

Earth Sciences in Namibia: providing a Sustainable Future

The International Year of Planet Earth (IYPE) was launched to promote awareness of geosciences and its benefits to society. It was also intended to create awareness of the relationship between human activity and its effects on the earth whilst highlighting the positive aspects of the association between the two. Namibia has abundant natural resources and the exploitation of these resources has consequences on the earth and human health.

The poster highlights on *Ground water, Natural Resources, Earth and Health* due to their high relevance to Namibian society. Furthermore emphasis is placed on the Namibian outreach activities to promote IYPE and create awareness of earth sciences. The Year also advocates the sustainable use of natural resources at a rate that does not endanger the natural balance of the earth's ecosystems and at the same time yielding significant development.

The Namibian National Committee (NNC), lead by Dr. G. Schneider the Director of the Geological Survey of Namibia (GSN), has initiated several ventures in cooperation with various noteworthy partners including the Geological Society of Namibia and the University of Namibia. Although the IYPE has come to an end, the NNC intends to continue with its various outreach activities.

Earth and Health

"All substances are poisons; there is none which is not a poison. The right dose differentiates a poison and a remedy." (Paracelsus (1493-1541).

Every day we eat, drink and breathe minerals and trace elements never giving a thought of what moves into our bodies. Usually the natural concentration of elements in nature is not high enough to cause health problems however due to natural phenomena or human activities, extremely high accumulations of elements can occur in nature and can lead to major health problems. Some health issues for example dental fluorosis are directly related to such occurrences.

Negative human activities cause contamination of soil and water, generation of excessive amounts of dust and destruction of habitat and ecosystems. In Namibia, dust is a common problem especially at mine sites and surrounding areas. Prolonged exposure to dust containing inhalable fractions of silica can cause silicosis.

Namibia has several abandoned mines with untreated tailings and people in those areas are exposed to the unhealthy elements from the tailings often resulting in respiratory illnesses. Such is the case in Oamites where a military base occupies a former mine site.

In Tsumeb soil contamination has been caused by copper processing activities particularly from the Tsumeb smelter. Exposure is mainly owed to airborne dust settling around the town and agricultural activities on contaminated soils.



Mining activities at Rossing Uranium Mine.



Rosh Pinah Mine tailings.



Okorusu Mine blasts.



Oamites military base camp on a dusty day.



Namibia is lucky to have His Excellency the Founding President of the Republic of Namibia, Dr. Sam Nujoma as the Patron of the International Year of Planet Earth. His Excellency recently obtained his masters degree in geology from the University of Namibia and he is an avid supporter and promoter of geosciences.

Groundwater

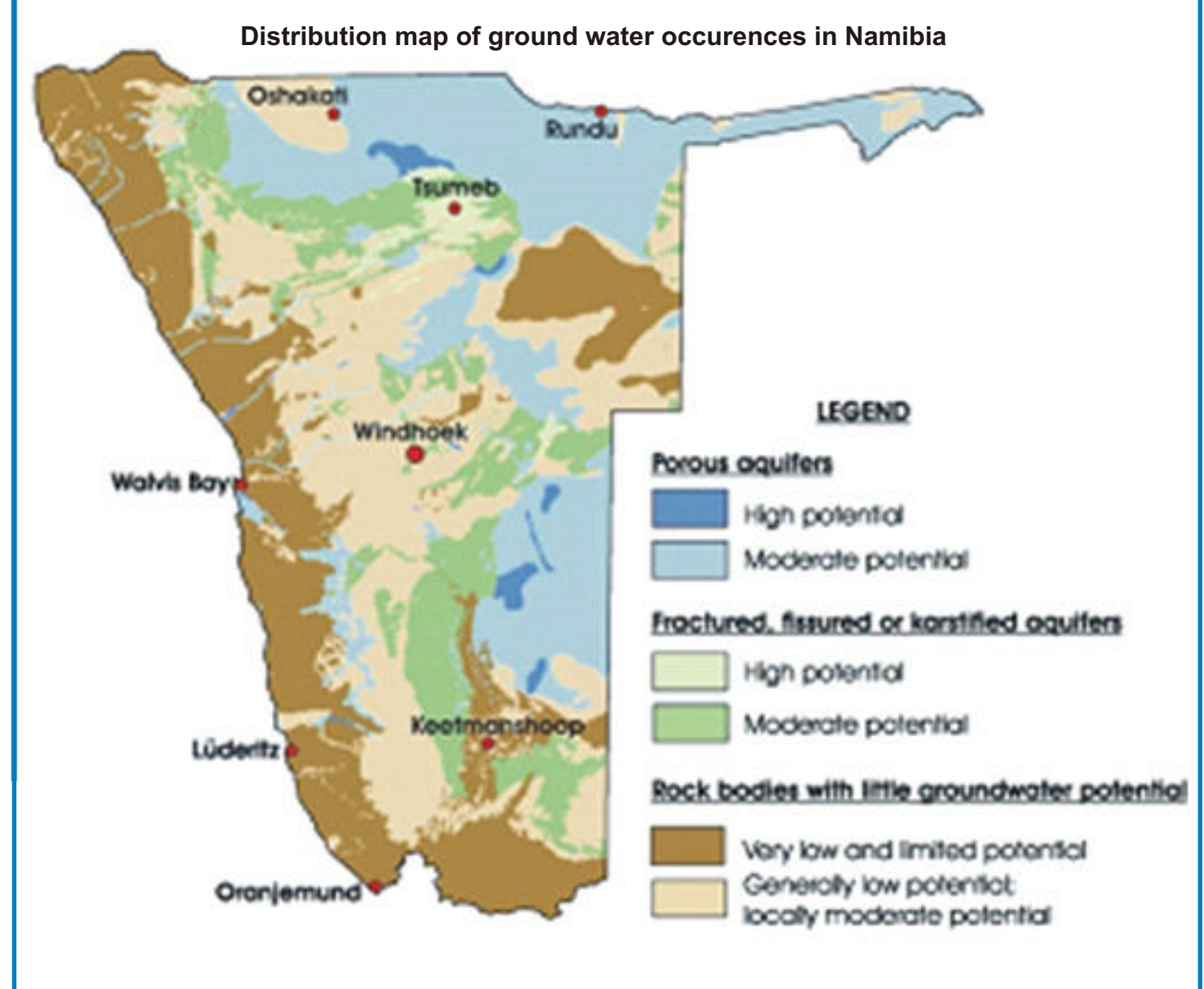
Groundwater constitutes the underground part of the water cycle, it is water stored underground in porous rocks and soils that store and transmit water. Groundwater is a very precious resource since it accumulates over thousands of years. Rapid extraction can deplete ground water sources and lead to intrusion of salt water in coastal areas.

Namibia has a semi-arid climate and as a result surface water is sparse making groundwater a valuable resource. Three types of aquifers are found in Namibia: sandy, karst and fractured aquifers. These supply water to major towns including the capital city Windhoek which is fed by aquifers from the Berk Aukas area.

Over-extraction of ground water is common in Namibia, since agriculture and mining which are the main economic activities, require vast amounts of water. However efforts have been made to mitigate the effects of ground water over-extraction. For example in the Naukluft National Park, the University of Namibia in collaboration with NamWater (the national water supplier) and Ministry of Agriculture and Water Affairs held consultations with local farmers and tourist resorts to raise awareness of the implications of over-exploitation of groundwater and to solicit possible solutions.



Lake Otjikoto, here the underground water is exposed.



Natural Resources

Namibia is endowed with abundant natural resources such as uranium, diamonds, gold, copper and many more. The mining sector is one of the major contributors to the Namibian economy along with the fishing and agricultural industries.

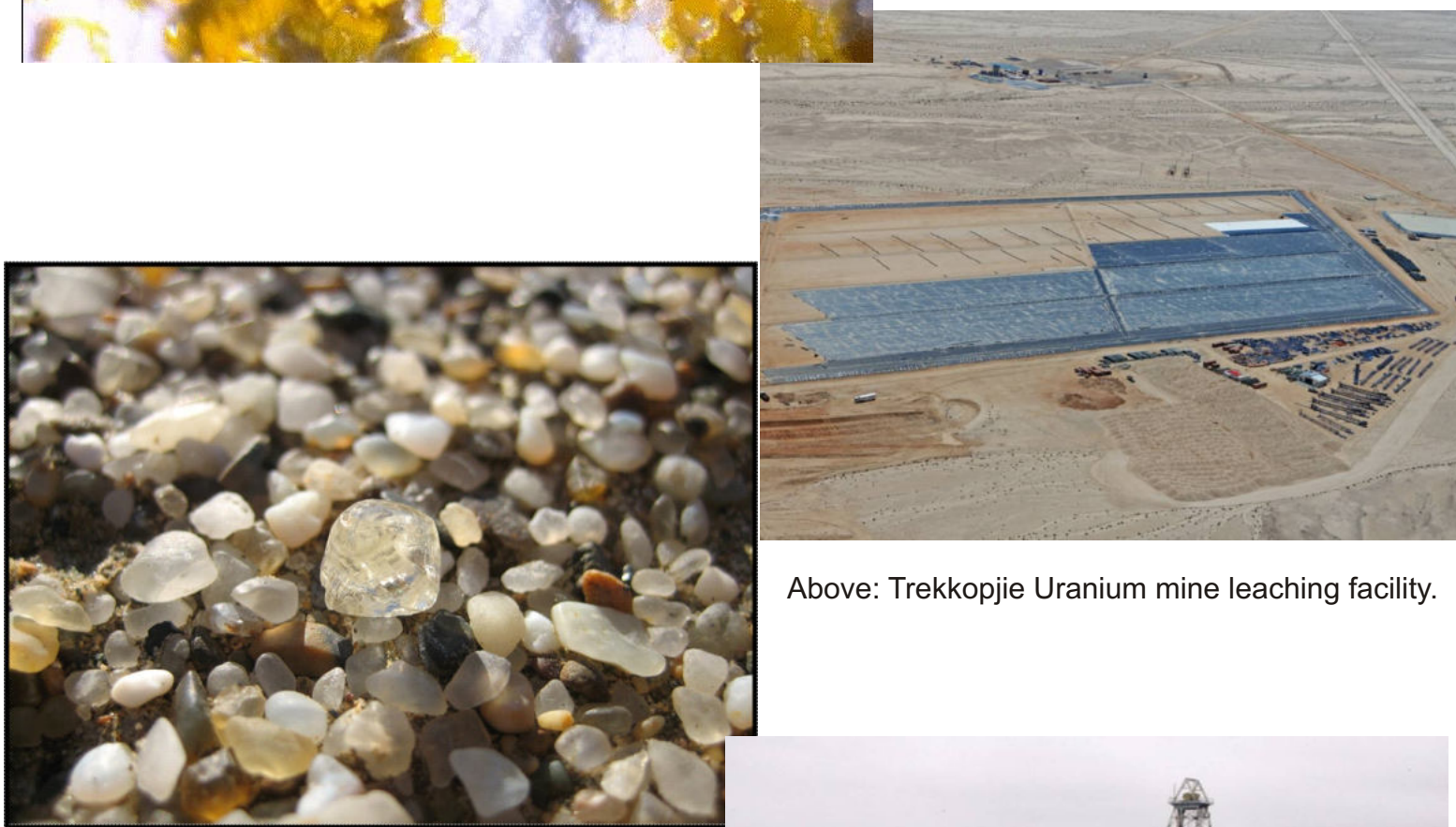
Namibia is currently one of the largest exporters of uranium in the world along with Canada, Australia, Niger and Russia. Uranium mining is flourishing in Namibia due to the increased need for energy worldwide. Namibia currently has two major Uranium mines in production with three more mines envisioned by 2013.

Diamonds are found offshore along the southern Namibian coast, along the Orange River and in Lüderitz where diamonds are mined onshore. Namibia hosts world class base metal deposits such as Copper deposits in the northern and central parts and Lead/Zinc deposits in the south. Apart from metal and mineral commodities, dimension stone, building materials such as calcareous sand, cement and salt are also mined in Namibia.

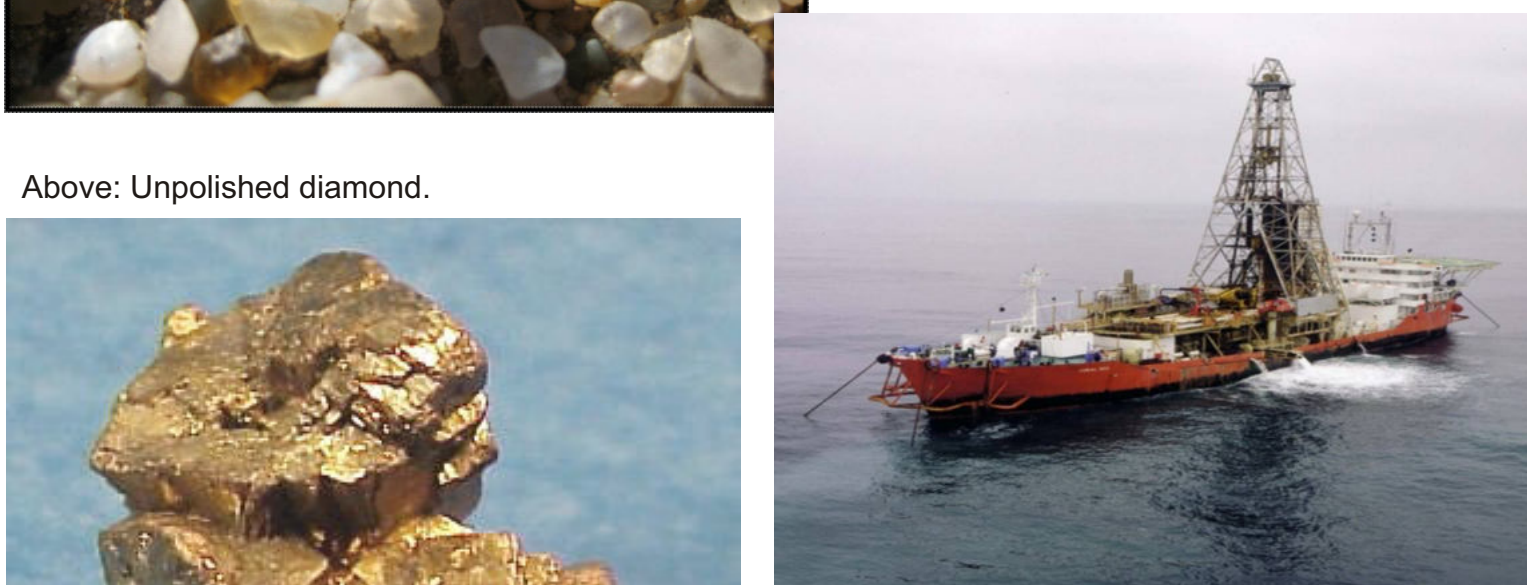
Namibia was one of the first countries in the world to incorporate the protection of environment into its constitution and protection of the environment is high on the government's agenda. Monitoring programmes on environmental rehabilitation are carried out by government agencies and various stakeholders. As we extract resources to our benefit from earth it is only fair that we reimburse to the earth by rehabilitating the environment as much as possible.



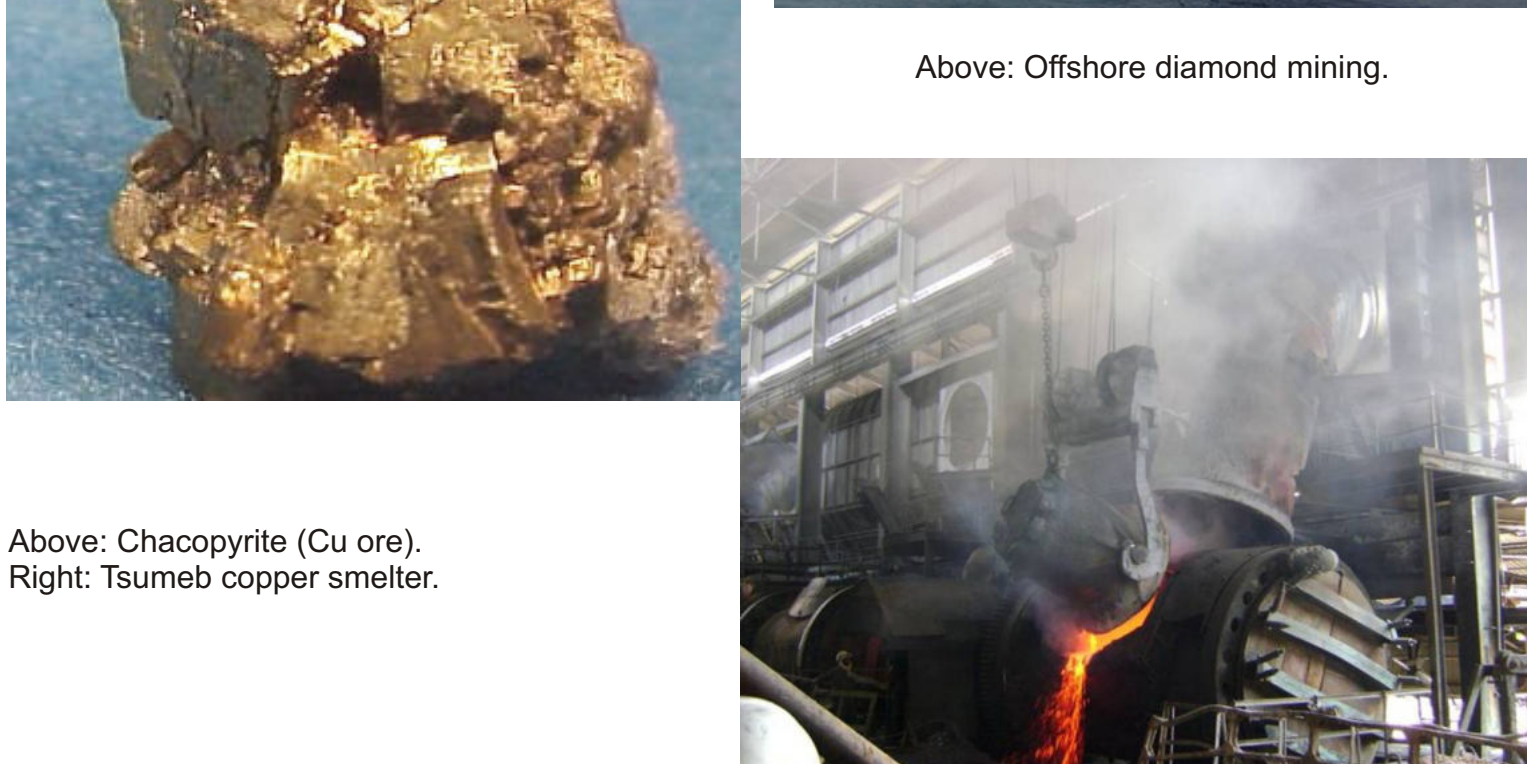
Uranium mineral



Above: Trekopje Uranium mine leaching facility.



Above: Unpolished diamond.



Above: Offshore diamond mining.

Above: Chacopyrite (Cu ore). Right: Tsumeb copper smelter.

Outreach Activities

The NNC has had a busy triennium with several events and outreach initiatives carried out to promote Earth Sciences. A highlight was the production of customized International Year of Planet Earth posters using Namibian examples set in the Namibian context. The poster series cover the following science themes Groundwater, Hazards, Earth and Health, Climate change, Resources, Deep Earth, Ocean, Soil and Earth and Life. The Megacities theme was not covered due to the lack of relevance to Namibian society, and in its place a poster with the theme "Earth and Man a controversial relationship" was compiled. The IYPE logo was also translated into the 11 different indigenous languages and colouring book was designed aimed at primary school pupils covering all themes excluding the megacities one. In addition, the NNC launched an IYPE poster exhibition at the University of Namibia library. The National Committee plans to distribute the posters and colouring books to primary and secondary schools in cooperation with Ministry of Education.

The Geology Department of the University of Namibia (UNAM) continuously promotes earth sciences as part of their community services, students visit primary and secondary schools in the country sciences during academic field trips. In addition the UNAM Geology Students Society actively campaigns for youth to pursue their further studies in the field of earth sciences by sending representatives to various secondary schools. In 2009 the Geology Students Society in conjunction with the UNAM Accounting Society sent representatives to 12 schools in Northern Namibia.

A youth debate focusing on the uranium rush in the Erongo region in western Namibia recently took place, on the 6th November 2009 as part of the Strategic Environmental Impact Assessment (SEIA) currently being conducted by the Ministry of Mines and Energy in conjunction with several stakeholders. The debate served as the ideal platform to gauge the view of Namibia's youth on the impact of several uranium mines in Namibia. Topics discussed covered water use, land use planning, socio-economic development, social and general infrastructure and community development. The points discussed were drafted into a document that is currently being fine tuned and will be included in the SEIA.

The Year served as an opportunity for Namibian earth scientists to come out of their isolation to inform and educate the Namibian public about earth sciences and its benefits to society. IYPE also provided a platform for the geoscientists to promote the importance of sustainably utilizing our natural resources. Our future can only be secured if we protect the environment without compromising the benefits brought by development. In short, mother earth will provide and take care of us if we take care of her.



A. UNAM students at a local High School.
B. Youth attending a Uranium debate.
C. IYPE display at IMME.
D. School children at the Earth Science Museum.
E. IYPE poster display.



Top and bottom right: example of a Namibianized IYPE poster and the colouring book.

