcanoes National Park, Rwanda and Queen Elizabeth National Park Uganda. Virunga National



Park forms the backbone of this landscape and connects to the Volcanoes Park in Rwanda together with the Mgahinga Gorilla, Queen Elizabeth, Rwenzori Mountains, and Semuliki National Parks in Uganda. The transboundary collaboration in the Greater Virunga Landscape was the transboundary population of mountain gorillas in the 451km² Virunga Massif which straddles the border of DRC, Rwanda and Uganda.

Risks to mountain gorillas is being mitigated by range States through the suspension of tourism, controlled movement of personnel, and the heightened vigilance to the best practice guidelines for visitation as well as health monitoring. Spearheaded by the Greater Virunga Transboundary Collaboration, a regional emergent coronavirus contingency plan is being developed with the support of International Gorilla Conservation Programme (IGCP), Gorilla Doctors and other partners.

This plan, based on a previously developed Ebola Virus Disease contingency plan, is a framework for coordinating action by Protected Area Authorities in mountain gorilla range States, as well as sharing resources and information. It aims at protecting mountain gorillas, conservation personnel, tourists and park adjacent communities from SARS CoV-2, the emergent coronavirus that causes the human disease COVID-19.

UNESCO supported this initiative lead by the IGCP, Conservation International, Fauna & Flora International and World Wildlife Fund (WWF). The contingency plan was adopted by the Greater Virunga Transboundary Collaboration (GVTC) and Gorilla Doctors.

<https://en.unesco.org/news/unesco-supports-development-regional-contingency-plan-protecting-mountain-gorillas-0>

3.1.6 Development of a Training Manual on Environmental Communication for Science Journalists in Africa



Within the Science Sector, the Assistant Director General (ADG) has encouraged all the divisions to work together within the mandate of UNESCO. Based on this recommendation, all divisions in our office are collaborating to develop a training manual for Journalists in Science Communication on environmental related issues. In Africa, as elsewhere, science stories are overwhelmed by politics, sports

and business news. The poor quality and quantity of science stories is exacerbated by a 'formal training deficit' because few journalists have a scientific background. Moreover, stories are increasingly written from press releases without independent analysis or skeptical review. This leads to the unfortunate and ever-increasing practice of "churnalism", whereby news organisations republish verbatim materials sent by public relations agencies and commercial sources, undermining the credibility of science reporting.

Few journalists, for example, have had formal training in science communication, although a variety of programs for such training exist and are becoming the focus of research. Moreover, many journalists, institutional public information officers, advocates, and others who communicate science in the course of their work lack training either in science or in

the communication of science per se. Training journalists to become more discerning translators of scientific information is one mechanism and mainstream opportunity for improving science journalism. This type of professional development can build journalists' understanding of scientific methods and uncertainty and help them place environmental stories within a broader scientific context, giving news audiences a much richer suite of information from which to form their opinions. These professional development opportunities for journalists are essential in a constantly evolving news landscape.

3.1.7 Webinar on the COVID-19 Pandemic and Lessons for Science Journalism in Africa

The emergence of COVID-19 comes with an upsurge of rumours, controversies and fake news reported by media houses, which threatens public trust in media information about the pandemic. In the context of Africa, the explosion of fake news has in part been attributed to challenges in the acquisition, verification and dissemination of reliable information; ineffective interaction between scientists and journalists; and the training deficit in Science Journalism in Africa. With its key mandate in Science and Communication and Information, UNESCO is taking key measures to stop the spread of fear, panic and fake news on COVID-19. In this vein, the UNESCO Office for Eastern Africa collaborated with the Sci.Dev.Net (one of the world's leading source of reliable and authoritative news on science and development in the developing world) and other regional partners to organize a webinar on 25th November 2020 with the aim of documenting lessons learnt in overcoming the aforementioned challenges.

The webinar brought together reputable African journalists and health experts who discussed various issues on lessons for the acquisition, verification and dissemination of reliable information, lessons for effective interaction between scientists and journalists and lessons for the training and capacity building of science journalists. The output of the discussions shall lead to the development of a policy brief incorporating suggestions for improving the role of science journalist in public health.

<https://en.unesco.org/news/covid-19-pandemic-and-lessons-science-journalism-africa>

3.1.8 Nomination of the Sudd Wetland as Biosphere Reserve under UNESCO Man and Biosphere Reserves

Upon the request from Ministry of Environment and Forestry, we are working with the government of South Sudan to prepare the Biosphere Reserve nomination dossier. A virtual introductory meeting was held in early Dec 2020 with the participation of the South Sudan Ministry officials, UNESCO (Nairobi & Juba Office) and the consultant. A roadmap for the creation of the BR was presented by the consultant and discussed by the team. More meetings to follow.

3.2 Geology

3.2.1 Development of educational curriculum and policy guidelines on Artisanal and Small-Scale Mining for formal and non-formal education in Eastern Africa in partnership with AMDC and Inter-University Council for East Africa – A team of consultant from East Africa and British Columbia University of Canada



Artisanal and Small-scale Mining (ASM) represents more than an emerging rural economy; it is a way of life for millions of women and men across Eastern Africa. One of the most persistent features of the ASM sector is its informality, which creates challenges to reduce informal employment, promote safe working environments, and boost

decent work opportunities, especially for unemployed youth in the region. This research project aims to strengthen the evidence base on how ASM-specific education can advance formalization efforts and to what extent, Non-formal Work-Based Learning (NWBL) programs can facilitate decent work transitions for disadvantaged women, men and youth in the East Africa Community (EAC).

Research objectives aim to:

- Map existing training institutions with an ASM module in their programme (school of mines, vocational colleges).
- Develop a model curriculum for formal and non-formal education and a mapping of various forms of donor-supported capacity-building training activities in ASM.
- Recommend how the model curriculum developed could be integrated into academic programs at multiple educational levels in Eastern Africa in consultation with the Inter-University Council for East Africa.
- Develop policy guidelines and framework on formal and non-formal education in the ASM Sector of Eastern Africa.

On completion of the above research findings, a foundation will be set for:

- Establishing a Regional Center of Excellence in Artisanal Mining Education (CEAME), targeting multiple commodities.
- Increase provisioning of accredited ASM-specific certificates for rural youth, women and men in the region.
- Evaluating the effectiveness of NWBL programs to enhance labour market productivity and value addition.
- Increase use of geoscientific data to enhance productivity.
- Mitigate geo-environmental hazards in the region.



So far, 2 non-formal short course training and MSc curriculums have been developed and the policy guidelines and framework is almost complete.

3.2.2 First International Conference on GEOPARKS

This first International Conference for Africa and Arab States was supposed to be organised in Ngorongoro Lengai UNESCO Global Geopark in Tanzania; the only Geopark in Sub-Saharan Africa. Due to the pandemic, it was postponed and instead a virtual conference took place on 11 December 2020. The objective of the webinar was to show the importance of geo-heritage for sustainable development and to enable governments to support emerging geo-heritage initiatives. Facilitated by international experts, the webinar was a forum for exchanges with local experts or stakeholders where challenges, opportunities and emerging initiatives was discussed.

3.3 Disaster Risk Reduction

3.3.1 Strengthening Disaster Prevention Approaches in Eastern Africa



On Tuesday 2 March 2020, UNESCO and the Government of Japan officially signed the agreement for the commencement of the project: “Strengthening Disaster Prevention Approaches in Eastern Africa”. By providing substantial funding support, the Government of Japan has again demonstrated their commitment to UNESCO and the humanitarian and development needs of Africa.

The overarching purpose of this project is to support the development and integration of science-evidenced AI innovations, citizen science and gender-responsive actions into strategies and action plans for disaster risk reduction in schools, higher education, communities and public sector institutions in Eastern Africa. The project will be implemented within 12 months with the following as beneficiary countries: Comoros, Djibouti, Eritrea, Ethiopia, Kenya, Madagascar, Rwanda, South Sudan, Tanzania and Uganda.

The results of this project are expected to yield three main outcomes/targets:

- i) At least three Science-evidenced AI and citizen science approaches adopted for DRR.
- ii) At least five Policy decisions on AI, modern technologies and citizen science for DRR taken by countries based on UNESCO engagement and information dissemination.
- iii) At least 20 Institutions and community groups are trained and able to apply science-evidenced AI and citizen science best practices in DRR.

As at the end of the year, some of the progress for the project involved:

- i) AI based Chatbot is under development with Weather International Inc. of Japan integrating weather data from Kenya, Rwanda, South Sudan, Tanzania and Uganda. This Chatbot will be linked with LINE (social media application) available for IOS and Android Operating system.
- ii) DRR policy analysis with policy recommendations and entry points defined for mainstreaming AI and citizen science approaches into DRR policy instruments in Eastern Africa is underway.
- iii) Conducting a gender analysis of current institutional, political and decision-support

frameworks associated with DRR to allow the enactment or strengthening of gender-responsive regulatory frameworks, policies and institutions for DRR.

- iv) Reviewing the disaster profiles of the targeted countries taking into account major disasters (climate-related threats, natural disasters and geological hazards) occurring in the past ten years and their future projections, and how they have impacted on and are likely to impact on women as members of the society.

<https://en.unesco.org/news/agreement-signed-between-unesco-and-government-japan-commencement-project-strengthening>

3.3.2 Know DRR – A Smart Phone application to import education and awareness on Disaster Risk Reduction. Through application the concept of DRR and the full disaster management cycle: prevention, mitigation and preparedness to response, recovery and rehabilitation to educate school children on DRR

DRR in education equips people with knowledge and skills so that hazards cause the least possible loss of human life, as little damage and destruction as possible, and cause only minimum disruption to economic, social and cultural activities. What

people know is more important than what they have when it comes to saving lives and reducing losses. It strengthens individual’s and community’s resilience to hazards, while enhancing the education system’s preparedness for and responses to disasters.



The learning materials developed in smart phone as an outreach material the DRR in teaching and learning, could be done as learning by playing. Key elements of mainstreaming DRR in teaching and learning involve:

- Mainstreaming of DRR into the virtual media activities, starting from the primary level to secondary level standards this includes multi-hazard education.
- Including DRR in non-formal multimedia channels with children friendly.
- Ensuring teachers, school managers and staff have incorporated DRR into their training activities.
- Ensuring DRR learning materials and resources are available to key stakeholders.
- Encouraging children and youth to be champions and leaders in DRR.

- Supporting professionalization of and research in DRR in institutes of higher education.

<https://en.unesco.org/news/know-drr-smart-phone-edutainment-app>

3.3.3 Project launch: “Strengthening Disaster Prevention Approaches in Eastern Africa”

On Friday 16 October 2020, UNESCO organized an information meeting in collaboration with the Government of Japan and other partners to officially launch the Japanese funded project, “Strengthening Disaster Prevention Approaches in Eastern Africa” which was officially signed at the Embassy of Japan in Nairobi, Kenya on Tuesday 2 March 2020.



<https://en.unesco.org/news/project-launch-strengthening-disaster-prevention-approaches-eastern-africa>

3.3.4 Ghana quiz competition to celebrate the 2020 International Day for Disaster Risk Reduction (IDRR)

The 2020 IDRR quiz competition is the second edition of the Ghana National DRR Quiz. Green Africa Youth Organization (GAYO) in partnership with the Africa Youth Advisory for Disaster Risk Reduction (AYAB DRR), Ghana National Disaster Management Organization (NADMO), and UNESCO Accra Office, implemented a quiz competition to promote the agenda of Disaster Risk Reduction in the country and worldwide.

With the aid of GAYO’s regional coordinators and university campus chapters, the events were successfully executed. The first three (3) quizzes were preliminaries amongst high schools while the fourth quiz was the grand finale, hosting champions from the various other belts. Four (4) schools from the various regions were selected by GAYO, NADMO, and GES. From the North, competing schools were Bolgatanga SHS, Bolgatanga Girls SHS, Vitting Technical SHS, and Tamale SHS. In Kumasi, the schools included KNUST SHS, Serwaa Nyarko SHS, Kumasi Anglican SHS, and Prempeh College. Cape Coast Schools were Cape Coast International School, SAMMO SHS, Aggrey Memorial, and St Augustine’s SHS.



The first quiz was in Bolgatanga Region followed by the second in Kumasi and third in Cape Coast. The grand finale took place in Accra involving the winning schools from the preliminary competition including SAMMO SHS, Serwaa Nyarko SHS, and Bolgatanga SHS. Last year’s

winning school TEPA SHS, was brought back to defend their championship and they were able to take back the trophy as winners of the 2020 IDRR Quiz Competition.

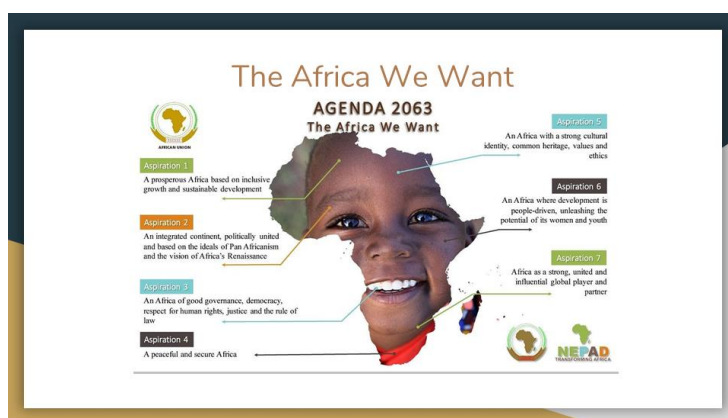
The overall agenda of promoting awareness of basic principles of DRR, Sendai Framework for DRR (SFDRR), Program of Action (PoA) and their connections to SDGs, Ghana's strategy on engaging young people in DRR, Recovery information on COVID 19 and Earthquakes was achieved as students attempted to answer the questions.

Post evaluation was carried out at the various locations and positive feedback was received. Stories from the media were shared on various broadcasting stations while journalists uploaded news articles on various sites. Participants and the public commended the quiz as well as the awareness created with the hope that it will continue in the coming years. From the quiz competition, several contacts were established including all regional GES, GBC, and NADMO directors. This was an accomplishment as it will facilitate easier implementation of future IDDRR quizzes.

3.3.5 Webinar on Youth engagement on COVID-19 for “the Africa We Want”

AYAB DRR was instituted under the African Union Commission (AUC), with the support of the United Nations Office for Disaster Risk Reduction (UNDRR) for the African Region in Nairobi to meaningfully engage young people in DRR processes on the Continent. AYAB joined hands with UNESCO as part of an effort to support young Africans action on COVID-19. The Natural Sciences of UNESCO joined hands with AYAB DRR to organise a Webinar on youth engagement on COVID-19 for “the Africa We Want” on 15 April 2020.

The webinar highlighted AYAB DRR's digital Advocacy on COVID19 through social media (Facebook, Twitter & Instagram) to share risk reduction information from WHO and Africa Centre for Disease Control. In addition, some innovative and proactive initiatives of young Africans to support risk reduction measures and coping mechanisms against COVID19 were highlighted. These initiatives included the development of a solar powered automated hand washing basin, printing of 3-D protective masks, translation of risk reduction messages into local languages at vantage points, using arts, mobile application and entertainment to dispel myths and false information of COVID-19. Young Africans also made personal contributions and campaigned for funds from family and friends to buy ingredients to prepare WHO homemade hand sanitizers and provide assistance to vulnerable groups who have been adversely affected by the pandemic.



The following were the outcomes of the webinar:

- UNESCO would support AYAB to facilitate the strengthening of young people's capacity in integrating disaster risk reduction into health education to build a culture

of safety and resilience for life.

- AYAB would lead the compilation of best practices and case studies of young Africans initiatives on COVID-19 which would serve as an educational material for future pandemics.
- UNESCO would support AYAB to promote the use of innovative IT Solutions and communication approaches by young people for dissemination of risk reduction and recovery information to vulnerable populations, particularly communities at risk.
- AYAB would advocate for meaningful youth engagement in the design and implementation of gender-responsive and inclusive disaster risk reduction policies and plans that addresses the needs and empowers vulnerable population; women, children, people with disabilities, older persons, migrants, and other population at risk and protection needs before, during and after disasters.

From the above, it is clear that the webinar was a success with the enriching discussions between the participating agencies and young people. It is hoped that the outcomes of the webinar would be supported by the participating Agencies (UNESCO, UNDRR, AUC and AYAB DRR - as young Africans representative) to achieve meaningful engagement of young people in DRR for “the Africa we want ”.

<https://en.unesco.org/news/natural-sciences-unesco-joined-hands-africa-youth-advisory-board-disaster-risk-reduction-ayab>

3.3.6 Survey on Youth Engagement on COVID-19 for the Africa We Want

A follow up survey was conducted to evaluate the role of African youth in pandemics. The survey results indicated that the youth-focused or youth-led activities as response to the COVID-19 pandemic are remarkable and commendable considering the limited support they have received at all levels. Their actions have demonstrated their intent to be part of the solution and



not to have the usual “victim” and “passive” actor tag. However, the impact of their activities can have far more impact and be sustainable if only they are empowered enough and adequately supported with funds, resources, risk communication training and guidance from both the public and private sector. This survey reports as jointly published by AYAB-DRR, AUC, UNESCO and UNDRR.

https://en.unesco.org/sites/default/files/youth_engagement_on_covid-19_for_the_africa_we_want_-_survey_report.pdf

3.4 Lessons Learnt

- Evaluation of Biosphere reserves is still very relevant and essential to decision-making for effective management of existing protected areas and for the expansion of the BR networks.

- Capacity building of members of individual countries on steps and requirement for nomination of sites as a biosphere reserve is necessary to ensure documents presented meet the standards required.
- Involvement of the youth in DRR, climate change and SDGs activities through quizzes, webinars, conferences etc. is necessary to raise their awareness on current issues affecting the world and ensure that they are able to build their resilience, meaningfully contribute to the process of developing adaptation and mitigation measures as well as sustainable development for a habitable future.

3.5 Challenges

- Despite an increasing the number of protected areas in the region, biodiversity continues to decline dramatically, in part due to limited resources to maintain these areas as strictly protected and/or to enforce relevant legal frameworks.
- There has been inconsistent and untimely evaluation of biosphere reserves in the region mainly due to challenges in obtaining sufficient funding as well as lack of technical expertise to conduct the evaluation.

3.6 Opportunities

- Training of the ASM on mining operations is an opportunity to ensure that local youth and artisanal miners gain meaningful employment through their improved bargaining power and local expertise is utilized in the processing of the minerals to avoid over-reliance on foreign nationals.
- With the improved knowledge and skills of the artisanal miners, governments can also consider setting up some of the processing industries in these mining regions to ensure value addition on the mined gems and to prevent loss of revenue through exportation of raw materials at a lower price and subsequent importation of the pricey finished products.
- Setting up of biosphere reserves in different sites should not be the end game but a further action needs to be taken to ensure that these reserves are periodically maintained to ensure they fully serve the purposes they are intended for rather than only as tourist attraction sites.

4. Water Sciences – IHP

4.1 UNESCO Nairobi office provides Regional Coordination Function for Africa under IHP

The Intergovernmental Hydrological Programme (IHP) stimulates and encourages hydrological research and assists Member States in research and training activities. Its eighth phase focuses on six thematic areas namely: water-related disasters and hydrological changes, groundwater in a changing environment, addressing water scarcity and quality, water and human settlements of the future, ecohydrology, engineering harmony for a sustainable world and water education, key to water security. UNESCO Office Nairobi provides coordination function for Sub-Saharan Africa as Regional Hydrologist. Under this function, it coordinates with all other regional offices in reporting to IHP Bureau, Council and related Governing Boards.

4.2 Turkana Water Security Project – working with county Government and other NGO in developing capacity of the local community in managing the water resources – Funded project under FIT agreement with Government of Slovakia

The current project envisages the provision of sustainable access to adequate, clean and safe water, to improve livelihoods, as well as to promote sanitation and personal hygiene of the target groups in:

- Maintenance and enhancing sustainability of the existing drinking water infrastructures.
- Construction and / or restoration of existing boreholes and improvement of mechanisms for improved groundwater recharge.
- Maintenance and promotion of water harvesting infrastructures to support household and agricultural needs.
- Improving sanitation and personal hygiene of the targeted groups through sanitation awareness campaigns and education.
- Introducing environmental awareness linked with sustainable maintenance.



The overall project is expected to be implemented in 30 months (end of January 2020 to end of June 2022). The following outputs are expected to be achieved:

Output N°1: Facilitate access to safe, sustainable, reliable and well-managed water facilities for the target communities.

Secure water access to the 53 community groups in the targeted area, via capacity building and maintenance of the water extraction points on at least 50% of the 160 existing water points within the target region.

Output N°2: Improve Water harvesting technology at community level.

County and local community-level outreaches and trainings on water harvesting.

Promote the constructions of sichts, check dams or bunds in the river system to create obstruction of the flow of river water in order to create small pool as well as to enhance groundwater recharge and regeneration of vegetation and grass.

Output N°3: Facilitate the use of alternative Energy for groundwater pumping in Turkana region.

Improve the knowledge and capabilities in maintenance of water extraction systems at the technical staff and the community levels.

Output N°4: Water for agricultural and livestock management in Turkana region.

Increase the amount of community group(s) trained on new agricultural practices and the use of organic fertilizers.

Key highlights for the project so far include:

- i) WASH trainings conducted in various villages to help improve hygiene practices among the community members.
- ii) Training workshop carried out on desert agriculture highlighting on water saving techniques in Agriculture, boosting nutrition through consumption of locally available fruits and vegetables, compost making as a means to manage waste and for use in small farms.
- iii) Repair and replacement work for about 60 water points accounting for 37% of the total by the Pump Management Unit (PMU) thus ensuring continuous supply of water to meet the needs.
- iv) To improve service provision of the PMU, a pump management training was also organized for the unit to boost their performance on maintenance work, borehole/well rehabilitation and on conducting pump testing exercises.
- v) Another achievement noted that directly aims towards gender inclusivity was the active participation of women and children in the trainings and workshops thus ensuring their opinions are heard.



<https://en.unesco.org/fieldoffice/nairobi/watsect>

4.3 Worked jointly with UNDP Kenya in developing a proposal for Hydrological, Geological and Socio-Economic study of the Kenya Rift Valley Lakes.

Based on a report from the United Nations Country Team (UNCT) in Kenya on flooding and rising water levels of lake levels in the rift valley, the Director of the UNESCO Nairobi Office advised the SC sector to work with UNDP for further follow up action. We worked with UNDP, Ministry of Environment, County Government of Nakuru and USAID in developing a technical concept paper.

The lakes within the African Rift Valley are causing serious problems due to the rising water levels. The proposed objectives of the study are:

- Conduct analysis of long-term hydrological variations and trends for lake levels and river flows, bathymetric surveys, climatic variations and trends (Rainfall & Evaporation).
- Map out hydro-geological dynamics, any geological incidences within the Rift Valley system that could be impacting on the lake basins.
- Analyse livelihoods and settlement patterns of communities in relation to dependence on the lake.
- Provide recommendations towards sustainable management and use of Lake Basin resources through informing policies, strategies, plans and programmes, as well as to guide coordinated agency actions.



The following are the expected deliverables:

- A description and analysis of data quantity and quality of meteorological and hydrological data, including rainfall and evaporation data, as well as streamflow, anthropogenic lake inflows, lake level data and statistics.
- Draft basin specific hydrological study and geological survey reports.
- Land use maps with possible future planning to avoid any disasters.
- Final lake basin specific Hydrological Study Reports (taking into consideration comments on the draft reports).
- Flood inundation maps associated with different water level return periods.
- Report on the seismic activities and the role in triggering flow of water into the lakes from other aquifer systems through new fractures created by the seismic activity.
- Final integrated report, policy framework for land use within the Lake Basin and detailed maps with GIS computability for future planning.

Field work activity was carried out by the team and a hydrological report on the Rift Valley lakes outlining possible causes and impacts on the livelihoods of the communities and recommendations produced.

4.4 UN Strategic Partnership for Water Security in the ASAL counties of Kenya – UNESCO as a co-lead has been instrumental in developing the project on Rapid Assessment of Water Resources in Arid and Semi-Arid Counties (ASAL) of Kenya.

The ASAL region is home to 36% of Kenya's population, 70% of its livestock and 90% of its wildlife. Improving the quality and availability of water in the region is necessary for improved health and economic development outcomes, and to meet national goals of increasing per capita freshwater endowment, water storage per capita, flood control, and access to safe water from 60% to 80% by 2022.

The United Nations is committed to supporting the Kenyan Government and fostering actions towards the water security targets of the Sustainable Development Goals. The

United Nations Development Assistance Framework (UNDAF) aims to strengthen government capacity to implement risk-informed strategies to increase water security and provide effective response and recovery to drought and flood emergencies. The ASAL counties, and those that suffer frequent flooding, will be the focus of UN support. Under the coordination of UNRC of Kenya, UNESCO and UNEP is taking the lead, with the participation of UNDP, FAO, UNICEF, WHO and UNOPS are working together in water-related projects and research in ASAL counties, covering issues of groundwater, surface water, transboundary water, water governance, agriculture and community resilience.

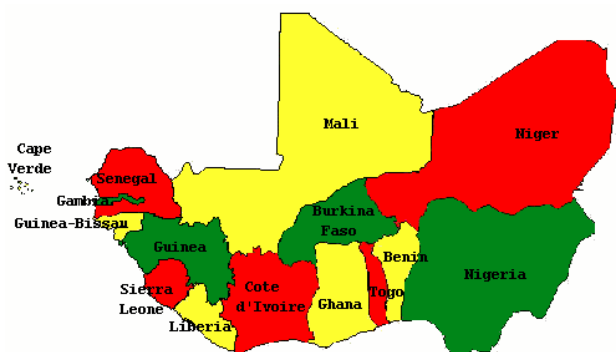
The rapid assessment to map and take inventory of the water resources will involve the following methods: (1) review of secondary information/ data from various sources; (2) key informant interviews on water resources; and where necessary (3) field measurements of biophysical indicators for specific water sources including the effects and effectiveness of various water conservation, harvesting and irrigation measures.

4.5 Development of a training manual on Water-Food-Energy nexus exclusively for Africa in collaboration with GIZ

As a follow up on the training programme organised on Water-Energy-Food Nexus for EAC and IGAD Member countries in partnership with GIZ, Germany and UNECA, a decision was made to develop an exclusive manual on W-E-F Nexus for Africa. The chapters are currently being written and shall feature selected Case studies where W-E-F nexus approach have been piloted. Due to the current pandemic, the final deliverables have been delayed.

4.6 Groundwater (Hydrogeology) Map of Africa

The International consortium of partners published a Groundwater Resources Map of Africa during the 7th Africa Water Week (2018) in Libreville, Gabon. This map was very well received by policy makers and planners from Africa who were part of the Africa Water Week. During discussions, it was suggested that a detailed groundwater map for the sub-regions be developed based on the regional economic communities of Africa.



Based on the success of the Groundwater Map for Africa, UNESCO is now working with the consortium and Regional Economic Commission in Africa to develop a detailed Map for the REC area. The first pilot has been initiated for ECOWAS Region after which, work on other regions will follow. This mapping exercise will also bring out other derivative maps like groundwater quality, Karst Aquifer Map etc. Based on collective request for detailed sub-regional mapping, UNESCO-IHP initiated a dialogue with other international institutions. In May 2019, a preliminary meeting was organized with other international partners such as the German Federal Institute for Geosciences and Natural Resources (BGR); the British Geological Survey (BGS); Le Bureau de Recherches Géologiques et Minières (BRGM); and the International Groundwater Resources Assessment Center (IGRAC)- the UNESCO Category 2 Center in Delft, The Netherlands. Based on the discussions and the availability

of data, it was decided to start with the Economic Community of West African States (ECOWAS) region.

Several consultations have been done with the African Ministers' Council on Water (AMCOW) and the Water Resources Coordination Centre of ECOWAS on the possibility of having sub-regional hydrogeology or groundwater map. Besides a regional hydrogeological map, there is a plan to develop thematic and advocacy maps. For these maps, additional information is needed, either by deriving from the hydrogeological characterisation (e.g. storage properties) or from other aspects of groundwater assessment (social, economic, environmental, policy, etc.) to estimate values of groundwater productivity, dependency on groundwater, groundwater risk etc. Representatives of ECOWAS and AMCOW expressed interest primarily on a groundwater potential map and the groundwater monitoring/level map.

<https://en.unesco.org/news/hydrogeological-groundwater-mapping-ecowas-region>

4.7 Working with Kenyan National Academy of Sciences on a research project on the effectiveness of a water hyacinth bio-filtration wetland system in wastewater treatment

The pilot research aims to:

- Prove the concept of the effectiveness of a water hyacinth bio-filtration wetland system in wastewater treatment.
- Showcase low-cost connectivity of internet-based platforms integrated with internet of things sensors and actuators as an effective management tool for an Integrated Water Resources Management

4.8 Working with IGAD to prepare a proposal for transboundary aquifer mapping for member countries through the Global Environment Facility (GEF) funding in partnership with Executing Agency accredited by GEF



UNESCO received an official request from the Executive Secretary of IGAD Secretariat requesting support in mapping and analysing transboundary groundwater aquifers of IGAD Member countries. Already, a consultant has been identified and contract signed to prepare a fully-fledged project document in GEF format. A parallel consultation is going on with executing agencies of GEF as UNESCO is not yet an

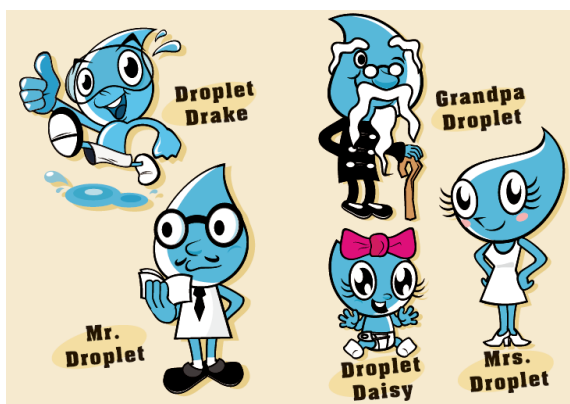
accredited executive agency. When the proposal is submitted, UNESCO will be the implementing agency under the Executing agency.

4.9 UNESCO and China Institute of Water Resources and Hydropower Research (IWHR) developed learning materials for Water Education for Schools in Chinese and currently being translated into English for the

benefit of African countries

During 2008, UNESCO under Italian Funds in Trust project in partnership with Institute of Water Resources and Hydropower Research (IHWR) of China implemented a project on water education for school children. As the school curriculum is already overloaded, the project team decided to develop a fun-based and informative reading material on water education for school children. They developed four books in Chinese language covering a broader scope of water related issues that is presented in the form of cartoons, riddles, games and stories to elaborate the relationship between water and human life. The book is not only meant to educate the students but also encourage them to apply the knowledge in solving challenges encountered on a daily basis.

In order to reach a wider audience, IWHR China is translating the books into three English volumes to be used by children in the African continent. These basic cartoon graphics will be retained from the original volume and Chinese texts will be translated into English; with examples and stories from Africa replacing the Chinese context. IWHR will produce 500 prints of the translated books along with e-



books in pdf to be used in our training programmes. Currently two of the volumes have been translated and being edited by the publisher. All the volumes are expected to be completed and published by the second quarter of 2021.

4.10 Catalysing Sustainable Water Security in Africa through new technology and Innovation for three REC-specific comprehensive and detailed policy reports

Science and technology have long been a major driver for Africa and global prosperity and has helped meet the ever-increasing demands on the water sector. Deploying new technologies, processes and knowledge that help make the continental water sector more innovative and profitable will be even more critical in the future. However, rather than the



usual small and uncoordinated efforts, making slow and uneven progress, a more coordinated strategic approach is required by the international research and innovation sector to the highly diverse and interrelated challenges. This will require major investments in new platforms for science, policy and enterprise to engage with a portfolio of short, medium and long-term programmes stimulating business investment, and helping governments to meet environmental and climate targets, as well as social objectives.

In an effort to advance knowledge and define the entry points for developing and scaling up best bet STI interventions in urban and rural setting for water security in Africa, UNESCO in collaboration with ACTS, the UN Economic Commission for Africa (UNECA) and AMCOW

seek to conduct an exploratory study on the use of STI in Africa's water sector.

4.11 Africa Regional Web Launch of the World Water Development Report 2020

UNESCO and partners organized an Africa Regional Web Launch of the 2020 World Water Development Report to discuss the entry points for seizing adaptation-mitigation synergies which indicate a growing momentum for climate action in the water sector, as well as the corresponding need for policy decisions, capacity development and investments.

Climate change and its impact on socioeconomic and environmental development is topical on the agenda of global concerns. While Africa is among the least contributors to climate change, it suffers most from the brunt of climate change in all of its sectors. In the water sector, several studies point to a future decrease in water abundance due to a range of drivers and stresses, including climate change. As the scientific



consensus of the nature of climate change and awareness of its possible impacts on water resources has increased in recent years, there has been a corresponding acknowledgement of the need to incorporate climate change into water planning and promote innovations that allow simultaneous achievement of mitigation and adaptation benefits in the water sector.

To this end, the United Nations World Water Development Report 2020 (WWDR 2020) on Water and Climate Change was designed to focus on the challenges, opportunities and potential responses to climate change, in terms of adaptation, mitigation and improved resilience that can be addressed through improving water management.

Following the release of the WWDR 2020, UNESCO Offices in Africa in partnership with the World Water Assessment Programme (WWAP) of UNESCO, the UN Economic Commission for Africa (UNECA), AMCOW and the African Union Commission organised the Africa Regional launch of the report on 27 April 2020. Leading experts and stakeholders from the aforementioned institutions presented on a range of topics that stimulated further discussions within countries about the entry points for seizing adaptation-mitigation synergies which indicate a growing momentum for climate action in the water sector, as well as the corresponding need for capacity development and investments.

Few of the key actionable messages from the Africa Regional Launch of the WWDR 2020 include:

- UNESCO will support collaboration and coordination between responsible institutions; ensuring that action is based on sound information and evidence; and increasing access to both public and private finance for climate-resilient investment.
- AMCOW will raise the profile of groundwater among the Members States within the framework of water resources management, and mobilize support from partners and member states to increase funding for provision of water points for WASH.

- Africa data sharing on water quantity and quality should be improved and invested.
- Greater public participation to manage climate change and water is suggested as a way to build adaptive capacities at multiple levels and prioritize risk reduction for socially vulnerable groups.

<https://en.unesco.org/news/africa-regional-web-launch-world-water-development-report-2020>

4.12 Youth and Water Security for Africa

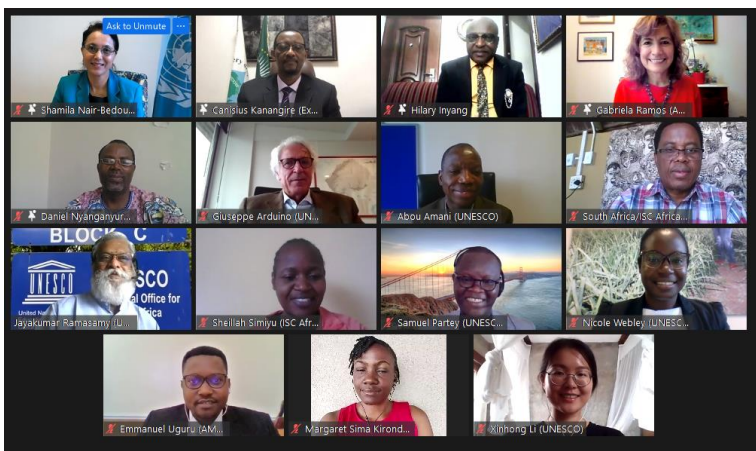


Earlier this year, UNESCO partnered with the International Science Council Regional Office for Africa (ISC ROA) and AMCOW to issue a Call for Extended Abstracts on Youth and Water Security in Africa. The premise of this Call underpins UNESCO’s Operational Strategy on Youth 2014-2021 and aimed at providing a medium for knowledge sharing and exchange as a means to advancing knowledge and addressing knowledge gaps on water security

issues in Africa with a focus on the experience of youth and young professionals. Overall, 119 extended abstracts were received from various regions and taken through a rigorous peer-review process with the involvement of relevant UNESCO, ISC ROA and AMCOW Programme Staff and Partners. Following the peer review, fifty (50) abstracts were shortlisted and will be included in an online booklet of abstracts. The authors of these 50 shortlisted abstracts were invited to submit complete manuscripts by 30 November 2020; which will be reviewed and participate in an online writers’ workshop. The top 25 manuscripts will be considered for inclusion in a special Publication on Youth and Water Security in Africa in 2021.

4.13 UNESCO and partners train African young professionals on scientific writing

Following a Call for extended Abstracts on Youth and Water Security in Africa, UNESCO in collaboration with ISC ROA and AMCOW organized an online writers’ workshop to train young professionals on scientific writing. The training took place on 30 October 2020 and was delivered by Prof Hillary Inyang, Former Chairperson of the ISC



Regional Committee for Africa who presented ‘approach to authorship and formatting of policy and technical manuscripts for scientific journals in the water resources knowledge sector’. About 92 persons attended this virtual workshop. The main outcomes of the

workshop were the proposals to publish a Guidebook on Scientific Writing for young researchers and create a youth network on water security and sanitation in partnership with AMCOW.

<https://en.unesco.org/news/unesco-and-partners-train-african-young-professionals-scientific-writing>

4.14 UNESCO is supporting AMCOW to set up a Youth Network for Water and Sanitation in Africa

Following the organization of the online writers' workshop on 30 October, UNESCO and AMCOW are in the early phases of discussing the possibility of establishing a youth network on water security and sanitation. The network will contribute to UNESCO's engagement of youth and young professionals within the context of SDG 6 and Agenda 2063: The Africa We Want.

4.15 Pilot Project on Nature-based flood adaptation measures in informal settlements, Mpazi Sub-Catchment, City of Kigali (CoK), Rwanda



Through this project, the Ministry of Environment, IHP National Committee of Rwanda and Rwanda Young Water Professionals (RYWP) are working on adaptation measures for flood inundation in Mpazi Sub-catchment informal settlement. Based on the local hydrodynamics and upstream-downstream linkages, risk maps will be generated. These maps will be

supplied to local authorities and community groups to determine the risk areas, minimize damage and update the response plans during this pandemic period.

4.16 Lessons Learnt

- Bringing climate change adaptation processes to community levels where the most vulnerable can also participate in building their own resilience or improve their ability to combat climate change impacts in a way they know how. The adaptation processes should be specific depending on the demography of a particular region, cultural practices/ norms and locally available materials. Policies developed at the national level without public participation and circulated for the community/public to follow may result in resistance as this may be seen as a 'rule imposition' however logical the policy is. The public need to understand the importance of such policies and how it can help them better adapt to climate change for better livelihoods.

4.17 Challenges

- The importance of proper education and training in the field of groundwater hydrology is currently not well embraced in the region's academic institutions. For


instance, fundamental courses on groundwater quantity, quality and modelling are not offered at undergraduate or postgraduate levels in many universities/institutes. It is therefore imperative that water managers, planners/decision makers, and local and regional governments get empowered through continuous training to effectively address their regions' groundwater needs.


- There is lack of long term groundwater monitoring data within most African countries and therefore developing a groundwater trend is not possible. The cost implication of such monitoring activities is prohibitive for most countries. This therefore means that management of the resource is also affected and is not done based on scientific evidence hence can lead to future sustainability issues.
- Data and information sharing are still a challenge within the region. Data acquisition among countries is almost impossible or involves a lengthy process hence hampering the effort of developing uniform plans or learning and adapting from each other especially on water resource management.


4.18 Opportunities

- There is the need for IHP to continue organizing climate change adaptation-oriented training courses for decision-makers and personnel involved in management of water resources. It is further important to support member states in developing research, responsive tools and policy capacity to increase climate change preparedness that have positive impacts on management of hydrological resources in general.
- More financial investment is needed to combat the impacts of climate change especially in developing countries which are more vulnerable. Continued collaboration with agencies and institutions that support climate action financing is therefore necessary as individual countries may not be able to solely tackle the problem of climate change.

Annex – 1 List of Extrabudgetary Projects:

| | |
|------------------------------|--|
| Project | Strengthening Disaster Prevention Approaches in Eastern Africa (STEDPEA) |
| Donor | Ministry of Foreign Affairs of Japan  |
| Beneficiary countries | Comoros, Djibouti, Eritrea, Ethiopia, Kenya, Madagascar, Rwanda, South Sudan, Tanzania and Uganda |
| Budget | US\$ 685,718.00 |
| Duration | 12 months |
| Main objectives | To support the development and integration of science-evidenced artificial intelligent (AI) innovations, citizen science and gender-responsive actions into strategies and action plans for disaster risk reduction in schools, higher education, communities and public sector institutions in Eastern Africa. This project is timely as it will support the adoption of science-evidenced best practices and inform decisions that enable institutions and policies for disaster risk reduction in Eastern Africa. |
| Expected outcomes | <ul style="list-style-type: none"> (i) Science-evidenced AI and citizen science approaches adopted for DRR (ii) Policy decisions on AI, modern technologies and citizen science for DRR taken by countries based on UNESCO engagement and information dissemination (iii) Institutions and community groups are trained and able to apply science-evidenced AI and citizen science best practices in DRR |
| Partners | <p>Weathernews Inc,</p> <p>LINE Corporation</p> <p>The National Research Institute for Earth Science and Disaster Resilience (NIED) Japan</p> |

| | |
|------------------------------|--|
| Project | Biodiversity Conservation and Sustainable Natural Resource Management for Integrated Community Development in National Parks of Madagascar - (BIOCOM) |
| Donor | Korea International Cooperation Agency (KOICA)  |
| Beneficiary countries | Madagascar |
| Budget | US\$ 5,500,000.00 |
| Duration | 24 months (2020-2024) |
| Main objectives | <p>The main objective is the conservation, advance research and promote wellbeing of the local community. The project considers the restoration and sustainable enhancement of these protected areas by local stakeholders and the maintenance of biological diversity.</p> |
| Expected outcomes | <p>(i) a reduction of deforestation and an increased area of ecologically intact forest and the initial phases of restoration of degraded habitats. Protected areas are well monitored, long-term conservation is assured and research advances as needed.</p> <p>(ii) the parks are effectively managed and protected, sustainable livelihoods (alternative income generating activities) of the local community developed.</p> <p>(iii) increased engagement of youth and women in natural resources governance through awareness, training activities and capacity-building activities.</p> |
| Partners | <p>Government of Madagascar, Ministry of Environment and Sustainable Development (MEDD)</p> <p>Ministry of National Education, Technical Education and Vocational Training</p> <p>Service d'Appui à la Gestion de l'Environnement (SAGE)</p> <p>Vahatra Association</p> |

| | |
|------------------------------|---|
| Project | Water Security for Turkana, Kenya (WATSECT) |
| Donor | <p>Slovak Agency for International Development Cooperation</p> <p>under the auspices of the Ministry of Foreign and European Affairs of the Slovak Republic</p>  |
| Beneficiary countries | Turkana County, Kenya |
| Budget | EUR€ 300,000 (US\$ 340,909) |
| Duration | 30 months (January 2020 - June 2022) |
| Main objectives | <p>(i) An access for the target communities to safe, sustainable, reliable and well -managed water facilities and consequent improvement of livelihood. Critical mass of experts/community leaders trained in aspects of safe, sustainable and reliable provision of water.</p> <p>(ii) Efficient operation of Eco-friendly-driven systems for lighting and water pumping in the target communities.</p> <p>(iii) Implementation of M&E system and strengthening cooperation with other relevant departments.</p> |
| Expected outcomes | <p>(i) An access for the target communities to safe, sustainable, reliable and well -managed water facilities and consequent improvement of livelihood. Critical mass of experts/community leaders trained in aspects of safe, sustainable and reliable provision of water.</p> <p>(ii) Efficient operation of Eco-friendly-driven systems for lighting and water pumping in the target communities.</p> <p>(iii) Implementation of M&E system and strengthening cooperation with other relevant departments.</p> |
| Partners | <p>Caritas Lodwar</p> <p>Turkana County, Kenya</p> |

Sector Staff

Dr Jayakumar Ramasamy, Senior Programme Specialist

Dr Samuel Tetteh Partey, Programme Specialist

Dr Alice Ochanda, National Programme Officer (on temporary assignment at HQ)

Ms Anne Lilande, Project Officer

Ms Xinhong Li, Sponsored Trainee





United Nations
Educational, Scientific and
Cultural Organization

Natural
Sciences
Sector

UNESCO Regional Office for Eastern Africa

UN Gigiri Complex, P.O. Box 30592 – 00100,
Nairobi, Kenya

Tel: +254-(0)20-7622356; Email: nairobi.hydrology@unesco.org

<https://en.unesco.org/node/315264>