

## **Earth Sciences Programme**

The Earth Sciences activities in the UNESCO Nairobi Office are collectively aiming at promoting and implementing the new UNESCO Earth Sciences Education Initiative in Africa (ESEIA), at improving the participation of African earth scientists to the International Geosciences Programme (IGCP) and at promoting the emergence of geological heritage/Geoparks) in Africa.

### **Earth Science Education Initiative in Africa**

Since the announcement of the ESEIA by the Director General at the Africa regional launch of the International Year of Planet Earth (IYPE) in Arusha in 2008, 5 regional workshops have been organised in Africa between 2009 and 2010 to assess regional capacities and needs in earth science education, research and industry in the continent. Recommendations from these workshops have been synthesised and prioritised. The following activities have been targeted and are under development as priority actions to launch the ESEIA.

- Strengthening earth science education in Africa through institutional networking
  - o This activity came as one of the recommendations from UNESCO Earth Sciences Education workshops held in Africa in 2010 and was widely supported African Earth Sciences community through a [resolution](#) during the 23<sup>rd</sup> Colloquium of African Geology in January 2011 in Johannesburg. The activity aims at establishing an “African Network of Earth Sciences Institutions” (ANESI) linked to the African Network of Scientific and Technological Institutions (ANSTI), hosted by the UNESCO Nairobi office. It will work toward:
    - promoting active collaboration in training, research and capacity building among African earth sciences institutions,
    - promoting and facilitating exchanges with earth sciences institutions from outside Africa,
    - maintaining a database of African earth science experts, working towards more visible impact of earth sciences in the sustainable development of the continent.ANESI will also focus on:
    - promoting the International Geosciences Programme (IGCP) in Africa,
    - developing strategies to close the gap between primary/secondary and tertiary education
  
- Strengthening Earth Science Infrastructures in Africa through Geological Field Mapping Training
  - o This activity came as one of the recommendations from UNESCO Earth Sciences Education workshops held in Africa in 2010 and was motivated by:
    - the crucial role of geological maps as infrastructure in creating earth science knowledge and wealth by attracting investments;

- the shortage of mapping geologists needed by mineral, environmental and land-use sectors in various African countries;
- the lack of geological mapping skills to graduates from African universities

The activity aims at developing an integrated, networked geological field mapping training courses across the continent with focus on post-graduates young professionals of geological surveys and other research institutions, and university lecturers. The mid-term objective is to progressively reach the level of a sustainable centre of excellence in Geological Field Mapping Training in Africa.

### **Promoting IGCP in Africa through Geo-hazard Research**

This activity aims increasing the visibility of [IGCP in Africa](#) and improving the involvement of African Earth scientists in IGCP through [training workshops](#) and seminars and projects implementation. In this regard, two driving projects falling into the IGCP “Geo-hazards” theme were chosen for the multidisciplinary approach they require, their potential to involve a large number of scientists from many regions of the continent, and their high environmental, social and economic impacts. They will be implemented during the next four years (2011-2014) with additional support from the Swedish International Development Agency (SIDA) funding.

- Assessing the Environmental and health Impacts of major Abandoned Mines in Sub-Saharan Africa
  - Mining operations contribute more than 20 percent of the economy of sub-Saharan Africa, making mining one of the principal drivers of economic activity in the region. Sub-Saharan Africa also has some of the richest agricultural areas in the continent, making the agricultural industry a vital arm of the region’s economy. The two industries of mining and agriculture are not only complementary but inextricably linked, in a way that negative impacts arising from the development of mining, may impinge on the development of agriculture. Indeed, several decades of metal mining has considerably altered the background levels of toxic metal species in the various environmental media in a way that is adversely affecting surface and groundwater resources, soil and food crops, with potential negative effects on the food chain and consequently, the health of man and animals. In many sub-Saharan African counties, the situation is worsened by the lack of a precise inventory of abandoned and derelict mines. Indeed, systematic surveys and impact assessment need to be carried out over the entire region to be able to determine the true extent of the detrimental effects of metal pollutants and their impact on human and animal health, as well as on the environment and its ecosystems. This is a pre-requisite for appropriate legislation development and enforcement.
- Seismotectonics and seismic hazards in Africa
  - The African continent includes seismically active zones with significant late Pleistocene and Holocene tectonics (last 100 ka) that characterize the

continental deformation and its permanent background seismicity. The realistic assessment at a regional scale of geological and geophysical hazards requires the building of a databank. The seismic hazards being among the major threats of the continent, seismotectonic studies and maps are a necessary step for the mitigation of earthquake disasters in Africa. In this project, the preparation of thematic maps in earthquake hazards constitutes an important objective necessary for the social and economic development of Africa.

### **Promoting Geological Heritage in Africa**

Africa is a colossus continent endowed with enormous potentials in geological features that are worthy of protection and conservation for educational and outreach purposes and for their ability to promote sustainable development, particularly through tourism and other economic and cultural activities. However, policies in this regards are still very weak (only 33 natural sites under UNESCO in 2009 with very few geological). A vigorous work of awareness in direction of decision makers and local communities is needed. Few countries have expressed interest in joining the UNESCO Global Geoparks Network, but a lot still need to be done in term of organisation, management and infrastructures in potential sites before translating these expressions into successful applications. This activity aims at:

- Promoting the understanding and conservation of the geological heritage in African countries;
- Assisting countries in identifying, documenting and evaluating the significance of geological features worthy of protection and preservation.
- Promote the geoparks initiative in the continent by supporting and advising governments, local communities and other stakeholders on concept development and capacity building through exchange of knowledge and expertise with the community of geoparks worldwide.