



1995 Technical Review
Summary
by Rawia Fadel

Reconstruction of Hafsia Quarter II

Medina of Tunis, Tunisia
1296.TUN



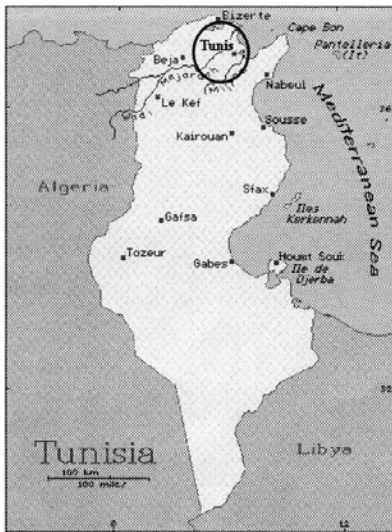
Architect
Association de Sauvegarde de la Médina (ASM)

Client
Municipality of Tunis

Developer
Agence de Réhabilitation et Rénovation Urbaine (ARRU)

Completed
Ongoing since 1985

The Hafsia quarter of the old city of Tunis has encountered rapid deterioration, since the beginning of this century, due to the departure of the more affluent inhabitants for the new European-style city adjacent to it. World War II caused great destruction and further demolition to implement grand schemes involving the widening of the avenues of the new city, as well as the building of large apartment blocks added to the disruption. The first phase of reconstruction, to restore the traditional architectural and urban character of the Hafsia quarter, was completed in 1977 and received an Aga Khan Award in 1983. The current project represents the continuation of the reconstruction effort on a larger scale, and in an integrated manner. The project involved the recreation the traditional urban fabric and upgrading of the infrastructure in an area of about 13.5 hectares. The objectives have also included rehabilitation of 600 housing units; the construction of 400 housing units, commercial and office spaces, and service facilities. The project has largely succeeded, producing replicable measures, and contributed to bringing about important institutional changes with far reaching implications.



Context

Historical background

The Medina, or old city, of Tunis was founded by the Muslim Arabs in the 8th century on the site of an earlier settlement. The city became an important port in the middle ages under the Hafsid dynasty, closely linked with the Italian city states, France and Spain. Devastated in the 16th century during the Ottoman-Spanish conflicts, the Medina revived under Ottoman rule in the 17th century. Its wealth was based mainly on trade, as well as the crafts and agricultural skills brought by Andalusian immigrants. The Medina was added to the World Heritage List in 1981, for its great influence on the development of architecture and the decorative arts in the eastern Maghreb. Its palaces and houses,

schools and numerous souks are testimony to the spatial organisation and daily life of a great Islamic city. Social and religious requirements, in addition to those of climate, commerce, and defence, created a special urban form. Courtyard houses grouped around mosques and madrasas, and the skyline pierced by minarets, recall belief and learning. The souks recall commerce and economic power, and the city gates are an enduring symbol of the city as a protective institution. Covering about 270 hectares, with some 100,000 inhabitants, the Medina today is a quarter of great historic interest with a variety of functions within the grand city of Tunis area.

The Hafsia quarter, located in the eastern part of the Medina, was traditionally referred to as the Hara, the area inhabited by the Jewish community of Tunis. After the

establishment of the French protectorate, wealthy Jewish families abandoned the Medina for the new "European" city. The poorest families who remained in the Hara were unable to maintain their homes; the buildings fell into such a state of disrepair that the protectorate authorities declared the area a health hazard in 1933. Subsequently, some municipal slum clearance and reconstruction projects were carried out in the thirties and forties. Further changes occurred during the Second World War, when the site was bombed and partially destroyed. The Hafsia area began to grow in importance in the fifties because of its proximity to the growing modern quarters of Tunis. However, its character has been threatened by demolition. Old buildings and road patterns continued to disappear being replaced by new housing blocks and

*Aerial view of
Medina with the
Hafsia quarter
emphasised*



wide avenues. A poor population in search of housing close to work places in the new modern city also continued to settle in the remaining derelict houses of Hafsia and in squatter areas, and living conditions continued to deteriorate.

After independence in 1956, the municipality of Tunis devised grandiose projects to upgrade the Medina. This included carving boulevards across the dense web of narrow streets and courtyard houses, and constructing large apartment blocks. In 1967, bulldozers moved into the populous quarter of Sidi El Bechir and almost incited a popular uprising. The grandiose projects were quickly abandoned, and a commission was set up to study the future of the old city. This commission was to become the Association for the Safeguard of the Medina or ASM. Since its establishment in 1967, ASM has been engaged in various activities which aim to investigate the possibilities for rehabilitating the old city, and conserving its character and urban fabric. It has studied the role of the old city in the context of the capital-region, and has sought to improve living conditions for its inhabitants.

Local architecture

The Medina of Tunis is a city of varied styles transplanted through invasions and migrations. With time,

Hafsid stonework, Turkish inspired minarets and ceramic panels, and whitewashed facades have come to seem harmonious as part of the long history of Tunisian art and architecture, existing alongside Andalusian green tiled domes. The diversity of housing styles, including courtyard houses, and southern European style apartment buildings, also express as cohabitation and an integration of cultures.

In the 19th century, the Maghreb was greatly influenced by industrialisation in Europe. Although the facades of the first buildings of the new city were little different from those of Palermo or Marseilles, Tunisian influences subsequently appeared in loggias, terraces and balconies adapted to climatic and local conditions.

Climate

Tunis has a Mediterranean semi-arid climate with an annual rainfall ranging from 300-600 millimetres. In winter, moisture laden winds usually arrive from the north west. The Hafsia site is somewhat protected

from these winds as it is sloping downwards from west to east.

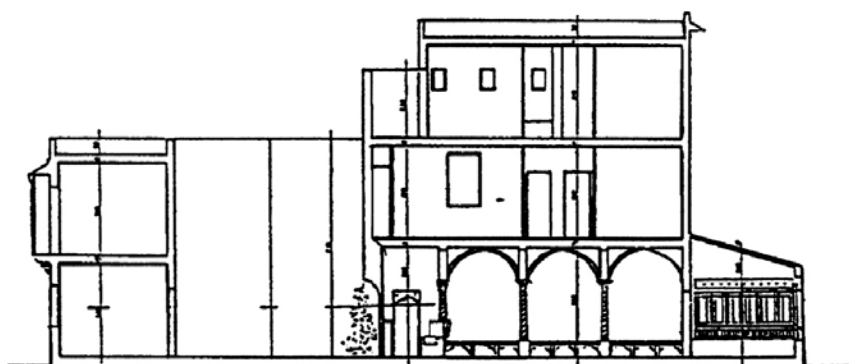
Site

The Medina's characteristic urban form, a dense fabric of courtyard houses served by a web of alleys and narrow streets, had basically taken shape by the end of the 18th century. Demolitions in the 19th century removed most of the walls, while leaving intact the souks and residential areas. These stand as a physical reminder of a high Tunisian culture, a melange of Mediterranean influences on a bedrock of Muslim culture.

Topography

The Medina of Tunis is located on a site that is rather flat, with a gentle slope of about one per cent from west to east. The Hafsia site forms the north-eastern edge of the Medina on low ground towards which storm water would normally flow. The soil is a mixture of clay and limestone. The water table lies approximately 1-1.5 metres below the ground level.

Section



Programme

General objectives

The reconstruction of the Hafsia quarter has had three main phases. This technical review deals with the last phase. However, the previous phases will be briefly described to clarify the evolution of the program for the phase under review.

Between 1931 and 1972, a number of projects were put forward for the reconstruction of the Hafsia quarter, through which it would be annexed to the neighbouring fabric of the new city. The street pattern of the new city centre was to be ex-

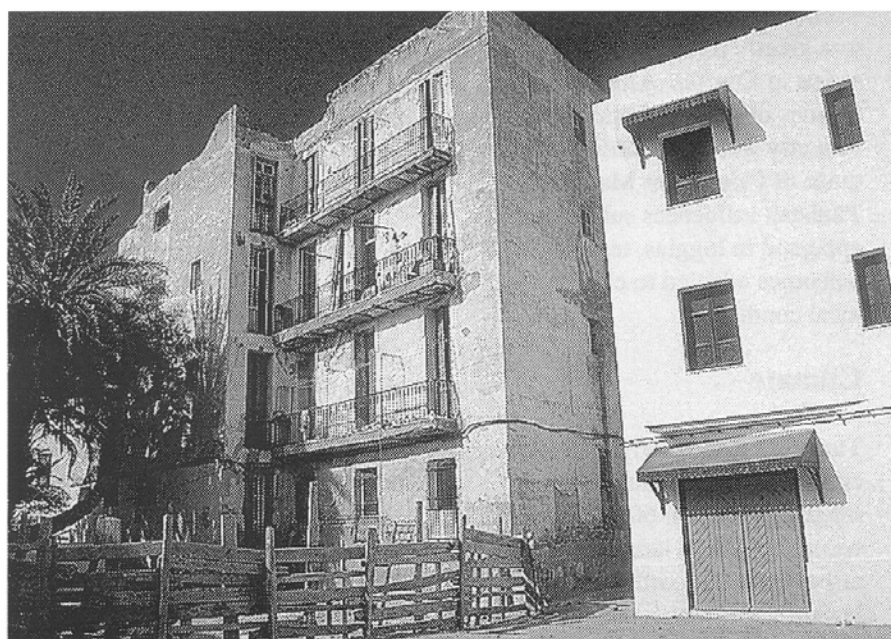
panded through Hafsia along with the introduction of large low-rise building blocks. Under this programme, several parts of Hafsia were demolished and four-floor apartment blocks were constructed.

The First Phase of the Hafsia Project (1972-80) began with a decision in 1970 to reconstruct Hafsia as a part of the historic city and this changed the course of events. This phase aimed to reconstruct the residential and commercial sections with particular attention to

maintaining a harmonious relationship with the existing morphology of the old city, and providing suitable housing solutions for the poor. The programme included reconstruction of Souk el Hout with about 100 shops; construction of 22 new shops with private offices for professionals above them; and the building of about 95 housing units. This phase was reviewed in detail and received an Aga Khan Award in 1983. The review concluded, relative to originality, that "The reconstruction of the Hafsia quarter is probably not a spectacular operation, but it has nevertheless demonstrated the Tunisian authorities' will to check the gradual destruction of the Medina."

The Second Phase of the Hafsia Project (1981-93) demonstrated a recognition that despite successes achieved during the first phase, the deterioration of the Medina continued to spread. Thus, phase II of the reconstruction of Hafsia was launched, as a component of the Third Urban Project co-financed by the World Bank and the Tunisian Government and was considered as a "pilot" project due to its being the first integrated programme in a historic urban area in Tunis.

- The general objectives of the Hafsia II project included the following:
- The conservation of the historic character and the cultural heritage of the area;
- The carrying out a comprehensive programme to reconstruct the Hafsia quarter, including the restoration, rehabilitation, or renewal of the residential and commercial sections, paying particular attention to maintaining a harmonious relationship with the traditional urban fabric;



Detail of new housing (right) and existing residence (left)

*View from the roof of
a kindergarten*

- The development of institutional and financial arrangements to effectively implement the reconstruction programme, giving due consideration to the financial abilities and needs of the residents of Hafsia; and
- The consolidation of previous efforts to improve the urban environment and living conditions, and restore the vitality of the area.

Functional requirements

Within the general objectives, the functional requirements can be grouped into three main components as follows:

- an infrastructure component, involving the construction, installation, or improvement of the utilities and street networks, and services;
- a rehabilitation component, involving the upgrading, restoration and reuse of decayed structures as appropriate; and
- a reconstruction component, involving building on vacant land, and on sites cleared by demolition (this component included social housing units, private developers' housing, properties for commercial use, offices, underground car parks, and public facilities).

Description

Building data

Hafsia II, or the second phase of reconstruction of the Hafsia quarter, may be fully appreciated through consideration of the following statistics:

- Total area covered by the project 135,000 sm (13.5 hectares)

Hafsia Quarter II, Tunis, Tunisia



- Upgraded roads and services 3,000 sm
- Rehabilitation (about 600 units) 65,000 sm
- Demolition 14,000 sm
- New Construction:
 - Housing Units (about 400) 35,000 sm
 - Commercial (total built area) 5,342 sm
 - Offices (total built area) 4,144 sm
 - Services (hammam, clinic, nursery, post office, parking, etc.) 6,130 sm

Design concepts

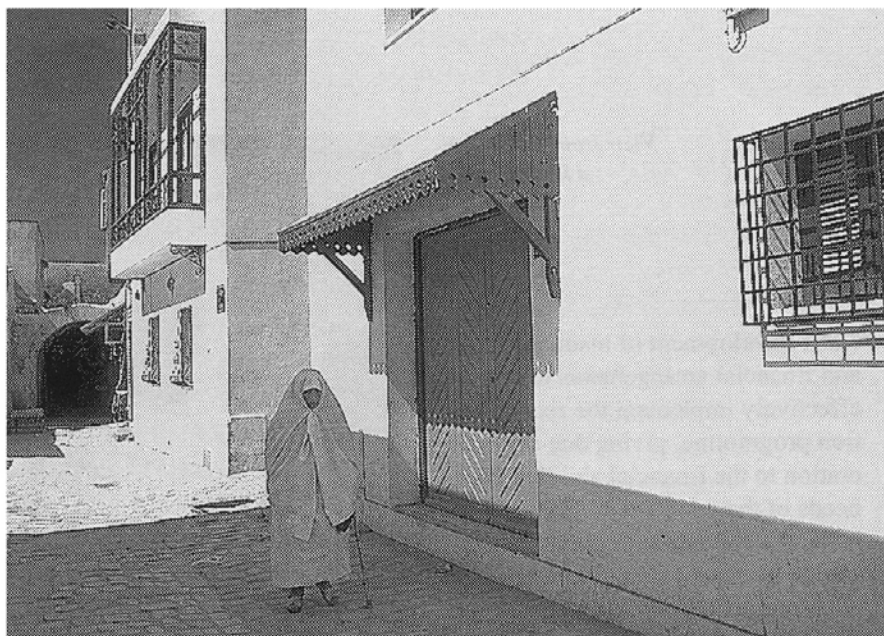
Physical constraints played an important part in project formulation. A detailed master plan was prepared for the entire project site based on a survey of the physical conditions and characteristics of each building and vacant land. Accordingly, a site plan was prepared which identified areas and buildings targeted for rehabilitation, reconstruction, and demolition. Detailed studies, designs, and construction drawings were carried out for buildings requiring restoration, or rehabilitation. Designs and complete construction documents

were produced for vacant land and for areas requiring infill or demolition and reconstruction. This included housing units, office and commercial spaces, and social service facilities.

Detailed studies were also carried out for the infrastructure. Particular attention was paid to the planning of improvements required to the network of roads and pedestrian paths in order to meet the needs for access, for communal outdoor spaces, and for proper storm drainage while ensuring minimal impact on the traditional urban fabric.

User requirements were determined based on the findings of physical and socio-economic surveys carried out at an early stage. The findings of the surveys determined the type and extent of interventions needed, in terms of rehabilitation, or demolition and reconstruction. Whether the construction work can be carried out while the units are occupied; and the financial arrangements required in relation to the ownership status of the occupants was also determined. The findings also identified the additional housing units needed to relocate some

View of
rue des Négresses



families in order to reduce overcrowding, or provide temporary accommodations for families whose units cannot be rehabilitated while they are occupying them. Thirty-five families later refused to leave the temporary housing units. Those tenants, or de facto occupants originally ineligible for loans from the National Housing Savings Fund, gained a new status, becoming owner-occupiers in newly constructed housing areas on the western edge of the city.

An architectural vocabulary based mainly on the traditional architecture of the area has been developed and used rather successfully. This has included plain white walls, large projecting or recessed wall blocks for the articulation of the facade; the skilful use of contrast between white walls and deep openings and dark windows; arcades and arched openings for building entrances and entrances to alleys to articulate urban spaces; traditional bay windows and patterns of iron-work for window grills and balcony rails, light wood canopies above windows and balconies; and the development of decorative features and traditional motifs such as for the treatment of external wall corners, and the wide decorated frames around main entrances.

The road network is very narrow and confined to allow separation between vehicular and pedestrian movement, landscaping. Certain paths were so narrow that they have been restricted to the use of pedestrians. Although the project attempted to create small outdoor spaces, these have been limited and mostly used

for car movement and parking. Outdoor landscaped areas are infrequent. However, the design of most housing units has provided internal courts or secluded balconies that are well protected and enjoy privacy. These spaces allowed families to create their own private landscaped areas. Outdoor landscaping is characterised by distinctive plain white walls, and articulated building facades; decorated doorways and external corners; special street signs and lighting fixtures; and the use of cobble stones for street pavement.

Materials and technology

Major structural changes in restored and rehabilitated buildings has varied according to the structural system and the condition of each building. Some buildings had stone bearing walls and wood ceilings, and required strengthening, particularly around doorways and large openings. Other old buildings, having concrete structural systems, required reinforcement of old or the addition of new concrete members. New buildings are built with reinforced concrete column and beam structures which are prevalent throughout

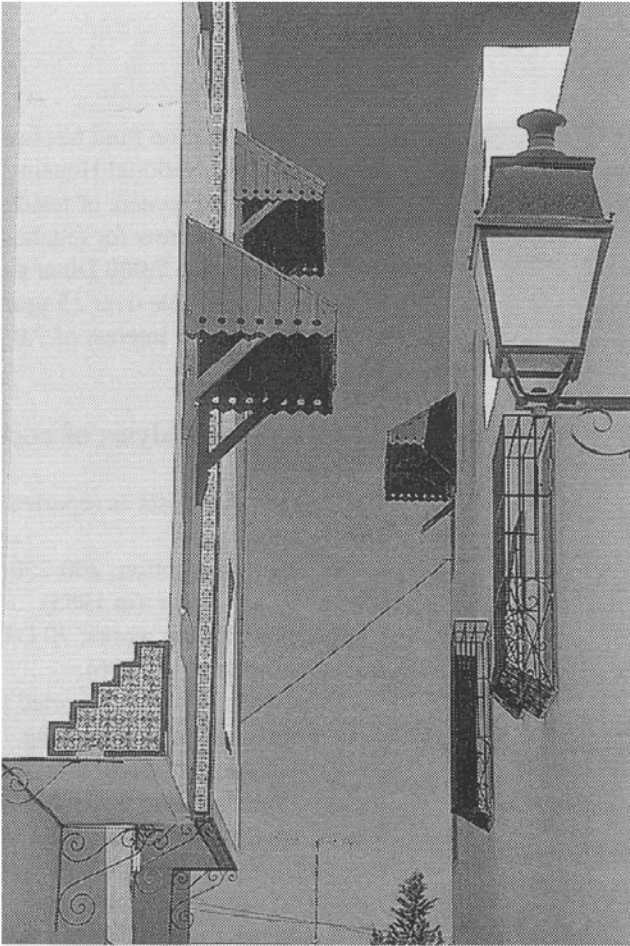
Tunis. Walls are mostly of hollow concrete blocks or cored terra cotta bricks which are burned clay units with open cores to reduce the weight.

Structural members of most new buildings are in situ concrete. Clay bricks, with open cores, are used for exterior walls as infill between reinforced concrete frame members, and for internal partitions. Exterior finishing is mostly plain, smooth stucco, with doorways accentuated with wide frames of glazed ceramic tiles. Door steps and internal stairs have terrazzo finish. Floors are paved with terrazzo tiles. Internal walls are mostly smooth plastered.

The project employed essentially low-tech construction methods. Most of the on-site labour was unskilled except for restoration works which required skilled local labour.

Most buildings needed waterproofing treatment. The installation of a storm drainage system for the entire Hafsia quarter, however, along with the treatment of the road surface to provide adequate slope, helped to protect the buildings from the effects of heavy rains and any potential rise in the underground water table.

Utilities, infrastructure networks, and service facilities have been



*Corner details,
rue des Négresses*

upgraded, installed, or constructed, and include the following: water and sewage networks with connections to each plot or building; gas, electricity, and telephone service facilities and networks installed and connected to all buildings, with provisions for connections to future buildings on vacant lots; the internal road network resurfaced with pavement cobblestones, and provided with proper slope and storm drainage connections; outdoor lighting installed in all streets; standard permanent lighting fixtures mounted on the exterior walls of buildings; and on vacant sites, as well as buildings under construction, temporary fixtures on posts installed until it is possible to replace them by standard wall-hung fixtures; facilities for solid waste collection and disposal, including containers placed on a number of selected sites and special collection carts suitable for narrow streets; and social service facilities, including a nursery, a clinic, and a public bath.

Hafsia Quarter II, Tunis, Tunisia

Origins of technology, materials, labour force, and professionals

Technology, materials, and labour
The technology and materials used for rehabilitation and new construction were essentially local, and differ little from those commonly used in Tunis. The labour was all Tunisian, and most of the work did not require special skills except for restoration jobs. Professionals
The project, from the initiation of Phase I in 1970, has provided on-the-job training for national professionals involved in restoration, rehabilitation, and reconstruction of historic areas and management of urban development. Apart from the contributions of a few foreign architects and economists during the first phase between 1970-73, and the involvement of the World Bank in issues related to the financing of the project, the Hafsia II project was carried out by Tunisian professionals.

Construction schedule and costs

History of project

The main project stages and dates were as follows:

April 1982

Boundaries of the intervention area defined by a decree

June 1982

Physical and socio-economic investigations and surveys completed

June 1983

Final designs and building regulations approved by local council

October 1983

Decree for property seizure and demolition

April 1984

Re-housing, in temporary units, families forced to evacuate for demolition

July 1984

Demolition started

April 1985- May 1986

First construction phase carried out as a pilot project and included 40 housing units, to re-house the families affected by the demolition, and a hotel

October 1986- July 1988

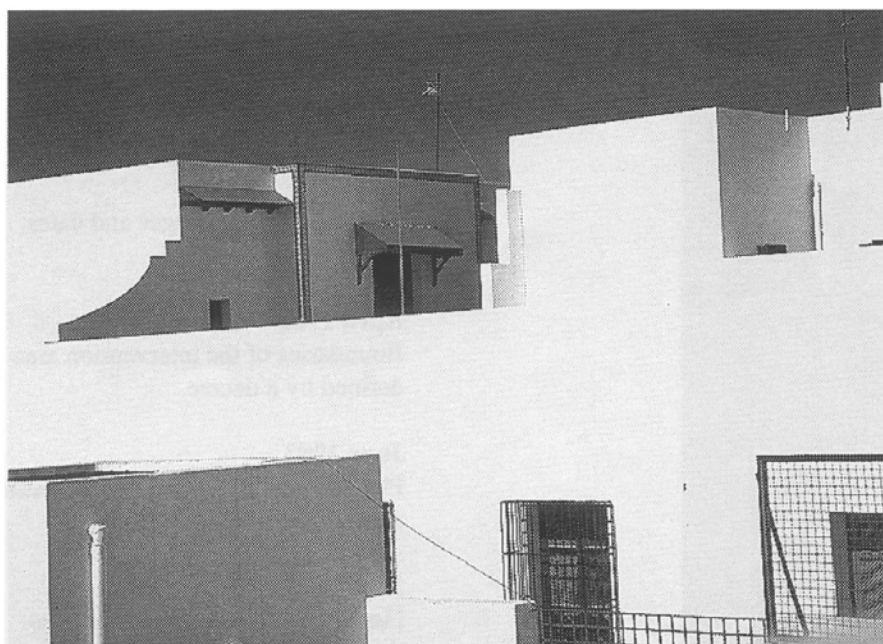
Second construction phase included 56 housing units, and 31 shops

June 1989- January 1992

Third construction phase included 68 housing units and 26 shops

December 1990- July 1993

Fourth construction phase included 54 housing units and 37 shops. A housing block containing 29 apartments was also constructed to rehouse as many as possible, on a rental basis, of the families which



View of roof terraces

were forced to evacuate due to demolition and could not afford buying housing units.

In 1986, rehabilitation started, targeting about 600 housing units. It is now almost 90 per-cent complete.

Construction documents, terms of reference, and requests for proposals for infrastructure development were prepared in June, 1984 and a contractor was selected. Work on the infrastructure started soon afterward in November, 1984.

Construction schedule and costs

History of project

The total cost of the project (not including the price of land) was DT 13,900,000 (or 13,622,000 US\$ at an exchange rate of 0.98 in 1990). Base costs were identified as follows:

Initial budget	14,500,000 DT
Price of land	1,400,000 DT
Main items of cost:	

• Infrastructure	970,000 DT
• Labour	4,300,000 DT
• Materials	6,500,000 DT
• Professional fees	300,000 DT
• Other expenses (legal, financing, etc.)	230,000 DT

Costs, financing, and comparative costs

The main sources of finance for the Hafsia II project were a World Bank loan, 20 per cent, and another from the Tunisian Government, 80 per cent. Financing of the rehabilitation component, however, included additional sources through the establishment of a rehabilitation fund as follows:

World bank loan	1,220,000 DT
Value added from sales of upgraded serviced land	154,000 DT
National housing savings fund	500,000 DT
Beneficiaries self financing (municipality & private)	522,000 DT

The rehabilitation fund has been managed by the National Housing Bank. It allowed owners of residential property to borrow for rehabilitation purposes up to 7,000 Dinar per housing unit, payable over 15 years at an annual rate of interest of 7.0 per cent.

Qualitative analysis of costs

The average unit costs as reported by ARRUE were:

- for new construction: 200-250 DT per square metre (in 1985)
- for rehabilitation works: 70 DT per square metre (in 1986).

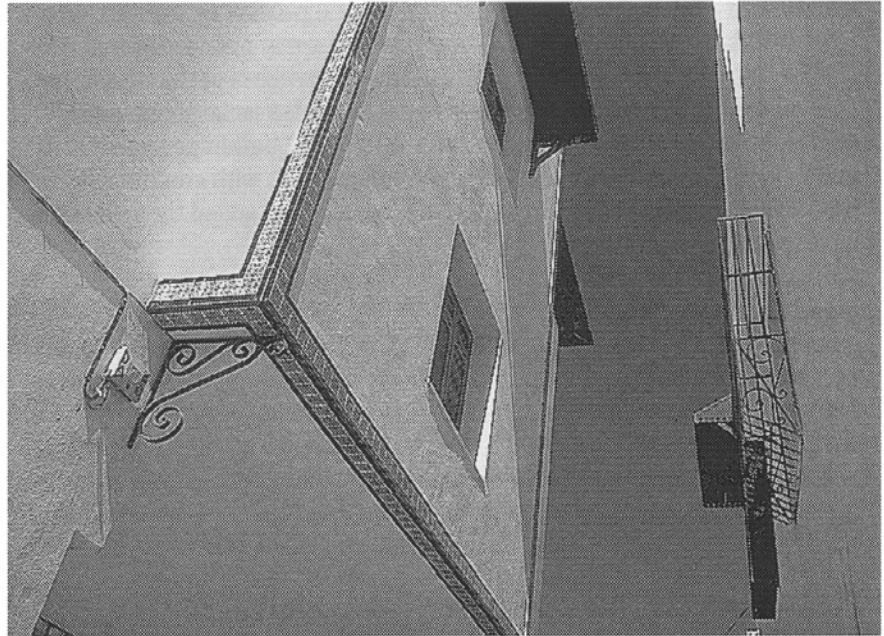
These averages were reported to be in the low-range of prevailing costs of similar construction works in the area. Savings were possible mainly through the reliance on small groups of skilled workers which were assembled and closely supervised by ASM, and the ability to keep overheads to a minimum.

The financial plan of the project included arrangements to make it possible for the property owners to secure financing for rehabilitation works. Recent changes in the rent freeze law, which will allow property owners to raise the rents of rehabilitated units based on improvement costs, should make it more attractive for property owners to borrow for rehabilitation.

An important feature of the financial plan was the institution of a cross subsidy system which was developed following a study of the socio-economic characteristics of the area's inhabitants. Under this system, older houses would be exempted from contributing to the costs of upgrading the streets and the infrastructure, and a special rehabilitation fund would be created from revenues generated by selling building plots and property in the Medina. These are in addition to funds received from the World Bank. This arrangement has been successful financially and has generated more funds than expected.

Maintenance costs

The municipality and utilities companies are responsible for the maintenance of the site, the common areas, and the infrastructure network as part of their overall maintenance programme for the city. No separate figures could be obtained relative to the maintenance of the Hafsia quarter. However, ASM reported that the quarter does not present any unusual maintenance requirements or problems, and maintenance costs would be considered average for the Medina area.



Detail on the rue des Négresses

Technical assessment

Functional assessment

Within the general objectives of the Hafsia II project, the components of the functional requirements have not all been achieved to the same extent. The components which have been achieved include: the recreation of the traditional urban fabric and the street network; the upgrading of the infrastructure and services; the renewal and revitalisation of commercial areas; and the sale of vacant serviced land, and new mid-level housing units, to subsidise the rehabilitation component of the project.

The rehabilitation component has only been partly successful. The instruments necessary for the implementation of a successful rehabilitation programme were not present. During the implementation of the project, the rent control law, which was in effect at the time, did not allow any increase in rents for upgraded private property. A reform of the legislation organising the relationship between landlords and tenants was necessary. This reform was introduced by law 93- 122 in

December 1993 which provides for "an increase in rent on the basis of improvements made." Thus, while the rehabilitation component was not effectively achieved, it provided an opportunity to identify the constraints and problems, and motivate the process of legislative reform necessary for the future conservation of a whole range of traditional urban areas in Tunisia. A number of targets in the area of rehabilitation, however, have been achieved and included the rehabilitation of owner occupied private housing, housing units occupied by single tenants, and municipal housing.

The Hafsia II project was instrumental in the formulation of effective financial arrangements to achieve social objectives. The residents have been encouraged to own and rehabilitate their housing units through arrangements made with the National Savings Fund for Housing (NSFH). NSFH had previously been lending only for buying land and for new construction. Changes in the policies of NSFH were achieved which allowed lending for upgrading of

existing buildings, and buying old buildings. A cross-subsidy mechanism was also formulated. Following upgrading of the infrastructure, land and property values went up. Several vacant plots were then sold to private developers at profit. The proceeds were used to support the housing fund which provided subsidised loans to the needy. The project has succeeded in enabling the inhabitants to rehabilitate and own their units, and ownership has reached about 80 per cent.

Climate

The traditional urban fabric which has been recreated by the project presents a suitable response to climatic conditions. The design of buildings, their massing and grouping also helped to create pleasant outdoor spaces. The design of the individual buildings provided all houses with good natural lighting and ventilation, and with courtyards or balconies that are well sheltered. However, there is an obvious lack of common outdoor space.

Choice of materials and level of technology

The choice of materials and technology seems to have been primarily guided by the desire to meet functional requirements with minimal cost. Some qualitative aspects have, therefore, been affected. The plumbing system is generally of poor quality. Initial electrical and telephone connections have been inadequate, and new connecting wires can be seen along the walls and across the streets. The residents have also changed or upgraded some items notably exterior doors, and the finishing of internal corridors and staircases.

Maintenance

The Hafsia quarter seems generally clean and well maintained except for

street signs and lighting fixtures which are in poor condition. Due to the narrowness of the streets, the quarter also lacks green areas. Individual buildings appear well maintained, with continuous improvements being added by inhabitants.

Design features

The project has succeeded in mending and restoring the traditional urban fabric. This includes the street network, the common areas, and the harmonious relationship between the building blocks in terms of form and height, mass and colour, and design features. The urban design aspects, particularly in taking advantage of the layout and the bridge houses, provided a variety of vistas, an interesting degree of complexity, and a reasonable degree of differentiation and identity.

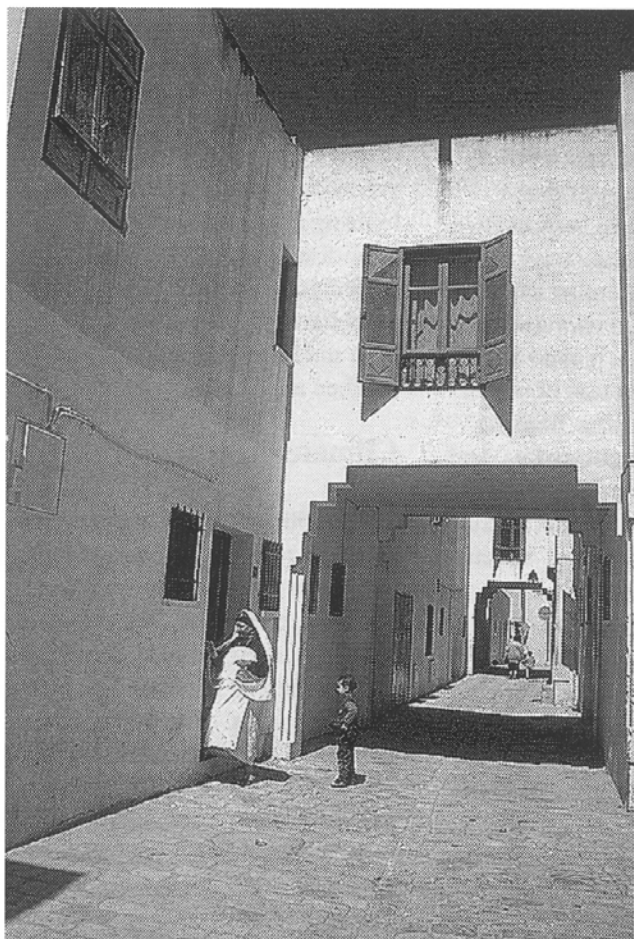
Users

The project addressed the requirements of households with different socio-economic characteristics and needs. This included past residents of Hafsia who opted to rehabilitate their homes with or without loans, relocate in temporary residences while their homes were being rehabilitated, or acquire new housing units in Hafsia. It also addressed the needs of potentially new residents.

Minimum standards for housing were established. For the very poor, the minimum standards called for a separate housing unit containing two rooms, a bathroom, and a small kitchen, or the equivalent of about 40 square metres, per household. The monthly rent was established at 18 per cent of the household income. For households which opt and qualify to buy, the ceiling for the monthly payment was established at about 22 per cent of the household income. About 134 households have been affected by the new construction and demolition programme. Of these, 46 families qualified to own housing units in Hafsia as their monthly incomes exceeded 150 Dinars. About 23 families with monthly incomes of less than 120 Dinars could be rehoused in rental units in Hafsia. The remaining 65 families with monthly incomes of less than 120 Dinars had to be rehoused, in subsidised housing, outside Hafsia.

The rehabilitation component targeted about 60 per cent of all the housing units in the Hafsia quarter (i.e. about 600 housing units). This component is now over 90 per cent complete, and the target is expected to be fully achieved within two years.

The image of the Hafsia quarter has changed, from an area that was socially undesirable, to a special urban environment sought after by families of various socio-economic characteristics for its cultural and aesthetic qualities, as well as for its



View of
rue Errakah



Plans of the Medina before 1933(top), during 1980 (middle), and following the 1981 reconstruction (below)



convenient location and services.

A 1994 study by Harvard University analysed the impact of the Hafsia project based on a socio-economic survey. The main findings indicated that the overall social impact of the project was positive, even though it was not possible to rehouse in Hafsia a large number of the original residents. The overall economic impact was also positive, as the investment will be fully recovered before the due date. The quarter became very attractive commercially, and residential buildings began to include more commercial activities than anticipated. This commercial vitality, however, is putting pressure on residential uses. Property auctioning to private developers was also economically successful and property values increased greatly. Most of the developers, however, were speculators, and this had a negative social impact. These speculators changed the houses they

Hafsia Quarter II, Tunis, Tunisia

built into garment factories that employ workers from outside Hafsia. As a result, the Hafsia roads are filled with more cars and pedestrians.

Some inhabitants have made modifications to the internal organisation of their units. Changes included the elimination and addition of partitions, moving entrance doors, and rearranging kitchens and storage areas. Some users have improved the finishes, mostly by adding stone veneer on the outside, and ceramic tiles on some of the internal walls, particularly of corridors and staircases.

Project personnel

The Hafsia II project lasted for about 13 years from its inception in 1981 to near completion in 1993. During this period, a large number of professionals were involved, and several have

changed positions and responsibilities. Therefore, it has been difficult to prepare an exhaustive list of project personnel and their roles in the project.

The main client was the Municipality of Tunis. The Mayor of Tunis, M'Hamed Ali Bouleymen, who is also the President of ASM, has provided special support to the project. Other clients include the owners of buildings which were part of the project. The Association de Sauvegarde de la Medina (ASM) has assumed the role of planner/architect of the project, and also worked as lead contractor for the execution of the project in close collaboration with the Tunisian urban renewal agency (ARRU) as the contracting authority. M'Hamed Ali Bouleymen, Mayor of Tunis, is the President of ASM. Abdelaziz Daoulatli, ex-Vice-President of ASM, currently Director General of the National Institute of Heritage played a major role in directing the project at the beginning. ASM technical personnel and their roles were as follows:

Lead architects

Achraf Bahri-Meddeb
Samia Akrouit-Yaiche
The late Amor Jaziri

Associate architects

Zoubeir Mouhli
Faika Bejaoui
Abdelkerim Gazzah
Amor Bouzguenda

Architects

Khaled Ben Abdallah
Khaled Bouzid
Lotfi Bouzouit
Institutional and financial aspects
Denis Lesage

Agence de Réhabilitation et Rénovation Urbaine (ARRU) has assumed the role of client representative and contracting authority. Ali Chaouch, ex-Director General of ARRU, currently Minister of Hous-

ing and Services, played a major role in the execution of the project . The current Director General of ARRUE is Chadli Karoui. ARRUE's technical personnel and their roles were as follows:

Operation management

Mohamed Ali Gaigi
Tahar Ben Amara

Architect

Inchirah Hababou
Institutional and financial aspects
Habib Abichou
Kacem Ben Halima

Other private consultants and contractors participated in the project as follows:

Infrastructure studies

COVER ENTREPRISE VRD

Infrastructure contractor

MAGHREB ETUDES

Structural studies

SANDID et ENGEBATRAP

Construction contractor

SOTUETEC et TEAM

Rawia Fadel
May 1995