

The inventory of the historic city of Sana'a

A tool for urban conservation



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Introduction

The Old City of Sana'a is known world-wide as one of the most authentic and significant examples of the extraordinary urban civilisation which developed in the Arabia Felix in the 2nd century B.C. Since the 1970s it has been the object of many studies by urban specialists, architects and historians, testifying to its outstanding heritage values, and pointing out the threats from the nascent and rapid modernisation affecting its authenticity and integrity after many centuries of almost complete isolation. At the beginning of the 1980s a Campaign and an Action Plan to preserve the Old City were proposed by UNESCO¹, which were launched after its inscription on the World Heritage List in 1986.

Later, an action strategy was set up and partially implemented to safeguard, revitalise and upgrade the historic city². Several studies pointed to the need to preserve the traditional building techniques, whilst numerous interventions were carried out for the restoration and rehabilitation of some important historic buildings and most of all the improvement of the urban infrastructure. However, effective measures for the conservation and the rehabilitation of the urban fabric are still lacking or seem to be insufficient to address the current rapid and diffuse changes in functions and meanings.

This publication documents the main outcomes of the studies undertaken in 2003 - 2006, by UNESCO's World Heritage Centre and the General Organisation for the Preservation of the Historic Cities of Yemen (GOPHCY), in order to establish appropriate conservation measures for the Old City World Heritage site and to eventually prepare a Conservation and Rehabilitation Plan, which would include also the other historic settlements in the larger Sana'a metropolitan area³. In particular, the following tasks were carried out:

- an initial assessment of the state of conservation of the Old City and some project proposals were developed for the upgrading of public open spaces in the most sensitive areas on the edges of the Old City;



¹ See Lewcock R. (1982): The Campaign to Preserve the Old City of Sana'a, UNESCO Paris.

² See Lane, M.B. (1988): San'a'. Pilot restoration projects for the International Campaign to Safeguard the Old City of San'a', GOPHCY, UNDP-UNESCO, Paris.

³ The activities for the inventory of the Old City of Sana'a were made possible thanks to the Italian voluntary contribution within the framework of the Italy/UNESCO Joint Declaration for the Protection of the Cultural and Natural Heritage. The extension of the inventory to the other main historic settlements was funded within the framework of the International Campaign for the safeguarding of the Old city of Sana'a, managed by the Culture Sector of UNESCO.

The whole programme was carried out in collaboration with the GOPHCY Center for Architectural Training and Studies (CATS) and with the support of the Yemeni Social Fund for Development.



- the preparation and the implementation of a detailed and exhaustive inventory of the buildings and open spaces in the Old City of Sana'a, intended to establish protection measures, which was later extended to the other main historic settlements of Bir-al- Azab and Rawdah;

- the proposal of a "Work Plan" for the establishment of a Conservation Plan for the historic settlements of the capital city.

Throughout the process, the concern for conservation has progressively extended from the protection of the most significant monuments and architectural features to the preservation and rehabilitation of the urban pattern, and from only the World Heritage site of Sana'a Al Qadima to the historic settlements pattern in the wider metropolitan area.



The conservation of the Old City and the historic settlements of Sana'a: a planning perspective

New challenges for the conservation of the Old City

At the time of inscription on the World Heritage List in the 1980s, the Old City was declining and its heritage values were seriously threatened by the pressures of modernisation and rapid urbanisation. Now, increased attention must be paid by the institutions for its conservation, new issues have to be addressed, due to the dramatic changes occurring in the larger urban area. To this purpose, it is worth mentioning that:

- the historic city is no longer a "city in itself" (an outstanding urban fabric enclosed within its walls) but only a small though fundamental entity within Greater Sana'a, which now probably represents less than 1/30 - 1/40 of the overall urban population⁴. The Old City is subjected to fast and considerable social changes - departure of the higher income population, rural migration and increase of poverty - with widespread consequences on the housing stock tenure and the real estate market, which may imply a change of uses of both the built structures and the open spaces (like the "bustans"). Hence, for instance, the transformation of the historic "tower houses" into "apartment blocks" or the development of new commercial activities, the decay of traditional handicraft techniques and the abandonment of historic structures like the "samsarat"⁵. These social and economic changes are so relevant as to become key issues to be addressed by any conservation and rehabilitation policy;

- together with its "twin city" of Bir Al Azab, also known as the "Turkish quarter", the Old City represents the central core, both in geographical and functional terms, of a fast growing metropolitan area. The sort of "Central Business District" that was developed in the sixties and the seventies in between and along the edges of the two cities, mainly in Bir Al Azab, still provides the hinges where the main directions of urban growth coalesce and come in contact with the historic urban fabric. But whilst most government and administrative functions of the Capital are

⁴ The process was described by H.Eckert (1992): "The Chief Urban Functions of Old Sana'a in the City of Sana'a Today": in the early '90's the population of the Old City was estimated at about 50.000 inhabitants, against 1 million in the Greater Sana'a area. According to other sources (see Cultural Heritage (Protection) Project, February 1999 cited) the Old city population in 1999 was about 60000, whilst anecdotic information from H. Eckert report the population of Sana'a to reach today 2,2 - 2,5 millions of inhabitants.

⁵ As for the physical transformations related to these processes, see the doctoral thesis of J.P.Feiner (1997): "La vieille ville de Sana'a: analyse morphologique comme fondement de la sauvegarde patrimoniale", which offers a very rich base of information on the heritage conservation issues of the Old City, built on field surveys and observations.

⁶ In Rawdha many fine examples of Yemeni traditional architecture can be found that could be considered unique in many respects. Rawdha architecture is indeed a mix of the traditional urban and countryside Sana'ani architecture, with gardens and orchards surrounding each palace or house. While in Sana'a the old city texture mainly consists of small and big palaces and house towers, in Rawdha the palaces or tower houses become a sort of country villa or mansion, keeping the same architectural designs and profiles. The architecture of Rawdha is a tribute to the zabur technique, mainly used for the ground and the first floor, while the remaining floors are built in baked bricks, but the use of zabur for the entire building up to 3 or 4 floors is also frequently found.

⁷ Wadi Dhar, site of the most famous Imam palace, the "Rock Palace", and one of the most beautiful green areas around the city, is considered a very important heritage site. Like in Rawdha, beautiful palaces or countryside villas are scattered along the wadi together with several old market places and small villages. Al Gheria is the biggest and most important site along the wadi, with a rich heritage comprising an Imam palace and several ancient buildings. Here the architecture differs from that of Rawdha or Sana'a but at the same time keeping a strong relation.

accommodated in Bir Al Azab, the Old City's functional role seems to be more strongly linked to the higher concentration of traditional retail and handicraft activities that mainly serve the increasing low-income population of the larger urban area rather than to the presence of social facilities and cultural and religious institutions. A growing pressure in terms of activities and accessibility is being exerted on the "twin cities", which is leading to an increasing divide of functions and activities;

- on the other hand, the Old City is part of a larger historic urban and regional system, which has now been absorbed into the Sana'a metropolitan area, and not only includes Bir Al Azab but also other settlements such as Rawdah, with its remarkable pattern of residence buildings and gardens, linked to the Old City by the wadi valley landscapes, which used to be the week-end and summer resorts for Sana'a's rich families until 1965/1970⁶, and other mountain villages like Wadi Dhar, with one of the most remarkable Royal Palaces in Yemen⁷, Hadda, Bayt Zapatan, Sana' and Bayt Boss. Together with the Old City, these historic settlements reflect different layers and aspects of the same architectural and urban culture as Sana'a, and have been seriously affected, though in different ways, by the ongoing process of modernisation and urbanisation.

Fig. 1 - The "twin cities" of Sana'a: the Old City (right), still partially enclosed within the ancient walls (thick blue line), and Bir Al Azab (left) whose fabric merges with the recent urbanisation on both sides of the ancient walls, now demolished (red line). The new pattern of thoroughfares (yellow line) divides the two fabrics along the strip of the new "central business district" (violet), and surrounds the "twin cities", coalescing on the ancient main roads (light blue lines) and heading to the historic souk area (violet).



A comparison between the map of Rathjens and Wissmann of 1929 and the most recent aerial photographs and maps of the mid 90s makes an initial appraisal of the degree of preservation and/or transformations of the historic urban patterns of the Old City and Bir Al Azab possible.

As for the Old City, the partial demolition of the city walls can be noted, together with the appearance of new residential and commercial developments within and outside the former line of the walls. These merge with the Bir Al Azab redevelopment to the west, where most of the political, administrative, and modern economic activities are located, and with the new commercial and residential developments spreading in the outskirts to the north and the south. If most of the ancient urban pattern is still preserved in its integrity, the built fabric has nonetheless been affected by many scattered individual interventions - such as new constructions in the bustans and gardens, and other kinds of widespread alterations that will be examined later.

In Bir Al Azab, transformations have been more radical, and have led to the complete demolition of the city gates and walls, whose former line is no longer visible, and to the overall densification of the remaining historic fabric, which was characterised by rich houses surround-



Fig. 2 - Urban pattern transformations within the city walls of the Old City since 1930s.

ded by gardens and cultivated areas. The majority of this urban landscape has been redeveloped to enable the building of new residential neighbourhoods or to house new institutional, administrative or service settlements, in connection with the opening of new thoroughfares or to the widening of the ancient streets and paths leading to the gates. One can ascertain that only the densely built-up pattern of the former Jewish district of Al Qa'a has been preserved in its integrity, despite it being in a poor state of repair. As a consequence, most of the open areas have disappeared, and the spatial continuity of the ancient fabric has been definitely broken. Even if numerous heritage features of high interest (palaces and houses with their gardens, some bustans, and so on) still remain preserved, many are often abandoned or in danger.

The other minor historic centres generally suffer from physical and functional decay and seem to have been seriously affected by inconsistent development and infrastructural works. The available documentation doesn't allow the appraisal of the extent of such changes, but the evidence is clear that, like Bir Al Azab, the historic architectural and urban features of Rawdah, Wadi Dhar and the other settlements deserve a careful survey and assessment, in order to be protected as a substantial part of Sana'a's heritage.



Fig. 3 - Urban transformations in Bir Al Azab since 1930s. The dotted black line represents the perimeter of the ancient walls, now demolished.

An overview of the past and recent conservation actions

An initial assessment of the state of conservation of the World Heritage property - the Old City of Sana'a - highlights the new challenges for the conservation of this outstanding cultural heritage site within the broader context of the larger metropolitan area⁸.

At first glance, it was observed that, in spite of the fast process of urbanisation and modernisation that has occurred in the city of Sana'a over the past decades, the greater part of the historic fabric of the Old City and its architectural heritage are still well preserved, especially if compared to other World Heritage cities of the Arab World. The "deep roots" of the extraordinary culture of the city are still alive, but the process of change has come to a very delicate turning point, with new threats and opportunities that need to be assessed, and call urgently for a consistent overall conservation and planning policy.

The campaign for conservation supported by UNESCO was successful in the promotion of numerous interventions, implemented by the Yemeni government and international cooperation. These have been an important contribution to the overall preservation of the historic and cultural heritage of the Old City. Amongst these:

- **the city walls have been reconstructed** with the intention of recreating the historical and traditional image but in fact, in a certain places, their shape, thickness and line have been seriously altered. Moreover, building materials and techniques have been adopted which conflict with the traditional ones, and which have proven to be less resistant and durable;

- **the wadi has been remodelled** to become an "urban space", but unfortunately it has been transformed into a thoroughfare, which may increase the pressure of vehicular traffic on the Old City, and create a barrier between the eastern and western neighbourhoods. The edges on both sides could provide new interesting open spaces for the adjacent residential neighbourhoods, but require appropriate landscaping;

- most street surfaces have been paved since the 80s in the souk area and in many residential neighbourhoods, thus increasing the liveability and the environmental quality of the Old City, but in many cases recent and ongoing repaving interventions have used inappropriate materials



Please note that blue text refers to the images on the side of the page.

⁸ Cfr. Daniele Pini and Franca Miglioli, with the collaboration of Marco Livadiotti: Mission Report (14 -24 June 2003), UNESCO - World Heritage Centre.



and building techniques, and are not coordinated with infrastructure improvement interventions;

- several public facilities and services have been made by the Yemeni authorities, with the [restoration and reuse](#) of some historical buildings for administrative, cultural, handicraft and commercial activities, whilst other remarkable private houses have been restored and re-used with the help of international cooperation, to house museums or other cultural activities. In some cases the quality of the intervention is very high, but their impact on the overall urban fabric is very low, due to their functional and spatial isolation, and to the inconsistent transformations occurring in the surrounding context.

All these actions, scattered in the urban fabric, have somewhat helped to increase awareness of the need for preserving the Old City, but are not sufficient to protect the whole of the historic fabric and its architectural features, and often reflect different and contradictory concepts of conservation.

More recently, some interventions have been undertaken, which seem to approach conservation from a more general point of view. This also concerns the urban fabric as a whole, and not only the individual features, i.e. the rehabilitation of some residential neighbourhoods along the edge of the wadi, and the widespread rehabilitation of the bustans and megsamat. Also, the current restoration of the [National Museum in the Mutwakil](#), where particular attention has been given to the use of traditional materials and building techniques, may be very important since it would re-establish the ancient "urban hinge" between the Old City and Bir Al Azab, and hopefully help to re-create closer spatial links between the "twin cities".

In the meantime, it must be stressed that these interventions and the efforts to preserve the Old City's heritage have not helped to raise a parallel interest in the preservation of the rich heritage of the other historic settlements in the Greater Sana'a area, particularly Bir Al Azab and Rawdah, where no protection measures exist at all, and an extremely important architectural and urban heritage is at risk of being lost.

Moreover, it has to be noted that recently, some interventions have been undertaken which have aimed to "rejuvenate" the image of the

Old City but which strongly contradict any acceptable concept of conservation. These are:

- the widespread and systematic **whitewashing** of the facades along the Wadi Saila and in many other parts of the historic fabric;
- the construction of an **open air theatre** in the bustan Al Amri, besides the Al Mahdi Mosque, along the Wadi Saila, which used to provide one of the most impressive views on the Old City skyline.

Both of these interventions reflect an idea of the old city as "scenery", to be enhanced according to conventional stylistic criteria of mere visibility and/or to be exploited as the back-drop of some special glamorous event. Like most of the diffused interventions on the historic fabric and open spaces, carried out both by the public and the private sphere in the Old City, they seem only to reflect a concern for the respect of a somewhat vague idea of "traditional" architectural style, regardless to the effects on the historic morphological and functional features of the urban structure and on its image, and without any consideration of the social and economic consequences.

New threats from diffused and uncontrolled transformations

More dangerous and widespread transformations are linked to the ongoing overall process of urbanisation and modernisation, which affect to a different extent the Old City and the other historic settlements in Greater Sana'a. In particular, the demolition of a large part of the walls of the Old City and the total destruction of the walls of Bir Al Azab, created a new overwhelming pressure on the ancient urban fabric. The new settlements now come in contact with the ancient and traditional fabrics with a heavy impact on their morphological integrity and function, whilst the architectural heritage is seriously threatened by widespread intervention, which progressively disfigure the extraordinary urban image of the historic city. In the Old City, some major changes are threatening the integrity and the heritage values of the historic fabric, and deserve to be carefully assessed:

- a widespread "soukization"⁹ of the residential quarters near the historical gates and the new openings in the city walls, with the introduction of new retail activities at the street level. These are felt to be in con-



⁹ The term "soukization" is used by H. Eckert and J. Feiner, in the works cited above.



trast with the traditional sense of habitation of the Sana'ni residents. This induces a dangerous physical and functional decay in the residential neighbourhoods, which is also related to the migration of high level income households outside of the Old City and to the rental of the premises to many different lower income newcomers and households;

- important transformations occur in the central souk area, with widespread vertical additions to the existing buildings, inappropriate shelters and street furniture, as well as the decay of some relevant traditional typologies, i.e.; most of the [samsarat](#) (caravanserai) have been abandoned or converted to storage or retail uses; fountains and wells, which were a substantial part of the urban water supply system, have been abandoned or demolished;

- on the other hand, the residential fabric is being subjected to scattered but widespread transformations aiming at improving living standards, and/or bound to the pressure of an increasing housing demand. These result in the following; [new vertical](#) (often 2 and more floors) and sometimes horizontal additions to the existing buildings; the demolition and reconstruction of existing buildings; the construction of new buildings that reduce the extent of open spaces and damage the bustans and gardens which represent an integral part of the historic fabric (see photo below);

- these changes are compounded by the spread of a kind of "neo-traditional" architectural style, with the use of the "mafraj" type of openings on all floors, the exaggerated use of decoration, and other almost caricature-like details;

- the occupation of green areas and gardens for the building not only of private houses but also of [public facilities](#) (like schools) which result in an improper densification of the historic fabric, and are often totally inconsistent with the architectural features and the spatial or functional structure of the Old City. This is particularly the case with the ongoing realisation by a private developer of a wide market area with sheltered stalls in the Bustan Ingad, near the Bustan Al-Sultan area, which is going to compromise one of the potentially most valuable landscape features along the Wadi Sailah, where one finds the most beautiful skylines of the Old City;

- the urban landscape and **skyline** have also been seriously affected by some "neo-traditional" skyscrapers and by a new out-of-scale minaret that have spoiled to a certain extent the world-famous skyline of the city with new inconsistent "landmarks". But the traditional cityscape is also deteriorating as a result of several interventions in Bir Al Azab and in the larger urban area (e.g. the telecommunication tower, new hotels and other developments);

- the urban fabric and its skyline are also affected by water tanks and **satellite installations** in open spaces and on the roofs: these are actually strong intrusions, which are presumably bound to be eliminated in the medium-long term through the improvement of the water supply in the Old City, and the planned cable network

All these interventions usually imply a more and more widespread use of new materials and building techniques, which often replace the traditional ones with a negative effect on the preservation of the fabric, and sometimes the destruction of relevant historic architectural features:

- the old traditional walls built in *zabur* are replaced with a new type of wall built with an incorrect *zabur* technique, and without any respect to the dimensions and sizes of the existing features. Usually the artisans employed to do such renovations come from other regions, and are not experts in traditional local Sana'ani techniques. As a consequence a new type of traditional architecture is imported from other regions of the country without any respect to the traditional building techniques of Sana'a¹¹;

- additions of new floors to existing old buildings are made with a new type of brick that is larger, higher and more red than the traditional one. A new fashion, beginning around 1985, is the dismantling of entire floors and their rebuilding using the new type of bricks with cement as mortar and not the traditional clay. The first use of this type of new dangerous and incorrect technique was Bab el Yemen gate around 1986;

- the use of different types of stone for any new building or additions to the existing buildings in the old city, imported from other cities or regions. These are often not appropriate, and inconsistent with Sana'a's architecture, since the traditional techniques of hand cutting



¹⁰ According to previous projects, Bustan Ingad was part of a wasteland that should have been rehabilitated to become a "public garden and ecomuseum", see: Lane (1988): "SAN'A". Pilot restoration projects for the International Campaign to Safeguard the Old City of San'a".

¹¹ As an example, for the reconstruction of the city walls, masters from Saada or other cities were employed. As a result the city walls of Sana'a look now more like the city walls of Saada or Amran.



and finishing are not respected. Moreover the widespread use of machine cutting creates a strong contrast with the historic heritage features;

- the opening of new commercial activities or the modernisation of the traditional ones which usually implies the replacement of most of the traditional wooden doors with steel doors;

- the total destruction of all traditional *zabur* fencing walls surrounding the gardens and yards or along the alleys of the old city, which were an important element of the traditional urban texture, to be replaced by *stone fencing*. This started mainly with the renovation campaign for the gardens of Old Sana'a around 4 years ago;

Beside the Old City, due to lack of any kind of protection, Bir Al Azab is becoming a congested "modern" district, with a more and more ordinary urban image, in spite of its important central functions and facilities. In particular, the integrity and continuity of historic urban pattern and fabric has been unquestionably affected, by the following transformations:

- the city walls and gates have been completely demolished and the ancient urban fabric now melds with the modern urbanisation without any break or spatial separation;

- the historic fabric is being deeply and widely transformed not only by an overall densification of the urban pattern, but also by several scattered redevelopment projects or re-use interventions of old houses and gardens;

- most of the bustans and other green areas are disappearing not only as a result of recent residential developments, but also due to the construction of many institutional buildings, public facilities, tourist and commercial developments, with no respect for the historic pattern.

Due to the present zoning regulations and/or to the lack of any measure of protection, several commercial and residential buildings have been built that create a strong contrast with the remaining historic fabric, in their height and typological characteristics, despite their attempts to imitate the so-called "traditional style" of the Sana'ani

architecture. Moreover, the same diffused interventions as in the Old City can be found, that disfigure the remaining heritage urban fabric and buildings:

- the residential fabric is particularly affected by an uncontrolled process of "modernisation", which implies demolitions and reconstructions, vertical and/or horizontal additions, and all kinds of transformations of the existing structures;

- almost all the **green spaces** and gardens have been occupied not only by private houses but also by hotels and, above all, administrative buildings (like Ministries and Embassies). These are often totally inconsistent with the architectural features and the spatial or functional structure of historic Bir al-Azab, and result in an intense densification of the urban fabric;

- as in Old Sana'a, the use of **different types of stone** for any new building, urban feature or additions to the existing buildings in Bir al-Azab, imported from other cities or regions and often inconsistent with Sana'ani architecture.

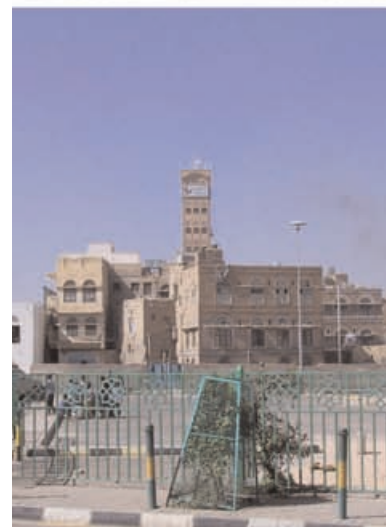
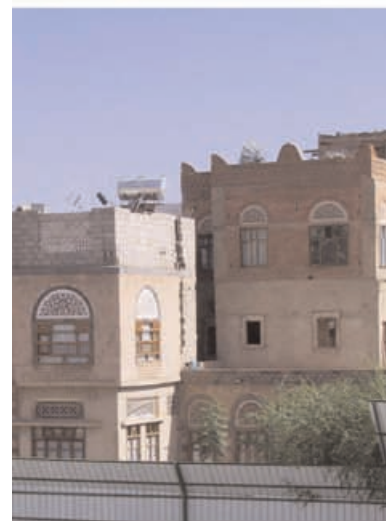
- the urban landscape and **skyline** have also been seriously affected by some modern skyscrapers and towers;

- public and private open spaces have been abandoned and few of them are still cultivated. This means that the elements necessary for irrigation (Bir and Marnah) are also disused;

- a lot of traditional *zabur* fencing walls surrounding gardens and bustans, which were an important element of the traditional urban fabric, have been destroyed or replaced using inconsistent materials.

As for Rawdah, if the ancient settlement pattern is still largely intact, the integrity of the urban fabric is threatened by fast-growing modern developments. Moreover, many scattered redevelopment interventions are disfiguring the ancient fabric with the demolition of important heritage features, whilst many historic buildings and gardens are abandoned or in bad repair:

- almost the whole traditional souk area has been deskapeel, losing its





function as the principal market of the village. The commercial area is being developed along the new main street;

- the residential fabric is being subjected to scattered but widespread transformations aiming at the improvement of living standards. These result in the following: **new vertical** and sometimes horizontal additions to the existing buildings; the construction of new buildings that reduce the extent of open spaces and deteriorate the bustans and gardens which represent one of the most important features of the historic fabric;



- the public and private open spaces have been abandoned and very few of them are still cultivated, and all the traditional constructions for irrigation (Bir and Marnah) are disused and even dismantled;

- the addition of new floors to existing old buildings is undertaken with a **new type of brick** that is larger, higher and redder than the traditional one;

- a lot of traditional **zabur** fencing walls surrounding gardens and bustans, which were an important element of the traditional urban fabric, have been destroyed or replaced using inconsistent materials.



The lack of an appropriate planning and legal framework

One of the main obstacles to the conservation of the Old City and its historic suburbs was the absence of an appropriate planning and legal framework, which seriously hampered and made almost ineffective the action of the concerned institutions, particularly the General Organisation for the Preservation of the Historic Cities of Yemen (GOPHCY).

The planning framework

A Master Plan was prepared in the late 70s, based on projections increasing the population from 160.000 inhabitants in 1977 to 985.000 for the year 2000 and the density from 55 persons/hectare to 96. If these projections were largely underestimated, the Master Plan has nonetheless provided the general layout of eventual urban growth. The main emphasis has been put on the construction of a new larger road network that was intended to form the backbone of the future expansions and/or of the redevelopment of the existing urban areas. The main orientation of city growth was to the North and to the South, due to the topographic constraints existing to the East and the West. This kept the whole of the historic "twin cities" of old Sana'a Al Qadima and Bir al Azab as the fundamental hinge of the rapidly growing urban structure, whilst Rawdah was to be merged in the new urbanisation developing to the north towards the airport and beyond. Among "development sectors" which were identified "to distribute future development of the city", the following concerned the historic city and its various parts:

- the "medina", encompassing the "Old Town" and the "Souk" where, according to the land use information available in 1977, the developed land represented 57% of the area. The existing population of 73.000 inhabitants was to increase up to 137.000 in the year 2000 through "infill" developments which were expected to cover the remaining undeveloped land;



- the Abdul Moghni sector, east of the "medina", encompassing the recently developed "central business district" along Nasser street and Ali Abdul Moghni street, and the historic fabric of Bir Al Azab, where the developed land represented 48% of the area. The planned development would have covered 93% of the area by the year 2000, allowing for a population increase from 46.500 inhabitants to 179.200;

- Rawdah, a sector substantially undeveloped in 1977 (only 9% of the area was developed) which included the "residential neighbourhoods" of the historic centre (considered as "particularly notable as they contain outstanding examples of Yemeni architecture"). Development here was planned to cover 76% of the area, with the population increasing from 8.900 inhabitants to 165.800.

In this framework, some "program objectives" were proposed regarding the historic fabrics, namely:

- attention should have been given to the protection of the Old Town from the [intrusion](#) of incompatible non-residential uses, and programs for rehabilitation assistance should have been set up to preserve the cultural integrity of residential neighbourhoods;

- the ["souk"](#) had to keep its viability and important function as a "bargain, craft and small business market", by accommodating elsewhere "large-scale shopping establishments": for that reason the development of a new high-density commercial centre was proposed in the Sailah sector, but this was not realised.

Furthermore an "Historic Preservation Element" was proposed which would have focused on "the area within the pre-Turkish walls" and would have also considered the former Jewish quarter of Al Qa'a, in order to reverse the damaging trends that threatened their viability and integrity.

These objectives and proposals were at least partially contradicted by the "development strategy" of the Master Plan. The development and/or the strengthening of a core activity was encouraged within each sector, so as to establish a basis for future expansions to be channelled through the new road construction. The assumption was made that residential developments would cluster around the activity centres for

accessibility to employment and shopping facilities, whilst the "high-intensity cores" would continue to expand, so that the general urban development would have occurred on the fringes of the concentrated areas. As a result:

- new residential areas were developed in the open areas within the city walls of both the Old City and Bir Al Azab. Fortunately, the developments within the Old City walls have had a lesser effect than had been expected and most of the bustans and megsamat have been preserved;
- a new road network has been created through the widening of existing streets and the construction of new ones in the historic fabrics, especially in Bir Al Azab, to facilitate traffic and car access within residential neighbourhoods;
- the commercial and business activities have been reinforced on the edges of the Old City, especially in connection with the main entrances of Bab Shu'ub, and Bab el Yemen, along Ali Abdul Moghni street, all over the ancient fabric of Bir Al Azab and its outskirts, and to a lesser extent in Rawdah.

The legislative framework

These developments occurred without any specific conservation measure for the historic fabric of the suburbs, whilst the Old City perimeter was submitted to legal protection by decree no. 17/1994 concerning the "General Provisions for Violations", and a decree issued by the Prime Minister, no. 204/2001 regarding "Regulations for Constructions and Violations in the Historical Cities".

Though without the power of a law, the Decree 204/2001 provides for legislative tools aimed at the "preservation and protection of historical cities, landmarks and sites" as well as "buildings and their historical and cultural style", preventing "assaults and works of destruction and demolition and construction works that use non-traditional materials not allowed by the General Organisation for the Preservation of the Historical Cities". It defines very strict conditions for any type of construction and gives the GOPHCY a crucial role in the control of building activity. Moreover a list of conditions and controls is provided, which

have to be ensured in order to legitimate building renovation and demolition works. These include:

- the use of "traditional building materials" and the conformity to the "general pattern of the historical cities": if these conditions are not fulfilled, works must be stopped;
- the preservation of existing open spaces between buildings, as well as of the "green" and cultivated areas, "which form an important constituent of the historical cities";
- the conservation of the existing functions of "historical buildings and landmarks", and the prevention of any uses "that may be hazardous to these structures or make them lose their original style or properties". The "distinctive features and the peculiar activities of the traditional markets should be preserved", and the "opening of new commercial outlets in the residential areas ... which are set up by the GOPCHY, should be stopped";
- the suspension of any new and additional work that changes the historical elements and the architectural style of historical buildings.

The Decree also provides a detailed list of prohibited activities, which include amongst others:

- additional or annexed constructions to an existing building, including "vertical and horizontal expansions ... if such works will alter the architectural style of a historical city";
- any kind of intervention that may imply the direct or indirect "demolition, expunction, deformation, alteration or damage to the historical cities and sights", including "engravings and decorations that are found on the buildings";
- the construction of new buildings attached to historical buildings, elements or landmarks, as well as in the religious areas, in public areas, in "white" open and cultivated areas: the uprooting of trees and the use of the areas for disposing of waste or garbage is also prohibited;
- the creation of new commercial outlets in the residential areas and

"the alteration of the function of a building or any part thereof" without written approval of the GOPHCY;

- the use of building materials which do not conform to traditional approaches such as "reinforced concrete, iron doors in lieu of wooden doors or use of aluminium windows in lieu of wooden windows, etc.", as well as "scraping red bricks or covering thereof with defacing materials such as paints, etc."

The "violations"

A survey was carried out by GOPHCY during the period July 2002 - February 2003 to identify the "violations" committed according to the above decree, with a team formed by technicians of different involved parties (such as Public Works, Local Councils and Awaqf) specially appointed under the direction of GOPHCY. The following types of violations were identified:

- the use of different building materials and techniques not conforming to the traditional and historical architecture;
- the construction of new buildings on open and public spaces;
- the opening of new commercial outlets;
- additions (mainly vertical) to existing buildings.

The so-called "violations" are spread in the urban fabric. There are about 1800, and 400 of them are considered to be particularly serious. A detailed analysis of these makes clear how the concept itself of "violations" is rather unclear and covers a set of interventions which are disparate and have a very different impact on the urban fabric and the cityscape.

On the one hand, the "violations" include all the buildings along Ali Abdul Moghni street, which form a part of the "CBD" realised after the 60s and the 70s with the demolition of the city walls, according to the Master Plan. Also the buildings constructed in the same period in the Bab Shub and Bab El Yemen districts, inside and outside the city walls. Of course these interventions have seriously disfigured the Old City fabric with a harmful impact on its functions and liveability, but they can hardly be considered as "violations" from the legal or planning points of view. These should rather be regarded as an effect of the lack of a



Fig. 4 - The violations recorded in the Bab Sabah and Bab Shu'ub areas.

"buffer" zone, and a major planning issue to be addressed in a future conservation and rehabilitation policy.

On the other hand, no clear distinction is made between the new constructions and the reconstruction of pre-existing buildings: the "violations" are recorded only with reference to the use of wrong materials apparently without any concern for the scale of the interventions or the functions of the building.

Nonetheless, the survey and registration of the "violations" is an important step towards an increased awareness of the Old City protection issues, and could represent an important contribution to a more consistent conservation and rehabilitation policy.



The need for a "Conservation and Rehabilitation Plan"

As a conclusion of this overview, it is evident that a conservation policy can not be based only on "projects" carried out by public authorities or by international cooperation, though ambitious and widespread within the urban fabric. The restoration of specifically important monuments or architectural complexes, or the improvement of the urban infrastructure may become effective for the conservation of the historic fabric and its heritage values only if a more general regulatory and planning framework is established and enforced to control the process of modernisation. This process is changing the role and the meaning of the Old City and its suburbs in the context of intense urbanisation.

A new planning approach addressing these issues should consider the historic heritage of the different urban fabrics not as a "constraint" to modernisation but as a "resource" for a more sustainable urban development - an asset to be preserved not only to keep alive the "deep roots" of the city's cultural identity, but also to promote activities which can improve the economic and social condition of its inhabitants.

A "Conservation and Rehabilitation Plan" has to be established, based on a broader concept of "heritage", which includes not only the "monuments" and the "remarkable buildings", but also their context, with the "minor" and "vernacular" architectural expressions, the articulation of the urban spaces, landscape features, according to the most advanced international "state of art" in planning. Obviously, this heritage can only be preserved if life is able to remain a part of it, and if the functions and meanings which are favoured are compatible with its characteristics, through the "adaptive" reuse of its various features.

Conservation has therefore to be associated with "rehabilitation", and the Plan has to provide tools for protecting the heritage features from further deterioration, while favouring at the same time all the possible compatible interventions in the Old City (and in the other historic settlements), which can improve the living conditions of the population and bring new activities and uses. To this purpose, it is essential to create

the conditions for making conservation planning effective. On one hand, it is necessary to improve and develop a cultural, legislative and institutional framework, which suffers from:

- the lack of awareness, and the presence of different and contrasting concepts on conservation amongst authorities and public opinion;
- the lack of legal tools for an overall heritage classification and protection;
- the overlapping of powers and responsibilities, and the lack of institutional capacities and technical skills.

On the other hand, it is necessary to set up an "incremental" planning process, to be implemented gradually through a well-coordinated sequence of regulatory measures, strategic projects and studies on the most relevant issues that may affect the preservation of the Old City, and also of the other historic centres in the Greater Sana'a metropolitan area. It would be harmful indeed to preserve only a part of the "deep roots" and to let the rest be destroyed or indefinitely disfigured. The lack of awareness and vision relating to the protection of Sana'ni heritage is probably the most important issue to be addressed in order to set-up a consistent and successful conservation and rehabilitation policy. Moreover the concept that heritage is merely a matter of "antiquities" or individual monuments and outstanding sites to be preserved for their "aesthetic" characteristics, regardless of their broader cultural meaning and socio-economic context is widespread. Therefore heritage protection is sometimes considered to be a "subjective" requirement of "cultural" circles, which has to withdraw in front of the "objective" needs of the "modernisation" and technical development. There seems to be little concern about heritage, and the role that its conservation and rehabilitation can play in ensuring a more sustainable urban development. Moreover, evidence on the ground and meetings held at GOPHCY and the other administrations also makes it clear that different and sometimes contrasting approaches and visions exist, when heritage conservation becomes a priority: no shared concepts and clear definitions exist of what should be considered as the "traditional" architectural style, or "traditional" buildings materials and techniques.

It is therefore essential to establish a clear definition of some concepts and terms, in order to formulate general criteria and rules for intervention in the protected areas, in order to avoid a merely "aesthetic" con-

servation policy, and hence eliminate arbitrary interpretations, which may affect the decision-making process.

From this point of view, it is urgent to remove all the ambiguities of the decree 204/2001 on "Violations" that refers to the perimeter of the Old City, and which should therefore be extended to the other historic settlements in the metropolitan area of Sana'a. While it is important to note that a "violation" exists only when an intervention occurs which conflicts with the existing approved plans and regulations, concepts which underlie these terms should be defined. For example: the use of "traditional building material"; conformity of works to the "general pattern of the historical cities"; prevention of any uses "that may be hazardous to these structures or make them lose their original style or properties"; "distinctive features" and "peculiar activities of the traditional markets" to be preserved, etc. In order to undertake a consistent conservation and rehabilitation policy a set of "actions" was proposed by the UNESCO World Heritage Centre, to be carried out in different phases, which can be summarised as follows:

Start-up phase

- complete and clarify the legal framework with the approval of the Draft Law for the Protection of Historic Cities and Draft Building Law, and the amendments to the decree relating to "violations";
- undertake the creation of an appropriate institutional set-up to deal with the preparation and the follow-up of the different regulatory and planning actions, with the strengthening and the full empowerment of GOPCHY;

Phase 1

- the realisation of a detailed inventory of built structures and open spaces in the Old City, using GIS techniques, to serve as an information baseline for the preparation of appropriate regulation to control the building activities and for the establishment of a Conservation and Rehabilitation Plan;
- the establishment of temporary regulatory measures for the protection of the historical architectural and urban features of the, on the basis of the existing legislation on the "violations", including the identification of "conservation areas", "buffer zones" and "no-build zones";

- the identification and the establishment of a protection perimeter for the other historical settlements and areas to be preserved within Greater Sana'a, to be declared as "historical cities" subject to the existing legislation on "violations" and to an appropriate revision of the Master Plan.

Phase 2

- the carrying out of the inventory of built structures and open spaces in the other historic settlements identified in the Greater Sana'a area, with the same techniques and methods used for the Old City (GIS techniques), in view of the establishment of specific protection measures to be included in the Conservation and Rehabilitation Plan for Sana'a;
- the establishment and the gradual implementation of urban regeneration, rehabilitation and conservation priority projects concerning some crucial "sensitive areas", which have been already identified or could be identified in the process.

Phase 3

- the preparation and establishment of a Conservation and Rehabilitation Plan for the Old City, Bir Al Azab, Rawdah and the other historic settlements of the Greater Sana'a area, to be integrated in the new Master Plan as a tool for the preservation of the historical heritage within the framework of an overall urban development. The Conservation and Rehabilitation Plan should be based, on one hand, on the "inventories" carried out in the previous phases, and, on the other hand, on a series of studies intended to offer an accurate description of the current situation and an outline of the future trends and issues to be addressed.

This programme of action should aim not only to prepare a plan, but mainly to start a sustainable and long-term planning process, in order to ensure the continuous management of the outstanding Sana'a heritage asset, to be carried out by the Yemeni authorities, in close cooperation with UNESCO.

The "inventories"

Together with the creation of an appropriate institutional set-up, the implementation of an inventory of all the built structures and open spaces has been considered as the first, necessary step of a consistent conservation and rehabilitation policy to be enforced in the "protection areas". In the framework of the technical assistance provided by UNESCO to the GOPHCY, the "inventories" were carried out for the Old City of Sana'a¹², inscribed in the World Heritage list since 1986, and the two most important historical suburbs of Bir Al Azab and Rawdah¹³, whose protection was decided by the Yemeni Government by decree in September 2005.

In the framework of the procedures proposed for the establishment of the Conservation and Rehabilitation Plan, the implementation of the inventories is strictly related to the establishment of a non-arbitrary regulation, ensuring an effective control of the building activities for the safeguard of the Old City and the historic suburbs, even before the final approval of the Plan. For this reason the inventories have been extended to cover the historic and traditional fabric that were already included in the protection area of Old Sana'a, and that were to be included in the protection areas of Bir Al Azab and Rawdah.

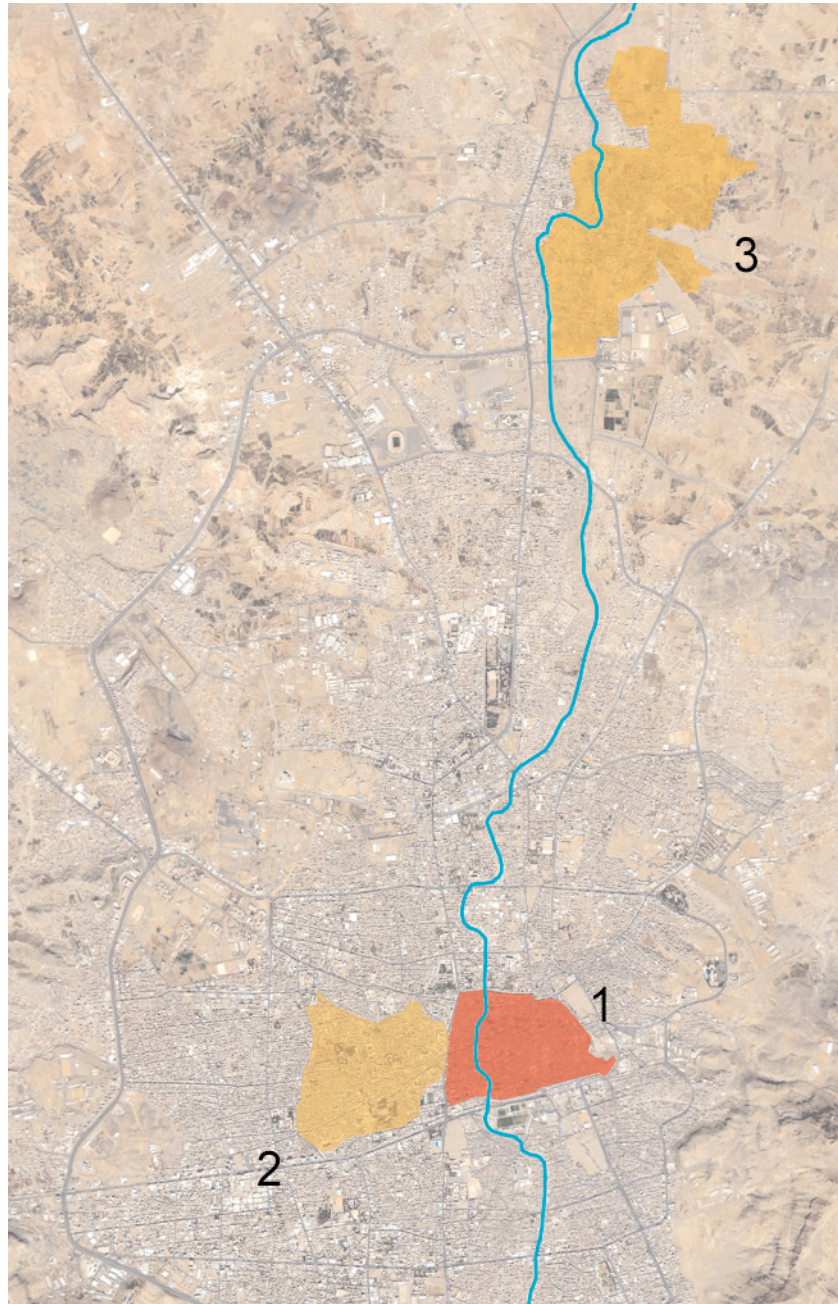
The main goal of the inventories, at this stage, is to provide the GOPHCY and the other concerned administrations with a tool to control and monitor building activities, as well as the overall physical and functional transformations which may affect the urban fabric of the historic city. The inventories are therefore intended to provide updated and comprehensive information, which would help establish the degrees of protection and to define the possible required interventions, thus giving the officials and the professionals of both the public and the private sectors a clear and solid base to plan and design the work to be undertaken. It is believed that this will result not only in increased capacity for the protection of the architectural and urban heritage, but also in a broader awareness of the values to be preserved and enhanced.

¹² The inventory of the Old City of Sana'a was carried out in 2004-2006 by the GOPHCY under the guidance and supervision of a team appointed by the UNESCO - World Heritage Centre, with funds from the Italian Cooperation and the Social Fund for Development of the Yemeni Republic.

¹³ The Inventory of the buildings and open spaces in the historic centres of Bir Al Azab and Rawdah was conducted in 2005 as an extension of the Inventory undertaken for the Old City of Sana'a. A specific project was prepared by UNESCO - CLT/CH, in collaboration with the Facoltà di Architettura of the University of Ferrara and the Department of Architecture of the University of Sana'a.

Fig. 5 - The historic settlements inventoried:

- 1 - The WH site of Sana'a Al Qadima and its immediate surroundings;
- 2 - Bir Al Azab;
- 3 - Rawdah



The inventories are also to provide, in the longer term, the information base which is necessary to undertake the establishment of the proposed Conservation and Rehabilitation Plan, concerning the typology, the architectural and spatial values, as well as the physical and functional consistency of the urban and architectural heritage to be preserved within the different protection areas.

The information has been collected through direct observation and mapping by means of survey sheets¹⁴ specific to the different types of heritage features, and organised into a database to be continuously updated during the management and planning process. Thus the inventories have been designed so as to construct a GIS that could be used by the GOPHCY, and possibly by any other concerned administration, to carry out the procedures for delivering the building permits or the monitoring of the building activity, and would support in the future the preparation and the evaluation of more complex and articulated conservation policies.

It must be noted that the implementation of the inventories through comprehensive field surveys has allowed for the achievement of other important objectives.

First and foremost, the working process - from the preparation of the field survey to the data entry - has provided a unique opportunity to develop a long-term program of "training on the job" of Yemeni students of Architecture and young architects, who were employed by the GOPHCY as surveyors and later on as technicians with growing responsibilities. These included the ability to recognise and evaluate heritage components and values, and the use of electronic tools for mapping and organising information.

In this framework, the construction of the GIS has required the preparation of a detailed and reliable digitised base map of the Old City and the two suburbs of Bir Al Azab and Rawdah, through the updating and the correction of the available maps, dating from the 1980's and largely unreliable to a great extent. Moreover, the information collected through the filed survey allowed the construction of a data base concerning all the buildings and open spaces of the Old City and the heritage buildings in the two suburbs.

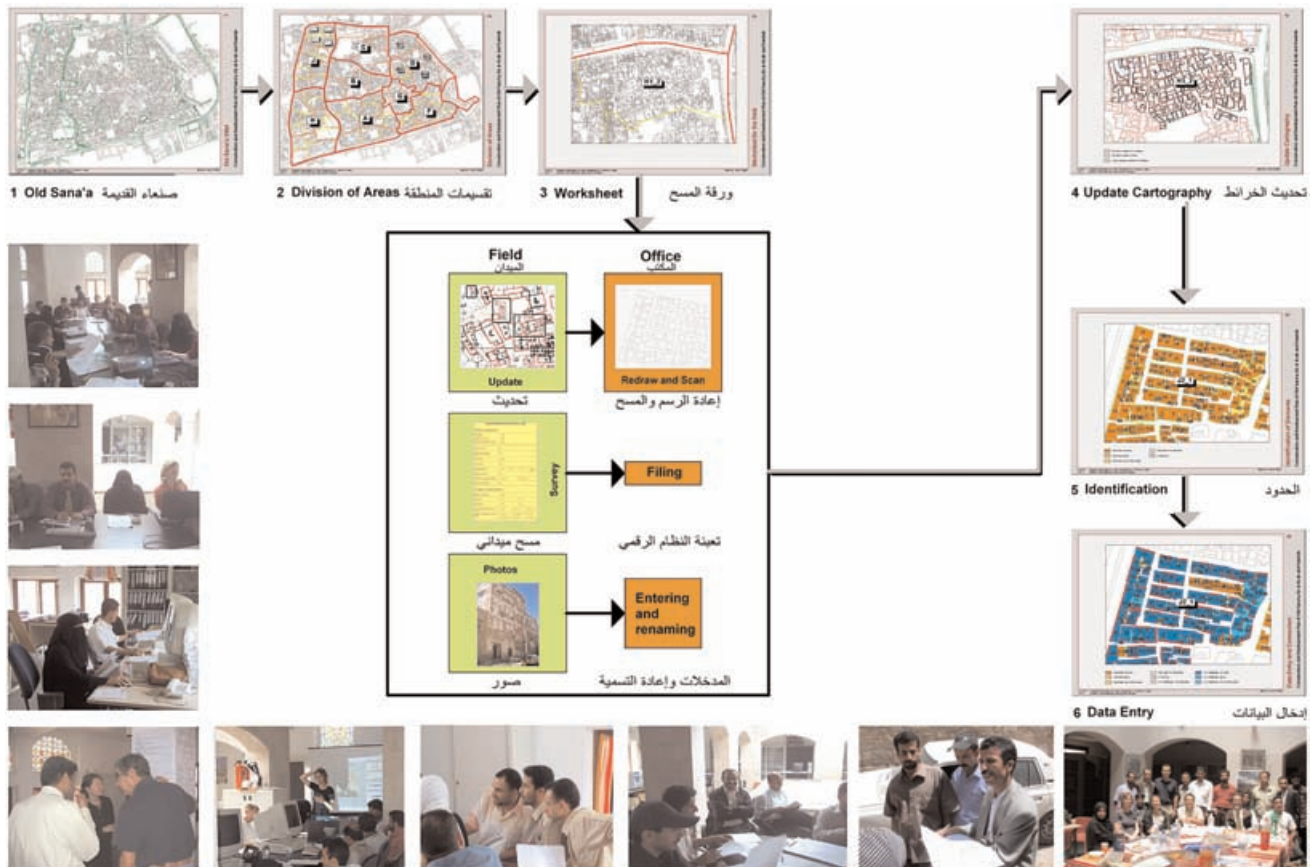
¹⁴ Due to the limited available resources, and consequently the very strict envisaged time framework, only the features that might be observed from outside (streets, open spaces, roofs) have been surveyed. However the definite identification of each building, construction and open space would allow for a further integration of the collected data with other type of information, i.e. concerning the interior characteristics of the buildings, the households, and so on.

Fig. 6 - The data structure for the GIS system and the survey phases.

These can now represent an important tool in making the administrative procedures more effective as well as the monitoring of the building activities in the historic fabric, while still providing a fundamental technical support for the eventual preparation of the Conservation and Rehabilitation Plan.

Finally, the field survey has allowed for the construction of a digital photographic archive documenting each building and open space in the historic fabric - an invaluable "visual" baseline for the future assessment of the transformations.

It is important to stress that the "Inventories" have not been designed



to provide documentation of the extent, the characteristics and the present state of the heritage components and values in the historic urban fabric. If this was the main goal, other more general issues have been taken into account that may be relevant for the establishment of a Conservation and Rehabilitation Plan, in particular the spatial distribution of uses and functions, the housing tenure and the registered "violations" of decree 204/2001 protecting the Old City.

The awareness that the data collected will need not only to be updated, but also integrated and complemented with other data in the process has led to the necessity for an "open" information structure, to be implemented in the subsequent phases. Therefore, the inventories have been conceived as a system to be eventually fed with the outcomes of other further surveys and research to be carried out as necessary components of a long term and lasting policy to be developed by the GOPHCY and the other institutions concerned

Intended to facilitate the enforcement of a Building Regulation and eventually the establishment of a Conservation and Rehabilitation Plan, the inventories have not been designed as a tool to document in detail the monuments and sites to be listed for their outstanding heritage values, or to collect and make available relevant information and documents - such as historic documents and others - to be used for the design of conservation interventions.

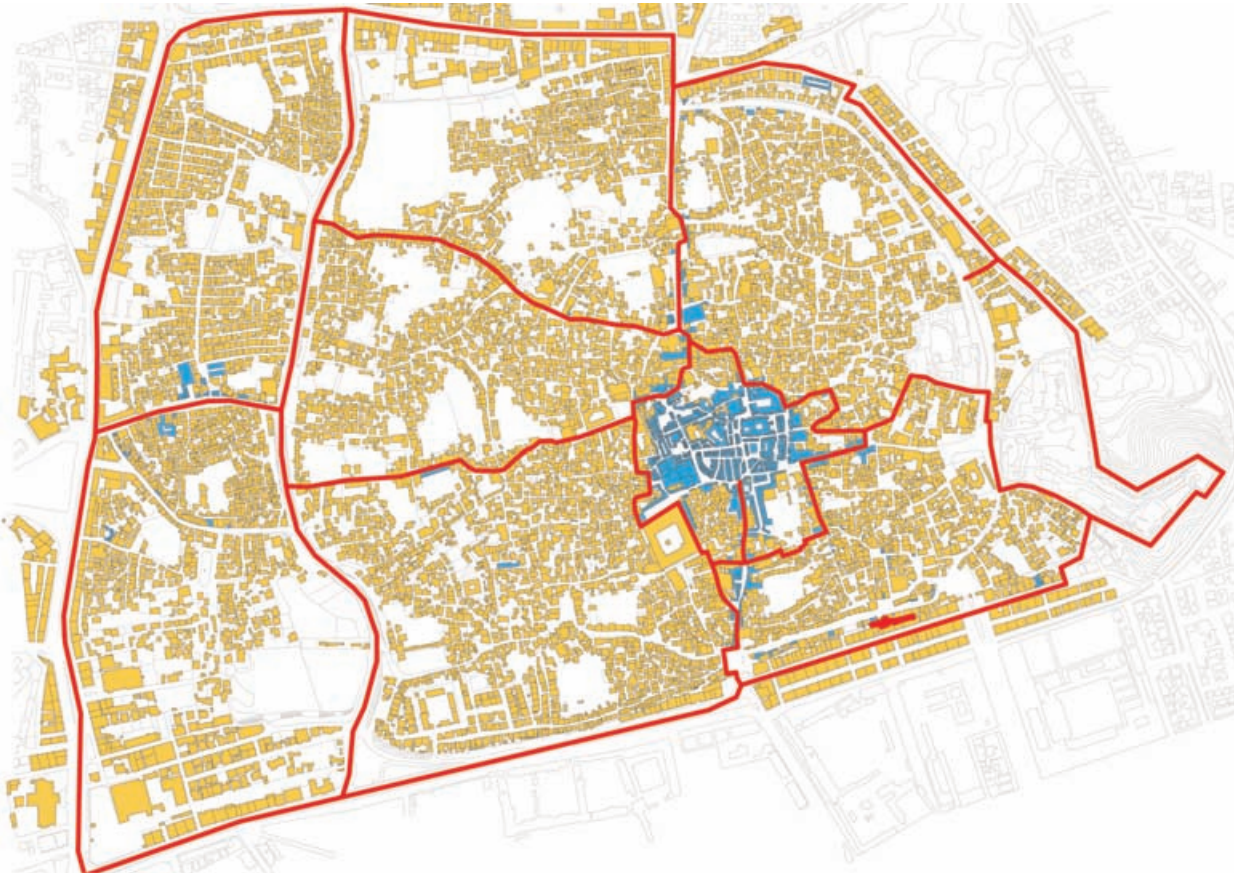
These could be inserted eventually in the database, when the resources would be available to carry out more in-depth and specific surveys and research, or when required by the study of specific conservation works.

At the same time, inventories are intended to document the extent and the wealth of urban and architectural heritage not only of the Old City - this is supposedly largely known - but also of the historic suburbs. Hopefully, they will be exploited to increase awareness among authorities, technical bodies and the general public about the need to develop and implement a consistent and widespread conservation strategy.

As a contribution to this process, some of the possible relevant outcomes of the survey are presented here in the form of an "atlas". This

Fig. 7 - The survey areas in the Old City of Sana'a.

shows the possible use of the inventories as a tool to increase the knowledge and understanding of the historic fabric, while still focusing on some of the issues to be addressed in the next phases.



The Inventory of the Old City

The Inventory of the Old City covers the protected perimeter as defined by the decree no. 17/1994 and by the decree issued by the Prime Minister (no. 204/2001), where there is an urgent need to establish a detailed and effective Building Regulation, fixing clear rules for building activities which may affect the heritage values of the historic fabric and its different components. The survey area of the inventory thus includes:

- the urban fabric encompassed within the ancient City walls, which corresponds to the World Heritage site. As mentioned above, this includes several developments between the 1930s and the 1990s, which respect to a certain extent the traditional patterns and construction methods;
- the new fabric of the development or renewal interventions that occurred since the 1970s, surrounding and sometimes replacing the same city walls along Ali Abdul Moghni Street to the west, Az-Zubayri and As-Salam street to the south, Al Laqiya street to the east, and Bab Ach-Sha'ub street to the north. Here the building typologies and the construction methods mostly correspond to "modern" patterns even if they attempt to imitate the traditional architectural styles.

This perimeter was covered by the survey carried out by GOPHCY in July 2002 - February 2003 in order to identify the "violations". It should be noted that the two fabrics often merge, particularly along Ali Abdul Moghni Street to the west and near the gates. Therefore a clear distinction between the preserved historic fabric and the "neo-traditional" is impossible. As a result, the inventory was carried out using the same criteria for both.

The information sought for the establishment of the inventory reflects strong concern for the identification of the distinctive elements, which determine the heritage values of the historic and traditional architecture and urban fabric of the Old City and need to be preserved in their



authenticity and integrity. To this end, reference has been made to the several important studies available on the traditional Sana'ni house and architectural know-how¹⁵.

The field survey

The inventory has been implemented through an extensive [field survey](#), by mean of a visual analysis carried out from the street and some high observation points (i.e. the roofs of the highest buildings in the blocks), normally without entering the buildings or interviewing the residents. It consisted of two main types of data:

- the record of the relevant physical and functional features;
- the evaluation of the state of conservation, the architectural quality and other relevant aspects, which imply a judgement based on pre-established criteria.

The survey sheets to collect the required information have been structured to enable the direct entry of the data into the GIS system. This includes codified fields which refer to:

- the buildings and related open spaces in the residential quarters;
- the buildings and the related open spaces in the souk area;
- the bustans, megshamat and other relevant open spaces.

Besides the necessary data for the identification of the building or open space, the survey sheets were structured in the following sections, each one documenting a set of characteristics and issues highlighted by the available studies, and to be addressed by the Building Regulation and the Conservation and Rehabilitation Plan.

As for the buildings in the residential quarter, the data collected referred to each single building unit, even in the case of larger houses or residential clusters, which may be formed by several interconnected constructions:

- general information on the building: ownership, number of resident families;
- typological and architectural characteristics: number of floors, size, type of roof and presence of contemporary installations and/or traditio-

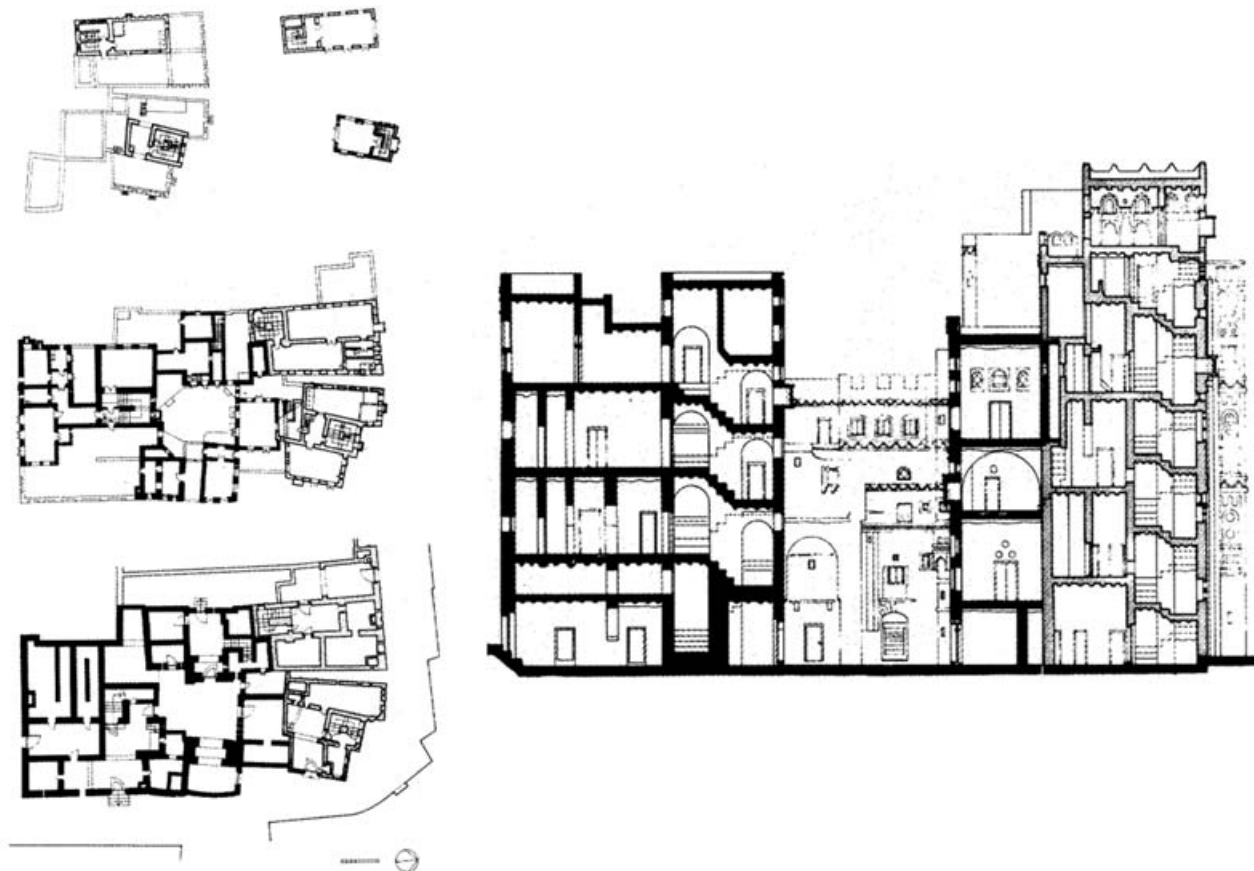
nal structures, types of transformations (including additions) made in the last 15 years and materials used;

- state of occupancy and uses: functional typology, functions at the ground and upper floors, presence of dangerous or harmful activities;
- evaluation of the physical state of conservation, the architectural quality and the required interventions;
- presence and types of "violations" according to the decree 204/2001 and the survey, 2002.

Moreover, for each building a detailed survey has been carried out for the front elevations, considered as the fundamental feature of the typological identity of the Sana'ni architecture. Each front elevation has

¹⁵ See in particular the studies of R.B. Serjant (1980), P. Costa (1977), R. Lewcock (1986), R. Varanda (1994), J. Feiner (2004).

Fig. 8 - A residential cluster consisting of several building units in the Salah al-Din quarter. Source, Ronal Lewcock, "The Old walled City of Sana'a", UNESCO 1986.





been identified with reference to its surrounding context and its different components have been recorded according to the following structure:

- composition layout: presence of different architectural layers and periods of construction;
- ground floor: type of structure, type of entrances and other openings and related materials;
- upper storeys: type of structure, type of openings and related materials, presence of added components and decorative elements;
- presence of "violations".

Finally, the open spaces and non built-up areas related to each building have been identified and recorded in order to provide the following information:

- typology, uses and existing structures;
- entrances and fences, including materials;
- general conditions.

Similarly, the survey sheet for the bustans, mekshamat and other relevant open spaces includes the following information:

- ownership, typology and use of the space: in particular, this is intended to identify the type of space ([bustan](#), [mekshamat](#) and others), as well as the type of use and prevailing vegetation;
- fencing and hard landscaping: information on the fencing walls, paths and paved areas when existing, including materials, recent transformations and specific interventions required;
- [irrigation](#): information on the type of water supply and irrigation system;
- evaluation of the overall state of conservation, the architectural quality and the required interventions.

As for the buildings in the souk area, the same structure was used, but reference has been made to different architectural and functional elements. Moreover, due to the specific one-storey typology of the Souks, no detailed investigation was needed on front elevations, and no open spaces have to be recorded.

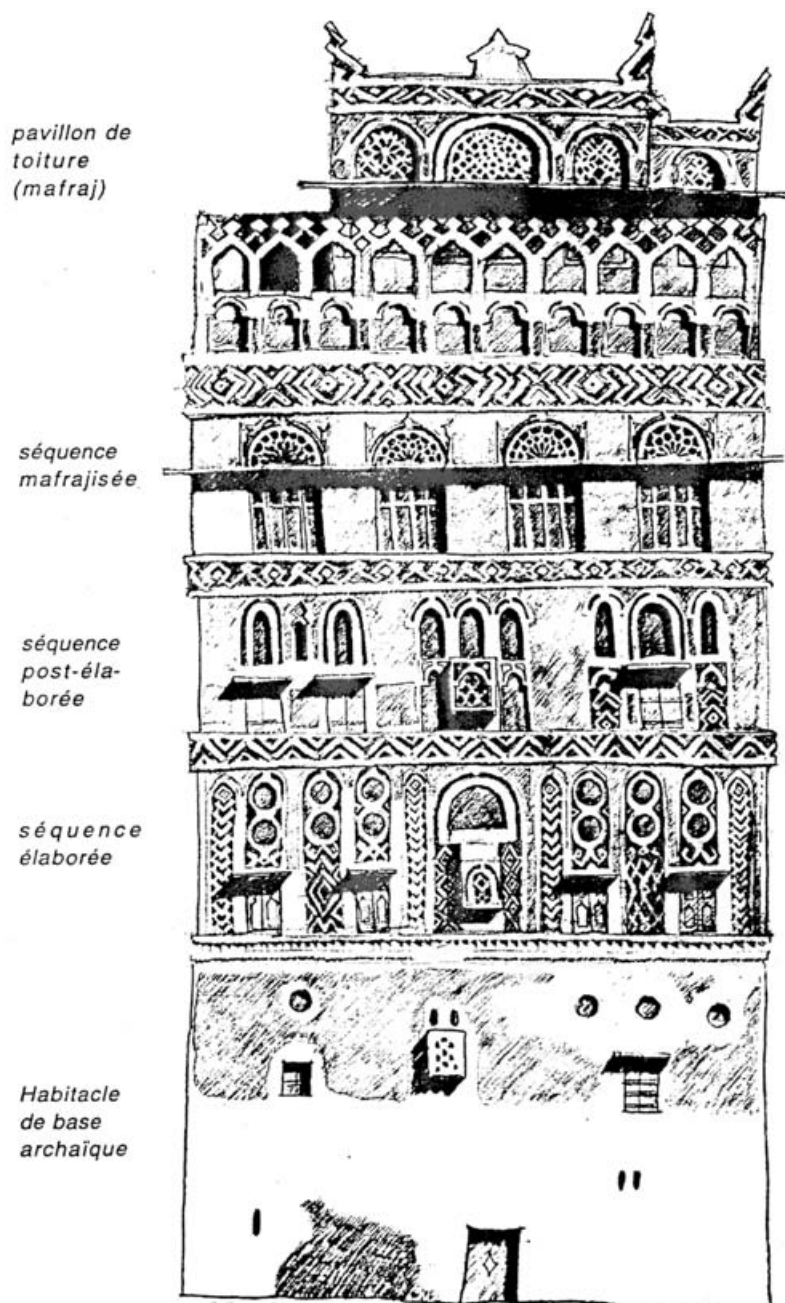


Fig. 9 - The typical façade layout proposed by J. Feiner, showing the evolution of the "tower house" and the architectural styles. Source, Jacques Paul Feiner, "La vieille ville de Sana'a: analyse morphologique comme fondement de la sauvegarde patrimoniale", Thèse Ecole Polytechnique Fédérale de Lausanne, 1997.



The criteria of evaluation

The survey sheets are basically structured to record the current visible features of buildings and open spaces. They include, however, some evaluations and judgements that can only be carried out in the field, and deal with the following aspects:

- the overall architectural quality of the buildings and open spaces;
- the types of transformations;
- the overall state of repair.

The architectural quality of the buildings has been assessed on the basis of both the presence and wealth of traditional architectural elements and the consistency with the historic urban fabric. The following classification has been adopted:

- **monumental**: building or construction with peculiar cultural meanings (historic, symbolic, religious, etc.), which displays outstanding typological and architectural features (volume and composition of façades, ornamentation, materials and building techniques), and a very high degree of integrity. It represents a landmark and/or a visual point of reference within the surrounding urban fabric;

- **excellent**: building or construction with a very high degree of integrity of its historic, typological and architectural features that witness the traditions of Sana'ani architecture. It represents a distinctive element within the urban fabric;

- **good**: building or construction whose typological and architectural features still reflect to a high degree the traditions of historic Sana'ani architecture. It conforms to the pattern (street alignment, adjacent building heights, etc.) and entirely fits into the historic urban fabric;

- **ordinary**: building or construction whose typological and architectural features don't reflect necessarily the traditions of historic Sana'ani architecture. It conforms to the surrounding urban pattern (street alignment, adjacent building heights, etc.), but it can represent an architectural disruption and disturbance into the historic urban fabric;

- **inconsistent**: building or construction whose typological and architectural features contrast with the traditions of historic Sana'ani architecture. It doesn't conform to the surrounding urban pattern (street alignment, adjacent building heights, etc.), and/or represents a rupture with, and a heavy visual intrusion into the historic urban fabric.



As for the recent transformations made to the buildings and open spaces, reference has been made to the date (1989) of the most accurate map of the city available when the survey was carried out, in order to detect the new buildings, the demolitions and other changes which had taken place in relation to the fabric. Based on specific training on the job, the presence of recent additions, installations and other types of construction has been recorded and a general evaluation of the types of interventions has been given according to the following categories:

- restoration: when the typological and architectural features of the whole building, or at least an important part of it, were totally preserved and restored to a previous historic condition;

- rehabilitation: when the building has been made available to previous or new uses, consistent with its historic, typological and architectural characteristics, adapting the structures to new functional needs (interior distribution, equipment, etc.), without changes to volume, height, articulation of spaces, façade composition and ornamentation layout;



- renovation: when the building has been made available to previous or new uses with some major changes to the previous typological and architectural characteristics;

- reconstruction: when a pre-existing building has been demolished and rebuilt on the same blueprint, roughly respecting the major typological characteristics;

- redevelopment: when a pre-existing building has been demolished and rebuilt on a different blueprint, and with entirely new typological characteristics;

- new building: in case of a building (or a part of it) erected on a vacant land;

- demolition: in case of a building (or a part of it) being demolished, and the land now vacant or unused.

As for the state of repair, the evaluation mainly relates to the structural condition of the buildings and leads to a rough classification of their state of conservation. The conditions of stability and the integrity of the vertical structures and the roofs were mainly considered, as well as the state of conservation and maintenance of the external finishes (windows, plastering, etc.). Based on visual evidence, the buildings were classified by the surveyors according to the following categories:

- **good**: when all the structural elements and the finishes look to be in good repair, with a high level of maintenance;

- **ordinary**: when the structural elements don't show any relevant cracks, which may represent a risk for the stability of the building, and the finishes are still efficient though lacking an appropriate maintenance;

- **bad**: when the structural elements show cracks, which may represent a risk for the stability of the building, and the finishes totally lack maintenance and efficiency;

- **ruin**: when some structural elements, particularly the roof, have already collapsed, making the building no longer safety usable for any purpose.



The survey "handbook"

The surveyors and all the work team at GOPHCY needed a common outlook and shared criteria in the recognition and assessment of the heritage features as an essential condition in performing the inventory correctly, and also to increase cultural awareness and technical skills through a dedicated training program. This was initially developed through seminars and lectures on the different issues concerning the survey implementation, the use of the geographic databases and the management of informatics tools. It was later performed in all the subsequent phases of the field survey, data entry and GIS construction and exploitation.

In this framework, a "handbook" has been formulated by the experts for the surveyors, in order to provide the operational guidelines to perform the different phases of the survey and GIS construction, i.e. the [updating](#) of the existing cartography, the identification of the "objects" to be surveyed (buildings, elevations, open spaces, etc.), collecting the required [information](#), the photographic survey, the [data entry](#).

In particular, the "handbook" was intended to be a tool to be used on-site by the surveyors to recognise and assess all the features and architectural elements found in the buildings and open spaces to be inventoried - be they "traditional" or "contemporary", with heritage values or inconsistent. It provides a sort of basic architectural "vocabulary", based on the studies cited above, and reinforced by the common know-how of the professional and experts at GOPHCY, the university and other national and international institutions, which are or may be concerned with heritage conservation and planning in the Capital city.

Some examples of the "vocabulary", which refer to different "fields" of the survey sheet for the buildings and the front elevations, are presented in the following pages.

It is hoped that this "handbook" would be integrated and completed to become a tool not only to increase heritage understanding amongst students and professionals, but also to raise awareness among the wider public.





Building - Architectural information

Vertical addition

Identify the presence of vertical additions; specify the date of their construction and the number of floors that have been added; point out if the additions are consistent with the original buildings.

Date:

Number of floors:

Consistent: Yes - No



Building - Architectural information

Traditional structures on the roof

Identify the presence of traditional architectural structures consistent with the building.

Mafraj - Diwan
Staircase
Chimney



Building - Architectural information

Main function of upper storeys

Residence

Service

Culture

Administration

Health

Religion

Store

Neighbourhood's shop

Town commerce



Building - Front elevation

General composition

Identify the composition rules which the front elevation consists of. This front elevation consists of 1 architectural layout.



Building - Front elevation

Ground floor - Principal and secondary entrance

Point out if the entrance of the building faces directly the street.

From the courtyard

From the street



Building - Front elevation

Ground floor - Principal and secondary entrance

Point out if the entrance of the building faces the courtyard.

From the courtyard

From the street

Building - Architectural information

Contemporary structures on the roof

Identify the presence of contemporary architectural structures and specify if they are consistent or not with the original building.

Mafraj - Diwan
Staircase
Chimney
Other
Consistent: Yes - No



Building - Architectural information

Ground floor function

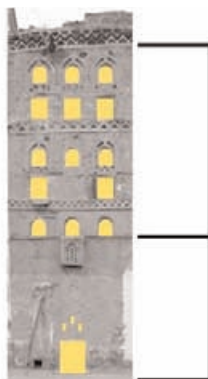
Residence
Service
Neighbourhood's shop
Town commerce
Dangerous commerce
Handicraft without environmental impact
Culture
Handicraft with environmental impact
Administration
Health
Religion
Store



Building - Front elevation

General composition

Identify the composition rules which the front elevation consists of.
This front elevation consists of 2 architectural layouts.



Building - Front elevation

General composition

Identify the composition rules which the front elevation consists of.
This front elevation consists of 3 architectural layouts.



Building - Front elevation

Ground floor - Use of second entrance

Identify the use of the secondary entrance.

Closed
Shop door
In use



Building - Front elevation

Ground floor - Material of principal entrance

Identify the material of the entrance.

Original timber
Modern timber
Metal
Plywood





Building - Front elevation

Ground floor - Material of ground floor structure

Wajh: external stone facings



Building - Front elevation

Ground floor - Material of ground floor structure

Habash: black lava stone



Building - Front elevation

Ground floor - Material of ground floor structure

Zabur: sun dried coarse clay



Building - Front elevation

Ground floor - Material of ground floor's structure

Identify the building material of the basic structure of the ground floor.

Wajh: external stone facings

Habash: black lava stone

Waqis: hewn stone

Zabur: sun dried coarse clay

'Ajur: baked bricks



Building - Front elevation

Ground floor - Material of contemporary windows frame

Metal - Aluminium

Timber

Mix



Building - Front elevation

Ground floor - Material of contemporary shop door

Metal - Aluminium

Timber

Mix

Building - Front elevation

Ground floor - Material of ground floor structure

Waqis: hewn stone



Building - Front elevation

Ground floor - Material of ground floor structure

'Ajur: backed bricks



Building - Front elevation

Upper - Main material of structure

Identify the building material of the basic structure of the upper storeys.

Wajh: external stone facings
Habash: black lava stone
Waqis: hewn stone
Zabur: sun dried coarse clay
'Ajur: baked bricks



Building - Front elevation

Ground floor - Additional contemporary openings

Identify the typology and the material of the contemporary openings.

Door
Window
Shop door

Metal - Aluminium
Timber
Mix



Building - Front elevation

Upper - Additional elements

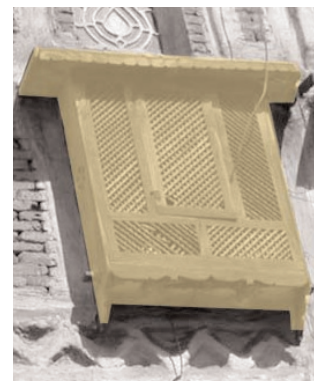
Shubbak



Building - Front elevation

Upper - Additional elements

Kushk
Mashrabiyya
Taqa assarf





Building - Front elevation

Upper storeys - Traditional opening typology - Elements

Taqa - Sharashu: window, opening for ventilation and lighting; normally rectangular whit wooden shutters.



Building - Front elevation

Upper storeys - Traditional opening typology - Elements

A'qd - Qamaria: fanlight. It can hold lighting elements or it can be a decorative shape of the building front.



Building - Front elevation

Upper storeys - Traditional opening typology - Elements

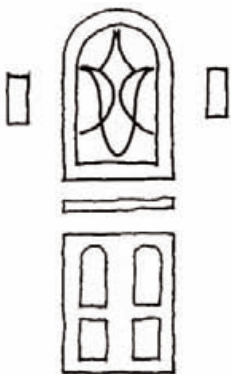
Shaqus: small ventilation slit; normal comes up to the bigger windows.



Building - Front elevation

Upper storeys - Traditional opening typology - Elements

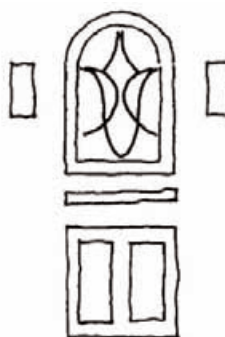
Mansama: openings in the wall, in connection with bricks or stones. They create an airing system.



Building - Front elevation

Upper storeys - Traditional opening typology - Type A

A'qd (ratio basis - height 1:2)
Takhrim
Kunna
Taqa (ratio basis - height 1:1,5)
Shaqus



Building - Front elevation

Upper storeys - Traditional opening typology - Type B

A'qd (ratio basis - height 1:2)
Takhrim
Kunna
Taqa (ratio basis - height 1:1)
Shaqus

Building - Front elevation

Upper storeys - Traditional opening typology - Elements

Takhrim: fanlight made of coloured glass set in stucco tracery.



Building - Front elevation

Upper storeys - Traditional opening typology - Elements

Kunna: narrow canopy above windows, usually made of wood, zinc or stone provides shade.



Building - Front elevation

Upper storeys - Traditional opening typology

The traditional openings represent a fundamental aspect in the façade construction. Using the same elements, the shapes and the combinations can be different. We advised the survey teams to build their own vocabulary, starting from the most used elements, described in the previous pages, and taking as an example these aforementioned variations, type A, type B and type C. There can be differences in style or in dimension. By "style" we mean the co-existence or lack of between basic elements. For "dimension" we mean the ratio between the parts, with height. This identification work will not have to be carried out on the ground but in the office, using the photos as a basis. This identification will also have to be done in accordance with the information collected from the other work groups so as to construct a common language.

For "opening typology" we mean the ratio between the different elements which go to make its shape; therefore not only the rectangular window or the arch or the ventilation openings, but the mix of all of them.

The survey teams will have to identify how many opening typologies are present in the building front and they have to identify their type and their number.

Type A - Opening number: 2

Type B - Opening number: 3

Type C - Opening number: 4





Inventoried buildings and open spaces (see Map 01)*

The inventory of the Old City was carried out on the following main components of the urban fabric, shown in the map:

- the residential quarters, developing along the main axes leading from the gates to the **central souk**, and around the main bustan and meghshamat. This fabric includes houses of different types with only residential uses, multifunctional buildings combining residential with other uses, and specialised buildings for specific activities (religious, educational, administrative, and so on);
- the central souk and the other specialised **commercial structures** scattered along the main axes;
- the bustans, meghshamat and all other kinds of open spaces.

Building typologies in residential quarters (Map 02)

In the residential quarters, 72% of the buildings show a purely residential typology, and only 6% of the buildings belong to "mixed" typologies combining the residence with other functions. The latter are mainly concentrated by the new development or renewal areas adjacent to the ancient walls path, along Abdul Moghni street and near Bab As-Salam. 22% of the buildings belong to specific "specialised" typologies - i.e. religious buildings, schools, hammams, health and education facilities, administration, and so on - these are scattered in the residential fabric, and often represent, as is the case for the mosques, the community core of the different quarters. The survey thus confirms the persistence of a clear "zoning" in the historic urban fabric, consisting of a definite distinction between the spaces and the facilities dedicated to the resident population and their family life, and the spaces for the production and exchange of goods. This still seems to remain as an essential characteristic of the historic fabric.

Souks and commercial structures (Map 03)

Outside, but surrounded by or inserted within the residential quarters, the souk and the other traditional commercial structures represent the other fundamental components of the historic urban fabric. These are also strongly specialised and do not include other functions. However, a distinction can be made between the "traditional" typologies, with

* Here below the main results of GIS database analysis are presented, followed by the related maps.

small shops in serial building units, concentrated in the central souk and mainly operating in the sectors of the crafts (38%), textile and clothes (35%) and nutrition (16%), and the new "modern" ones, which usually occupy larger units and mainly operate in the sectors of "services" (72%), jewellery (15%) and household hardware (7%). The survey shows how these structures have expanded outside the traditional central core and form an almost continuous spine along the street leading to Bab Yemen. Also important concentrations can be found near Bab As-Sabah, Bab As-Salam and Bab ash-Sha'ub.

Building height (Map 04)

The Old City's fabric appears to be very dense and varied. Buildings of different heights are mixed in the same block and drawn up along the same street, making the urban landscape extremely diversified and spatially rich. Building height clearly confirms the "zoning" of the functional typologies. Whilst in the souk and the other commercial structures, the large majority of the commercial building units (86%) are only one storey high, in the residential quarters about half have **3 or 4 storeys** (respectively 27% and 21%), and 6% are 5 or more storeys high, but generally represent a harmful rupture in the Old City skyline. In the residential quarters, however, there is a large number of lower buildings, particularly in the new developments along the city walls line, that do not reflect the traditional image of the Sana'ni "tower house".

Architectural layers and façade layout (Map 05)

The architectural configuration of most of the buildings in the Old City is the result of a long construction process, consisting of subsequent horizontal and vertical additions. This is clearly visible in the **front elevations**, which usually show that various layers built with different materials, architectural elements and decorative patterns that can be linked to different historic periods. The variety of architectural forms and details resulting from the superposition of different historic and architectural layers in the same building is one of the main characteristics of the urban fabric, which explains its extraordinary heritage values and cultural interest. The inventory shows that almost half (45%) of the buildings' main front elevations are structured with two architectural layers and more than 20% with at least three.



Buildings architectural quality (Map 06)

In the residential quarters, the buildings holding a very high architectural quality ("good" to "monumental") represent only 41% of the total, whilst the same amount consists of "ordinary buildings", which conform to the historic street pattern and the surrounding fabric. About 20% of the buildings look "inconsistent" and represent a rupture with the historic urban context; these are mainly located outside the city walls, on the northern and south-western edges of the Old City, where urban renewal and development has occurred since the 1970s. Similar considerations can be made for the buildings inventoried in the souk areas. Here, 39% is of "good" or "excellent quality, but the majority appears of "ordinary" quality (50%), whilst the ratio of "inconsistent" is 10%. The survey confirms that the highest heritage values in the Old City not only lie in the extraordinary quality of some buildings but mainly in the spatial articulation of the urban fabric.

Building ownership (Map 07)

The larger part of the buildings in the residential quarters are of private ownership (93%), and only a very small rate (1,5%) belong to many different owners: that means that in spite of the superposed architectural and historical layers marking the façade, the house is a unitary entity. In the same quarters, the number of buildings owned by public administrations (3%) or by the waqf (4%) is almost insignificant.

The situation changes radically in the souks and other commercial structures, where most of the properties belong to the waqf (65%) and private ownership covers only 1/3 of the units.

State of occupancy (Map 08)

In both the residential quarters and the souks, the large majority of the building units are fully occupied (91% and 92% respectively), thus confirming the high vitality of the Old City. The rate of "unoccupied" or "partially occupied" buildings, however, is not negligible, and probably refers to buildings in "bad" or "ruined" conditions, and/or to some specific types of buildings, such as the samsarah in the central souk.

Use of street-level spaces in residential districts (Map 09)

In the residential quarters, the main function of the ground floor still reflects to some extent its traditional use, since it consists of a "store" for 41% of the buildings, and residence for 28%. The presence of stores is particularly evident in the oldest parts of the "intra muros" urban fabric (i.e. in the eastern and central quarters), whilst the residence is present in the western quarters, which developed since the 30s west of the wadi Salla. However, the presence of commerce (13%) of both "neighbourhood" and "town" types, and "services" (16%), has to be noted since it represents an important change in the traditional function of these quarters. This is particularly evident in the renewal areas along the western and southern wall threads, where many of these structures developed notably since the 70s. The other types of functions are not relevant in terms of quantity, but they play an important role in the urban structure, sometimes preserving its traditional character as in the case of the religious buildings.

The system of commercial activities (Map 10)

The uses of the ground floors in the whole fabric clearly show the spread of commercial activities in the residential quarters. This phenomenon not only concerns the new developments or the renewal areas along the city walls, but also the historic fabric especially along the axes which connect the central souk to the gate. This so called "soukisation" is progressively mitigating the rigid zoning that used to characterise the traditional urban structure. This phenomenon is radically changing the streetscape and the overall urban image, the consequences of which need to be carefully investigated on the housing pattern, the social composition of the resident population, and the real estate market.

Cohabitation (Map 11)

A large majority of the residential buildings (70%) are inhabited by only one family, according to the traditional housing pattern of all the historic Arab cities. A relevant number (30%), however, is inhabited by more families, most probably as a result of an inner vertical partition of the buildings. This is probably linked to the migration of the wealthiest families towards the new residential areas being recently developed in





the larger metropolitan area. It is not possible at this stage to affirm that this phenomenon is somehow linked to the spread of the "soukuisation", and to the consequent decay of the traditional residential quality of the affected neighbourhood, but it is evident that an important number of houses are being transformed into "apartment blocks" and a large part of the resident households are tenants.

Recent transformations (Map 12)

The survey carried out shows that very intense building activity has occurred in the perimeter in the last 15 years. In the residential quarters, 4145 buildings (i.e. 42% of the total) appear to have undergone interventions of different types. Amongst these interventions, the construction of "new buildings" count for 31% of the total and are mainly concentrated in the new developments along the city walls, on the northern and south-western sides, even if many isolated interventions can be found within the historic fabric. Adding to this the "reconstruction" and "redevelopment" of pre-existing buildings (6% and 5% respectively), it appears that 42% of interventions have implied the construction of new structures; in other terms, that about 18% of the buildings inventoried in the perimeter are recent. On the other hand, the amount of interventions of renovation (24%), rehabilitation (24%) and restoration (7%) show a high degree of maintenance and reuse, which may be considered as an outcome of the protection measures established and the control on building activities enforced by the GOPHCY since the 1990s, which have probably prevented a larger amount of reconstruction and redevelopment interventions.

All of these interventions have modified to a different degree the traditional image of the Old City. A relevant number of buildings present recent vertical or horizontal **additions** (respectively 8% and 3%), often constructed with contemporary inconsistent materials, but the most numerous and harmful transformations concern the opening of **new metal or aluminium doors** and windows at the ground floors (10%) or the upper floors (9%), and most of all the installation of water tanks (60%) and **aerials** (47%) on the roofs, that are changing the Old City's profile. As for the souk and the other commercial structures, the rate of transformation is slightly lower (37%) in the area, but it must be considered that these are mainly concentrated in the historic fabric. Thus, if the rate of "new buildings" and "redevelopment" is palpably lower (10%

and 6% respectively), large and sometimes intrusive recent interventions can be found especially in the surroundings of the central souk, whilst the large majority of the interventions consist in "renovation" (56%), rehabilitation (20%) and restoration (7%).

If many of these interventions reflect the need to adapt the traditional buildings to the needs of modern life, and are unavoidable to a large extent, the risk must be stressed of a serious loss of the heritage values in the historic fabric, since the architectural criteria, the building techniques and the materials used are often in contrast with the traditional know-how and architectural characters. However, these transformations are also to be considered as a sign of the attractiveness and vitality of the Old City, and of the capacity of its urban pattern to accommodate new uses and functions.

Repair of the Buildings (Map 13)

The state of conservation has been evaluated on the basis of the "general conditions" of the buildings as they appear from the front elevations on the street and the open spaces, taking into consideration the type and the stability of the structure, the presence and the consistency of the traditional architectural and decorative elements, the kind of materials. Also the presence of elements, which may disfigure the traditional shape and the heritage values of the buildings have been considered, such as additions and new openings with inconsistent materials.

Thus the classification combines different types of data, in order to define the degree of integrity and the heritage interest of the building. It clearly reflects the intense building activity and the high degree of transformation which has occurred in recent years. In the residential quarters, almost half of the buildings appear to be in "good" condition (49%), and 34% "ordinary", due to insufficient maintenance or inconsistent renovation and reconstruction. It has to be noted, however, that 17 % are in "bad" or "ruined" condition and require urgent interventions. As for the souk and commercial structures, most of them (57%) show "ordinary" conditions, mainly due to the presence of inconsistent materials and openings, whilst 30% can be considered in "good condition". Also the rate of "bad" and "ruined" (13%), though lower than in the residential quarters, is far from being negligible. This data, if com-



bined with the classification of the buildings by "architectural quality" and the identification of the transformation undergone in the last 15 years, demonstrates the urgency of enforcing appropriate building regulations to orient interventions toward more satisfactory conservation outcomes.

Repair of Open spaces (Map 14)

The system of open spaces represents an essential feature of the historic and traditional urban fabric. It includes several types of space, from the [smaller courtyard](#) of the housing blocks to the larger gardens and orchards, such as the [bustan and megshamat](#). Similarly to the buildings, the evaluation of their state of conservation takes in to consideration different types of data: the state of use, the presence of constructions such as basins, water tanks, etc., as well as the presence and type of fencing materials and types of [landscape arrangements](#).

The general conditions of the smaller open spaces, generally courtyards of the residential patterns (95%), reflect to a large extent the state of repair of the buildings, with the same rate of "good" (49%), but a lower rate of "ordinary" (22%), and a much higher rate of "bad" and "abandoned" open spaces (respectively at 27% and 2%). These are indeed often used as a mere service area, occupied with water tanks (57%) and other utilitarian constructions, such as garages or kitchens, and this probably reflects not only an attempt to improve the housing conditions, but also the changes which have occurred in occupation, with the increase of tenant households. As for the bustan and megshamat, the situation appears to be much better: most of the larger open spaces are in "good" condition (58%), still serving as agricultural land for the residents, also due to several rehabilitation interventions, which included the restoration of the traditional constructions and fences. However, some of them are still in "bad" condition (10%) or "abandoned" (8%), whilst 24% is "ordinary" and requires upgrading and rehabilitation interventions.

**Map 01 - The inventoried
buildings and open spaces**

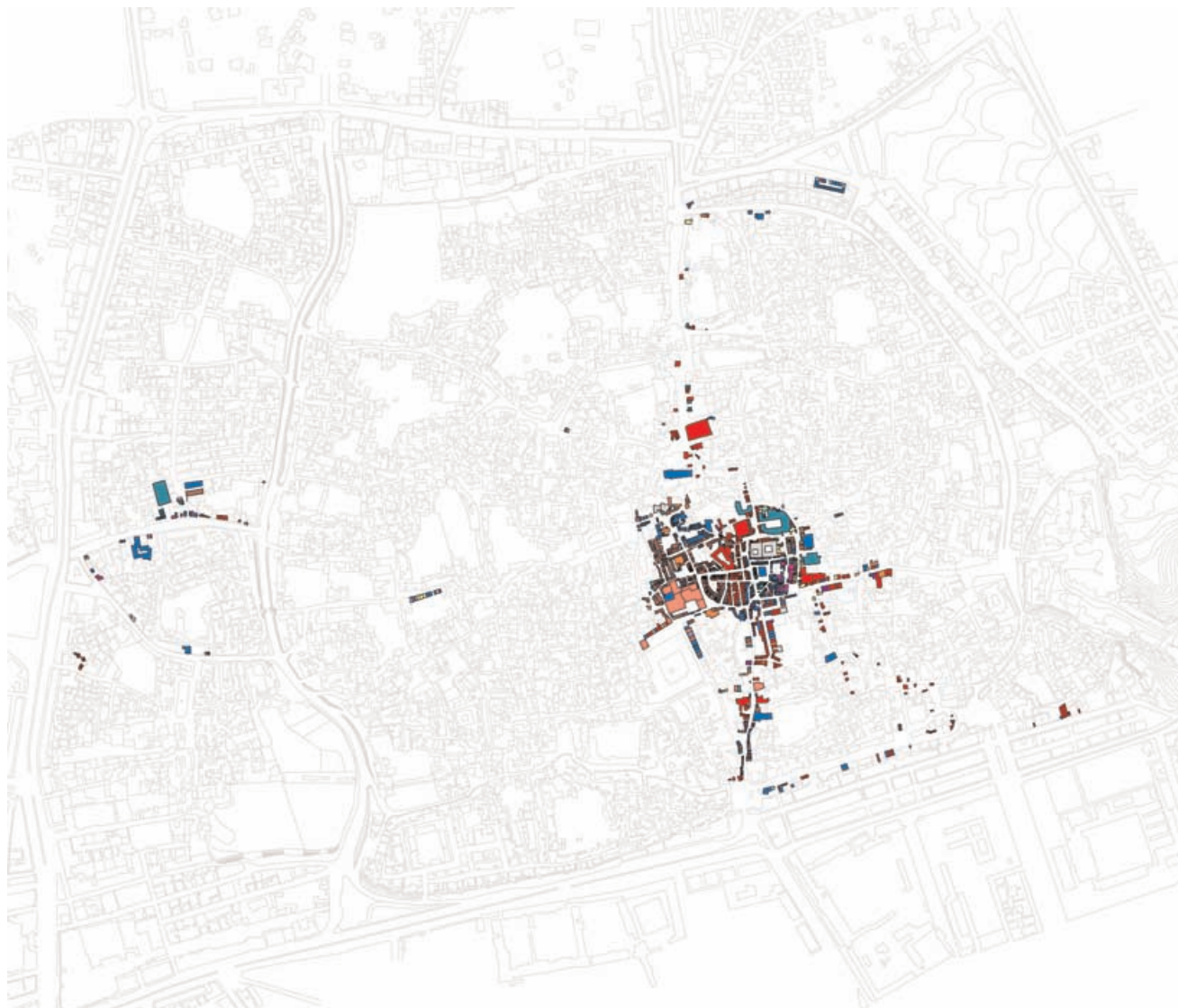


**Map 02 - Building typologies
in residential quarters**

- Residential
- Multifunctional
- Specialist



Map 03 - Suqs and commercial structures



Map 04 - Building height

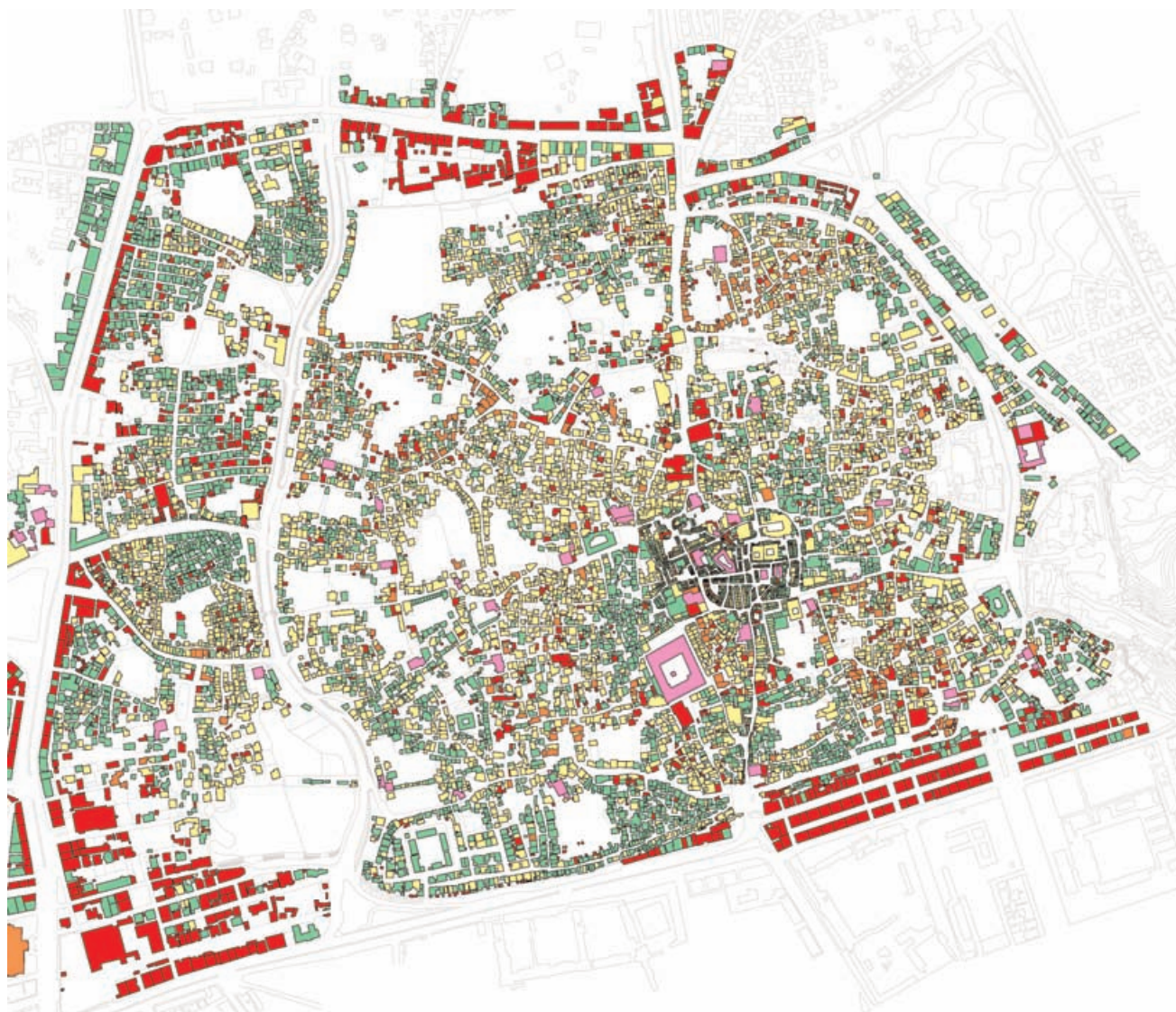


Map 05 - Architectural layers and façade layout

- Building - 1 layout
- Building - 2 layout
- Building - 3 layout
- Building - More layout



Map 06 - Buildings architectural quality



Map 07 - Building ownership

Map 08 - State of occupancy

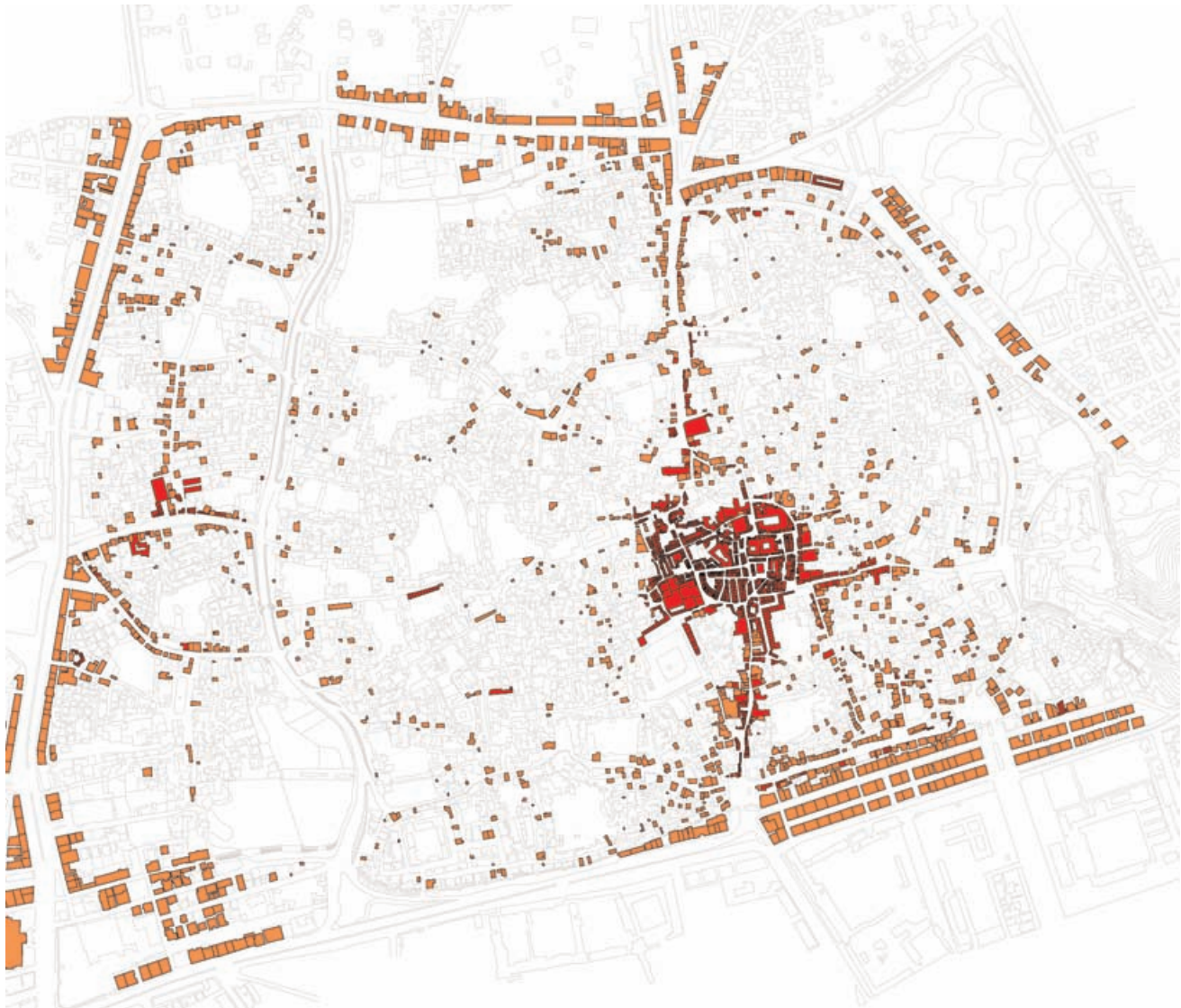


Map 09 - Use of street-level spaces in residential districts

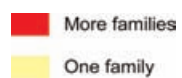


Map 10 - The system of commercial activities

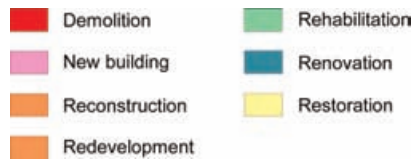
- Commerce and handicraft in the urban pattern
- Souk area



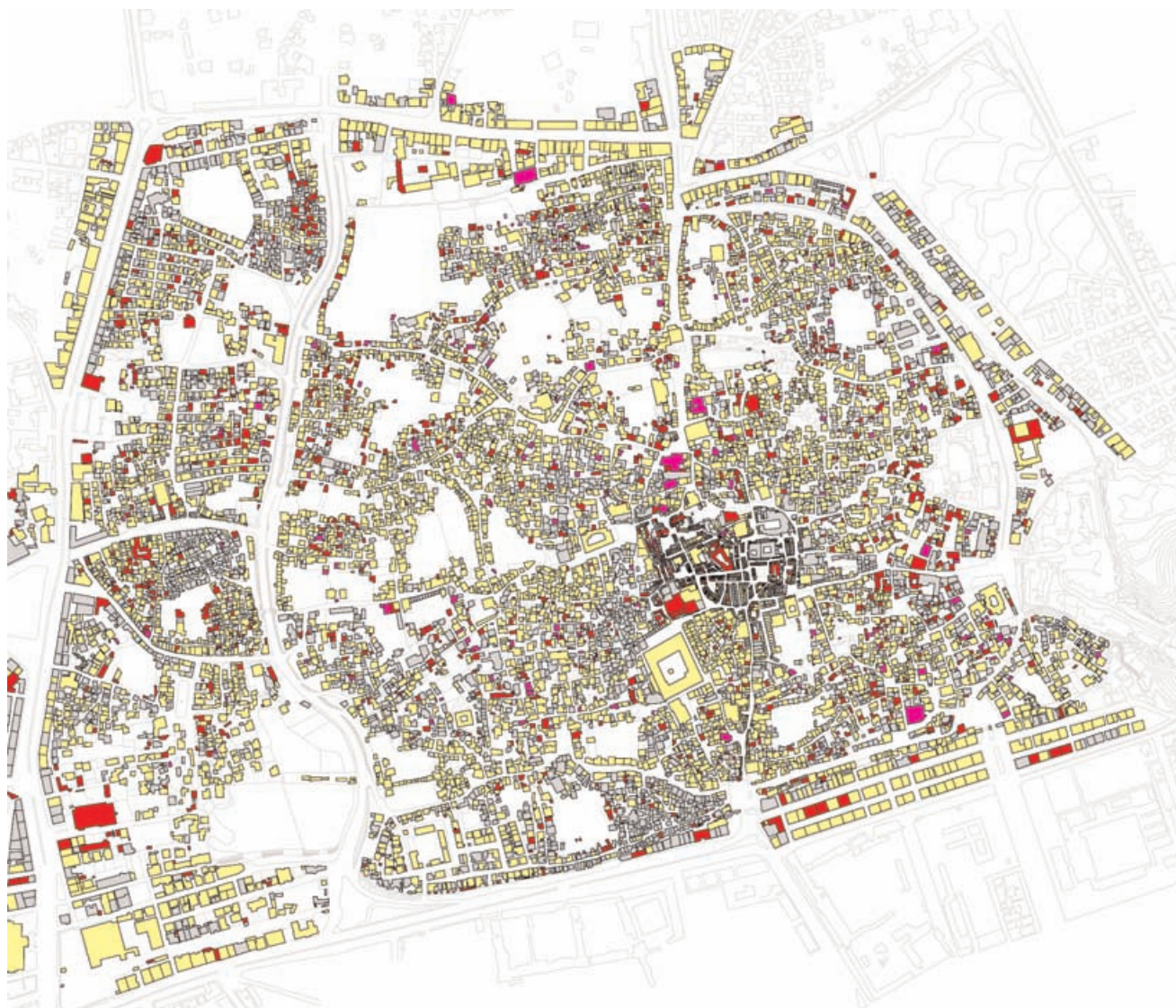
Map 11 - Cohabitation



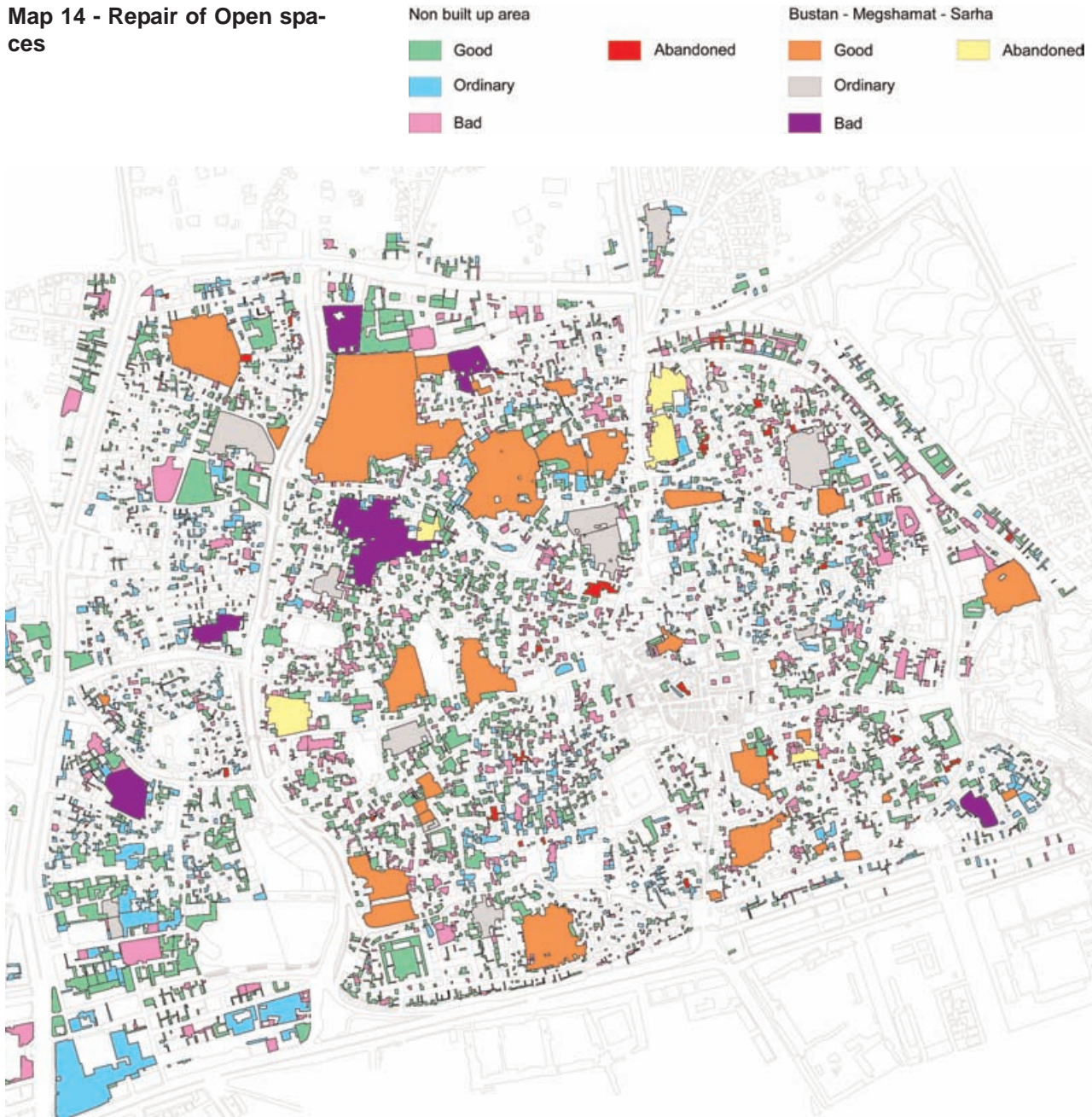
Map 12 - Recent transformations



Map 13 - Repair of the Buildings



Map 14 - Repair of Open spaces



The extension of the Inventory to the historic suburbs of Bir Al Azab and Rawdah

As for the suburbs of Bir Al Azab and Rawdah, the inventory was developed as an extension of the one already undertaken for the Old City of Sana'a, after the decision of the Yemeni Government to issue a decree for the protection of Bir el Azab, El Gabel village, Hadda village, Sana village, Rawdah, Attan village and Beit Bows village as heritage of national interest¹⁶. The limited resources available led to the classification of the two main historic suburbs of Bir Al Azab and Rawdah as priority areas as they are seriously threatened by major transformations. In this framework, and due to the total lack of information and documentation on these historic centres, the implementation of the Inventory extension was preceded by the definition of the protection perimeters to be established according to the recent governmental decision, which would add to the existing protection perimeter of the World heritage site of Old Sana'a. Moreover, preliminary surveys were carried out in order to identify the architectural and urban heritage features to be preserved according to the different degree of cultural values and integrity, based on the same criteria used in the inventory for Old Sana'a.

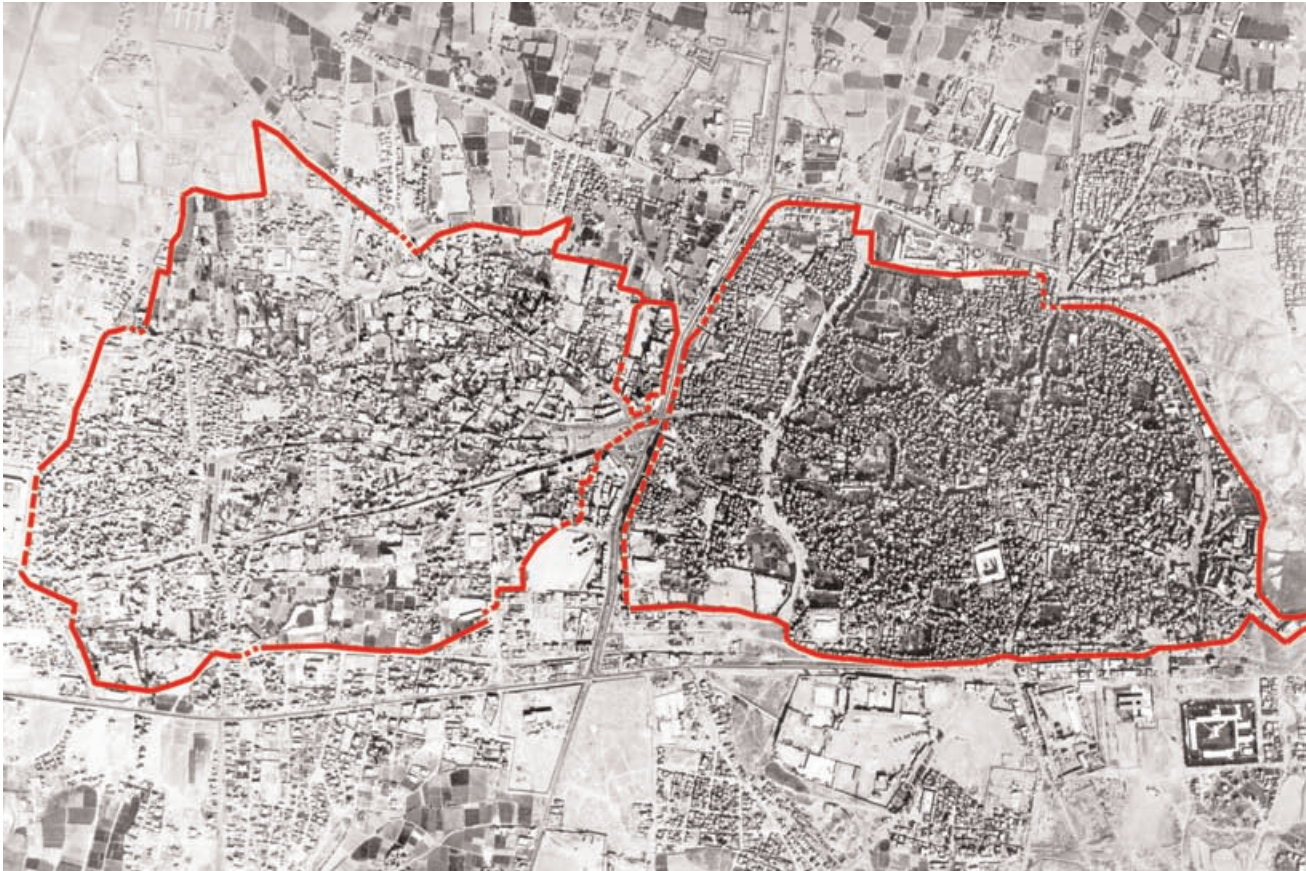
The inventory for the two suburbs has been carried out with the main objective of integrating the GIS information data base undertaken for Old Sana'a, in order to provide information on a larger part of the heritage asset in the rest of the Capital city. The information data base, though entirely compatible with the one of Old Sana'a, is less rich in details, since it is not intended to represent a tool for an immediate control of the building activity, and therefore doesn't include the identification of all the architectural elements of the heritage buildings or open spaces. It is mainly intended to create a basic information support for further studies and investigations, to be undertaken as other resources are made available. Furthermore, it offers an opportunity to increase the knowledge and the awareness of the importance of such a neglected heritage among administrative officials and technicians, as well as in public opinion.

¹⁶ The decree was finally issued in September 2005, when the Inventory survey was still ongoing.

The definition of the Protection Perimeters

The protection perimeters for Bir Al Azab and Rawdah have been outlined to identify all the urban areas that need to be covered by overall and specific building and land use regulations, in order to safeguard the existing heritage features as a cultural asset and a vital component of both the present-day and future city. These areas encompass all of the remaining historic urban fabrics, as identified through the analysis of historic cartography and/or by the appearance of specific cultural and spatial characteristics, regardless of their present state of conservation and, to a certain extent, integrity.

Fig. 10 - The protection perimeters for Sana'a, Bir Al Azab and Al Qaa. The identification of the protection area for Bir Al Azab and Al Qaa start from the analysis of the cartography of Manzoni (1879) and Wissman (1933). This made possible the identification of the former city wall line, still clearly visible on the aerial photograph of the 1970s.



The criteria have been formulated to consider the heritage which reflects the evolution of the urban structure before the urban growth of the 1960's and 1970's, based on modern road infrastructures, settlement and architectural typologies, building materials and technologies often conflicting with traditional ones. However, more than the date of urbanisation and construction, the following elements have been taken into consideration for the identification of the urban fabric perimeters to be protected:

- the presence of pre-modern morphological and typological features in the spatial organisation of the urban fabric, in particular: a) the shape and spatial configuration of the **street pattern** reflecting the key role of historic structures such as the city walls and the gates, the mosques, the souks and other traditional services and institutions; b) the close relationship of the built-up blocks and clusters to the site and the open spaces, such as the bustans and megshamat;

- the prevailing presence of traditional **architectural typologies** specific to the different settlements (tower houses, block houses, farm houses, **villas**, etc.), characterised by the use of the traditional architectural elements, building materials and techniques identified in the previous reports.

In particular, the identification of the protection perimeter of Bir Al Azab, which also includes the ancient Jewish quarter of Al Qaa, has been largely based on the analysis of historic maps, dating from the second half of the 19th century until the 1930s.

A continuity can be seen in the evolution of the urban fabric within the city walls that were still standing until the 1970s. In particular, the city gates, now demolished, used to command the street pattern and determine the location of the main urban spaces and functions. If compared with the present situation, the morphological structure of the late 1970s still looks preserved to a different extent, with the major street pattern still unchanged, in spite of the heavy transformations that occurred over the past 30 years or so. But the urban fabric has been disfigured in many places by intrusive new buildings and reconstructions, while the continuity of the spatial framework along the main axes has been broken by new urbanisations or renewal interventions. However, in this context large parts of the historic fabric and some important open spa-



ces remain preserved, though to some degree this has now led us to consider the line of the demolished city wall as the perimeter of the protection area to be investigated.

As for Rawdah, due to the lack of historic maps and other reliable documents, the identification of its protection perimeter has been carried out on the basis of several site visits and the analysis of aerial photographs and satellite images. These were aimed at the recognition of the historic traditional settlement pattern as defined by the presence of typical structural elements, which determine the morphology and the spatial organisation of the historic fabric, i.e. the mosques, the souk and other commercial structures, the irrigation network, the

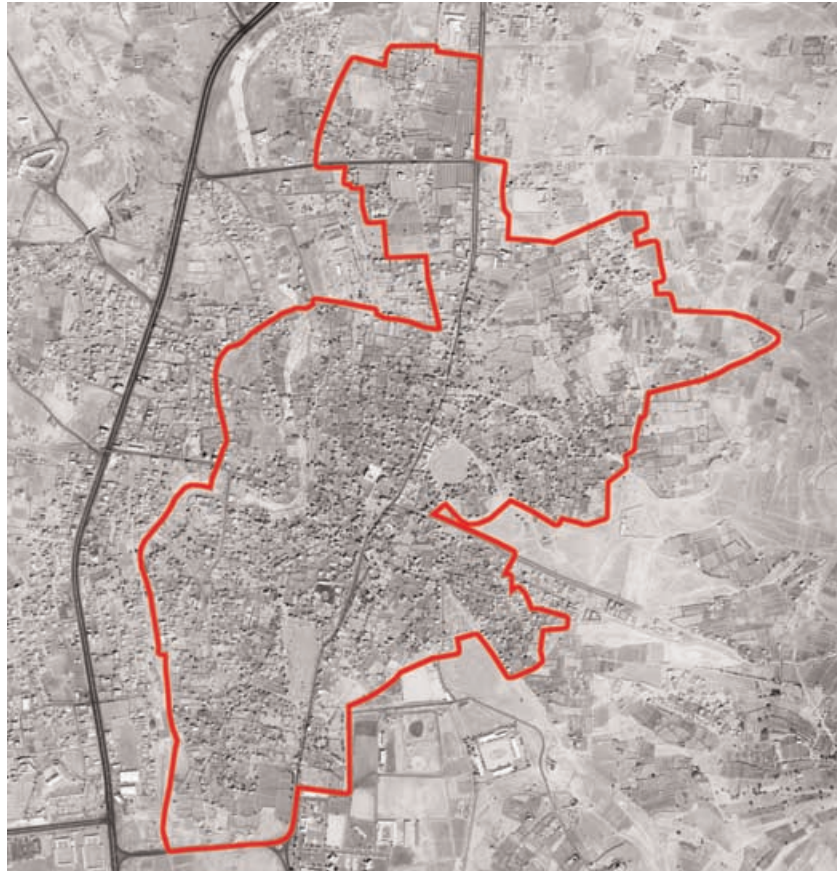


Fig. 11 - Rawdah. The proposed protection area.

bustan and mekshamat. Also considered were the spatial articulation of the residential clusters, their relationship to the site, and the main environmental features, like the wadi.

Therefore, a large protection perimeter was proposed which includes the denser urban fabric along the main axis of the ancient souks, partially redeveloped in the last decades to form a new thoroughfare, and a series of traditional residential clusters surrounded by gardens and agricultural lands closely connected by a continuous and consistent street network.

In both cases, the protection areas are far from being homogeneous. They comprise settlements of high historic interest and cultural values, whose fabric deserves to be preserved and rehabilitated, as well as other surrounding or interstitial areas with no specific interest and values that may even be considered as intrusions and disruptions. On the other hand, due to the recent and ongoing processes of urbanisation, the historic fabric often merges with new urban patterns, making the usual concept of a "buffer zone" difficult to apply.

The protection perimeters are therefore larger than the remaining historic settlements of heritage interest, and respond to the fundamental goal of defining the areas where an overall conservation and rehabilitation policy is needed, not only to preserve the current heritage features, but also to prevent other building or infrastructure interventions, which may definitely affect their role and meaning in the urban context, and ultimately reduce their importance as a resource for sustainable socio economic development.

These perimeters would thus represent the necessary planning context to undertake a conservation policy, which has to be eventually articulated zone by zone with specific building and land use regulations, according to the different degree of heritage interest and cultural value of the urban fabric.

The identification of the survey zones for the inventory

Due to the impacts of the modernisation and urbanisation process, the areas within these protection perimeters show different degrees of integrity and authenticity. Hence, for the sake of the inventory, the following types of situations have been recognized, on the basis of site visits and analysis:



- the historic and "traditional" fabric. In these areas, the urban spatial pattern has been preserved and appears to be legible in its main components and characteristics (i.e. the street network, the morphological and functional relations between the main structural elements, the balance between built-up structures and open spaces), though different degrees of integrity of the architectural heritage could appear;

- the "transitional" or "mixed" urban fabric. In these areas a densification or even a transformation of the historic fabric may appear, due to the urbanisation of the pre-existing open spaces or to localised redevelopment interventions, but still the street pattern and the most relevant components of the historic urban fabric have been basically preserved; the architectural heritage has however been preserved to a different extent;

- the "new" urbanisation. These areas may be inserted within the historic fabric or, in some cases, may surround it, but always show a spatial pattern, which results from modern planning regulations and generally doesn't include any heritage features.

Within the above areas, all of the existing bustans, mekshamat and other relevant open spaces are to be considered as remains of the historic and traditional fabric, hence a heritage feature to be preserved in itself.

The identification of the different types of areas has been carried out differently in Bir Al Azab and Rawdah. As for Bir Al Azab, the existence of detailed historic cartography and an aerial photograph of the 1970s did allow for identification of the historic fabric and new urbanisation. The eventual on-site visits made an accurate definition of the different types of zones possible, in particular the "mixed" ones.

The survey areas were defined so as to start an exhaustive inventory of all the buildings on the historic fabric of the quarter of Al Qaa, whose spatial pattern appears to have been preserved with a high degree of integrity, whilst the other historic fabrics and the "mixed" areas were "checked" in order to identify the heritage items to be investigated and inventoried later. As for Rawdah, the lack of any historical document has not allowed for an initial identification of the different types of area within the general protection perimeter. Therefore the whole area

within the protection perimeter was surveyed in order to identify the heritage items to be eventually investigated and inventoried. The identification of the heritage items to be inventoried both in Bir Al Azab (the "check" areas) and Rawdah has been carried out on the ground on the basis of the same criteria, which refer to:

- typological and constructive features, regardless of the date of construction of the building;
- presence of some specific architectural and decorative elements, already identified in the previous reports on the old city;
- position in the urban context;
- rarity or uniqueness.

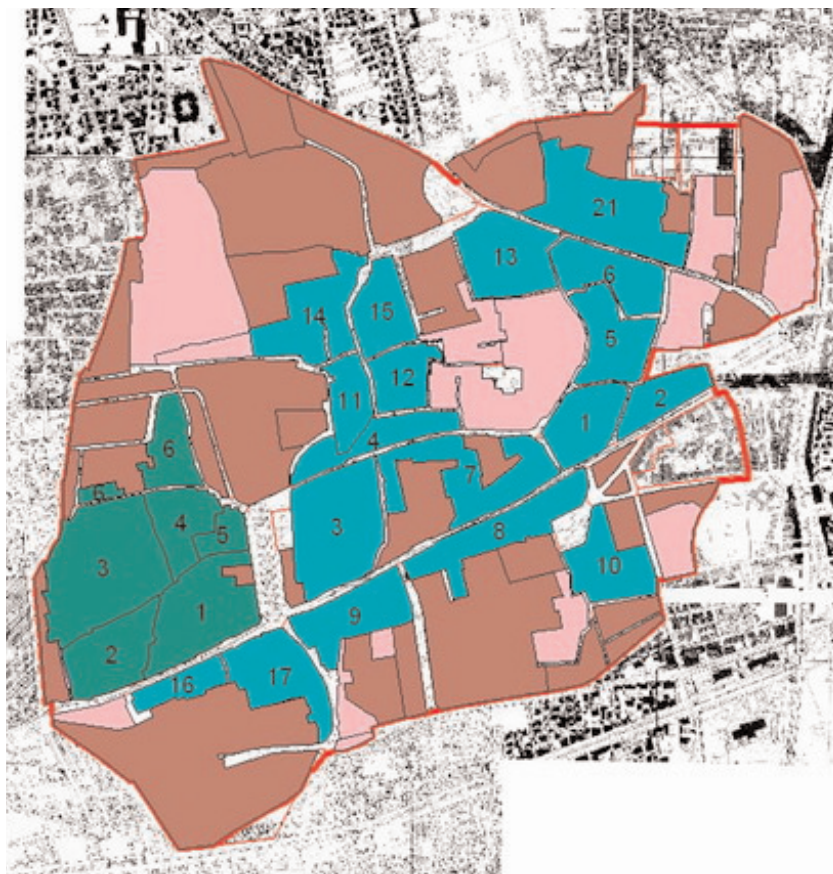


Fig. 12 - The different types of areas within the protection perimeter of Bir Al Azab, identified on the basis of the historic cartography and site visits:

Dark green: the quarter of Al Qaa, where all the buildings and open spaces have been surveyed and inventoried;

Light green: the historic and traditional fabric of Bir Azab, where all the buildings and open spaces of heritage interest have been surveyed and inventoried;

Pink: the mixed or "transitional" fabric of Bir Al Azab, where the buildings with some degree of heritage interest have been identified through a previous survey and eventually inventoried;

Brown: new urbanisation where no inventory has been carried out.

The field survey

The Inventory of Bir Al Azab and Rawdah was performed through an extensive field survey covering the proposed protection perimeters. With only the exception of the Al Qaa district in Bir Al Azab, where all the buildings were taken in to consideration, the survey has been carried out in three phases¹⁷:

- the first was dedicated to the identification of the heritage items, which were recorded on a table and on the available base map. As a result, each item was given an ID number and the base map was appropriately updated manually. At the same time, an initial evaluation of the level of interest was made on the basis of some pre-established criteria¹⁸;
- the second was dedicated to the drawing up of the survey sheet for each item, which was completed with an exhaustive photographic campaign;
- the third consisted of office work dedicated to the review of the survey sheets, preparation of the updated digitised map, downloading and classification of the photographs and data entry from the revised sheets, in order to create the inventory data base.

Similarly, the survey sheet for the bustans, mekshamat and other relevant open spaces includes the following information:

- identification of the open space, as above;
- property, typology and use of the space, as above. In particular, this is intended to identify the type of space (Bustan, Mekshamat and others), as well as the type of use and prevailing vegetation;
- fencing: this section includes information on the fencing walls, when existing: materials and specific interventions required;
- Irrigation: this section includes information on the type of water supply and irrigation system;
- state of conservation and level of heritage interest. This section requires an overall evaluation of the general condition of the open space and of its cultural interest.

In both cases, an additional section is dedicated to the tentative definition of the required types of interventions, to be eventually verified for the sake of the building regulations to be integrated in the conservation and rehabilitation plan.

¹⁷ The field survey for Bir Al Azab and Rawdah was undertaken by UNESCO - CLT and GOPHCY with the help of a group of 18 Italian and Yemeni students, assisted and coordinated by the international team of experts, Prof. Daniele Pini and architects Luca Lanzoni and Saveria Teston of the Facoltà di Architettura of Ferrara, and the Prof. Abdallah Al Adbeen of the Department of Architecture of the University of Sana'a. The survey was then finalised and the Inventory implemented by the Yemeni students under the guidance of Saveria Teston and the team of GOPHCY. For the technical procedures of the preparation and organisation of the survey and the implementation of the Inventory, see: Saveria Teston, Mission Report, UNESCO - Division of Cultural Heritage, July / September 2005.

¹⁸ As for the initial identification of the heritage items in Bir Al Azab and Rawdah, it must be stressed however that the general criteria have been adopted to include in the survey all the items which could show the least element of interest.

The criteria of evaluation

As in the case of Old Sana'a, these two survey sheets have been adapted to the different characteristics of Bir Al Azab and Rawdah, and are basically structured to be filled in by the simple identification and assessment of the actual features of buildings and open spaces. However they include an evaluation exercise¹⁹ dealing with the following aspects:

- the conditions and the state of repair;
- the level of heritage interest.

The criteria below have been proposed and tested through numerous on-site visits with all the experts and the student surveyors, for both the buildings and the open spaces. Whilst the criteria used to classify the "conditions and the state of conservation" are the same as adopted for the Old City, the evaluation of the "level of heritage interest" proceeds from different considerations. It reflects and synthesises a judgement on the architectural and heritage values that in the Old City was analytically based on the record of all the composition, constructive and decorative elements, according to the "vocabulary" provided by the "handbook". Since the same method could not be applied, due to the limited resources and time framework, a general evaluation has been given considering the following aspects:

- the authenticity and integrity of the typological and architectural features, as well as the quality and the wealth of the spatial, structural and formal composition, the construction details and finishes, the decoration, etc.;
- the position and the uniqueness of the building in relation to its urban context;
- the historic values and all the other elements (including symbolic and representative meanings), which may lead to the identification of the building as a heritage item.

On these bases, the buildings were classified by the surveyors according to the following categories, regardless of the typology and use:

¹⁹ These evaluations were carried out on site by each team of surveyors and the assisting expert, and later verified in the office, with the help of the photographs, and comparing the most controversial cases with the other teams and experts.

- high: when a building of high architectural quality, with a high level of integrity, stands out in the urban context and/or represents a distinguished example of a specific typology;

- medium: when a building of relevant architectural quality, whose structure has been affected by recent transformations, still fits in the urban context as a historic or traditional feature;

- low: when a building of poor architectural quality still presents some historic or traditional features and does not represent an intrusion into the urban context.

For all the other matters, the same methods and criteria have been used that were already established in the Old City inventory.

Bir Al Azab, Al Qaa - Inventoried buildings and open spaces

The protection area of Bir Al Azab consists of two distinct types of urban fabric. The suburb of Bir Al Azab proper is structured by the two main axes of 26th September street and Gamal Abdul Nasser Street that coalesce at Tahrir Square at the western entrance of the Old City - the so-called "Turkish town". The historic fabric here has been largely affected by densification, renewal and new urbanisation, but the remaining still presents a low density pattern of houses of different types, sometimes still surrounded by gardens and agricultural areas.

The ancient Jewish quarter of Al Qaa, on the western edge of the now-destroyed section of the city walls, develops its densely built fabric along the souk axis. The street pattern has remained almost unchanged and, if many houses have been reconstructed and open spaces built-up, the characters of the historic fabric have been preserved to a large extent.

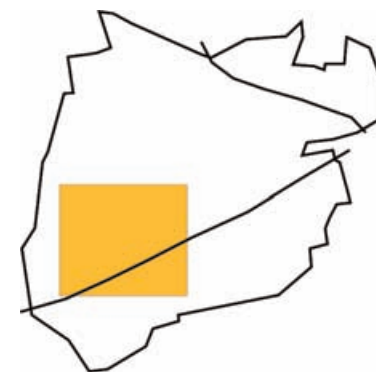


The following elements have been inventoried in Bir Al Azab:

Houses - 670
 Suq -
 Mosques - 6
 Hammam - 3
 Other buildings - 20
 Open spaces related to buildings and residential clusters - 370
 Bustan, Megshamat, open spaces - 56

The following elements have been inventoried in Al Qaa:

Houses - 764
 Suq - 30
 Mosques - 3
 Hammam - 1
 Other buildings - 15
 Open spaces related to buildings and residential clusters - 469
 Bustan, Megshamat, open spaces - 12





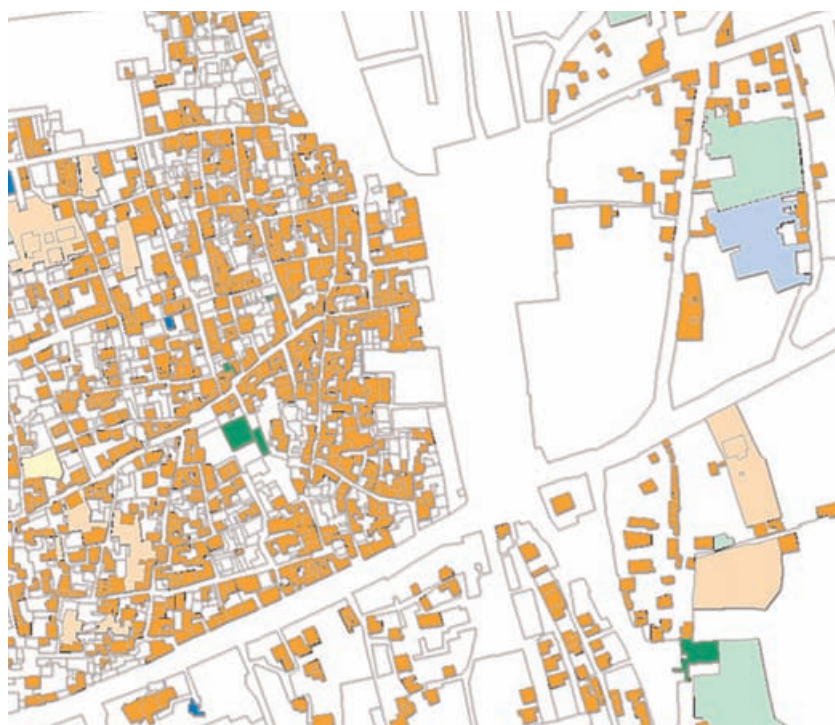
Bir Al Azab, Al Qaa - Typology of buildings

The remaining historic urban fabric of Bir Al Azab and Al Qaa largely consist of houses, which still have a residential use (82,4% and 82,9 respectively), but they also include a few significant buildings belonging to different typologies, such as mosques, hammams and others. Also, a traditional souk is still exists in Al Qaa, with typological characteristics that totally differ from the Old City, since the buildings are two storey and combine the shops with storage and/or residences at the upper floor. It must be stressed that the historic housing typologies are radically different in Bir Al Azab and Al Qaa. In the so called "Turkish quarter", the heritage houses mostly reflect the "suburban villa" type, and often consist of an articulated cluster of constructions of two or three floors (32% and 46% respectively), grouped around a courtyard and surrounded by gardens. In the ancient Jewish quarter, the houses are generally two-storey (56%), with an inner courtyard, and thus form a continuous and very dense fabric.



Bir Al Azab, Al Qaa - Ownership

The large majority of the buildings are of private ownership (99% in Al Qaa and 97% in Bir Al Azab), but the presence of some large and environmentally relevant open spaces belonging to public or waqf institutions has to be noted, since they represent a very important cultural and spatial asset.



Buildings

- Private
- Public
- Waqf

Open spaces

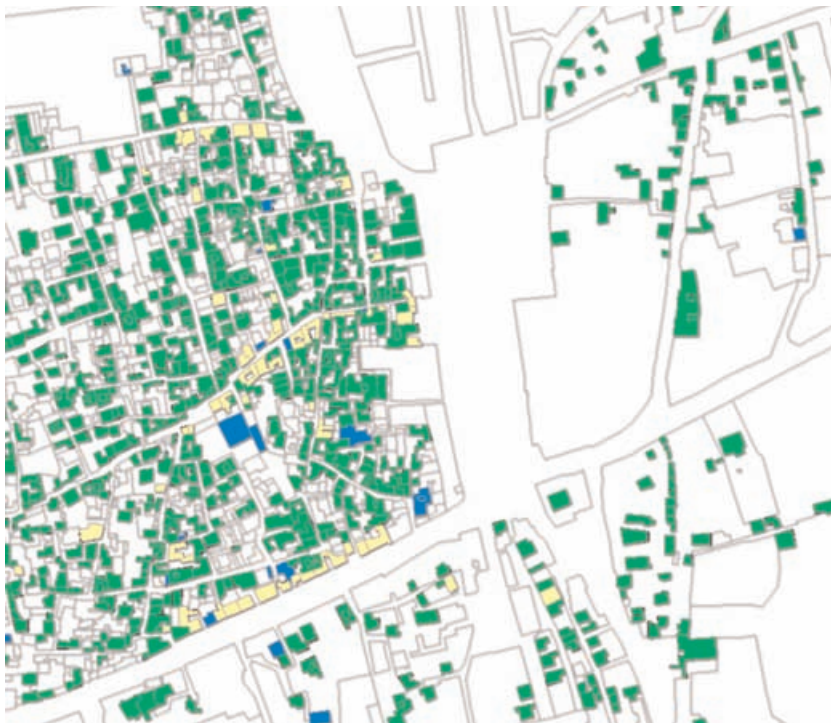
- Different owners
- Private
- Public
- Waqf



Bir Al Azab, Al Qaa - Occupancy of buildings

The remaining historic fabric appears to be broadly in use, and the rate of non-occupied or partially occupied buildings is similar in the Old City. However, the rate of entirely occupied buildings is rather lower in Al Qaa (90%) due to the presence of several "partially occupied" buildings in the axis of the souk, where many shops are now deserted and the buildings are only used as residences on the upper floor.

It has also to be noted that in Bir Al Azab some important heritage buildings and complexes are totally abandoned and in ruins.



Bir Al Azab, Al Qaa - Functions of buildings

Building use reflects the different functional structure of Bir Al Azab and the old Jewish Quarter of Al Qaa. If the ratio of residential and mixed uses is about the same (82% and 13% respectively), the merely commercial buildings clearly define the central souk axis in Al Qaa, whilst the many public and private services punctuate the urban fabric in Bir Al Azab, particularly in the surroundings of Tahrir square.



- Administration
- Commerce
- Commerce residence
- Cultural facilities
- Education
- Handicraft
- Health
- Private and public service
- Religion
- Residence
- Storage



Bir Al Azab, Al Qaa - Cohabitation

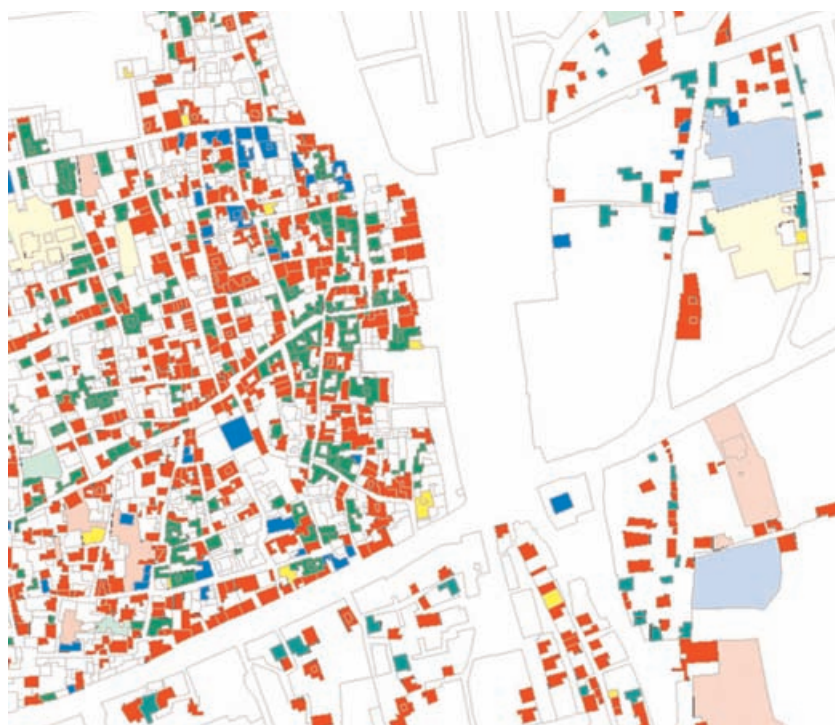
In Al Qaa, more than 80% of the buildings are occupied by one family, whilst in Bir Al Azab the rate of cohabitation (35%) is higher than in the Old City, which is probably the outcome of a similar process of functional transformation and densification.

The difference between Al Qaa and the rest of Bir Al Azab is evident. Probably the prevailing building size and typology in the ancient Jewish quarter make any inner subdivisions difficult, but certainly the low rate of cohabitation would require further investigation, specially if compared with the visible general decay of the urban fabric.



Bir Al Azab, Al Qaa - State of repair

The state of conservation of the buildings and the open spaces of heritage interest is generally very poor. As for the buildings, the rate of units which lay in a bad state of repair or are abandoned is 29,6% in Al Qaa and 29,3% in Bir Al Azab, whilst the prevailing condition is "ordinary" (65% and 63,5%). Only 5,4% in Al Qaa and 7,2% in Bir Al Azab are in good repair. The same considerations can be put forward for the open spaces, where the rate of units in "good" repair is very low and the large majority is "ordinary". It must be noted that the situation of the heritage components in the remaining historic fabric appears to be much worse than in the Old City both for Bir Al Azab, where the urban fabric undoubtedly shows an intense vitality, and for Al Qaa, where on the contrary the signs of decay and abandon are evident. The lack of maintenance is combined with a total lack of protection measures, and the risk is evident of further harmful losses if a consequent conservation policy would not be implemented.



Buildings

- Good
- Ordinary
- Bad
- Ruine

Open spaces

- Good
- Ordinary
- Abandoned
- Bad

The following elements have been here inventoried in Rawdah:

Houses - 620
 Suq - 98
 Mosques - 20
 Hammam - 9
 Other buildings - 292

Open spaces related to buildings and residential clusters - 370

Bustan, Megshamat and other relevant open spaces - 56

Rawdah - The Inventoried elements

The proposed protection area presents a well preserved pattern of settlements and open spaces that still reflects to a certain extent the traditional character of the ancient "garden city", with large houses and residential clusters closely linked to farmland.

It must be noted that the other types of buildings include 124 birs, 46 marnah, 14 basins, 4 sabils and 10 nawhab, which bear witness to the persistence of a historic landscape and urban pattern largely characterised by irrigated fenced "green" areas.

Also, it has to be stressed that, differently from Bir Al Azab, the heritage elements still form a complete and integrated urban structure, even if a new thoroughfare has definitely broken the spatial continuity between the souk and the main mosque, and other diffused interventions are disfiguring its historic and traditional image.



Rawdah - Typology of buildings

The historic urban fabric of Rawdah mostly consist of houses of different types (60%), which still have a prevailing residential use, but differently from Bir Al Azab also include a large number of other types of constructions (28%), which are related to the irrigation and the maintenance of the agricultural land and the gardens, such as bir, marnah, nawbah and so on.

Also, a traditional souk is still there, though in a very bad state of repair, whose units represent 9% of the heritage buildings and have typological characteristics similar to the Old City.

It has to be noted that many of the existing religious, administrative and commercial activities are still accommodated in buildings which have at least some heritage interest.



- House
- Mosque
- Suq
- Hammam
- Others
- Non buildings

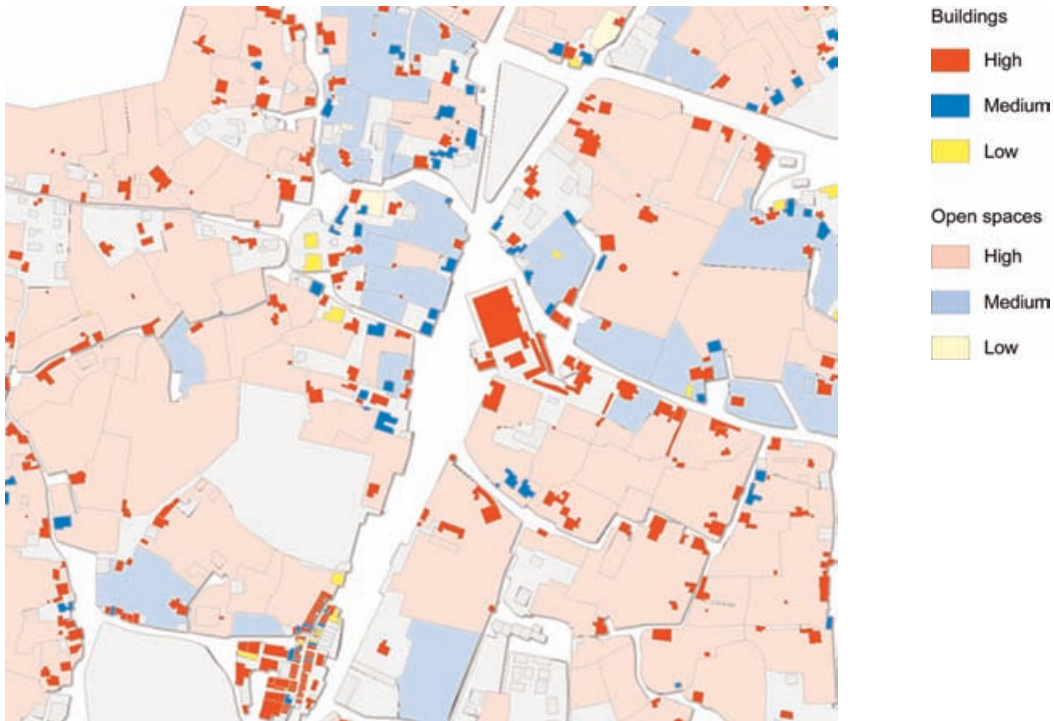


Rawdah - Heritage interest

The process of urbanisation and modernisation in Rawdah has not yet reached the same intensity as in Bir Al Azab, and the heritage values of the historic fabric appear to be much better preserved.

The large majority (83,5%) of the inventoried buildings are indeed of "high" interest, due to their architectural authenticity and integrity, and the relationship to the agricultural landscape.

The same level of heritage interest has been recorded for the bustan, whose traditional landscape structures are still largely preserved.



Rawdah - Ownership

As in the other historic settlements, the large majority of the buildings are privately owned (96%) but the presence of several religious buildings makes the number of waqf properties (3%) not irrelevant.



Buildings

- Private
- Public
- Waqf

Open spaces

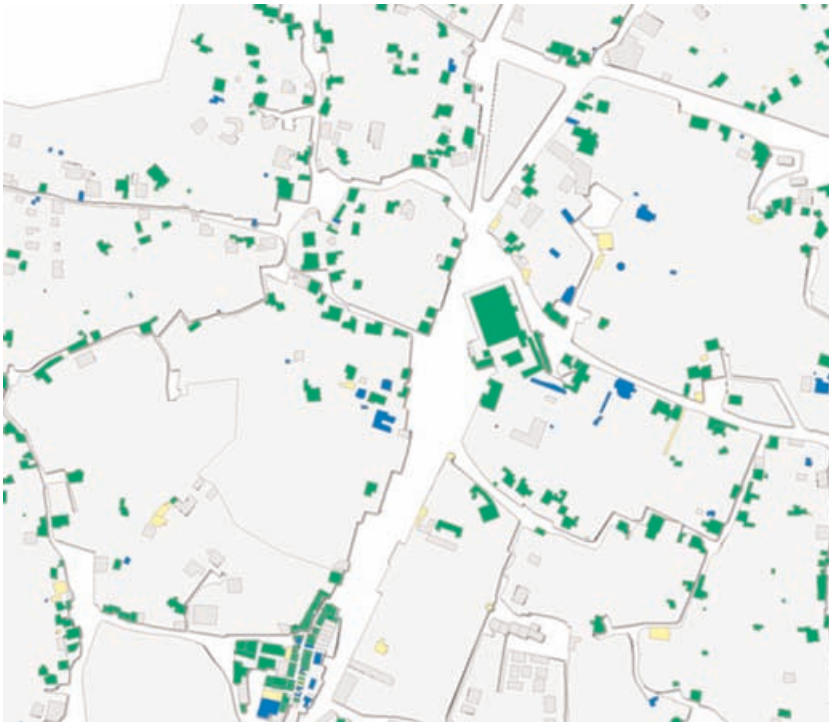
- Private
- Public
- Waqf



Rawdah - Occupancy of buildings

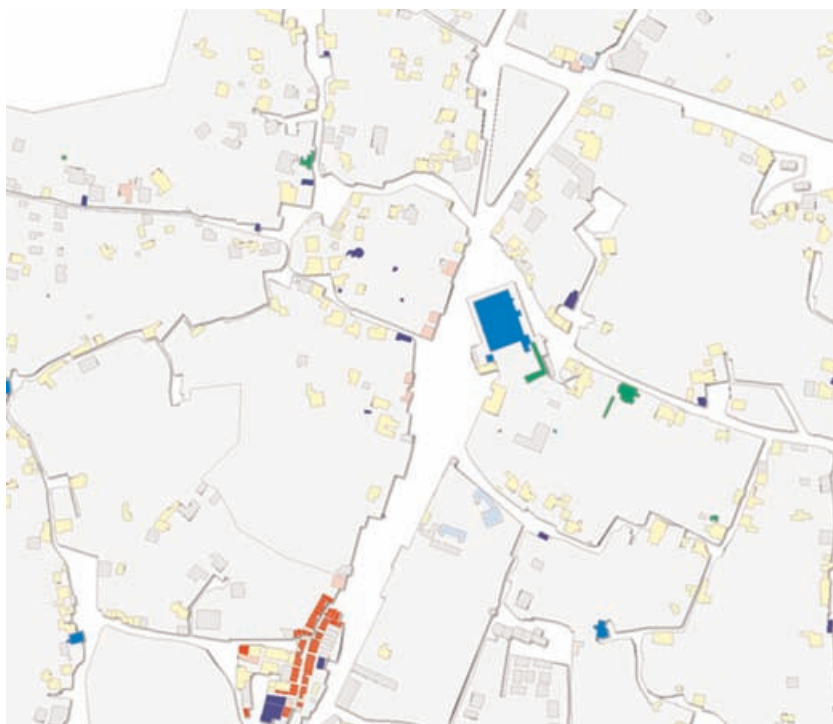
The historic fabric appears to be still largely in use (79%), but the rate of non-occupied or partially occupied buildings (16% and 5% respectively) is much higher than the Old City and Bir Al Azab. In some cases, both in the souk area and in the residential clusters, the old buildings have been abandoned and new ones built nearby.

This phenomenon is affecting the integrity and the heritage values of both the urban fabric and the agricultural landscape, and deserves to be carefully investigated to prevent further damage.



Rawdah - Functions of buildings

The buildings' uses reflect the relative complexity of the urban structure. The ratio of residential and mixed uses is lower than in the other suburbs (75% and 3% respectively), whilst the ratio is much higher for the commercial buildings (15%), which are concentrated on the souk axis, and the other buildings (7%) for religious functions, public or private services, and facilities, which are scattered in the settlements pattern.



- Administration
- Commerce
- Commerce residence
- Handicraft
- Private and public service
- Religion
- Residence
- Storage
- Non buildings
- Neighbourhood



Rawdah - Cohabitation

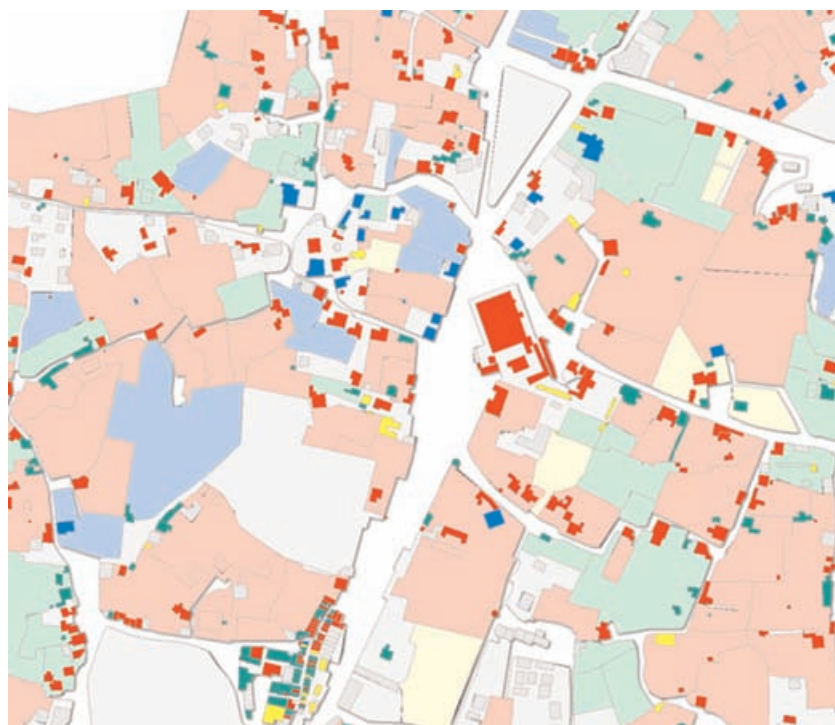
The rate of the buildings occupied by only one family (89%), is much higher than in the Old City and the other suburbs. It probably reflects, on the one hand, the strength of the traditional familial and housing patterns, and on the other hand, the lower impact of modern urbanisation.



Rawdah - State of repair

In spite of their integrity, the state of conservation of the buildings and the open spaces of heritage interest is generally very poor. As for the buildings, the rate of units which lay in a bad state of repair or abandon (36%) is even higher than in Bir Al Azab and Al Qaa, whilst the prevailing condition is "ordinary" (58%). Only 6% are in good repair. The same considerations can be put forward for the open spaces, where the rate of units in "good" repair is very low (only 7,2%), and the large majority is "ordinary" (69,2%).

The signs of decay and abandon are evident. The lack of maintenance seems to be combined with a limited dynamic of socio-economic development. The risk of harmful losses of the still preserved heritage values is evident, without the implementation of a consistent policy of conservation and revitalisation.



Buildings

- Good
- Ordinary
- Bad
- Ruine

Open spaces

- Good
- Ordinary
- Abandoned
- Bad

Toward the Conservation and Rehabilitation Plan for the Greater Sana'a Historic Centres Conservation Plan

The decision to extend the implementation of protection measures to other historic settlements in the area of the Capital - besides the Old City - has opened a new planning perspective. While it implies that conservation becomes an issue for the larger urban area of Sana'a, it also calls for the definition of a strategic vision and appropriate planning tools which include architectural heritage and the historic urban fabric as a potential asset, not as a constraint, for sustainable development. This requires the definition of a long-term and consistent conservation strategy, which would consist of a well established regulatory framework, and of a well-defined set of priority actions, in order to address the new challenges and issues which are imposed by the ongoing processes of change.

On one hand, the Plan should be based on a broader concept of "heritage", which includes not only "monuments" and "remarkable buildings", but also their context, the "minor" and "vernacular" architectural expressions, the articulation of the urban spaces and the landscape features, according to the most advanced international "state of the art" practises in conservation. Obviously, this heritage can only be preserved if life is kept in it, and functions and meanings are favoured, which are compatible with its characteristics, through the "adaptive" reuse of its different features. "Conservation" has therefore to be associated with "rehabilitation" and the Plan also has to provide tools for protecting the heritage features from further deterioration, while favouring at the same time all the possible compatible interventions in the Old City and in the other historic settlements, which can improve the living conditions of the population and bring new activities and uses.

On the other hand, the Plan has to be closely linked, or integrated, into the more general urban planning process, as a tool, which ensures the preservation of the historical heritage within the framework of the future urban development. Therefore, if it has to be based on the "inventories", which provide a clear identification of the heritage to be pre-

served, other studies and investigations are needed, which are intended to offer an accurate description of the current situation and an outline of the future trends and issues to be addressed, with regard to the morphological and functional structure of the different settlements, the socio-economic condition, the "formal" (institutional) and "informal" structures that govern local traditional culture and activities, the housing and real estate market, the environmental situation, the infrastructure network the municipal services, and so on.

On this basis, the Conservation and Rehabilitation Plan should define a strategy to give each historic centre an active role in the larger urban area, promoting their identity as a component of wider Sana'ni urban civilisation. For this reason, the Plan should cover with the same level of detail:

- the Old City - the World Heritage Site to be protected according to the international convention;
- the historic fabrics identified and inventoried in the other centres - i.e. Bir el Azab and Rawdah, and eventually El Gabel village, Hadda village, Sana village, Attan village and Beit Bows village - to be protected as an extension of the Old City.

From the technical point of view, the plan should include an appropriate conservation and land-use zoning, with related building and planning measures for each centre, in order to provide:

- the identification and classification of the zones to be submitted to the different degrees and types of protection;
- the identification and classification of the different types of buildings and open spaces to be submitted to the different degrees and types of protection;
- the establishment of a definite set of prescriptions and indications, including a land-use and building code to issue building permits and monitor building activity, concerning: (a) all the existing building and/or architectural features and open spaces, for the Old City; (b) all the heritage buildings and open spaces to be identified for the other historic centres;
- the identification of the "sensitive areas" to be submitted to special projects of urban regeneration and rehabilitation.

Guidelines from the Inventories

Some guidelines for the preparation of the Plan can be drawn from the implemented inventories. As for the identification of zones to be submitted to different degrees of protection, it may be assumed that:

- the historic and "traditional" fabric should be considered as "conservation areas", to be preserved as a whole. Specific planning measures should be adopted in order to preserve the morphology, the spatial pattern and detailed building regulations which have to be established in order to define the types of interventions appropriate for each building;
- the "mixed" or "transitional" fabrics can be considered as "urban regeneration areas", where planning measures have to be adopted in order to preserve the remaining historic spatial pattern and architectural heritage. At the same time, these should address the negative effects of the densification and redevelopment interventions that occurred in the recent urbanisation process, whilst preventing further transformations that could eventually disfigure the remaining historic pattern;
- the newly urbanised areas have to be considered as "buffer zones" where no interventions could be allowed that may cause further decay to the urban fabric and prevent its conservation;
- all the surviving bustan, mekshamat and other relevant open spaces have to be considered as "no build" areas and be rehabilitated as spaces for agriculture and leisure.

The Inventories could also be used for the establishment of the general prescriptions concerning the types of interventions required or admitted for each building, that can be defined as follows:

- restoration: this type of intervention is aimed at preserving and/or reconstituting the integrity of the typological and architectural features of the buildings or constructions of particularly high interest, which have a "monumental" character. This should be carried out on the basis of an accurate information and documentation, including the analysis of the historic evolution and a careful survey and diagnosis of the actual architectural structures. The same building materials and techniques which characterise the historic structures have to be used,

in order to preserve the authenticity of the building. Only those uses should be admitted, which are consistent with the preservation or reconstitution of the integrity and authenticity of the building;

- rehabilitation: this type of intervention is aimed at the preservation of the existing buildings or edifices of high interest, to make them available for the previous or new uses that are consistent with the typological and architectural features. The building structures can be adapted to the new functional needs (inner distribution, equipment, etc.) without major changes to volume or to building height, the articulation of spaces, the façade composition, or the ornamentation layout. Building materials and techniques should be used which are consistent with the historic typological and architectural features;

- renovation: this category implies the conservation of the historic and traditional structures as well as the partial restructuring or reconstruction of an existing building, in order to make it available to previous or new uses whilst improving the structural and functional conditions. Demolition and reconstruction is applied only to those parts, which are inconsistent with the historic and traditional typological and architectural features. The existing buildings or constructions have to be made available to previous or new uses with major changes to the current typological and architectural features (volume and building height, functional distribution and articulation of spaces, façade composition, ornamentation layout) using new but appropriate materials and building techniques, when needed. It is applied to all the buildings of medium or low interest, which have been heavily transformed but still keep some interesting architectural features, as well as to ordinary buildings, which fit in to the historic or traditional urban context;

- reconstruction: this category implies the possibility to demolish and rebuild an existing building, respecting the land use and the typological and architectural features, in order to re-establish the continuity of the historic urban fabric (volume and building height, façade composition and layout), with new appropriate materials and building techniques. In particular cases, to be defined by the Conservation Plan, this category could imply the possibility to demolish and rebuild two or more adjacent buildings with a new layout, respecting the specific land use and building regulations to be established;

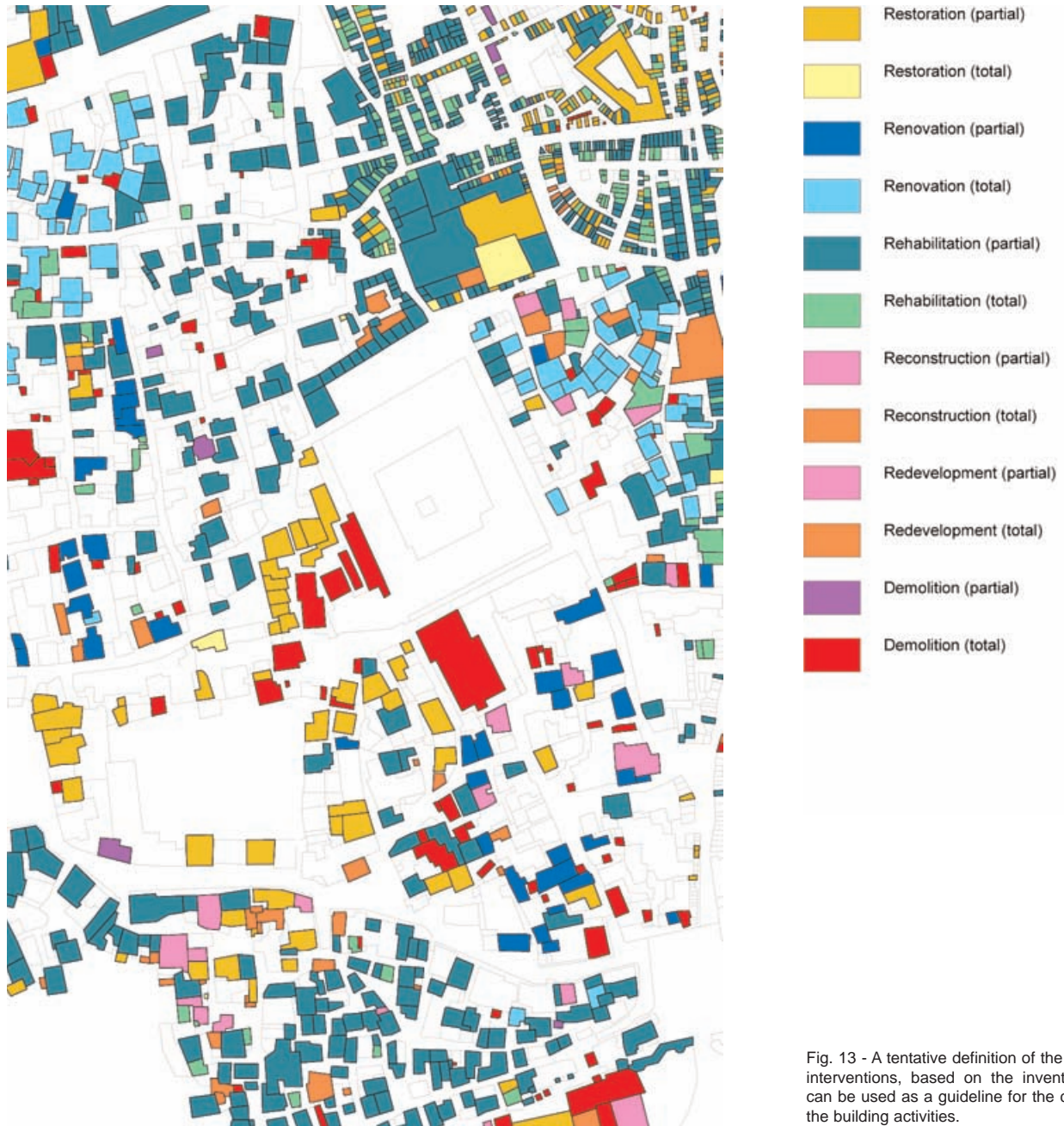


Fig. 13 - A tentative definition of the required interventions, based on the inventory, that can be used as a guideline for the control of the building activities.

- demolition: this category applies to existing building (or a part of it) to be demolished, without reconstruction or redevelopment of the land, which has to be made available for new landscape arrangements or urban infrastructure improvements.

Each of those interventions may be total or partial:

- total, when the entire building structure is affected by the intervention of recovery;
- partial, if only a portion of the building - that could be a horizontal and/or vertical addition, or simply an architectural element (like for instance inconsistent plastering) - needs to be brought back to its original and traditional characteristics.

The information provided by the inventories allows for the classification of the buildings according to these categories, and it can be used by the GOPHCY and the other concerned authorities as a guideline for control against current building activities.

This could be the basis of a building regulation to be related to land-use prescriptions concerning uses and activities, and to be integrated by other prescriptions concerning the materials and building techniques. To this purpose, a clear definition is needed of "traditional" materials and building techniques. "Tradition" indeed not only refers to "old" but also to "local": there are "old" materials and building techniques that could be inconsistent with the local "traditions", and on the other hand, due to the complexity and the different degree of heritage values of the urban fabric, "modern" is not necessarily synonymous with "inconsistent": in many cases, it is the way "modern" materials are used that makes them inconsistent with the conservation objective.

A list of materials which refer to local Sana'ni architectural tradition should be made, to be used in all interventions of restoration, refurbishment and rehabilitation concerning the buildings inventoried as "monumental", "excellent" and "good" quality. However, the general principle has to be asserted that all the existing "traditional" architectural elements, as identified by the survey and described in the inventory, have to be preserved and/or restored in any type of intervention, using appropriate materials and building techniques.

An agenda for the preparation of the Plan

In order to prepare and implement the plan the following, essential tasks need to be accomplished:

- the constitution of a Sana'a conservation planning unit;
- the use of inventories in the control and management of building activities, and the development of the consequent actions to increase the awareness of Sana'a's architectural heritage preservation;
- the development of sector studies and analyses on the current situation and trends in the historic settlements;
- the elaboration of the Conservation and Rehabilitation Plan documents.

The establishment of a conservation planning unit has to be considered as a pre-condition for the implementation of any further works and for the elaboration of the Plan documents. It should be created in the framework of the GOPHCY-CATS, with the support and the collaboration of the other national institutions involved in the Capital's urban policies, i.e. the Capital Secretariat and others to be eventually identified by the Yemeni authorities.

In this framework it would be possible for the GOPHCT to use the inventories as a tool for its inspection and building permissions delivery, which is run in connection with the Urban Planning Department and the Municipality, as well as to raise awareness²⁰. To this purpose the GIS database should be integrated with information concerning:

- violations (from GOPHCY);
- building permissions (from the Municipality)
- emergencies (from the Planning Department)

On the basis of the inventories and of the available documentation - to be collected and organised by the Unit - the envisaged sectoral studies and analysis could be undertaken, in order to outline the most relevant issues, and to provide the necessary information and conceptual framework for the definition of an overall integrated conservation strategy. At this point, it is crucial to appraise the following aspects:

- the environmental situation, including the ecological conditions, the

²⁰ The initial exploitation of the inventories data allowed the organization of an exhibition and a three day symposium on the outcomes of the survey, at the GOPHCY-CATS in August 2007, under the auspices of the Ministry of Culture, with the support of DED (German cooperation). Other initiatives are planned at GOPHCY-CAT in order to increase awareness amongst the public and the officials.

infrastructural network, the municipal services;

- the socio-economic conditions, aiming at the analysis of the social structures, the economic activities, the employment issues, the service and facilities available to the population;
- the role of "formal" (institutional) and "informal" structures that govern local traditional culture and activities;
- the analysis of the different housing typologies and other building typologies (i.e. commercial, religious buildings and others) which aim at identifying the current transformations being made by the inhabitants and users;
- the analysis of morphological and functional structures of the different residential neighbourhoods and commercial districts;
- the analysis of the housing and real estate market.

Further on, it will be possible to undertake the following tasks in order to prepare the final documents of the conservation plan for all the historic settlements of the Greater Sana'a:

- definition of an overall and integrated conservation planning strategy;
- elaboration of land use and conservation zoning with the identification and classification of the heritage areas and buildings to be submitted to different degrees of protection, and related planning and building regulations;
- identification and layout proposals of special action projects concerning the sensitive areas or the priority issues.

In the meanwhile it will be necessary to study the most appropriate institutional set-ups to enforce the conservation measures and integrate the Conservation and Rehabilitation Plan into the Greater Sana'a Master Plan which is as yet to be finalised and approved.

Bibliography

Al-Abed, A.M. - Mustapha, F.H. (1996), "Satisfaction level with dwelling unit in low-income public housing in Yemen", XXIVth IAHS World Housing Congress, Ankara, pp.981-92.

Audouin, R. - Saliba, H.P. (1998), "Rapport de Mission", UNESCO - WHC.

Berger/Kampsax (1978a), "Draft Final Report Sana'a Master Plan" V.B-II, Sana'a, Ministry of Urban Planning and Housing, Sana'a.

Berger/Kampsax (1978b), "Sana'a Master Plan", Vol. A, Sana'a, Ministry of Urban Planning and Housing, Sana'a.

Costa, P. -Vicario, E. (1977): *Yemen, paese di costruttori*, Electa Editrice, Milano

Eckert, H. (1992), "The Chief Urban Functions of Old Sana'a" in "the City of Sana'a Today", UNDP/YEM/88/006 Technical Report, Paris

Feiner, J. Paul (1997), "La vieille ville de Sana'a: analyse morphologique comme fondement de la sauvegarde patrimoniale", Thèse Ecole Polytechnique Fédérale de Lausanne

Gilmore Hankey Kirke Ltd. in association with Pan Yemen Consulting Services (1999), "Cultural Heritage (Protection) Project", Republic of Yemen, Ministry of Culture and Tourism, Sana'a

Lane, M.B. (1988): San'a'. "Pilot restoration projects for the International Campaign to Safeguard the Old City of San'a'", GOPHCY, UNDP-UNESCO, Paris

Lewcock, R.(1982): "The Campaign to Preserve the Old City of Sana'a," ICOMOS Paris

Lewcock, R. (1983): "The Old City of Sana'a", in Evin, A. (ed): *Development and Urban Metamorphosis; Volume 1: Yemen at the Cross-Roads*, Concept Media/The Aga Khan Award for Architecture, Singapore

Lewcock, R. (1986): "The old walled city of San'a." Unesco, Paris

Lewcock, R. (1976): "Towns and Buildings in Arabia, North Yemen." *Architectural Association Quarterly* (London), Vol. VIII, No 1.

Matthews, H. (1980), "Building in the Yemen: Report on the Proceedings Held at the Bouwcentrum", Bouwcentrum and Information Centre for School Building and Museum of Ethnography, Rotterdam.

Pini, D. - Miglioli, F. (2003), "Mission Report", UNESCO - WHC, Paris.

Pini, D. (2005), "Mission Report", UNESCO - CLT/CH, Paris.

Serjeant, R.B. (1980): "The Islamic City: Selected Papers from the Colloquium held at the Middle East Centre", Faculty of Oriental Studies, Cambridge. Paris, Unesco, 1980. Part I, Social Stratification in Arabia (R.B. Serjeant); Part II, San'a' (Paolo M. Costa).

Serjeant, R.B. - Lewcock, R. (1983), *Sana'a: An Arabian Islamic City*, The World of Islam Festival Trust, London.

UNESCO, UNDP (1996): "Preservation of the Old City of Sana'a. Project findings and Recommendations", Paris.

Varanda, F. (1994), "Art of Building in Yemen." Ph.D diss., University of Durham.



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