WORKING PAPER 2.3

Committee: United Nations Educational, Scientific and Cultural Organization

Topic: Preserving Cultural Heritage with Innovative Technology in Context of Natural Disaster

Sponsors: Ethiopia, India, Mexico, Brazil, Saudi Arabia

Cultural heritage is a vital aspect of our history, representing the values, customs, and traditions of our ancestors. However, the impact of natural disasters on cultural heritage protection can be devastating in some countries such as India, Ethiopia, Mexico, Brazil and Saudi Arabia. Natural disasters such as earthquakes, fire and desertification can cause damage or destruction to cultural heritage sites, and the impact of natural disasters on cultural heritage protection underscores the need for disaster risk reduction strategies that take into account the unique vulnerabilities of cultural heritage sites. To that end we propose:

**PartⅠ：Earthquake**

**Prediction and monitoring:**

* Implement **machine learning algorithms** to analyze historical data and real-time data from sensors and weather reports, to predict the likelihood and severity of natural disasters.
* Use **remote sensing technology**, such as satellite images, to monitor the condition of cultural heritage sites and detect any changes or damage caused by natural disasters.
* Develop **earthquake early warning systems**, that can alert officials and the public of an incoming earthquake, giving people more time to evacuate and protect themselves and their cultural heritage.

**Protection and resilience:**

* Use **3D printing technology** to create replicas of cultural heritage artifacts and structures, which can be used to create backups or replacements in case of damage or destruction.
* Develop **smart materials and coatings**, such as fire-resistant paints or water-resistant barriers, to protect cultural heritage from natural disasters.
* Use **virtual reality and augmented reality** to create immersive experiences that can help educate the public about cultural heritage, and to create simulations that can help planners understand how to protect and preserve these sites.

**Restoration and recovery:**

* Use **drones and aerial imagery** to create high-resolution maps of damaged cultural heritage sites, which can be used to guide restoration efforts.
* Use **laser scanning and photogrammetry** to create 3D models of damaged structures, which can be used to create digital replicas, or to guide restoration efforts.
* Develop **innovative restoration methods**, such as 3D printing or robotic restoration, that can quickly and efficiently restore damaged cultural heritage sites.

**PartⅡ：Fire**

**Before the fire**

* further resolving the problem of fireproof materials to make it easier to obtain and apply to building where cultural heritage is located.
* Using camera **monitoring technology** to keep abreast of cultural heritage fires or smoke at any time, so that corresponding measures can be taken quickly.
* Formulating specific measures to maximize the protection of cultural heritage through simulation scenario of fire.

**In the fire**

Using **OUV monitoring technology** to take aerial photos and record fire monitoring data to help firefighters monitor the fire scene in real time inside and outside the fire scene , so as to achieve timely fire disposal and emergency measures.

**After the fire**

using thermal imaging technology to capture the high temperature at the fire scene to help fire emergency workers find the fire site in time and take effective carbonization measures.

Using the **stable air pressure system** to reduce the impact of coke, toxic gas and other harmful substances generated by the combustion of culturally heritage by adjusting the internal temperature and oxygen level, thus reducing the damage of cultural heritage.

**Part**Ⅲ**：Desertification**

**Before the desert**

* It is highly recommended that several water conservancy program should be set to deal with the lack of water in local areas.
* Chemical technologies should be involved in the land governance to prevent the soil from being too drought or barren.

**In the desert**

* The biological technologies can be introduced into the desert to create and cultivate more oasis in the desert to make the land green again.

Overall, these technologies can help to protect, preserve, and restore cultural heritage during natural disasters, ensuring that future generations can continue to enjoy and learn from these important cultural treasures.