

HOW UNESCO'S MANDATE IN EARTH SCIENCES CONTRIBUTES TO THE IMPLEMENTATION OF THE UNITED NATIONS 2030 AGENDA



What are the Sustainable Development Goals?

As a universal call to action, in 2015 the United Nations adopted Sustainable Development Goals (SDGs) as part of the 2030 Agenda for Sustainable Development to be implemented over fifteen years (2015-2030). With 17 objectives and 169 targets, the SDGs have the overall aim to eradicate poverty and other deprivations, introduce strategies that improve health and education, reduce inequality and spur economic growth, while at the same time ensuring environmental protection. To achieve this, a great transformation of the financial, economic and political systems that govern our societies is needed and political commitment and decisive action by all stakeholders is vital. Fully interconnected, the SDGs cover areas as diverse as education, gender equality, responsible consumption and production, and peace, justice and strong institutions. Each SDG has targets that need to be accomplished. Progress on the implementation of these targets is monitored by the Member States through the Voluntary National Reviews and presented at the UN High-level Political Forum on Sustainable Development, the main global forum for reviewing successes, challenges and lessons learned on achieving the 2030 Agenda for Sustainable Development.

How does Earth Sciences contribute to the implementation of the SDG's?

Geoscience, or Earth Science, is the study of the Earth. This includes its surface and the processes that shape it but also its interior and the dynamics that occur beneath the crust. Through the study of the oceans, the atmosphere, rivers and lakes, ice sheets and glaciers, volcanoes and earthquakes, earth science aims to understand how these systems work today, how they operated in the past and to predict how they may behave in the future. The study of geoscience also covers how living things, including humans, interact with the Earth, for example, through the resources we use or how water and ecosystems are interconnected.

The overall aim of the SDGs is to pave the way for a sustainable world and, as it is demonstrated in this booklet, geoscience is at the core of this mission. This discipline has the ability to grasp the complex interconnections between the atmosphere, hydrosphere, cryosphere, biosphere, and lithosphere giving a unique whole-planet perspective of the Earth system. However, it suffers from inherent limitations - incomplete data, lack of experimental control or the inability to make direct measurements - that are related to the fact that geoscience studies a 4.6 billion year old planet where most events occur at temporal scales much larger than the human lifetime. These challenges are very similar to those faced by sustainability science.

It therefore becomes evident that geoscience is paramount for the successful implementation of the Sustainable Development Goals.

The International Geoscience Programme (IGCP)

Since 1972, UNESCO, through the International Geoscience Programme (IGCP) and in partnership with the International Union of Geological Sciences (IUGS), has harnessed the intellectual capacity of a worldwide network of geoscientists to lay the foundation for our planet's future, focusing on responsible and environmental resource extraction, natural hazard resilience and preparedness, and adaptability in an era of changing climate. UNESCO, the only United Nations organization with a mandate to support research and capacity building in geology and geophysics, and its flagship programme, the International Geoscience Programme, actively contribute to society and to the implementation of the Sustainable Development Goals.

IGCP's Contribution to SDG 11



UNESCO supports an international consortium of researchers working to map the distribution and processes of ground failure and subsidence caused by subsurface fluid extraction, to develop risk assessment by determining the most probable conditions (geological and human activities) of ground failure and to identify effective management and mitigation strategies to reduce this geologic risk.

UNESCO also sponsors a project identifying seismogenic faults in populated areas of Latin America and the incorporation of this information into seismic hazard assessment and work dedicated to assessing the seismic vulnerability of buildings located on hillsides. These projects help develop sustainable cities and safer living conditions by providing advice and education for the local authorities.

Rising populations and increasing migration have led to the growth of mega-cities. By 2050, two-thirds of all humanity - 6.5 billion people - will live in cities and to make them more sustainable a strong investment in career and business opportunities, safe and affordable housing, and building resilient societies and economies is needed. **SDG 11 aims at making cities and human settlements inclusive, safe, resilient and sustainable.**

Part of this must include assessing the risk posed to many cities by natural hazards, such as ground motion. This can be a result of the extraction of groundwater, fluid injection from hydrocarbon production or natural subsidence. Unexpected fissure generation and fault activation associated with anthropogenic land subsidence strongly affects the development of urban settlements, industrial centres, agricultural and other economic activities. It is therefore vital to understand the mechanisms by which ground motion occurs using remote sensing techniques, laboratory experiments and fieldwork.



Right: examples of ground fracturing in Mexico City caused by earthquakes that were triggered by the movement of seismogenic faults.

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