



Project Description for ARASIA TC Programme

TC Cycle 2020-2021

Project Number: RAS1025

Project Title: Enhancing the Capabilities of Radiocarbon Dating in Archaeological Applications (ARASIA).

Overall Objective: To strengthen the valorization of cultural heritage and the understanding of ancient history using nuclear techniques.

Project Duration: (2020 – 2021)

Project Description: Lebanon and its neighboring countries, or what is known by Levant, and all Arab countries are rich in archaeological patrimony due to the fact that they have seen several human occupations since the lower Palaeolithic (3.3 million to 300 000 years). A large number of archaeological sites and excavations have unearthed remains dating back thousands of years that belong to earlier civilization (e.g. Prehistoric, Phoenician, Babylonian, Assyrian, Hellenistic, Roman, Byzantine, Omayyad, Abbasside, Mamluk, Ottoman, and others). Organic remains, such as bones, charcoal, seeds etc., are the main findings that require absolute dating in order to better understand the past human history and to reconstruct early human occupation. In Lebanon, in the last ten years, due to the booming real-estate activity in the major cities, large scale campaigns of archaeological excavations were and still are undertaken, surfacing very large numbers of findings that could be dated by radiocarbon. Some Arab countries are well equipped and have the necessary techniques to determine carbon-14, using the conventional radiocarbon method (benzene synthesis or carbon dioxide absorption and measurements with liquid scintillation counting (LSC)). However, the application of carbon-14 dating in archaeology is still moderate and most findings are dated in foreign laboratories which is usually associated with high cost and risks, due to cross-border shipping of valuable artefacts. This project will enhance the national expertise in extending the applications of their existing radiocarbon dating laboratories to cover archaeological studies and undergo better valorization of cultural heritage through the training that will be organized, and the purchase of necessary small equipment, standards and reference materials.

Problem to be addressed: All ARASIA State Parties are rich in archaeological patrimony. Large number of archaeological sites and excavations have unearthed remains dating thousands of years that belong to earlier civilization. Organic remains, such as bones, charcoal, seeds, etc., are the main findings that require absolute dating in order to better understand the past human history and to reconstruct early human occupation. Most radiocarbon dating for artefacts is carried out in foreign laboratories with expensive cost. Some MSs have the necessary technique (conventional radiocarbon method), however, its application in archaeological studies is still absent. This project will address



the topic of radiocarbon dating in cultural heritage that will provide necessary knowledge and improve expertise in this field, and help participating MSs to undergo studies related to the valorization of cultural heritage. Radiocarbon dating will give absolute ages of ancient organic remains in excavation and therefore, will play an important role in the reconstruction of the ancient past and in studying national cultural heritage.

This project is proposed as a regional activity for the following reason(s): All MSs are rich in archaeological patrimony and large numbers of findings that merit profound studies and absolute dating. The majority of these countries undergo such studies in foreign laboratories, but outsourcing these studies entails a considerable financial burden, and also limits the ability of performing all necessary investigations and dating analyses of large numbers of samples. Having these facilities and knowhow in the region will provide a great deal of flexibility and autonomy in managing the cultural heritage of MSs.

Stakeholders: Stakeholders will include (1) ministries which are in charge and responsible for archaeological sites, archaeological research and archaeological excavations (like the Ministry of Culture in Lebanon); (2) countries' museums; (3) conservators; and (4) academics and archaeologists from universities. Absolute ages acquired from radiocarbon dating will be delivered to the above mentioned stakeholders, as they are the main project participants responsible for cultural heritage valorization, restoration and conservation of artifacts.

Partnerships: Partnerships will be established with ministries of tourism or education existing in MSs; archaeologists; national museums; curators; conservators and academics.

Role of nuclear technology: Radiocarbon dating is an essential nuclear technique applied to determine the absolute age of archaeological findings and hence, to better understand ancient human history and to enhance the valorization of cultural heritage.