



Cultural Heritage of Pakistan: Conservation Problems and Techniques for its Protection

T. Saeed

Department of Archaeology & Museums, Islamabad, Pakistan

ABSTRACT

Pakistan is one of the fortunate countries of the world which possesses earliest socio-political history that goes back to Paleolithic. Its continuation has been expected to the significant period of about 2 million old from today. The areas of this Paleolithic culture have been found in the Potohar (or Pothohar) plateau, the area in and around district Rawalpindi, Punjab province of Pakistan, predictable to have been the most primitive habitat of the human species. This region in fact had played an active role in the evolution of human history since remote antiquity. This is the land where a number of ancient civilizations, cultures, religions art and architecture developed from prehistoric period to the Muslim period including British colonial era. The historical period monuments are well known ranging from the caravan serais (Inn) and baolis (step well) along the ancient routes, to historical forts, religious and secular buildings of Hindu, Muslim and Sikh periods, rock shelters, pre and historic mounds, graveyards and sacred ponds in the region. During the British Colonial rule "Archaeological Survey of India" was formed in the year 1860 for archaeological researches. At the time of independence of Pakistan, new department with the name "Department of Archaeology & Museums" (DOAM) was created to perform same functions and obligations. Since its inception the Department of Archaeology and Museums, Government of Pakistan has been performing its activities until 2011 when in sequel of 18th constitutional Amendments, all sites and monuments along with technical and financial resources were transferred to respective provinces.

Keywords: Cultural Heritage, Pre and Post-Independence Activities, Management, Legislation, Conservation Problems and Techniques

1. Immovable cultural heritage and efforts for its protection in Pakistan

1.1 Cultural heritage of Pakistan

The land comprising on present Pakistan has been a homeland of many cultures and civilizations. Paleolithic culture has been discovered in the Potohar Plateau, which has been estimated about 2 million years old from present. The crude stone tools used by them for their livelihood, called as Pre-Soan tools have been discovered and found in great quantity. These earliest people meander here for many thousands of years, and enter towards a new culture called as Mesolithic. After development of agriculture activities, the stone tools were re- fined towards a culture called as Neolithic. The start of this organized society and division of labour is evidenced at Mehrgarh in Kacchi Plain south of the Bolan Pass in Balochistan. The discovery of an organized community life in seventh millennium BCE in Pakistan is of enormous impact, as very few ancient sites in the world have been discovered so remote cultural antiquity [1].

The early agricultural economy introduced and developed during the following two millennia whose traces have been discovered from a number of archaeological sites located in the different areas of Baluchistan, Sindh, Punjab, Khyber Pakhtunkhwa and Gilgit-Baltistan. The presence and discovery of these sites provide concrete evidences that the diffusion of this prehistoric culture was a uniform occurrence throughout, which developed later on into the Chalcolithic era. It was occurred when the change over from stone to copper and bronze took place in the fourth millennium BCE. Afterward, from agrarian cultures appears in full bloom the Bronze Age phenomenon of an organized society over the vast regions covering the plains of the Punjab and Sindh. It has been named as the 'Indus Valley Civilization' or 'Harappan Civilization'. Harappa and Moenjodaro were two 'capital' cities of this civilization,

whereas there were numerous small towns and villages belonging to this civilization spread over the vast area of Pakistan. This great civilization after flourishing for about one thousand years during Ca. 2750 to 1750 BCE was declined. However, between the fall of the Indus Civilization period and the advent of the historic period, there is a gap in our past which has been filled after the discovery of the so-called 'Gandhara Grave Culture' in the different areas of Swat, Dir and Peshawar Valleys as well as at Hathial in Taxila Valley. This culture has filled the break between two periods called as Bronze Age period and Iron Age. The name of Gandhara Grave Culture is introduced because it presents a pattern of living in the Gandhara regions as evidenced by the distribution of burial graves spread over a large area.

During the Achaemenian rule on this part of the world, one of its important occupations was established at Taxila (Gandhara). However, Macedonian incursion under Alexander the Great in 326 BCE proved another major event in the history of this land. The momentum given to Buddhists by the Mauryan Emperor, Asoka, and the artistic impulses originated from the Bactrian Greeks in Central Asia led to the execution of the Buddhist Art of Gandhara under the patronage of the Kushanas. During 1st century CE to 4th century CE, the sculptural art known to the world as "Gandhara Art" becomes a Buddhist spiritual zeal. Beside sculptures, the architecture of Gandhara also marked characteristic of its own composition in nature and scope lending towards Ionic and Doric style of Classical Greeks.

The decline of the Graeco-Buddhist culture resulted in the revival of Brahmanism, though Buddhism continued in a much weaker form .and its sculptural art degenerated to Tantric iconography, often in the medium of bronze or brass group which belonged to ninth and tenth Centuries CE. The temples of the Salt Range areas, especially the Malot temple, are built in foursquare Kashmiri style. Associated to

* Corresponding author: t_saeed2000@hotmail.com

it, though not exactly related to these structural specimens, are a number of bronze, copper and marble statues having iconographical significance.

The first wave of Islam was introduced in the north-western parts of the Indian Sub-continent after its stabilization in the Arabia under the caliphate of the first and second pious Caliphs. The real impact of far-reaching effect was felt by an energetic young Arab General, Muhammad ibn al-Qasim in 711-12 CE. This was the time when the Arab rule was established here. The Islamic culture which came from central Asia to this part of the subcontinent was initiated through the military excursions of Sebuktegin, and later by his son and successor Mahmud of Ghazni during the 11th century CE.

The stream of history since then flowed uninterrupted through the successive rule of the Central Asian Turks, Khaljis, Tughluqs, Sayyids and Lodis. This was a very important period of the socio-cultural, religious-spiritual as well as political history of Pakistan, all imbued with Central Asian traits and traditions. The beginning decades of the sixteenth century witnessed yet another political change in the Subcontinent, and brought a new reigning power to the scene. The progenitor of this dynasty as called by modern historians the Mughal Empire, was Zahiru'd-Din Muhammad Babur (1526-1530). The rule of this imperial power lasted for well over three hundred years when it declined and fell [2-8].

1.2 Brief history of Archaeological researches in Pakistan

The first archaeological survey in Taxila valley (Pothohar region) was carried out by Sir Alexander Cunningham, the former Director General of Archaeological Survey of India during 1863-64 which provided rich information on some of the important monuments in this area [9]. After the Alexander Cunningham, Sir John Marshall carried out surveys and excavations on major Buddhist sites in Taxila valley during 1913-34 [10]. However, systematic study of the Paleolithic sequence of the Pothohar region was conducted by De Terra and Peterson based on a short season of survey in 1933 [11]. During field survey, they reported several Paleolithic sites and Pleistocene geology of the area. Peterson was followed by Paolo Graziosi in 1964. He conducted brief investigations in Pothohar Valley [12]. Another Paleolithic survey was carried out by Eden O. by Jonson from USA in 1964 [13].

However, a detailed archaeological Paleolithic survey of Pothohar including Rawalpindi region was undertaken by Raymond Allchin and Bridget Allchin, from the University of Cambridge in close collaboration with the Department of Archaeology and Museums, Government of Pakistan during 1979-1990 [14]. They recorded archaeological sites and two million old artifacts near Rewat and localities with fossils, to understand more about the climate, the plants and the environment.

The Department of Archaeology and Museums (hereafter DoAM) Government of Pakistan carried out research activities at Taxila and extended its excavations at Sarai Khola site (1968-1972) by M. A Halim (15) G.M Khan 1983 (16); G.M Khan 1988 (17); Salim 1978 (18); Bahadur Khan et al. 2002 [19]. Moreover, the Buddhist complex at Mankiyala near Rewat which was previously ransacked by General Court and General Ventura during the second half of 19th century was scientifically excavated in 1968 by S.R Dar [20]. Few years later a team of DoAM conducted archaeological researches in the surrounding areas of Taxila valley in 1973 A.N Khan 1990 [21]. A team from Taxila Institute of Asian Civilizations (TIAC) Quaid-i-Azam University, Islamabad under the leadership of Dr. Muhammad Salim carried out comprehensive researches of the Stone Age sites in Soan Valley, Pothohar Plateau and Attock area in 1997 and mapped a considerable number of Paleolithic period sites in the area [22].

1.3 Brief history of Administration and Legislation activities for protection of cultural heritage in Pakistan

In 1860 during the British Government Rule "Archaeological Survey of India" was established for proper preservation of cultural heritage of this part of the world. After independence of Pakistan, "Department of Archaeology & Museums" was established to perform its activities as custodian of cultural heritage of Pakistan. In early 19th century a large number of explorations, excavations, and conservations of ancient monuments and sites, were carried out by Archaeological Survey of India [23]. The Department of Archaeology and Museums however, continued the same legacy of archaeological excavations and conservation of sites/monuments in the different areas of Pakistan independently and in close collaboration with foreign archaeological missions. In order to perform its professional activities, the main legislation called as "Antiquities Act, 1975" came into force [24]. Later on, for proper protection, preservation and maintenance of movable and immovable antiquities in the country Rules were framed under the aforesaid Act by the Government of Pakistan. The Department of Archaeology and Museums placed six important sites/monuments on the World Heritage List of UNESCO in addition to protection of more than 400 sites declared as "Protected Antiquity" in term of Antiquities Act, 1975 and establishment of fourteen museums in the different areas of Pakistan.

2. Conservation of archaeological sites and monuments

The built heritage of Pakistan comprises on brick and stone constructions. There are a number of structural and multiple conservation issues to the archaeological sites and historical monuments in Pakistan. In fact, the management of ancient sites and monuments is not an easy matter of simple administration of staff posting at a site. It involves dealing with several interconnected administrative matters such as; overall supervision of the works of the entire field staff, protection of sites and their safety and security against

human vandalism and natural disasters, proper training to handle complex issues relating to protection and preservation of cultural heritage. Therefore, conservation process requires specialized equipment along with constant observation and to adopt preventive measures against the risks of deterioration of cultural heritage [25].

It is very much important to study the material used in a particular monument before to start any work for conservation, preservation, restoration, safeguarding etc. in order to maintain the authenticity and integrity of the monument [26]. The Management Plan, Conservation Plan, Tourism Plan all is required to be properly integrated with adoption of necessary and appropriate measures for proper preservation of cultural heritage [27]. There are a large number of conservation and structural problems but the main factors causing deterioration of the sites/monuments in Pakistan can be classified as under [28]:

2.1 Temperature

Substantial differences between day and night temperatures are common in tropical areas and the alternation between day and night temperatures which affects the ancient sites and archaeological remains. Since stone is a bad conductor of heat the forces thus set up are further aggravated by shaded areas and between surfaces of interior layers. This causes flaking to take place and to some extent granulation. These problems of flaking can be observed on the monuments of the 2nd and 3rd group at Makli Hill Monuments, Thatta.

2.2 Weather

Windborne particles are very harmful for the surface of any building and they are very dangerous when they are large. For example the velocity of the wind at historical monuments of Thatta is very high and this strong wind acts as a sand blaster on the exposed surfaces. Here limestone has been used for the construction of the monuments, and iron in the limestone is rusted by the humidity and then eroded by the strong wind causing problems of pitting which can be observed very easily. The high velocity of the wind itself is very dangerous to structures like, stupas, watch towers, canopies, tombs etc. At Makli Hills Monuments, Thatta (in the third group of monuments) some stone canopies have been found collapsed due to the high velocity of the wind and weather effects.

2.3 Light

Natural light is also injurious to ancient remains as well as the historical monuments, because it aids harmful chemical reactions. The light rays discolor pigment that does not have the ability to reflect the light in wavelength. The energy is thereby absorbed and this can break chemical bonds in materials and cause them to change. The clear sign of decay can be observed on the walls towards the east and west of the historical monuments at Makli Hills, Thatta.

2.4 Dampness

Humidity and temperature are closely related. The conditions of very high temperature and humidity along with the presence of light encourage the growth of organisms such as bacteria, mould, fungi and algae or plants like lichens and mosses. A thick layer of black coating can be observed for instance on most of the monuments at Taxila, Takht-i-Bai Monuments, Mardan, Makli Hill Monuments at Thatta, which is due to growth of the above mentioned micro-organisms and plants on the surface.

2.5 Air pollution

Sulphur dioxide is the most important pollution problem in stone decay. In fact dark deposits and black scabs observed on the surface of most of the stone built monuments at Taxila, Fort and Shalimar Gardens, Lahore, at Makli Hill, Thatta is mainly composed of calcium sulphates, which is formed by the reaction between sulfur dioxide and calcium carbonate of the limestone. The chief sources of this pollution are domestic coal fires and industrial furnaces.

2.6 Rain

Rain water is always damaging to archaeological sites/remains and monuments. Rain assisted by wind, causes general erosion of the surface. This erosion is accelerated in heavily polluted atmosphere. The great concentration of dissolved acid gases and signs of erosion by the rain can be observed on historical sites/monuments at Moenjodaro, Taxila, Takht-i-Bai, Fort and Shalimar Gardens, Lahore, Rohtas Fort, Jhelum.

3. Movable cultural heritage of Pakistan and its protection

Pakistan possesses a large number of marvelous movable cultural heritages in the shape of relics of our past. Our museums are repositories of some of the best masterpieces of our past. The antiquities are mainly comprised on following material:

- i. Lithic implements (Paleolithic period)
- ii. Pottery (Prehistoric Period)
- iii. Schist (Stone sculptures)
- iv. Terracotta Objects
- v. Stucco Objects
- vi. Wooden artifacts
- vii. Glass artifacts
- viii. Metallurgical Objects (gold, silver, bronze, iron, copper)
- ix. Coins (Copper, Silver, Bronze)
- x. Iron Objects / implements
- xi. Manuscripts (Paintings)
- xii. Textile / Fabric material objects

xiii. Ivory Objects

xiv. Bark (Scroll)

A large collection of repositories of movable cultural heritage is preserved in the different museums of Pakistan such as; Peshawar Museum, Lahore Museum, National Museum of Pakistan, Karachi, Dir Museum, Chakdara, Hund Museum, Sir Sahibzada Abdul Qayyum Museum, Peshawar University, Archaeological Museum, Moenjodaro, Archaeological Museum, Umerkot, Archaeological Museum Harappa, Archaeological Museum, Banbhore, Archaeological Museum, Taxila, Archaeological Museum, Swat, Islamabad Museum, Quaid-i-Azam Birth place Museum, Karachi, Quaid-i-Azam House Museum Karachi, Allama Iqbal Museum, Lahore, etc.

3.1 Basic Factors responsible for deterioration of artifacts in the Museums:

There are following basic factors responsible for deterioration of movable artifacts preserved in the different museums of the country:

i) Physical Factors

- Humidity
- Temperature (moisture)

ii) Chemical Factor

- Pollution of Atmosphere
- Dust etc.

iii) Physical + Chemical Factors

- Light

iv) Biological Factors

- Microorganism
- Insects and Pests (e.g. termite)

3.2 Main Conservation problems of museum artifacts

The decisive cause of deterioration in metal objects is corrosion or object deterioration by interaction with the environment. The prominent factors of deterioration of historical objects are the relative humidity as well as air pollution. However, in archaeological objects a decisive role has composition, depth, humidity and amount of gasses in the soil. In the terracotta/clay objects the degradation of an object occurs as a result of the interaction between the environments or with the materials that form the object. But in the case of ceramics, environmental factors are the major cause. There are several ways in which ceramics break down physically and chemically. Similarly, the manuscripts, fabric artifacts, and stone objects are also vulnerable to deterioration due to different physical and chemical problems. The treatment is usually applying to the damaged wooden, metal and ceramic artifacts as under:

- For the wooden objects it is essential to make control on humidity, environment and control the biotic problems with the help of humidifier and dehumidifier.
- Similarly, for metal objects, the main treatments applied for objects in metal are to control moisture, humidity, environmental strike and to curb the impact of chemical reaction.
- However, for the ceramics/clay objects the treatments which we usually apply are to make control on the environmental problems with the help of available human and material resources.

4. Dating techniques used in Archaeology

In the field of Archaeology, it is necessary to know how long ago in years a particular period or event was occurred. Archaeologist can use the sequence to study for example changes in tool technology from one stage to the next. This thought that something is older or younger relative to something else is the basis of relative dating. However, when we want to know absolute age in years before the present of the different parts of the sequence we need methods of absolute dating. The absolute dates help us to find how quickly changes such as the introduction of agriculture occurred, and whether they occurred simultaneously or at different times in different regions of the world.

Before World War II for much of archeology virtually the only reliable absolute dates were historical one, but only in the last 50 years have independent means of absolute dating become available, transforming archeology in the process. The relative methods permit us to decide that something is relatively older of younger than something else. The absolute methods make it possible to give a date in years. The initial steps in most archaeological research today still depend crucially on relative dating, on the ordering of artifacts, deposits, societies, and events into sequences, earlier before later.

However, whatever the dating method is applied, we need measure of time in order to build a chronology on the basis of years. Thus even age measurements such as radioactive clocks that are independent of annual cycle need for our purpose to be transformed into years. In fact, our timescale in years must date from or to fixed point in time. For instance, in the Christianera, this is by convention taken as the birth of Christ, in the year AD 1, with years counted back before Christ (BCE) and forwards after Christ. The expert scientists, who derive dates from radioactive methods, wanting a neutral international system without commitment to any of the above calendars, have chosen to count years back from the present (BP). They take BP to mean "before 1950". It is therefore clearest to convert any BP date for the last few thousand years into the BCE/CE system. For the assessment of stone tools pertaining to Paleolithic period, archeologists use the terms "BP" and "years ago".

In the field of Archaeology, there are following different scientific methods for dating and investigations of the tangible cultural heritage: -

- i. Pollen Dating
- ii. Faunal Dating
- iii. Tree-Ring Dating
- iv. Radio-carbon Dating
- v. Thermoluminescence Dating
- vi. Electron Spin Resonance
- vii. Potassium-Argon Dating
- viii. Uranium-series Dating
- ix. Fission-Track Dating
- x. X-ray fluorescence (XRF)
- xi. X-ray Diffraction Spectroscopy (XRD)
- xii. X-ray analysis

4.1. *Present set-up of Conservation Laboratories and their problems in Pakistan*

The main Conservation laboratories responsible for the preservation of cultural heritage in Pakistan:

i) Central Archaeological Laboratory, Lahore.

It is responsible for proper conservation of tangible cultural heritage in the shape of building material.

ii) National Museum of Pakistan's Paper Conservation Laboratory, Karachi.

It is responsible to take necessary steps for the conservation of manuscripts, books, paintings etc.

iii) Water & Soil Investigation Laboratory, Moenjodaro.

This laboratory is responsible for conservation of different material pertaining to the World Heritage Site of Moenjodaro.

iv) Tile & Mosaic Laboratory, Lahore.

This laboratory takes necessary steps for proper conservation of different material used in the buildings of World Heritage Monument of Lahore Fort and Shalimar Garden, Lahore.

4.2 *Some main issues of Conservation Laboratories in Pakistan:*

- There is an acute shortage of trained conservationists, chemists for appropriate preservation of cultural heritage in the shape of both movable as well as immovable antiquities
- Technical services for the purpose of research, documentation and conservation of movable objects are to be strengthened and enlarged to come up to the required international standard. For instance, no

provincial departments of Archaeology possess services of various methodologies of chemical treatment of antiquities and their dating of scientific standards like C-14, Thermo luminescence etc.

- Establishment of more conservation laboratories at all World Heritage and national level Sites/monuments.
- Latest and modern equipment for existing laboratories.
- The experts use the most suitable chemicals and carryout

scientific analysis for the examination and treatment of cultural heritage. The modern conservation laboratory need equipment such as microscopes, spectrometers, x-rays instruments for examination and proper study of artifacts and their chemical components. As such it is necessary that chemical laboratories are equipped with the provision of trained experts/staff and necessary apparatus.

5. **Conclusion**

Pakistan is not a 75 years old country but it has got an un-interrupted history of its own dating going back into the past about 2.5 million old which is the earliest period in history called as Paleolithic period (Old Stone Age). This land which is thickly dotted with more than eight thousand archaeological sites and historical monuments as yet documented has inherited one of the greatest civilizations of the world known as "Indus Valley Civilization" of 3rd millennium BCE. The cultural heritage of this land is not doubt very rich, varied and vibrant. Therefore, it is very much important and necessary to undertake special measures for proper protection, preservation and conservation of these relics of the past for posterity. There are several laws, rules, regulations at national level and international charters, UNESCO conventions, recommendations, instruments, which provide guidance to undertake appropriate measures for proper management, conservation and preservation of both movable and immovable cultural heritage.

Today, the civilized world is fully conscious and well aware about the preservation of their cultural heritage and equally consider that all sites and historical monuments are the common heritage of the entire world. Besides, the countries possessing the cultural heritage are not more than trustees. Therefore, all nations are responsible for the proper preservation of the relics of past which implies through conservation, restoration and preservation to prolong their life by slowing down from further decay. Our cultural heritage is at risk and facing acute problems both technical and financial. The conservation of ancient sites and monuments is a demanding profession as it requires lot of funds and proficiency in the process of protection and conservation of sites and monuments. Besides, there is great need of coordination and collaboration with all stakeholders both at federal and provincial departments in the process of preservation and protection of our cultural heritage.

However, due to lack of proper planning, dearth of trained staff, difficulty in acquiring appropriate material and

traditional craftsman skills/artisans and most importantly the substantial funds required are some of the main hurdles. There is no training institute functional to provide the training facilities to the young professionals working and responsible for protection of cultural heritage of mankind. Similarly, conservation science laboratories are not well equipped to meet the requirements for proper protection of our cultural heritage. Pakistan has great potential for promotion of cultural and religious tourism. Therefore, with proper protection of our cultural heritage can boost tourism in our country. This will not only help socio-economic development but also present soft image of Pakistan.

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