

Djingareyber Mosque

TIMBUKTU, MALI

The Djingareyber Mosque is known to have been constructed in 1325 by the Andalusian architect Abou Ishak, at the initiative of King Hadj Moussa, upon his return from pilgrimage to Mecca. Since then the Mosque has experienced a number of modifications, resulting from the organic nature of earthen architecture and its vulnerability to weathering. Archaeological test pits carried out in 2009 in the main prayer hall have shown that at least three successive buildings have occupied the site. The main earthen ornaments on the *qibla* wall and some pillars may date back to the sixteenth century. In 1988 the site was included in UNESCO's World Heritage List, together with the city's other two historic mosques, Sidi Yahya and Sankore.

The Mosque is located at the southern edge of Timbuktu's historic city, forming the core of modern Timbuktu, the home of 30,000 inhabitants and capital city of Mali's Northern Province.

Lying at the meeting point between the Niger River Delta and the Sahara Desert, Timbuktu and the Sahelian environment is affected by growing desertification. Trees that used to form raw materials for the Mosque's carpentry are no longer available. Wind erosion and accumulation of sand deposits in the city's open spaces are also of concern for the integrity of the urban fabric and public open spaces.

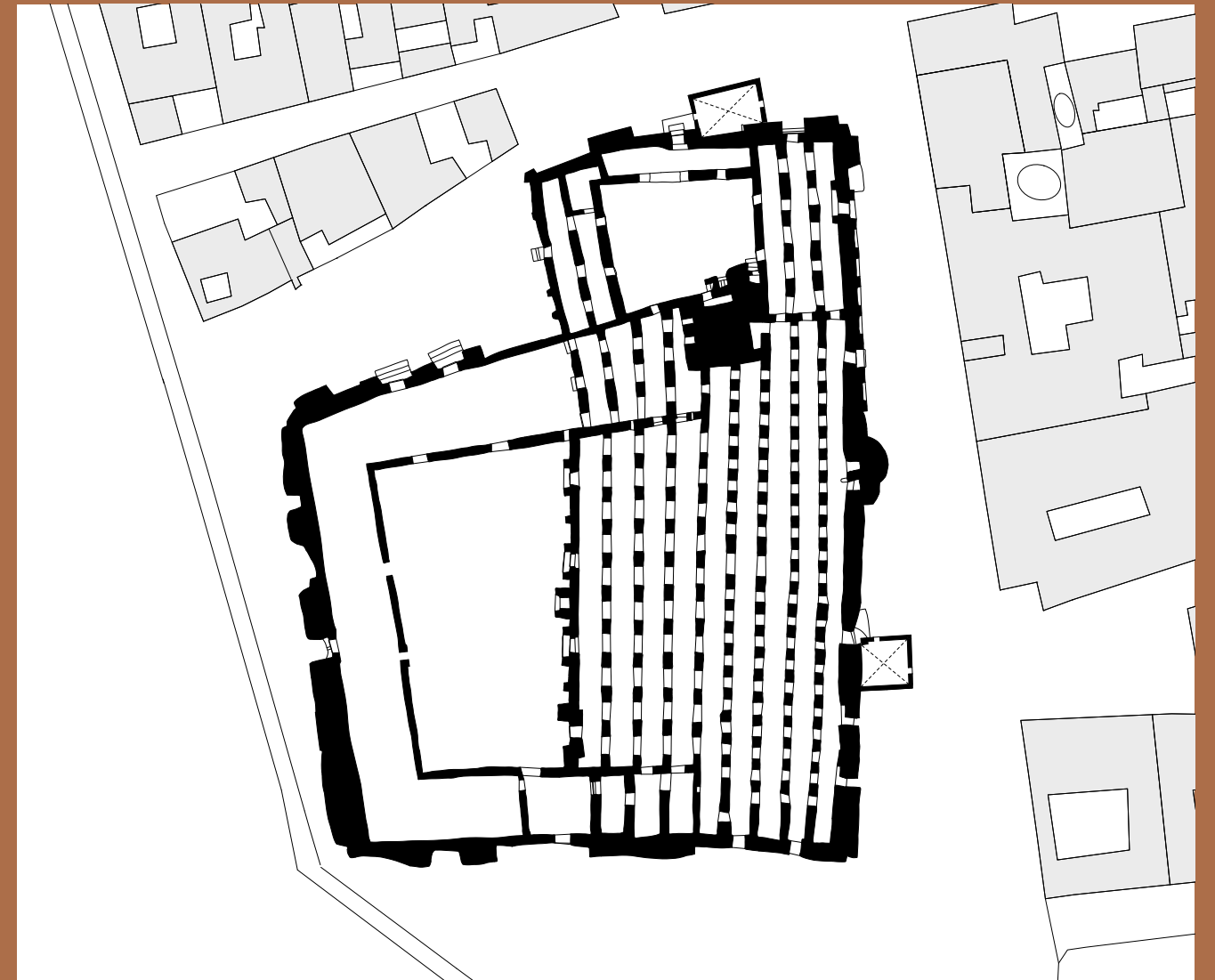
Built in mud and tuff stone, Djingareyber Mosque was in poor condition when it was first documented by the Aga Khan Trust for Culture (AKTC) in early 2007: a full topographic and architectural survey, first performed on the Mosque, was the basis for a damage assessment. It revealed that the building was in weak structural condition, particularly the roof and wall-bearing systems, due to water ingress in the roofing. This occurred because of defective slopes and accumulation of earth fill and the mediocre quality of local mud plasters due to the decline of familiarity with traditional crafts.

The project first focused on consolidating the mud masonry and carpentry, making the roofing watertight. Then the project aimed to conserve decorative earthen motifs and plastered surfaces in the interior spaces of the Mosque's covered prayer hall and replace the defective sound, ventilation and lighting installations.



The corner elevation of Djingareyber Mosque.

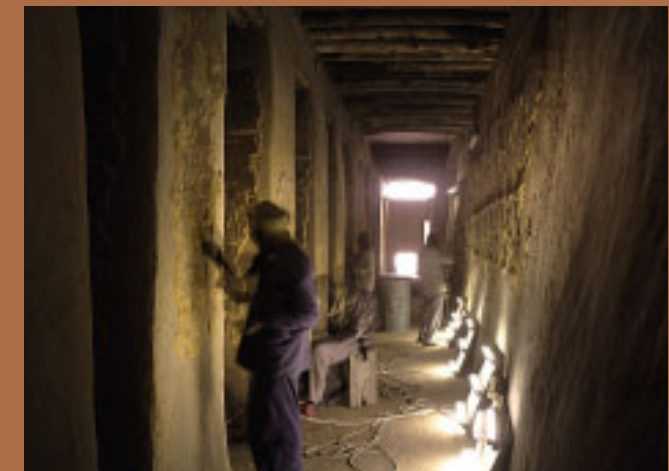
Opposite page:
Restoration work being done on the interior.



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▲ 10m

Project Scope/Objectives

Built in mud and tuff stone, Djingareyber Mosque was in poor condition before the intervention. The project focused on consolidating mud masonry and carpentry, making the roofing watertight, conserving decorative earthen motifs and plastered surfaces in the Mosque's interior, and also replacing the defective sound, ventilation and lighting systems.



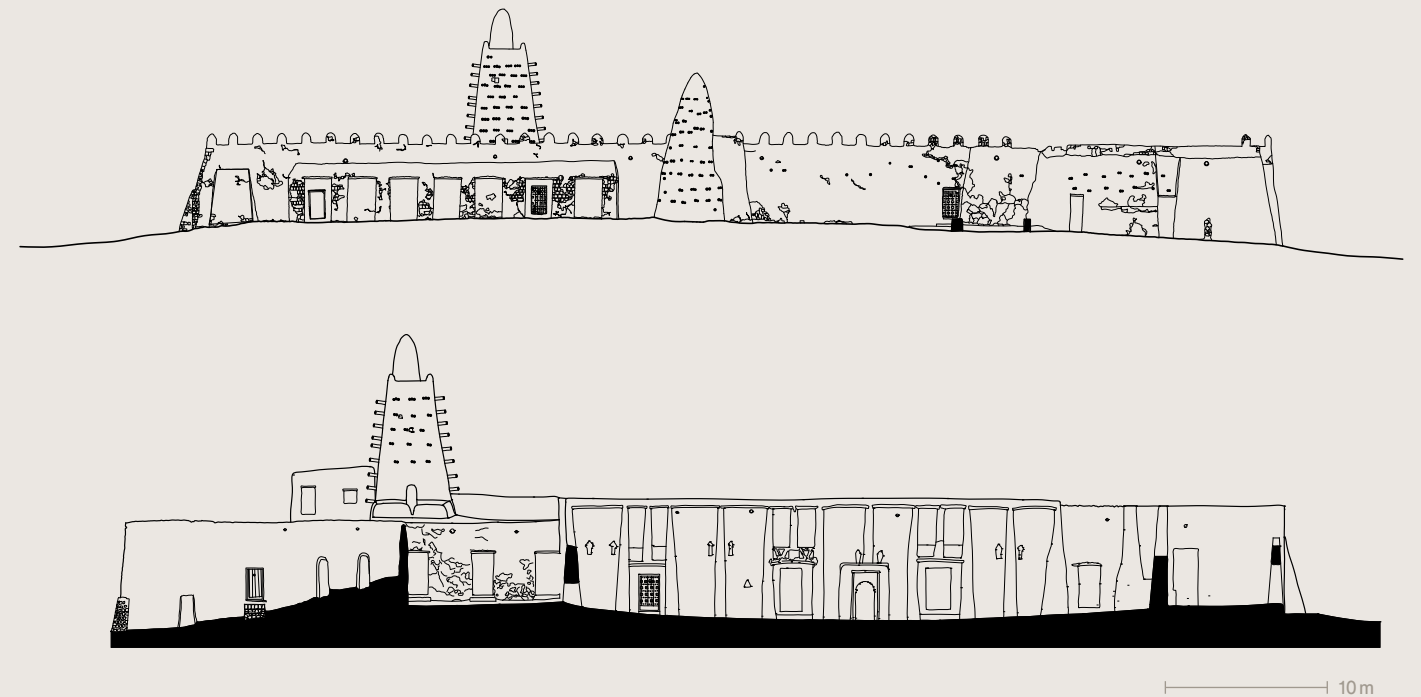


A minaret of Djingareyber Mosque after restoration. The Mosque was built in mud and tuff stone, evident in the foreground of the shot.

Opposite page:
The east elevation and longitudinal section of the Mosque.

Timbuktu is a remote location posing challenging logistical conditions. Sourcing quality construction materials in the immediate environment is difficult due to the decline of appropriate mud construction techniques. Logistics and local transportation, combined with the lack of skilled mid-level labour and security threats, are also challenging.

As a result, the work on Djingareyber Mosque was entirely in-house managed, employing traditional masons active in the neighbourhood's corporation. This mode of operations also enabled direct quality control, flexibility in resource allocation and on-the-job training in traditional building crafts and contemporary conservation methods to more than 140 community masons and craftsmen. Literacy classes were offered to all implementation crew and foremen as well as training in basic computer skills.



Background

BRIEF HISTORY OF PROJECT SITE

Timbuktu, a town with 30,000 inhabitants, is head of the Regional Council for the Northern Provinces of Mali. The population comprises a variety of ethnic groups, with a majority of Songhai, followed by Touaregs, Peuls, Bambaras and small proportions of other ethnic groups. Djingareyber Mosque was built in 1325 by King Hadj Moussa upon his return from a pilgrimage to Mecca, and has experienced a number of modifications over time. The main earthen ornaments on the *qibla* wall and some pillars may date to the 16th century. Archaeological test pits carried out in the main prayer hall revealed that at least three previous buildings occupied the site. In 1988 the Mosque was included in UNESCO's World Heritage List.

Challenges

PROJECT RISKS

Timbuktu is remote. Sourcing quality construction materials, transportation and finding skilled labour can be a challenge. In recent years security has become an increasing concern too.

SITE CONDITIONS

Timbuktu lies at the crossroads between the Niger River Delta and the Sahara Desert, an area affected by growing desertification. Trees that once served as the raw materials for the Mosque's carpentry are no longer available. The organic nature of the Mosque's earthen architecture makes the building vulnerable to weathering elements. Wind erosion and accumulations of sand deposits in the city's open spaces are of concern for the safeguard of the Mosque and overall city fabric.

INFRASTRUCTURE

The systems of water and sanitation in Timbuktu Old City are based on infiltration pits and built on sandy soil, posing hygiene hazards.

BUILDING CONDITIONS

Djingareyber Mosque's structure is threatened by a weakened wall-bearing system, water ingress in the roofing due to defective slopes and accumulation of earth fill, and the mediocre quality of local mud plasters associated with the decline in usage of traditional building techniques.

Significant Issues and Impact

DATA COLLECTION/SURVEYS

The AKTC project performed the first topographic and architectural surveys of the Mosque in 2007. Documentation of the work in progress is regularly compiled to form the basis of a set of as-built drawings.

HISTORIC BUILDINGS/MONUMENTS CONSERVED

Conservation of the historic Mosque was the main objective of the AKTC project. An interior space of 2000 m², together with 800 m² of courtyard spaces, was fully restored. The roofing system was improved using tie beams to evenly distribute the roof loads (lime-based mortar and layers of mud insulation).

COMMUNITY INVOLVEMENT/PROGRAMME

The community and its leaders play an important role in the decision-making process of the conservation through regular information and discussion sessions.

VOCATIONAL TRAINING/CAPACITY BUILDING

A group of 100 community masons and labour was trained in extensive earthen conservation methods. Literacy classes were offered to all implementation crew and foremen were trained in basic computer skills.

CONTRACTING METHODS

Due to a lack of qualified contractors for monument conservation in Mali, the work was in-house managed. This enabled direct quality control, on-the-job training and flexible use of resources.

RELEVANT CODES/STANDARDS ADOPTED

Although there are currently no building codes applicable to earthen architecture, the project is in line with conservation principles drawn up by ICOMOS and calls on the best practice of earth architecture specialists.

Partners

PUBLIC PARTNERS

Ministry of Culture, Republic of Mali.

COMMUNITY PARTNERS

Comité de gestion de Tombouctou.

Authoritative Framework

'Memorandum of Understanding' signed in 2004 between AKTC and the Ministry of Culture, providing the framework for an Earthen Architecture Programme in Mali.