

Environmental Risk Assessment and Mitigation on Cultural Heritage assets in Central Asia

ERAMCA

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Report – Strategic Educational Agenda

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1. Introduction

Foreseen Strategy Forum on need analysis in Environmental Risk Assessment and Mitigation on Cultural Heritage Assets in Central Asia was organized in Turin Polytechnic University in Tashkent on September 15, 2020, within the framework of the ERAMCA Erasmus + project.

The forum was conducted as a webinar in an online mode due to the COVID-19 pandemic situation in Uzbekistan and around the world. To improve the efficiency and productivity of the seminar, all keynote speakers from Uzbekistan were invited to a conference hall of the university. Program countries and partner countries, international and national authorities were participated in seminar via online mode.

High-officials and professionals participated at the seminar, among them were Head of UNESCO office in a Tashkent, Coordinator of National Erasmus+ Office (NEO) in Uzbekistan, Experts from ministry of culture of Uzbekistan, project officer of European Commission Education, Audiovisual and Culture Executive Agency and members from other stakeholders. Roughly speaking about 50 people participated at the seminar.

The aim of the seminar was to assess the competence requirements and correct needs from chief **specialists** of government authorities from Uzbekistan and Tajikistan who are responsible for cultural heritage conservation and management.

Weeks prior to the scheduled seminar, specialists were asked to so submit the position papers which they wrote about focal areas and competence which immediately need support to mitigate the environmental impact on Cultural Heritage Assets in Central Asia. In total, 9 specialists were participated at the seminar as a keynote speaker and 3 of them were from Tajikistan.

This report describes the summary of the assessment of skills and competence requirements, and overall approach to capacity building of young specialists based on submitted position papers.

2. Issues in Cultural heritages Conservation and Management

Today, there are 8208 objects of material-cultural heritage in our country, of which 4748 archeological objects, 2250 architectural monuments, 678 monumental works of art, 532 sightseeings of cultural heritage objects. The cities of Samarkand, Bukhara, Khiva and Shakhrisabz are included in the UNESCO World Heritage List as protected historical monuments.

On the territory of modern Tajikistan, there are ancient cities of Penjikent (known since the 6th century), Khujand, Ura-Tyube (and still famous for the products of local craftsmen), Isfara, Kanibadam, etc.

Moreover, Tajikistan has such monuments such the Gissar fortress, the Khoja Mashhad mausoleum, Ajina-Tepe with the remains of Buddhist monasteries of the 7th-8th centuries. Eight ancient monuments of Tajikistan included in the preliminary catalog of UNESCO.

These cultural heritages of Uzbekistan and Tajikistan are suffering from insufficient of proper conservation, restoration works and no constant monitoring system. Most of the time restoration works was done by non-professional workers without a scientifically grounded and approved restoration project.

The main reason for the deterioration of the state of cultural heritages in both countries are absence of qualified architect restorers. There is no system for training architect-restorers with higher education, as well as middle-level specialists in Tajikistan.

TajikMDPRM (Main Department for the Protection and Restoration of Monuments), which functions under the Ministry of Culture, is mainly engaged in the manufacture of sculptures, busts, landscaping of areas around monuments. Most of the restorations are made by local craftsmen without deep scientific analysis.

The knowledge and skills necessary for restorers are not taught due to the lack of a training system in Tajikistan. But since 2020, department of "Architecture and Design" has launched course of "Restoration of Architectural Monuments" for only master students. However, there is no course work or project, corresponding practice with a trip to the location of monuments of archeology or architecture in the curriculum of the discipline.

In Uzbekistan, a shortage of qualified experienced specialists is observed in almost all areas of restoration. Today, there are no professional schools that train restorers with a narrow specialization in Uzbekistan. Therefore, the study

and revival of ancient technologies is essential. Such specialties remain at the level of local craftsmen whose experience is transmitted according to the principle of "Usto-shogird,".

Main reason for shortage of qualified specialists in field of conservation and restoration was the shutdown of UzNIPrestoration research institute in 1994. This research institute was single in Central Asia where high qualified specialists in the field of conservation and restoration of cultural monuments were completed. Some of the specialists of the institute had been working in the Department of History and Theory of Architecture at TACI as a professor.

Since Uzbekistan has no special institutes or faculties for the training and preparation of specialists in the field of restoration and conservation, a proper curriculum has not been developed yet. After long efforts in 2019, there was opened a division within the Department of History and Theory of Architecture at TACI, for which a group of 28 people were taken at the bachelor's level.

But even there, the teaching of Special subjects begins only from the second year, that is, September 2020.

The training program developed for this direction is new and weak, and we hope it will be improved in the process of training and exchange of experience with foreign restoration universities in the coming years.

3. Assessment of Skills and Competence Requirements

Almost all specialists highlight the urgency of the assessment of seismic vulnerability of historical monuments. Because these monuments exist a long time under different kind of condition, the environmental impacts grow year by year due to climate change.

In practice, competence requirements are identified from detail assessment of physical condition of historical monuments. Based on this assessment, series of countermeasures will be taken for retrofitting, reconstruction, conservation and utilization of historical monuments. Therefore, young specialists must have multidisciplinary knowledge and experience. In fact, they must able to do:

Assess the physical condition of historical monuments by using modern technics and make a technical report based on this assessment, including overall seismic stability.

Assess and predict the consequences of seismic impact to historical monuments by means of computer simulation.

Know and able to select the correct retrofitting methods.

Restoration of damaged parts of historical monuments with respect to world wide internationally accepted methods.

Construct engineering protective structures against environmental impacts, such as groundwater table rise, salt attack, wind, noise and earthquakes.

Create and update geodatabase of urban area within the historical part and monitor urbanization

Develop management plan for historic urban fabric of world heritage properties in Uzbekistan and Tajikistan.

To accomplish first and second tasks, first of all young specialists should have geological knowledge because geology is varies depending the location of each historical monument. And they able to work with modern seismic meter equipment to assess the physical condition of Historical monuments. Each historical monument should have a passport, which includes the characteristics of seismic vulnerability for different earthquakes magnitudes.

Moreover, specialist should be able to use the 3D scanner and drones to documenting and construct computer model of historical monuments to simulate seismic vulnerability of historical monuments under different earthquake scenario. To have these knowledge and skills future specialists must study Applied Geology and Geomatics courses.

To plan and realize a correct retrofitting method for historical heritages, young construction engineer should have fundamental knowledge on strength of construction materials, chemical characteristics of construction materials. Moreover, specialists able to assess maximum seismic load to each construction materials by using modern testing machines. To obtain these knowledge and skills, young engineer must study structural engineering, structural mechanics and material sciences courses.

To correct restoration of historical monuments, it is necessary to have deep scientific knowledge of history of architecture, building typology of historical monuments and ancient building materials. They also have to be familiar with modern restoration methods in developed countries such as Greece, Italy, Iran and Egypt. All specialists in the field of restoration have to obtain "History of Restoration and Methods of Historical Monuments of Uzbekistan and



Tajikistan". A restorer should have the skills and ability to organize and get various specialists involved in order to eliminate the main reasons contributing to the intensive destruction of the monument. Lack of specialists is observed in such areas as: preparation technology and composition of the majolica; specialists assessing the effect of chemical reagents (salt and other composition) and moisture on stone and other materials; architects with a fine comprehension of the basics of the monumental structures and the surrounding area with historical and traditional architecture.

Most of the historical heritages of Uzbekistan and Tajikistan are suffering from groundwater table rise and salt attack. To construct protective engineering structures against above counted environmental impacts, young engineer needs to study geotechnical courses. Besides, young specialists should know how to assess hydrogeological conditions of the foundations of architectural monuments, analyze and calculate the bearing capacity of the foundation. Geotechnical knowledge is also necessary to giving permission to construction companies for excavation and land management projects within protected area of historical monuments.

Decree of the President of the Republic of Uzbekistan **F-5181** "*On improving the protection and use of objects of Historical Monuments and Archaeological heritages*" was dated January 16, 2018. The main aim of the decree is to create a unique renewable electronic database of all cultural and archaeological heritage objects in the country, preparation of passports, establishing their protection boundaries and other inventory data. Specialists who accomplish these tasks must be aware of Geographic information and remote sensing technics.

Based on the above reported competence requirements, following disciplines are considered urgent for future specialists:

1. Restoration
2. Structural Mechanics
3. Seismic Engineering
4. Geotechnics
5. Hydrogeology
6. Geomatics

All these divisions should be narrowly focused to solution of problems concerning the cultural heritage assets with the full of practical case studies.