

ICOA1679: COMMUNITY AND STAKEHOLDERS ENGAGEMENT IN REVIVAL OF URBAN HERITAGE: RESTORATION AND REHABILITATION PROJECT OF THE ROMAN NYMPHAEUM IN AMMAN

Subtheme 01: Integrating Heritage and Sustainable Urban Development by engaging diverse Communities for Heritage Management

Session 1: Sustainable Development and Community Engagement

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Abstract: This paper presents a case study for a best management practice with applied methods to the revival of urban heritage as an approach for sustainable heritage preservation. It demonstrates a practical example of restoration and rehabilitation for the Roman Nymphaeum in Amman, which is considered as the biggest monument of its kind in the region. The Nymphaeum was suffering from different deterioration factors and forms that affect its state of conservation and was considered a visual pollution in the downtown. However, through a joint project with the Hamdi Mango Centre for Scientific Research at the University of Jordan, Department of Antiquities and Greater Amman Municipality in supporting the preservation efforts of the monument, it was possible to waive and preserve large areas of the site, which needed urgent solutions of restoration and conservation and to regenerate its role within the current archaeological context.

The project is focusing on creating a new model in the downtown of Amman for the revival of urban heritage into a cultural forum open public space “Nymphaeum Archeological Park” that will foster socio-economic benefits to the community. The project will establish a new comprehensive methodology for cultural heritage preservation in Jordan based on community and stakeholders engagement with incorporation of all aspects of documentation, management, capacity building, conservation, rehabilitation, interpretation and presentation while monitoring and evaluation with regular maintenance to be enforced. This approach will close the cycle to ensure proper sustainability with compatible modern usage for archaeological sites.

Key words: *community, stakeholders, participation, development*

1 Residential

7.1 Existing condition

Construction and reconstruction in the district since the 1980's has been contrary to traditional styles and/or of poor quality with modern materials (large openings or glazed storefronts and poorly designed signage). Most of the new buildings are inconsistent with the historic fabric. The interior residential areas suffer from over building and haphazard construction making these areas dark and unhealthy. The layout inside many of the apartments is limited to one or two rooms per unit without toilet or kitchen. The lack of planning and proper oversight has also created inadequate drainage, heating, gas and fire protection. Residents choose to live in the area just due to the cheap rents and/or convenience to employment, but 70% of the residents are dissatisfied with the quality of life in the area.

7.2 Proposed Renovation and Reconstruction

The renewal plan proposes three principles for development in the heritage area. First, authentic heritage structures should be repaired and rehabilitated. Second, when feasible, buildings along main streets and adjacent to the major heritage compounds, should follow a courtyard development pattern (Fig.5). Finally, other new construction should be compatible with the traditional scale and texture of the heritage district.

Introduction

Brief Description of site:

The Roman Nymphaeum in Amman is the biggest Monument of its kind in the region and it was one of the main monumental buildings in the ancient city of Philadelphia (Modern Amman).

The Roman urban plan organized the city into two main parts; the upper part with the main Roman Temple of Hercules and the lower part, which follows a typical Roman city plan with two colonnaded streets (Cardo and Decumanus) along the major two Valleys of the city. The Nymphaeum was located close to the point where the Cardo intersects with Decumanus.

With its monumental structure the monument was built over a cave with a running water source for the city and standing directly upon the edge of the main stream oriented to northwest, its back is near to the stream edge and the main façade looking toward the Cardo according to the main city plan. The Nymphaeum is a half octagonal building with symmetrical design, the elevation can be divided into two sections; the lower part is the foundation including the barrel vaults, and the second part is the upper part (including the main façade of the building and its rear).

Today the monument is suffering from different deterioration factors and forms that affect its durability and stability. Furthermore, the air pollution deposits caused dis-formation of all whole monument surfaces, which is considered as a visual pollution in the down town and thus it needs urgent solution to restore and conserve the monument and to regenerate its role within the archaeological area (Fig. 1).



Fig.1– A view of the Nymphaeum before the kick off the project, ©Authors.

Project Purpose and Summary:

The project aims to set up conservation and restoration plan to safeguard the monument and overcome all the deterioration forms and factors affecting the stability and durability of the architectural and ornamental elements of the monument. Furthermore, a site management and rehabilitation plan will be performed for the Nymphaeum including interpretation and presentation to be ready for receiving the tourists and to create a new attraction in the down town of Amman.

Overall project objectives and the desired results:

- To set up conservation and restoration plan to safeguard one of the most important Roman Monuments at the Down Town of Amman “The Nymphaeum”.
- To perform a practical and sounding conservation and restoration works to overcome the deterioration forms and factors affecting the stability and durability of the architectural and ornamental elements of the monument.
- To rehabilitate the Nymphaeum and its surrounding area to prepare it for feasible tourism utilization that will benefit the community.
- To document the monument before and after conservation and restorations works of the project.
- To transform a neglected monument to be a vital touristic attraction in the down town of Amman.
- To re-connect the Monument with its original Roman urban context to complement the Roman Theatre, Odeon, and Amman Citadel that will regenerate the image of ancient Philadelphia.

To involve the specialists and research institutions in the project and enhance the knowledge sharing and exchange of experience in the field of conservation and restoration:

- To build the capacity of young graduate students in the majors of conservation and cultural resources management.
- Raising Awareness about the importance of the Nymphaeum within the Roman Urban context.

Project Significance and urgency

- **Historical Value:**

The Roman Nymphaeum in Amman is the biggest Monument of its kind in the region and compared to other Nymphaeum(s) in Jordan such as in Petra, Pella, Umm Qais and Jarash. The monument was one of the main monumental buildings in the ancient city Philadelphia (Modern Amman). It was very clear the significance of the monument due to the many travellers and orientalist visited and described the monument such as Macdonald, Conder, Burkhardt, Merrill, Butler, Robinson, and Seetzen which they all described its large size, architectural and ornamental features. Moreover, some parts were reused for building other structures especially during the Umayyad period where some bases, drums and capitals found reused in Umayyad walls and Abbasid rooms. This type of reusing historic buildings continued especially after the arrival of the new immigrants to the region including Caucasian groups and some Arabian tribes during the 17th century.

- **Architectural Value:**

The monument was built over a cave with a running water source for the city and standing directly upon the edge of the main stream oriented to northwest, its back is near to the stream edge and the main façade looking toward the Cardo according to the main city plan.

The Nymphaeum is a half octagonal building with symmetrical design, the elevation can be divided into two sections; the lower part is the foundation including the barrel vaults, and the second part is the upper part (including the main façade of the building and its rear). The monument was erected on a terrain sloped down to the south west over a cave with water streams running underneath and from its back. Therefore the foundation was built in a damp environment, and series of vaults were constructed to overcome the slope producing the level to erect the water basin of the Nymphaeum, with a façade where was a set of eleven niches. This solution was to enable the water of the south west stream to pass under the building without any damage to the monument joining the south east stream.

The whole structure was built mainly with limestone blocks from the outer side they used rustic blocks and in the main façade they used square blocks placed in alternate of diatonic and orthostats courses, the interior walls of the Nymphaeum and, lower parts of the three large apses and the small niches are fitted with round and square holes sunk in the stones which indicate that the interior was dressed by marble.

- **Artistic Value:**

The monument still has considerable decorative elements found during the excavations in the site. It is clear that the range of patterns employed in the building is quite wide, consisting of floral and geometrical designs, reels and beads. Blocks with decorative mouldings in shallow relief were also used. From the available remains of capitals, architraves, and friezes it could be imagined how much the Nymphaeum was elaborated and aesthetically modelled to be a place of rest and glory during the Roman Period.

- **Critical State of Conservation:**

Since the beginning of the construction of the Nymphaeum during the Roman Period it was suffering different problems because of the weathering conditions such as the damp raising and the subsequent salt crystallization, erosion and microorganism growth. The other major problem of the monument is its current location within the modern urban environment of the city of Amman with high concentration of air pollution, vibration, and necessary urban infrastructural changes such as the instalment of sewage system that goes under the monument and the opening of main streets around the building.

During the period from 1996 to 2002, only excavation works were performed together with a few incompatible restoration works in which inappropriate materials and techniques were used that caused further damage to the restored elements. Since this date no conservation or restoration works have been conducted. Thus, based on the research conducted by Dr. Mohammad El-Khalili, in assistance with Mr. Nizar Al Adarbeh, and his published report and articles concerning the architectural stability, critical state of conservation, deterioration features and factors, this project was compiled and proposed and discussed with the HE Dr. Monther Jamhawi, Director of the Department of Antiquities (DOA) and agreed to be conducted through Hamdi Mango Centre for Scientific Research (HMCSR) at the University of Jordan with the HMCSR Director Prof. Abeer Al Bawab. In the published assessment research work, Dr. El-Khalili highlighted the several deterioration features can be identified in the Nymphaeum including stone weathering, rising damp, efflorescence, sub-florescence, erosion, staining, crumbling, chipping, cracking, detachment, flaking, peeling, and spelling. Moreover, Dr. El-Khalili emphasized also on the urgency to conduct compatible restoration works to safeguard the monument remains.

Based on the previously mentioned severe conditions affecting the monument's stability and durability the Department of Antiquities listed the monument on its priorities for urgent intervention especially in the Down Town of Amman and in cooperation with the Greater Municipality of Amman to activate the role of this important monument within its area.

Project Components:

Component I: Conservation and Restoration

Today major achievement of the conservation results are very clear at the site and now any visitor who used to know the monument can express the huge difference because of the successful preservation and restoration works conducted by the project. The following has been the systematic steps towards this achievement:

- Preparations for site intervention:
 - Review the conservation plan with the DOA and receive the approvals needed including assigning a DOA representative to follow up and monitor conservation process at the site.
 - The project team worked on preparing a detailed plan for the conservation and restoration of the Nymphaeum based on reviewing previous interventions in the site and through several site visits. Moreover, different samples have been taken from the site to conduct scientific and non-destructive examination and investigation (Fig. 2).



Fig.2– During sampling mission at the site with the project team, ©Authors.

- Based on the conservation plan prepared and based on the review of the literature work and former restoration projects documents the project team has agreed on the detailed set of measures to be taken to conduct appropriate restoration for the site and focusing on using non-destructive techniques. This has been further elaborated based on the results of the analysis for the samples that have been collected from the site and analyzed at the Scientific Labs of the Collage of Science at the University of Jordan and the team prepared XRD-Technical Report, Chemical characterization of Building Materials.
- A major achievement of the project is the cooperation with the project partners the DoA and the Greater Amman Municipality (GAM) who worked on removing some buildings constructed in the border of the site which used to blocking the view and make clear visual pollution to the site. This step, in addition to GAM efforts in reorganizing the streets and the traffic flow and directions, will enhance the results of the project and will attract tourists to visit the site when it is ready for visitation.
- The project team worked with GAM and the DOA to clean the site from the grass and plants as well as re-organize the drums, stone parts and remains scattered and piled in front of the Nymphaeum and which were blocking the way to the upper level of the building (Fig. 3).
- Discovery of some important stone parts under the old demolished building by the Greater Amman Municipality. The team documented them, organized and ordered them to be restored.
- Re-organize the drums, stone parts and remains scattered and piled in front of the Nymphaeum.



Figure 3– Cleaning process and preparation works at the site, ©Authors.

- Installation of scaffolds needed at the site and purchasing service and equipment mandatory for starting the process of cleaning and restoring the site. The next phase of the project focused on installing the scaffolds at the site and purchasing service and equipment mandatory for starting the process of cleaning and restoring the site. Different techniques and methods have been verified based on the best practices in conservation and on international charters such as ICOMOS, UNESCO, other related charters especially those focusing on masonry architecture.

- **Cleaning process:**

- The cleaning was conducted first to the front façade of the monument and then to the rear façade through using different mechanical techniques.
- Water pumps with low pressure were used to remove all the dirt and rusts accumulated on the façade from the air pollution which was a mandatory procedure to start the conservation intervention.
- Use of different small tools including small brushes to clean the surface of the stone blocks including removing crusts and external crystalized salts, as well as removing any plants and fungi on the surface.
- Limited chemical cleaning technique by using wet bandages for some parts of the monument.

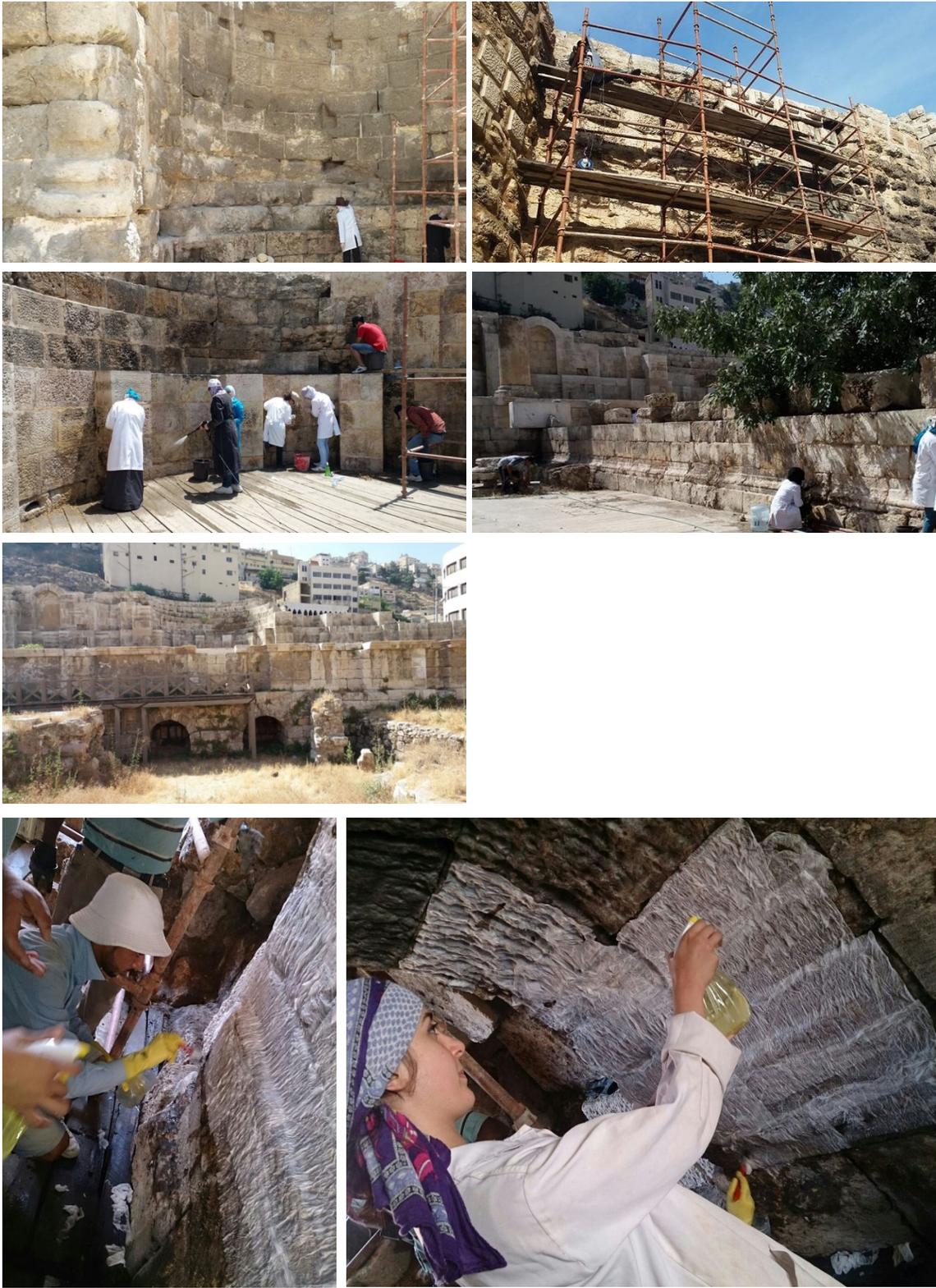


Fig.4– Cleaning process with the trainees and the final results, ©Authors.

▪ **Consolidation works (Fig. 5):**

- Filling the joints of the stone blocks with compatible mortar.
- Chemical consolidation and coating conducted using suitable polymers for the very fragile stones.
- Nano technology has been implemented, for the first time in Jordan, at the Nymphaeum with Nano-Calcium Hydroxide, which is injected in limited amounts, penetrates inside the stone, and transforms into Calcium Carbonate that consolidates the delicate internal building parts.



Fig.5- Consolidation works at the back side of the monument ©Authors.

▪ **Reconstruction:**

- The reconstruction intervention was taken for the very critical parts of the monument which is an important measure to stabilize the very risky parts and to ensure better structure stability. This action also strengthened the vulnerable and exposed parts suffered from different deterioration features.
- The missing parts were carefully measured and then the stone was brought in for a total or partial replacement depending on the parts that have been deteriorated or lost. The preparation of stones was based on the traditional technique of stone cutting using manual process to ensure better quality and better finishing of needed stone parts. The stone used mainly for this intervention were original unused stone blocks scattered at the site and has no current function, which will ensure more compatibility and preservation of the Nymphaeum.

▪ **Landscaping:**

A major flood of November 5, 2015 in Amman severely affected the downtown and the Nymphaeum Site. The flood caused a huge damage at the site and the project had to redo cleaning for several parts and for entire site that worked as a sewer for all the water coming to the downtown. It was very clear that major landscaping is highly needed to prevent soil movement and land sliding.

This measure has been taken at the last stage of the phase by cleaning up the front area from debris and then installing some terraces and compatible landscape works which proved to be effective

during winter in the last quarter of 2016. Another purpose of this intervention was to open the view to connect to the entrance of the monument.



Component II: Advanced Documentation

The documentation of the Nymphaeum followed three main steps as follows:

- **Site Preparation**

The team discussed the details of the advanced documentation needs for the site and the methodology of work. This included the agreement with the DOA about the use of the 3D Laser Scanning and surveying Equipment with technical assistance from their own team specialized in this kind of work. However, the work that has been mentioned in the first component left some obstacles including columns, drums and some architectural fragments and remains piled in a way that is blocking the view for the 3D scanning and surveying work. However, the DOA worked with the project team in solving this problem and ensured proper documentation of the site.

- **Data Collection:**

3D Laser scanning and advanced documentation have been conducted in cooperation with the DOA. Several scanning stations have been established and 3D scanning has been performed in millimetre detailed scale as clarified in the following images:



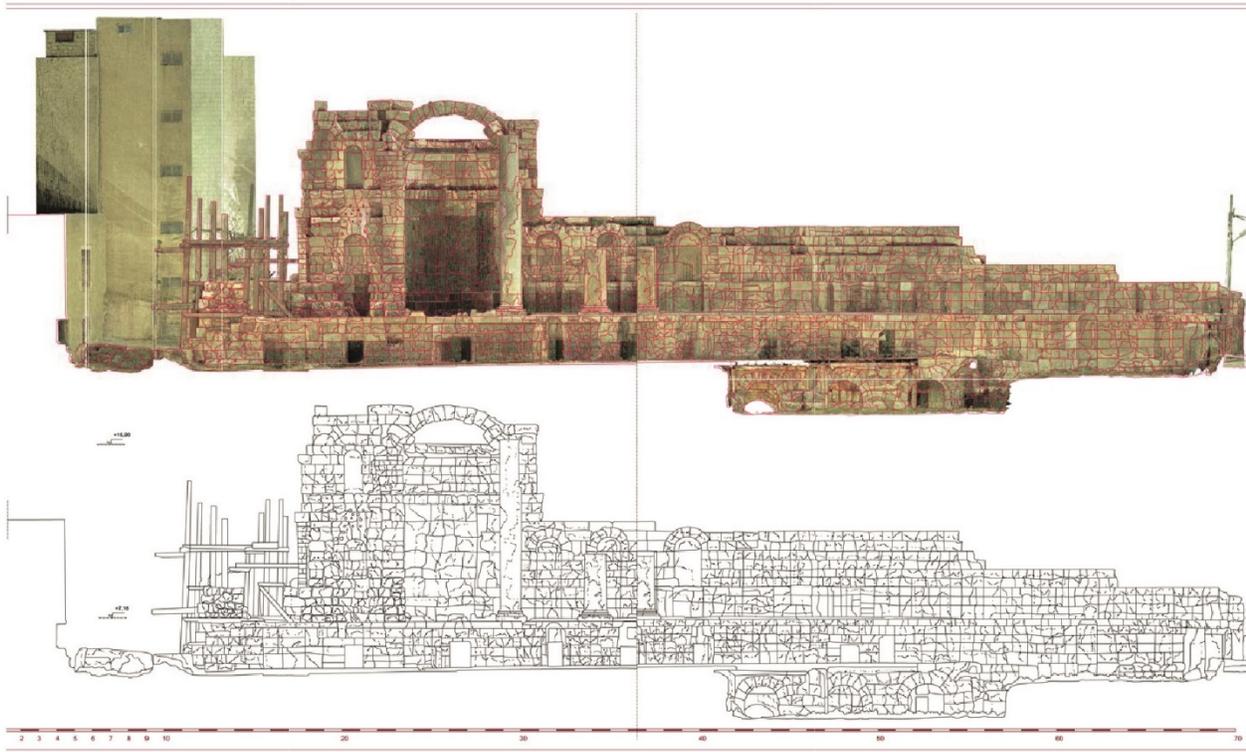
▪ **Initial Data Processing Results:**

From the previous accomplished 3D Laser scanning and advanced documentation conducted in cooperation with the Department of Antiquities (DOA). The collected data were processed by the project responsible team and several sections and illustrations have been developed for the use of conservation works and for the site management plan. More details of conservation interventions and deterioration features are being added to the illustrations. The illustrations will be used for the interpretation and presentation purposes of the monument.

▪ **Advanced Data Analysis and Final Results:**

New plans and sections have been developed in partnership with La Sapienza university of Rome through conducting advanced analysis to the point cloud from the 3D Laser scanning. The following drawings and models have been produced:

- 2D geometric and architectural drawings for the site and the monument (Elevation, plans, sections, from all sides) describing the overall geometry, the superficial condition, the deterioration features before and after the intervention. (Scale 1:50 - .dwg/dxf/pdf files).
- Numeric and geometric explorable 3D model of the site and the monument aiming at providing a professional interpretation for the site (.ptx/.3dm/.3ds files).
- Animation of the numeric and geometric 3D model of the site and the monument (.avi file).



Component III: Capacity Building and Raising Awareness

The project team members after the preparation of the training material worked on a hands-on field training program for target groups from university students of different majors included: Conservation, Cultural Resources Management, Chemistry, Biology, Tourism Management, Architecture, and Urban Planning. The students engaged during the lifetime of the project were mainly from the following universities:

- University of Jordan (UJ).
- Hashemite University (HU).
- Petra University (UoP).
- Jordan University of Science and Technology (JUST).
- German Jordanian University (GJU).



The students and universities were mainly engaged in the following activities under the project:

- **Site Visits:**

Several field visits organized to more than 200 students from different universities through discussing this opportunity with university professors on the idea of matching the curricula with practical exercises in the field. The site visits were focusing in presenting the deterioration features and factors, site conservation interventions, different techniques used for preservation, consolidation, cleaning, and reconstruction; also presenting to the students the concept of site planning, management, and tourism development.



The project team also arranged with the Department of Art History and Archaeology of Columbia University in New York during late March 2016, field visit to ten undergraduate students and two graduate assistants with 2 professors to learn about water importance in the urban planning of ancient cities and the construction of water-related monuments and they selected the Nymphaeum as their case study.

- **Scientific Workshops:**

The project organized a scientific workshop on February 19, 2015 at the Hashemite University with the attendance of more than 150 students from the majors of Conservation, Cultural Resources Management (CRM), and Sustainable Tourism. The workshop focused on presenting to the students the concept and philosophy behind the Nymphaeum project including full description and discussion on the project components as well as detail on the opportunity for students to take part in the project through hands on training in the field. Accordingly, many students registered and expressed their interest to participate in the field work and the project is cooperating with Queen Rania Faculty for Tourism and Heritage at the Hashemite University.

The project organized another important closing session at the Hamdi Mango Centre for Scientific Research (HMCSR) at the University of Jordan on January 12, 2017 for more than 50 university students on different work components of the project focusing on introduction about the project, conservation and restoration of the Nymphaeum, advanced documentation, chemical conservation, and site management and tourism development.

- **Scientific Research:**

The project discussed with several university professors the opportunity of using the Nymphaeum as a case study through encouraging students to conduct their thesis and graduation projects on subjects relevant to the project components while the project offered facilitation and material needed for the research. This practice enhanced the capacity building results of the project and ensured more sustainable results of the project with hands-on applications.

An example of this approach was established through a linkage with students' projects at the University of Petra in studying the urban planning and design in the downtown of Amman, which the project integrated the Nymphaeum in the students' case study through considering the heritage and archaeological parts of the downtown of Amman.



■ **Hands-on Training:**

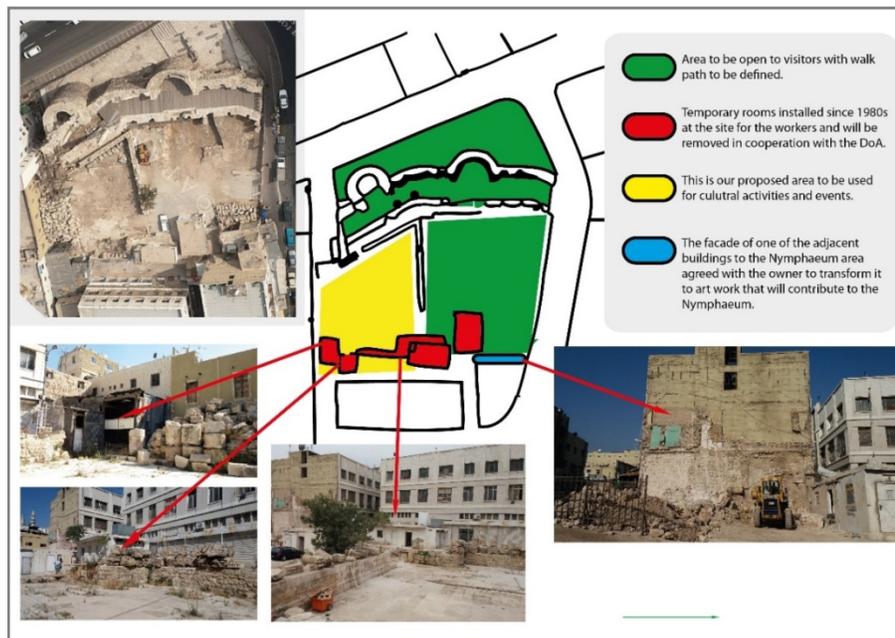
Around 40 university students from undergraduate and graduate levels took part in different conservation and restoration intervention phases of the project. Mainly the students worked on performing cleaning process, consolidation, replacement and reconstruction. This opportunity enhanced the applied skills of students and exposed them to very technical field work techniques. The project used the trained teams as conservation technicians and around 10 of which were selected to continue working at the site longer periods.



Component IV: Site Management Plan

The project team worked on the analysis of the site management needs and worked on different corrective actions directly which focused on the following:

- Safeguarding the environment:
Through cooperation with DOA and GAM the whole old fencing of the site was changed to a new and better one that enhanced the protection and diminished the visual pollution of old fencing. GAM demolished the old risky buildings confiscated long time before the project start to the right side of the gate of the site. GAM worked with the project in conducting a first cleaning to the site to remove all kinds of plants, hornet's nest, snakes, and others.
- Lighting up the site:
The project cooperated with Gam to install a new lighting using led system for lighting the site at night which enhanced the presentation of the site and became a great attraction to the downtown of Amman. This was a planned action and a prerequisite to enable the project to activate the utilization of the site for night activities.
- Archaeological Park:
The development of site plans and illustrations enhanced the modelling of the management for the site through identifying the needed further changes inside the site in terms of solving some major problems related to old buildings constructed by DOA for the purposes of excavation and conservation as well as working on the study of needed landscaping interventions. The following main interventions planned and some of them have been conducted during phase I of the project and others will follow in the second phase including, removing the temporary rooms from the site, mitigation measures and preventive conservation, circulation of visitors, and cultural forum area.



- **Management:**

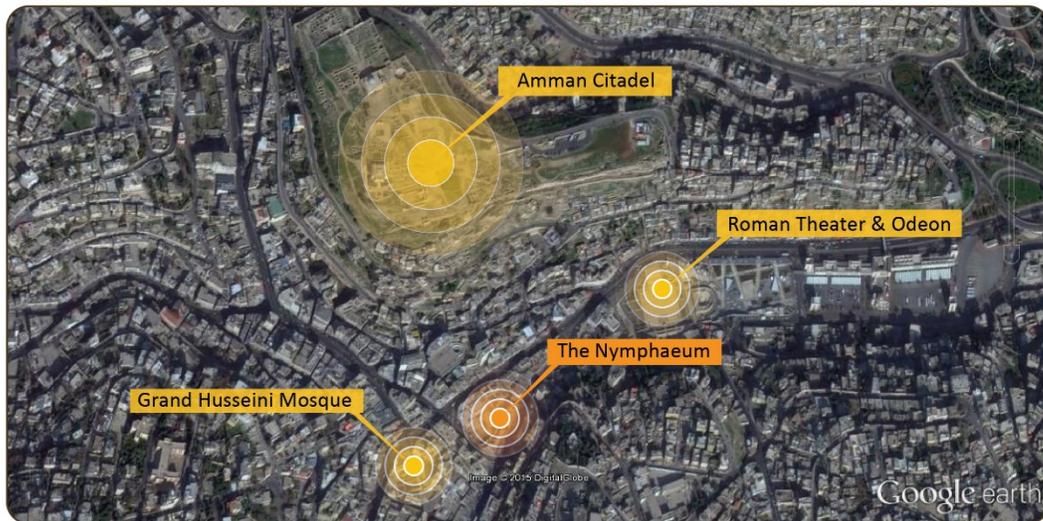
The project worked through cooperation with DOA in the management, monitoring, and future maintenance of the site. The Project agreed with the DOA to work on developing the concept of the “Archaeological Park” which will have a comprehensive plan.

Component V: Tourism Development

The development of the tourism scope for the site is very much linked to the Site Management component which will pave the way for tourism utilization at the site. The project team has explored several creative ideas for tourism development at the site which included the following:

- Linking the site with the different attractions at the downtown area including the original historical linkages of the monument with the Roman Theatres and the Citadel which will be part of the tourist itinerary. More cooperation for tourism promotion and marketing will be conducted with the Jordan Tourism Board, The Ministry of Tourism and Antiquities, and the Greater Municipality of Amman during Phase II of the Project.

The image shows the important location of the monument to connect it with the neighbouring touristic attractions.



- Utilize the site for cultural and tourism related events especially at night. The project planned to enhance the concept of regeneration of urban heritage in cultural activities through interceding the utilization of the site for activities such as the following which will be implemented during phase II of the project:
 - **Ceremonies:** For the first time ever the AFCP through the project conducted the first pilot through the two ceremonies of the project; the kick-off for phase I and Phase II that included receptions, music and speeches. This concept will be further enhanced during phase II to invite and conducted similar action with the project partners.
 - **Handicrafts:** To conduct a handicraft Bazaar and practical workshop at the cultural forum area of the site and invite tourists and locals to take part in such events.

- Social activity at the site: On April 21, 2016, the site hosted an activity for an initiative from IGCSE pupils of the Islamic Educational College to hold fun day of activities with the invitation of orphans from Russiefeh in a fun-day of activity that included paintings, hena-drawings and help in putting together different murals. The activity was made in joint cooperation with the Greater Amman Municipality and the Nymphaeum project.

Restoration and Rehabilitation of the Roman Nymphaeum in Amman. Phase 2: Nymphaeum Archaeological Park

As a result of phase of the project, it was evident that the project has to continue phase II in order to fulfill its objectives and to enhance the sustainability and capitalization of project outcomes. The project aims to continue the efforts of the first intervention phase started with the first AFCP grant in setting up conservation and restoration efforts to safeguard the monument and overcome all the deterioration forms and factors affecting the stability and durability of the architectural and ornamental elements of the monument. Furthermore, the second phase will focus on implementing the site management and rehabilitation plan to be ready during 2016 through the first grant including interpretation and presentation to be ready for receiving the tourists and to create a new attraction in the down town of Amman. The second phase will concurrently focus on and will create a new model in the downtown area for the revival of urban heritage we called “**The Nymphaeum Archaeological Park**”. This new concept and brand will also commemorate the concept of **open air museum**.

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Fig.5– Consolidation works ©Authors.	Error! Bookmark not defined.
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ICOA1679: L'ENGAGEMENT DES COMMUNAUTÉS ET DES ACTEURS LOCAUX DANS LE RENOUVEAU DU PATRIMOINE URBAIN: PROJET RESTAURATION ET DERÉHABILITATION DU NYMPHÉE ROMAIN D'AMMAN

Sous-thème 01: Intégrer le patrimoine et le développement urbain durable en engageant Diverses communautés pour la gestion du patrimoine

Session 1: Développement durable et engagement communautaire

Lieu: Hall Gulmohur, India Habitat Centre

Date et heure: 13 Décembre, 2017, 17:00 – 17:15

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Résumé: Cette communication présente une étude de cas pour une meilleure pratique de gestion avec des méthodes appliquées à la revitalisation du patrimoine urbain en tant qu'approche pour la préservation durable du patrimoine. Il montre un exemple concret de restauration et de réhabilitation du Nymphée romain d'Amman, considéré comme le plus grand monument de son genre dans la région. Le Nymphée souffrait de différents facteurs et formes de détérioration affectant son état de conservation, au point qu'il était considéré comme une pollution visuelle dans le centre-ville. Cependant, grâce à un projet conjoint avec le Centre de recherche scientifique Hamdi Mango de l'Université de Jordanie, le Département des Antiquités et la municipalité du Grand Amman pour soutenir l'effort de préservation du monument, il a été possible de préserver de vastes zones du site qui nécessitaient des solutions urgentes de restauration et de conservation, et de lui redonner un rôle dans le contexte archéologique actuel.

Le projet se concentre sur la création d'un nouveau modèle de renaissance du patrimoine urbain dans le centre-ville d'Amman: un forum culturel et un espace public ouvert, le « *Nymphaeum Archeological Park* », qui générera des bénéfices socio-économiques pour la communauté. Le projet doit établir une nouvelle méthodologie complète pour la préservation du patrimoine culturel en Jordanie basée sur l'engagement de la communauté et des parties prenantes avec l'intégration de tous les aspects : la documentation, la gestion, le renforcement des capacités, la conservation, la réhabilitation, l'interprétation et la présentation. Cette approche fermera le cycle pour assurer une durabilité appropriée avec une utilisation moderne compatible avec les sites archéologiques.

Mots-clés: communauté, parties prenantes, participation, développement