



United Nations  
Educational, Scientific and  
Cultural Organization

Liaison Office in Addis Ababa  
with the African Union and the  
Economic Commission for Africa

Science for sustainable  
human living



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Floating Mangrov**E**s for Tropical Oceans

*“The best time to plant a tree is twenty years ago;  
the second-best time is now”*

African proverb

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# Flora and Vegetation of Africa

UNESCO produced the book “Vegetation of Africa” (White 1983). Scientific documentations are highly important, but books alone cannot solve the problem of biodiversity loss. Forest depletion has led to the reduction of forest cover to unprecedented rates. In some areas, the natural vegetation has been decimated to small pockets only.

Many of the existing plant species have never been analyzed for their economic value. This can only be done with focused botanical researches and concerted activities.

Church forests play a major role in biodiversity conservation. UNESCO and the Development Arm of the Ethiopian Orthodox Church (EOC-DICAC) developed a conservation plan for indigenous trees around Lake Tana. This requires a nursery and plantations along roadsides, rivers, and between church forests.



## Concerted effort to preserve and sustainably utilize Africa's rich natural resources



A total of **125,000 USD** is needed to realize this highly important activity. You are kindly invited to support UNESCO and EOC-DICAC.

UNESCO and the Inter-Religious Council of Ethiopia plan to jointly develop an Abrahamic Botanic Garden in Africa's Capital City, Addis Ababa. Involvement of Ethiopia's leading vegetation specialists and Addis Ababa University is sought. This project will be a major contribution for regional biodiversity conservation, environmental education and the rapprochement of cultures.



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# UNESCO Biosphere Reserves in Africa

UNESCO biosphere reserves are places to develop and apply climate change resilience and mitigation. Biosphere reserves function as models for sustainable human living and for the reconciliation of sustainable development and nature conservation. One of UNESCO's most important comparative advantages is the World Network of Biosphere Reserves. Ethiopia has successfully established three Biosphere Reserves, namely Kafa, Yayu and Sheka Forest, more are currently planned. African countries have a total of 81 biosphere reserves in 33 countries.

Algeria	6	Malawi	2
Benin	2	Mali	1
Burkina Faso	2	Mauretania	1
Cameroon	3	Mauritius	1
Central African Republic	2	Morocco	3
Congo	2	Niger	2
Democratic Republic of the Congo	3	Nigeria	1
Côte d'Ivoire	2	Rwanda	1
Egypt	2	Sao Tome and Principe	1
Ethiopia	3	Senegal	5
Gabon	1	South Africa	6
Ghana	2	Sudan	2
Guinea	4	United Republic of Tanzania	3
Guinea-Bissau	1	Togo	1
Kenya	6	Tunisia	4
Madagascar	3	Uganda	2
		Zimbabwe	1



*“I believe humankind has looked at climate change ... as if it were a fiction, happening to someone else’s planet, as if pretending that climate change wasn’t real, would somehow make it go away.”*

(Leonardo Di Caprio, United Nations Climate Summit, 2014)

Considering the size of Africa there is a lot of scope for more participation of member states. Professional management of existing and future biosphere reserves has high priority and includes science-based interventions. Women and men are at the heart of UNESCO biosphere reserves and they need to benefit from them.

The generous financial support of the Global Citizen Foundation allows for two field excursions of young Arabs and Africans, learning about biosphere reserves in Ethiopia, Fujairah and Abu Dhabi.

It is time to turn from decades of warning of unwanted environmental changes and resource exploitation to a new era of action, seriously focusing on the application of best practices. Technical, intellectual and financial support of Government agencies, UN agencies the private sector and others is highly appreciated.



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# African Environmental Film Series

*“For too long, we have behaved as though we could ... burn and consume our way to prosperity ... A planet increasingly under stress (of) life’s vital resources – fresh water, clean air, affordable food ... We are running out of time”*

(Ban Ki-moon, Secretary-General of the United Nations, Rio+20 Conference, 2012)



The last United Nations conference on sustainable development (Rio+20) highlighted, that it is high time to globally implement “the future we want”.

This film series main objective is to raise awareness of environmental issues in Ethiopia and other African countries. Environmental problems can only be solved, if they are identified, studied and discussed to find most suitable interventions. UNESCO was the lead agency of the United Nations Decade on Education for Sustainable Development (2005 – 2014).

The proposed “African environmental film series” in collaboration with UNEP will offer a platform to reflect on emerging environmental issues, propose good practices and ways to move forward. Methods and tools for improvement will be suggested.

The implementation will be done by a professional Ethiopian film team. Cooperations with Addis Ababa University, UNEP Liaison Office in Addis Ababa and others will ensure high quality scientific input. Films are planned to be multi-lingual to reach a broad audience. The first film produced will address: **Geohazards and the geothermal potential of Ethiopia.**

Further films may cover the following topics:

- The World Network of UNESCO Biosphere Reserves
- UNESCO natural World Heritage sites
- Urban and natural ecosystem management
- Water resources management
- Climate change and green energy
- Food security
- Youth, women & environment
- Science for sustainable development
- Sustainable consumption and production
- Terrestrial, aquatic, coastal, and marine biodiversity



Any support for this important project to create awareness of environmental challenges and possible solutions in Africa, is warmly welcomed.



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# Better Buildings for Climate Change Resilience in Africa

Many compartments in Africa suffer from a lack of adequate water supply, electricity supply and an increasing overload of household waste. In the face of expected climate changes these problems will most likely worsen.



UNESCO in partnership with the Development Arm of the Orthodox Church (EOC-DICAC) and financially supported by the Manfred-Hermsen-Stiftung, developed a proposal. This has the aim to retro-fit an existing school-building inside the planned Lake Tana Biosphere Reserve.

Technical support will be provided by Ethiopia's Regional Eco-Hydrology Center and the Ethiopian Youth Climate Change Movement (EYCCM). The overall aim is to build a Green School by enhancing access to clean water, providing environmentally friendly energy and reducing and recycling waste.

UNESCO has also embarked on a dialogue with the Ethiopian Muslim Development Agency (EMDA) on the same subject. A proposal for a Green School close to the UNESCO World Heritage site in the old city of Harar has been developed.

## Green Schools in Ethiopia as a starting point to prepare for climate change

Experiences of Green School projects in such different climatic regions will enhance our knowledge on best design and implementation in future projects.

UNESCO biosphere reserves and human settlement are the ideal places for this activity. They already enjoy the attention and support of environmental science authorities and the involvement of local communities.

UNESCO has discussed this idea with the African Union as a major partner. UNECA and other UN agencies have been informed and will be invited for their support, in order to benefit the people of the whole African continent.



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# Water Resources Management

Ethiopia has set an ambitious target to increase drinking water coverage as reflected in the Universal Access Plan (UAP) and the Growth and Transformation Plan (GTP). Currently up to 80% of domestic water supply in Ethiopia is sourced from groundwater. Still there is more potential to support agricultural and urban water supply.

Unfortunately, Ethiopia's groundwater drilling program, particularly in arid areas of Afar, Somali and Oromia is characterized by remarkable failures. Very often this is due to poor planning, installation and management. Additionally, salinity is often in excess of WHO drinking water quality standards.

The challenges of drilling programs are much more pronounced in arid and semi-arid regions. However, adequate geological information can improve the success rate of wells. UNESCO is undertaking multiple projects that gear towards improving groundwater drilling success through technology transfer in mapping, capacity building and investing in groundwater data acquisition, monitoring and storage.

UNESCO's activities will assist Ethiopia's WASH program. The Regional Center for Eco-Hydrology as a future platform for capacity building and water resources management will also be supported.

## Enhancing capacity - to ensure high quality water supply for Ethiopia



To ensure capacity building, short-term training of young professionals will be done. Knowledge transfer through maps and CD-ROMs containing all available information on groundwater resources of investigated regions will help increasing drilling success rates.



UNESCO is currently developing a comprehensive project document on "The eco-hydrological watershed management of the Awash River Basin and Lake Abhe" in discussion with the Ministry of Environment and Forests, the Samara University, the Michael-Succow-Foundation as well as the World Food Program and UNICEF.



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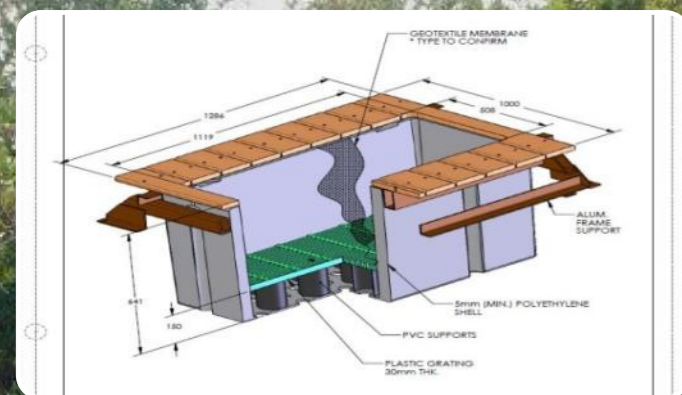
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# Floating Mangroves for Tropical Oceans

Mangroves, depending on species and location, have high primary productivity rates, producing large quantities of woody biomass, based on seawater only. This makes them highly valuable for the production of fresh-water independent biofuel.

By producing biofuel based on floating mangroves in the coastal seas, the competition for food-security is eliminated. One ton of wood-chips makes available ca. 3.500 kW/h of energy with fluctuating prices between 20 and 170 US\$/per ton over the last few years . Moreover, mangroves store up to 50 times more carbon when compared with tropical rainforests.



## An innovative source of renewable energy based on seawater utilization

A model of floating mangroves has been developed in Qatar showing a remarkable increase in biomass. There is the need to develop a larger proto-type with replica, in order to achieve a profound scientific understanding. The concept is a promising way of renewable energy production for all coastal tropical and some sub-tropical countries.

UNESCO Addis Ababa, in partnership with UNESCO's Division of Ecological and Earth Sciences, is exploring possibilities of further development. Support will also be given by the International Tropical Timber Organization (ITTO), the African Union Commission (AUC) and the UNESCO Chair on Sustainable Halophyte Utilisation (ISHU), based in Karachi, Pakistan.

Senegal has been preselected as a highly suitable member state to realize this important project, based on bio-geography, climate, existing capacity, institutional support and political will. Funding is needed to develop a prototype, in total an estimated amount of 1.500.000 USD. Partners are invited to join this promising and innovative project.



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# Conference on United Nations Accredited Sites in Africa

Good coordination and sharing of efforts towards the professional functioning of UN accredited sites will undoubtedly increase the benefits for the people living in and near these sites.

UN accredited sites imply UNESCO's biosphere reserves, UNESCO's World Heritage sites and the FAO's Globally Important Agricultural Heritage Sites. Ramsar Wetlands and Geoparks may also be discussed. They are suitable platforms for activities of diverse stakeholders and offer the chance for increased gender equality and youth participation.

UNESCO and the Ethiopian Ministry of Culture and Tourism and the Ministry of Science and Technology have embarked on a process of jointly organizing:

“Conference on UN accredited sites in Africa – Biosphere Reserves; World Heritage Sites and Globally Important Agricultural Heritage Sites – identification, establishment, management, functioning, and benefits”.

The main aim of the conference is to boost the functioning of these UN accredited sites towards sustainable human living. Experts will deliver valuable input on improved management, visibility, support and impact, particularly improved benefits for the local communities.

## Building up a network of exchange for future progress



To achieve high attention at the political and the decision-makers level, a full day VIP session with prominent political figures, UN agencies and the private sector is envisaged. Field trips to biosphere reserves and World Heritage sites will give opportunities for exchange and further discussions.

The conference is foreseen for November 2015 in Bahir Dar, Ethiopia. UNESCO's Science, Education, and Cultural Sectors directly and indirectly support this event with 100,000 USD. The African Union, African Member States, UN agencies, and other supporters are invited to participate and to provide intellectual, technical and financial support.



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# The Addis Ababa Science-Team warmly thanks our Partners & Supporters



## Disclaimer

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