2018 ECOSOC Integration Segment on

« Innovative communities : leveraging technology and innovation to build sustainable and resilient societies »

Contribution by UNESCO

The notion of resilience in the context of Agenda 2030

The United Nations defines resilience as "*the ability of a system, community or society exposed to hazards to resist, absorb, accommodate, adapt to, transform and recover from the effects of a hazard in a timely and efficient manner, including through the preservation and restoration of its essential basic structures and functions through risk management*."

UNESCO's areas of competence play vital roles in constructing a global culture of resilient communities in the context of Agenda 2030:

The **natural sciences** are critical, not only to building an evidence base and an understanding of risk related to natural phenomena, but also to develop the technology and innovation that allow prevention and early action, resistance, and absorption of the impacts of the individual and cascade hazards.

Education is a critical factor in building communities' and individual empowerment and resilience, and in reaching those furthest behind to sustainably improve conditions of lives. Educational content and teaching methods can contribute to positive behavioral change and promote resilience and social cohesion. Lifelong learning, as an organizing principle of all forms of education and types of provision, can play a key role in supporting sustainable and resilient societies. **Education for Sustainable Development** empowers people to change the way they think and work towards a sustainable and resilient future. It promotes the inclusion of sustainable development issues, such as climate change and biodiversity into teaching and learning. Individuals are encouraged to be responsible actors who resolve challenges, respect cultural diversity and contribute to creating a more sustainable world

Information and communication technologies (ICTs) can empower local communities with the tools to mitigate and adapt to climate change and natural disasters. Access to information and ICTs allow "early warning" systems and data and knowledge sharing that can save lives. Moreover, journalists and community media, particularly radio, play an essential role in reporting on climate change and in disseminating information critical for disaster preparedness and response.

Culture is recognized as a fundamental resource to promote community resilience and identity. Through the implementation of its mutually reinforcing culture conventions and guided by its Strategy to protect and promote culture in emergencies, UNESCO works with the international community to harness the power of culture in emergency situations, from preparedness through response to recovery, to achieving resilient, inclusive and sustainable societies.

Examples and good practices of UNESCO's work that illustrate how technology and innovation can help build a resilient future

In order to advance inclusive research and innovation strategies, in particular in developing countries, UNESCO has developed the **Global Observatory of Science, Technology and Innovation (GO-SPIN)**, a database and platform, enabling benchmarking, and giving access to STI policy, legal, and institutional instruments. GO-SPIN also serves to inform government decisions on investment in STI, including in relation to innovative technologies to enhance resilience.

A critical factor for building reliance, UNESCO promotes gender equality and women's empowerment through the UNESCO **science, mathematics, technology, and engineering** (**STEM) and Gender Advancement (SAGA) projects**, which aim to improve measurement and

policies for gender equality in STEM. On-the-ground actions include the support to innovation acceleration platforms, science parks and technology and business incubators in Indonesia and Namibia, facilitating the creation of knowledge-based small and medium size enterprises (SMEs) in technology business incubators (TBIs) and science parks.

Enhancing communities' resilience to climate change hazards, UNESCO advocates for, and shares best practices of, **Smart Water Management Systems** to ensure the minimization of non-revenue water and to promote green solutions with regard to water management. Coasts and beaches, critical to livelihoods, are facing changes that are adversely impacting coastal communities. Through **UNESCO's Sandwatch project**, citizen science and community-based observations of changing coastal environments are creating data serving as a baseline for measuring impacts of natural disasters and climate change, increasing understanding of risk and enhancing resilience.

Studies of trends in disaster and climate change impact suggest that each year, 175 million children are likely to be affected by natural hazard-related disasters. In close collaboration with UNESCO, SPRINT-Lab researchers at the University of Udine in Italy developed an innovative technical-triage methodology named **VISUS, assessing the vulnerabilities of existing school facilities related to natural hazards**. This allows cost-effective safety-upgrading strategies and science-based decisions to strengthen school safety, benefitting students and teachers. The VISUS methodology has been piloted with first positive results in vulnerable and high exposure areas, including Italy, El Salvador, Laos, Indonesia, Peru, Haiti and Mozambique, benefitting more than one million students overall.

An **earthquake early warning system (EEWS)** helps save lives and infrastructure by disseminating timely information about potentially catastrophic earthquake hazards. EEWS use state-of-the-art technology by rapid telemetric analysis of the initial seismic waves generated by an earthquake, detected from a dense network of seismic sensors. As the only UN agency with a mandate in Earth sciences, UNESCO has actively promoted international cooperation for the development and implementation of EEWS worldwide.

UNESCO is a part of the **I-REACT (Improving Resilience to Emergencies through Advanced Cyber Technologies)** project. Information from monitoring systems, earth observations, historical information and weather forecasts are combined with data gathered by new technological developments created by I-REACT. These include a mobile app and a social media analysis tool to account for real-time crowdsourced information, drones to improve mapping, wearables that provide an accurate positioning, as well as augmented reality glasses to facilitate reporting and information visualization by first responders. With this innovative approach, I-REACT empowers all the stakeholders involved in the prevention and management of disasters. Citizens are able to report first-hand information, policymakers are supported in the decision-making process, and first responders are equipped with essential tools for early warning and response.

Another example pioneering the use of ICTs to help build a resilient future, decrease vulnerabilities and foster inclusion, especially of the furthest left behind, is the research project **Landslide EVO**, which increases communities' resilience to landslides and flooding in Nepal through a participatory approach to knowledge generation and risk governance. Another example of the use of ICTs to build resilience is **Mountain EVO**, a project aiming to build Environmental Virtual Observatories (decentralized and open technology platforms for knowledge generation and exchange that enable participation of marginalized and vulnerable communities bypassed by the traditional mechanisms). It focuses on four remote and poor mountain regions, characterized by poor water supply, soil fertility and land cover. UNESCO also contributes to building a culture of prevention on climate-change-driven disaster risks by strengthening local journalists' professional capacities in the fields of Disaster Risk Reduction (DRR) and Climate Change Adaptation (CCA).

With respect to safeguarding cultural heritage, UNESCO and the Operational Satellite Applications Programme (UNOSAT) of the UN Institute for Training and Research (UNITAR) cooperate on a regular basis for the monitoring via satellite imagery of the destruction and damages to cultural heritage in Iraq, Syria, Libya and Yemen. In the context of this partnership and in line with the "Revive the Spirit of Mosul" initiative launched by UNESCO in 2017, the resulting comprehensive assessment of the urban heritage of the Old City of Mosul (Iraq) will provide essential data to inform larger planning, financing and implementation of post-crisis reconstruction and recovery programmes while contributing to the UN Recovery and Resilience Programme designed to help Iraq's Government fast-track the social dimensions of the city's sustainable reconstruction.

UNESCO´s **International Science School** "Bridging research and environmental adaptation to climate change in the Caribbean", to be held in Havana, from 28 May to 1 June 2018, will serve as a participatory and interdisciplinary forum to inter alia discuss the notion of resilience and provide policy guidance to tackle the complex challenges in the area of climate change adaptation. This capacity-building initiative of sub-regional scope is based on the unique platform provided by the synergies of the diverse international science programmes operated by the Organization, in particular by four programmes: the Management of Social Transformations (MOST) Programme, the Intergovernmental Oceanographic Commission (IOC), the International Hydrological Programme (IHP), and the Man and the Biosphere Programme (MAB).

Additional policy instruments or mechanisms relevant to UNESCO that support risk mitigation and foster resilience

Post-earthquake field investigation by International Platform for Reducing Earthquake Disasters (IPRED): The International Platform for Reducing Earthquake Disaster (IPRED) is a platform for collaborative research, training and education in the field of seismology and earthquake engineering. IPRED establishes post-earthquake scientific field investigation, to share findings and lessons from earthquake disasters with other earthquake-prone countries to enhance future disaster risk reduction.

ICTs build interlinkages of resilience in the implementation of the 2030 Agenda. A cross-cutting issue of the Sustainable Development Goals (SDGs), the essential role of ICTs for sustainable development is recognized by the UN General Assembly's review of the **World Summit on the Information Society** (A/70/125) noting that access to ICTs has "become a development indicator and an aspiration in and of itself". Through the sharing of information and best practices, identification of emerging trends and fostering of partnerships, international cooperation within the WSIS follow-up has contributed to development of resilient and sustainable knowledge societies.

The adoption of the "**Strategy to reinforce UNESCO's actions for the protection of cultural heritage and the promotion of cultural pluralism in the event of armed conflict**" and its addendum on natural disasters by the UNESCO General Conference in 2015 and 2017 respectively; the elaboration of its Action Plan to operationalize the provisions of the Strategy through the culture conventions; and the establishment of UNESCO's Heritage Emergency Fund represent a breakthrough in the response of the Organization to the acceleration of intentional attacks against culture, the illicit trafficking of cultural property to finance terrorism, and the recurrence of natural disasters. This comprehensive framework aims to foster a more coordinated response to emergencies through the integration of the protection of culture into humanitarian, security and peacebuilding actions and to reinforce UNESCO's efforts to support Member States in the prevention, mitigation and response to the loss of cultural heritage and diversity in emergencies.