

# **OASIS SETTLEMENT IN OMAN PILOT STUDY 1999 - 2000**





# OASIS SETTLEMENT IN OMAN PILOT STUDY 1999 - 2000

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supported by: Land Baden-Württemberg

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# INTRODUCTION

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Oases as a particular strategy of human adaptation to a harsh environment have over the past five millennia played a crucial role in the history of man on the Arabian Peninsula and have shaped much of its cultural environment. It were the oasis towns with their unique water system - the falaj - that were the setting in which Oman rose to and flourished as an international power during the Ya'ariba imamate and in particular since the reign of the Al Bu Said dynasty.

In the world of the late 20th century with its immense industrial and technological developments oases with their agricultural basis have ceased to play their former role as the chief source of making a living. The major developments and modern changes not only altered the capital Muscat and other big cities, but also left their impact upon the rural areas and in particular the oasis settlements. The old mud-brick or stone settlement nuclei with their characteristic spatial and architectural features, once given up by their inhabitants, deteriorate and eventually collapse. A very large number of oasis settlements in Oman are currently undergoing this process. If deterioration continues and these ancient quarters disappear altogether, it would be an immense loss for mankind in general and for Oman in particular, since the architectural heritage is closely linked to the socio-historical identity of Omani society. If we want to preserve them at least partially, it is not just a matter of restoration. What is uppermost needed is a detailed and solid documentation and an investigation of the possibilities of making use of old town quarters for tourism and other purposes, which have to be integrated into the overall developmental plans for Oman's oases.

The fore mentioned observations and reflections gave rise to the establishment of the joint documentation and research project on „Oasis Settlements in Oman . A first discussion on the necessity of recording and documenting abandoned and endangered settlement quarters in Oman was undertaken in 1995 during a visit of Prof. Dr. Heinz Gaube who was leading a students excursion to Oman, architect Knut Lohrer who was invited by SQU as a visiting consultant at that time and visiting Professor Dr. Birgit Mershen. Preliminary surveys carried out by Dr. Mershen and Knut Lohrer in 1995-1997 aimed at gaining a better insight into the extent of the necessary documentation, the typology and conservational conditions of traditional oasis settlements with the aim to select areas of particular interest. In 1997 a joint documentation and research project concerning the Omani oases was suggested by Tuebingen University and agreed upon by Sultan Qaboos University in February 1998.

In the following the project scope and concept was further elaborated to integrate specialists from different academic disciplines including archaeology, architecture, urban planning, history and agriculture and to include participants from Tuebingen University, Stuttgart University, Kassel University and the German Archaeological Institute. In March 1998 researchers from the German side visited Oman to finalize the project concept and structure. As a result of this visit a transect through the Western Hajar was selected for documentation and research in a pilot study over the next two years.



## INTRODUCTION

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The pilot study consists of four field campaigns (one month each) in spring and autumn of 1999 and 2000. It is anticipated that after the accomplishment of the pilot study, a proposal for a documentation and research project on the Omani oases on a much larger scale, and continuing over several years will have very good chances to be accepted by the German funding bodies. The project will then also involve other departments and colleges of SQU, such as the Department of Biology, the Department of Civil Engineering and the College of Agriculture.

Needless to say, the project aims at participation and training of staff members and students from SQU and various universities in Germany. The team involved in this undertaking has started on building an archive and a documentation within the Department of Archaeology at SQU and the Oriental Seminar of Tuebingen University. Such an archive should be accessible to students and researchers dealing with the architectural heritage of Oman.

His Excellency Muhammad az-Zubair's awareness and promotion of the cultural heritage has been of great assistance to the project team. The warm support of H.E. the Vice-President, various SQU departments and individuals contributed immensely to the formation and execution of this project. This project also gained the support of the administration of the College of Arts and all members of the Department of Archaeology.

The project is carried out in cooperation with ministries and departments involved in the preservation and development of different aspects related to the project, and will hopefully be integrated into the framework of the cultural and tourist development of the Sultanate.



# INTRODUCTION

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Wadi Bani Awf

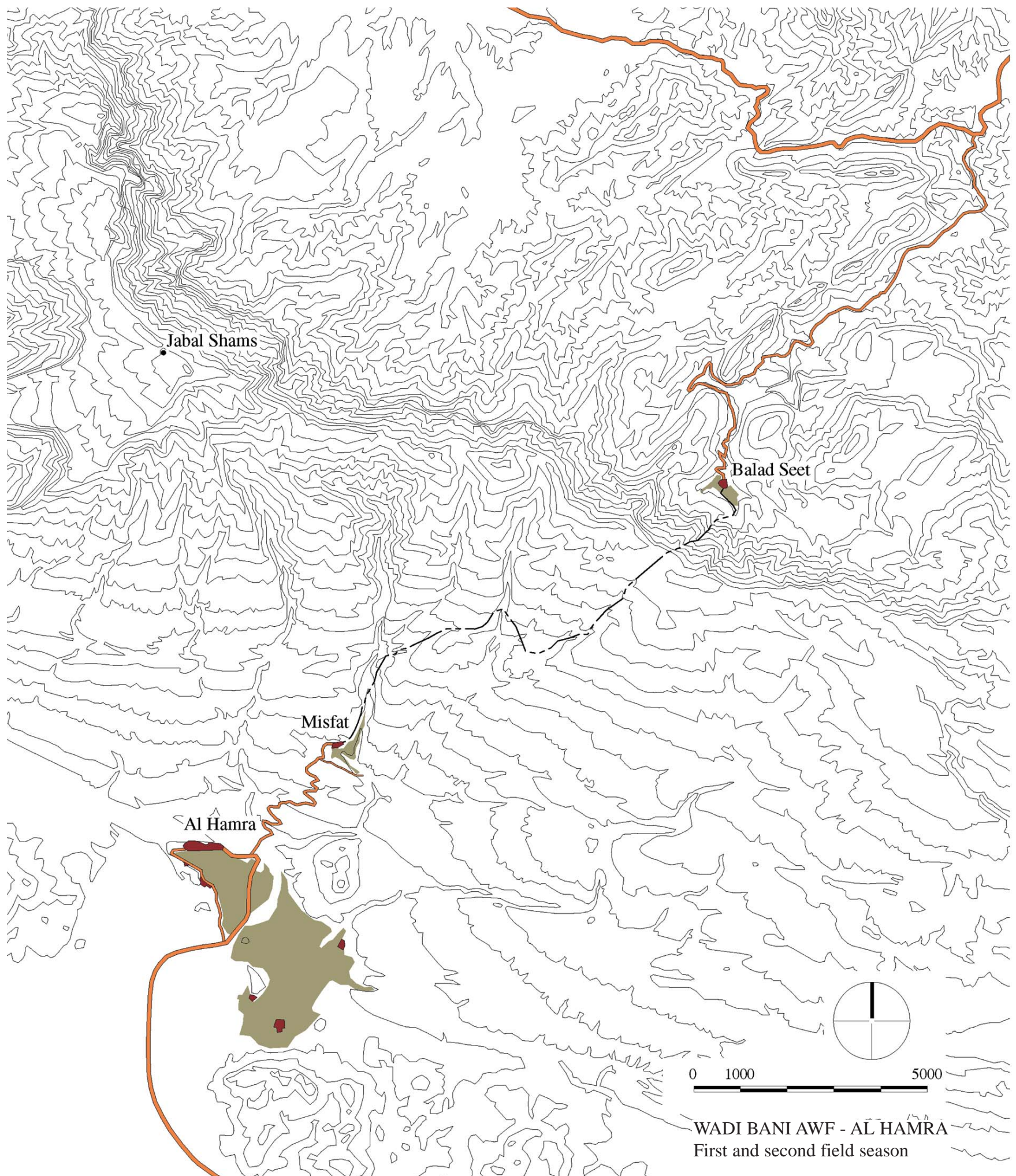


Wadi Bani Awf

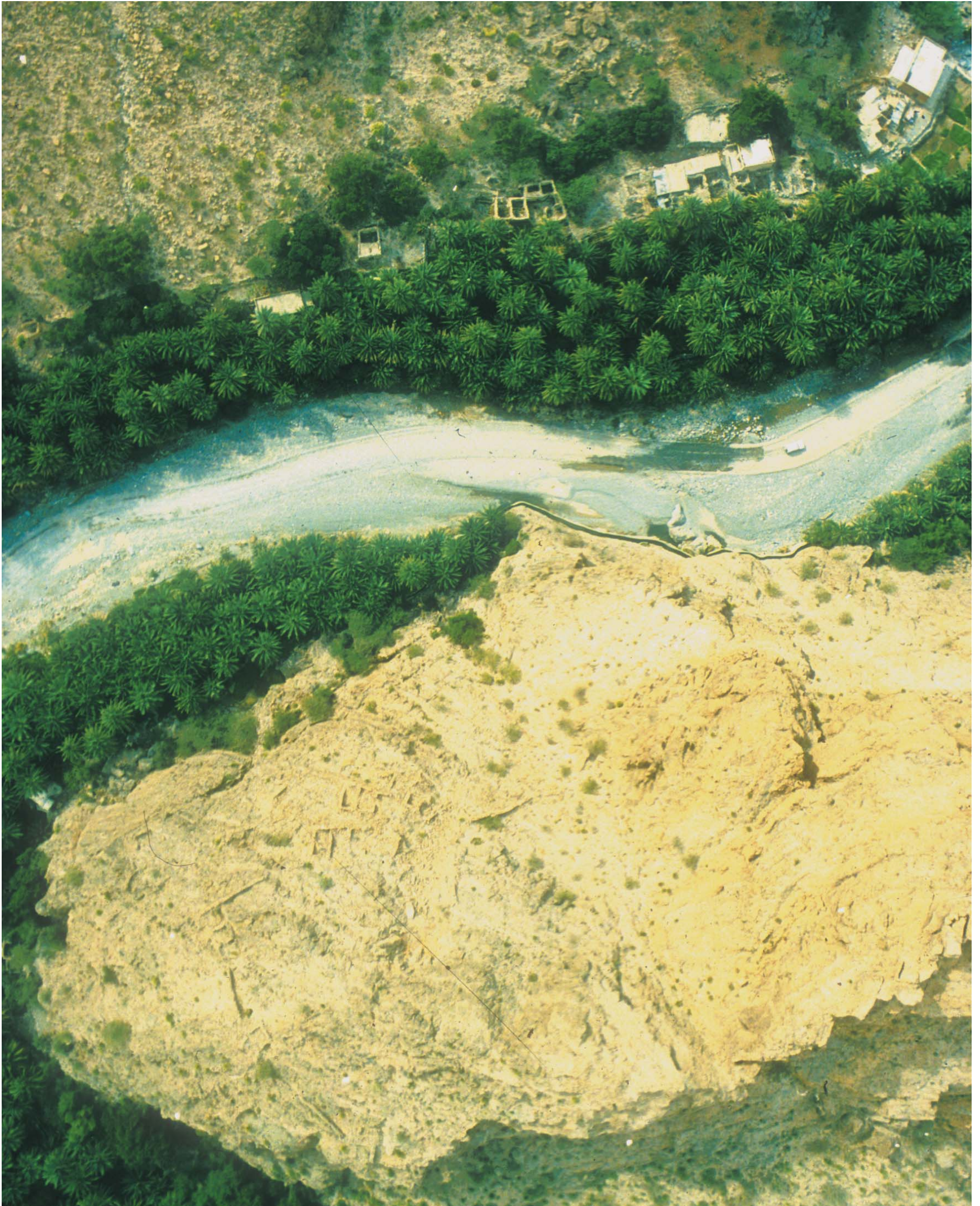


# INTRODUCTION

## TRANSECT: AL HAMRA / BALAD SEET





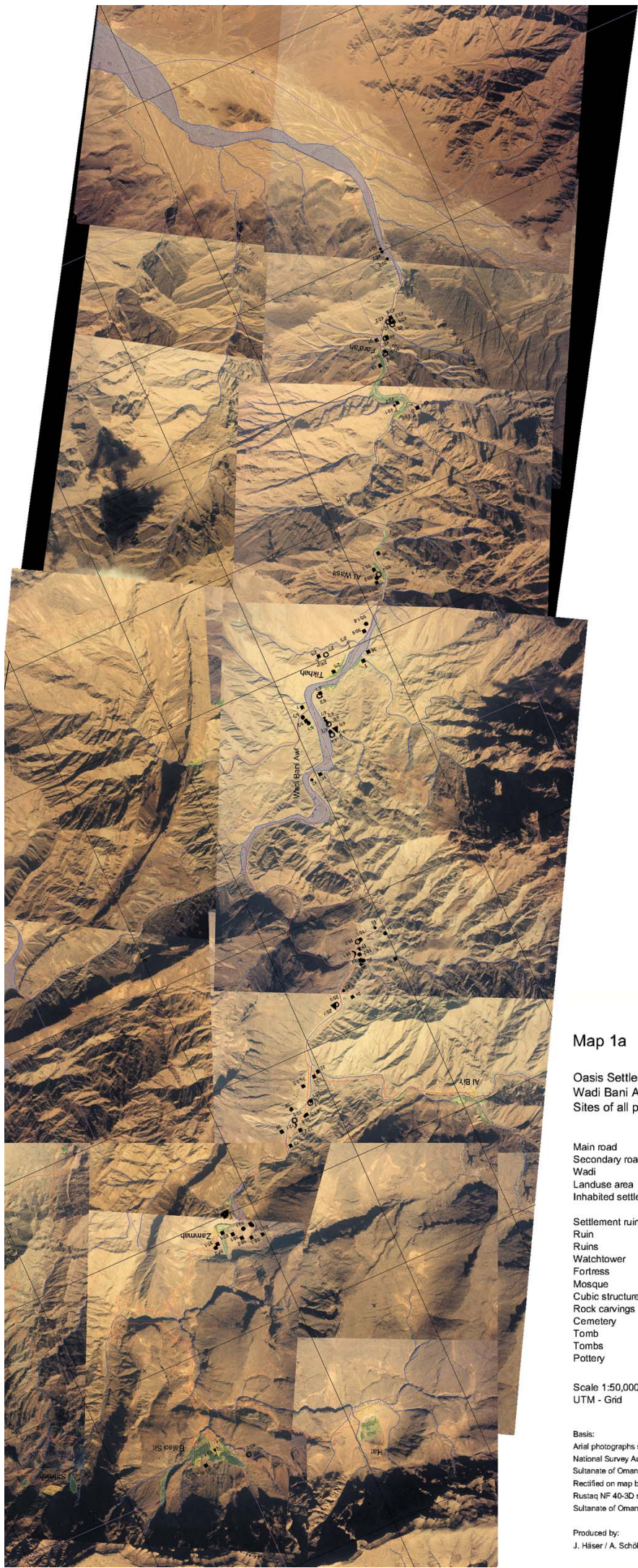


Salma



# ARCHAEOLOGY

## SETTLEMENTS



The oldest archaeological remains in the Wadi Bani Awf can be dated to the 3rd millennium B.C. These are large overground stone tombs of the beehive/Hafit-type. However, no settlement ruins have been found from this period. At this time the area was presumably used as pasture, and the camp sites of the shepherds have disappeared. The settlement occupation of the Wadi Bani Awf began in the Early Iron Age (1100-600 B.C.). Balad Seet is probably the most ancient settlement in the Wadi. According to the pottery finds, this site was inhabited from the Early Iron Age until today. Only pottery sherds but no architectural remains of the ancient periods have survived due to continuous habitation at the site. The lower parts of the Wadi Bani Awf have been occupied since the Early Islamic Period (630-1055 A.D.) and increasingly since the Middle Islamic Period (1055-1500 A.D.). All domestic architectural remains in the Wadi can be assigned to the Late Islamic Period (1500-1750 A.D.) or to modern times.



Underground tomb of the Wadi Suq Period or the Samad Period



Tomb of the 3rd millennium B.C.

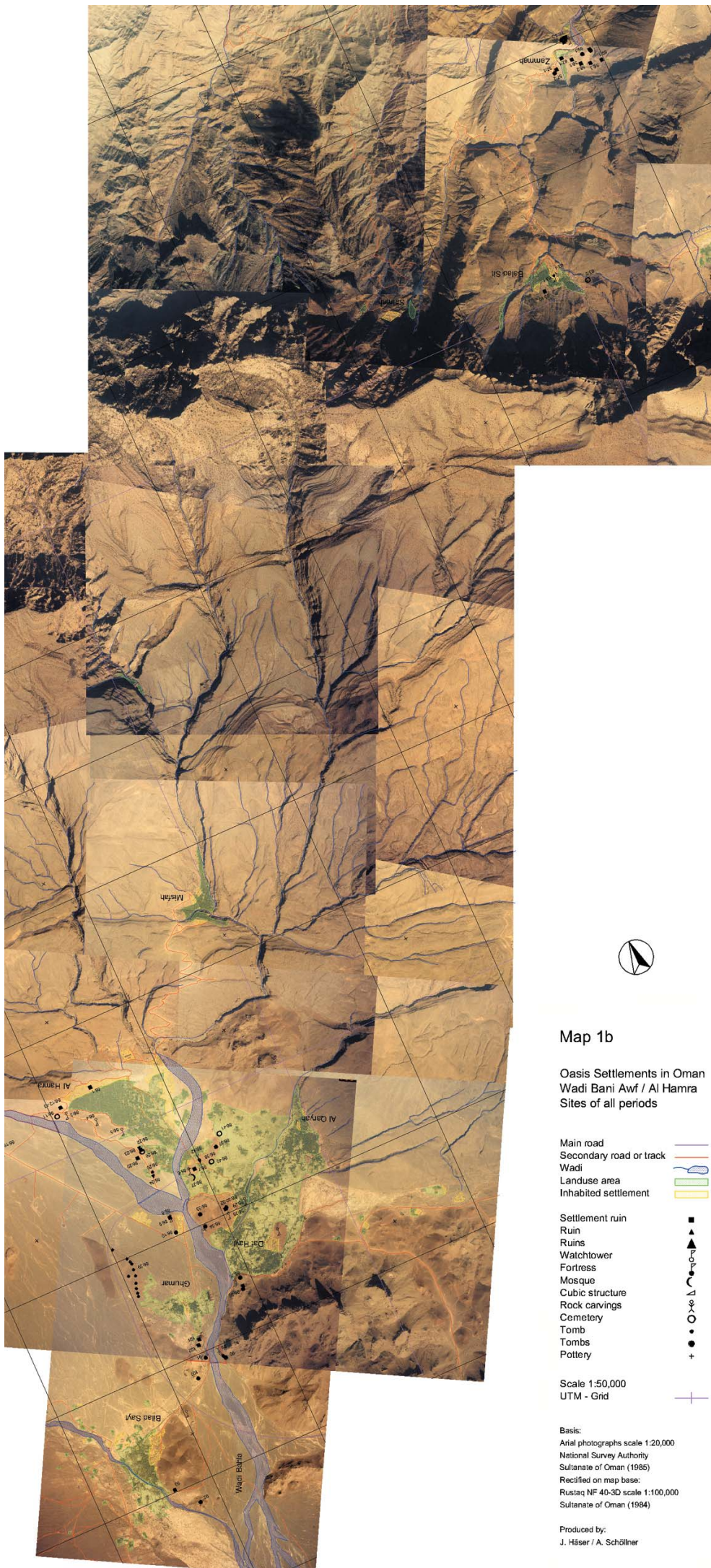


Gate to the ancient settlement above the modern oasis Fara ah



# ARCHAEOLOGY

## SETTLEMENTS



The Al Hamra region was probably settled during the Early Iron Age (1100-600 B.C.) for the first time. Two settlement ruins of this period have been found south of the modern town of Al Hamra. In the vicinity many tombs of different types but probably the same date have been discovered as well. However, no remains of the following Late Iron Age (300 B.C.-660 A.D.) could be found. Settlement activities seem to have started again in the Early Islamic Period (660-1155 A.D.). Pottery of this period was found close to the Hisn Khawr tower which is situated on a small hill south of Al Hamra. On the slopes of this hill old settlement ruins have been discovered which can be dated to the Late Islamic Period (1500-1750 A.D.) and probably even earlier, that is the Middle Islamic Period (1155-1500 A.D.). An old mosque is located at the foot of the hill. The town of Al Hamra was founded at the end of the 17th century A.D. No ancient ruins or even pottery of earlier periods have been found in the town.



Settlement ruin of the Early Iron at the foot of a watchtower



Hisn Khawr: old tower



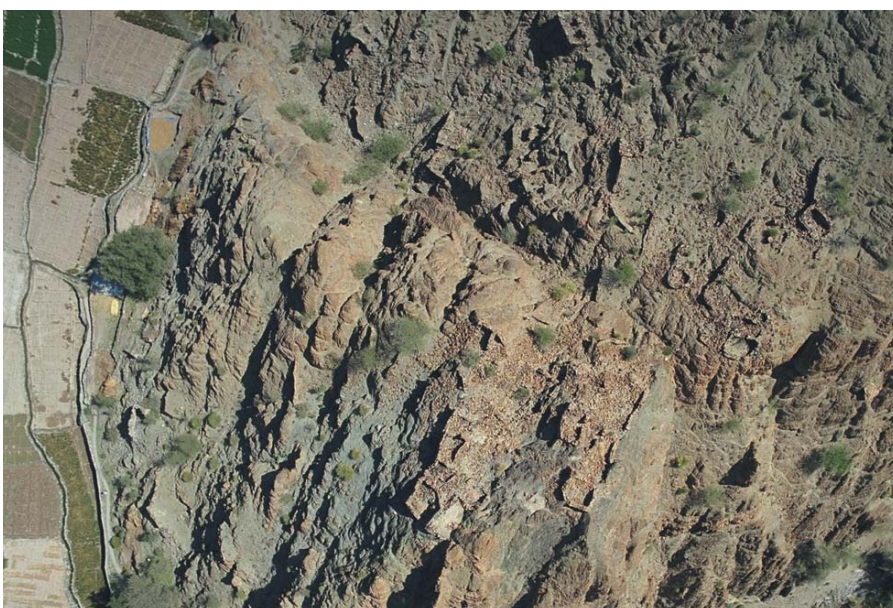
# ARCHAEOLOGY METHODS



Preparing the balloon to take aerial photographs



Taking aerial photographs with a ballon at Al Hamra



Aerial photograph at low altitude of the ruins of the old village of Zammah

Various scientific methods were used for the archaeological survey of the area under study. The survey has been prepared by studying aerial photographs of the National Survey Authority of the Sultanat Oman. Many features could be recognised and were marked on the photographs. Later, all of these points were visited during our field survey, and the different find spots were recorded with a Global Positioning System (GPS). The aerial photographs were also used to draw up the maps 1a and 1b of the study area with the help of a special computer software. All archaeological sites have been marked on these maps. After an inspection of our study area we decided to take photographs of the most important deserted settlements at a low altitude with the help of a balloon. These photographs were used to draw sketch plans of these sites. On the basis of these plans it is possible to investigate the architecture of the old villages. However, most important was the collection of pottery sherds, for they are a great assistance in dating the ancient tombs and settlements. We scrutinize the sherds to find out the methods of production and exchange systems, among others.

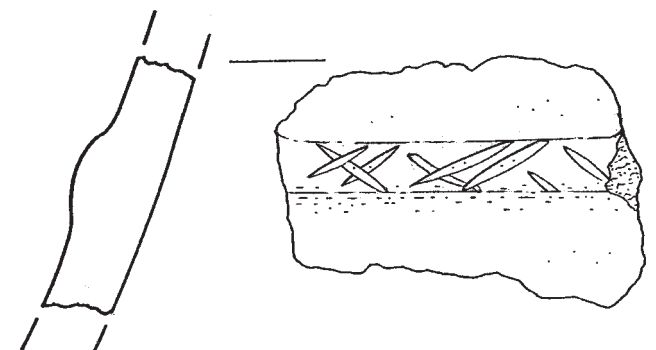


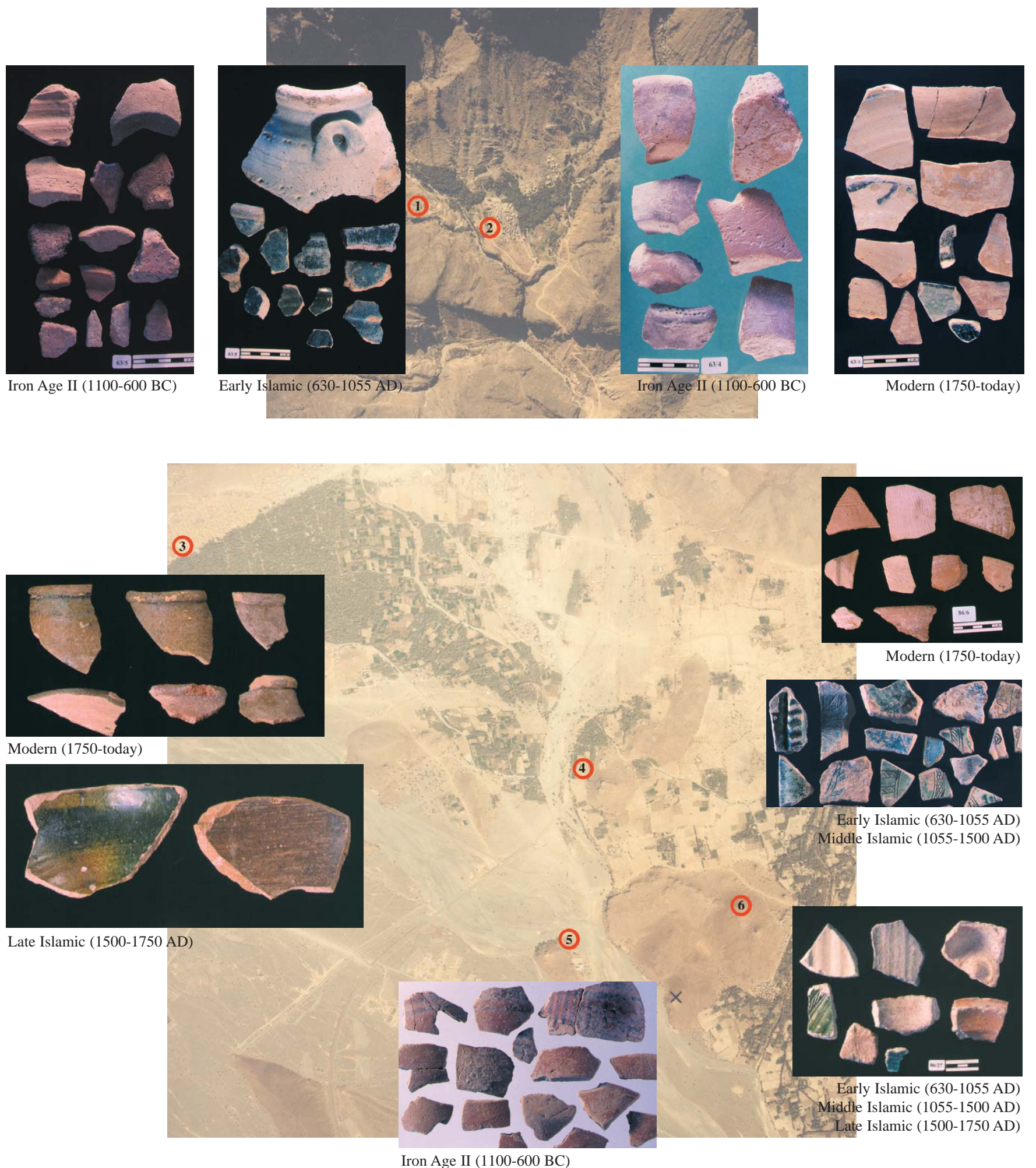
Foto and drawing of an Early Iron Age pottery sherd from Balad Seet





# ARCHAEOLOGY METHODS

About 50 old settlements have been found in the study area. They can be dated by the pottery found in the ruins. Two of the most ancient settlements in the study area are Balad Seet and Al Hamra. Due to the existence of arable land and sufficient water supply they have been occupied since the Iron Age, however not always on the same spot but at shifting places.



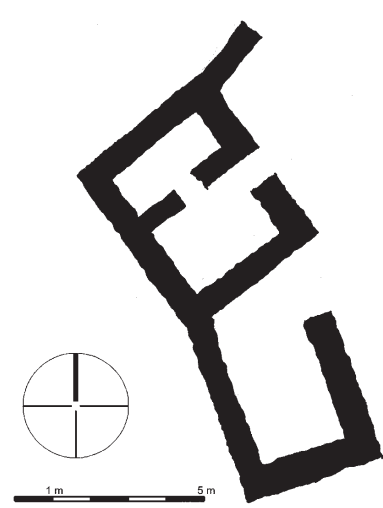


# ARCHAEOLOGY

## ABANDONED HOUSES SITE 19



House C



House C



House C

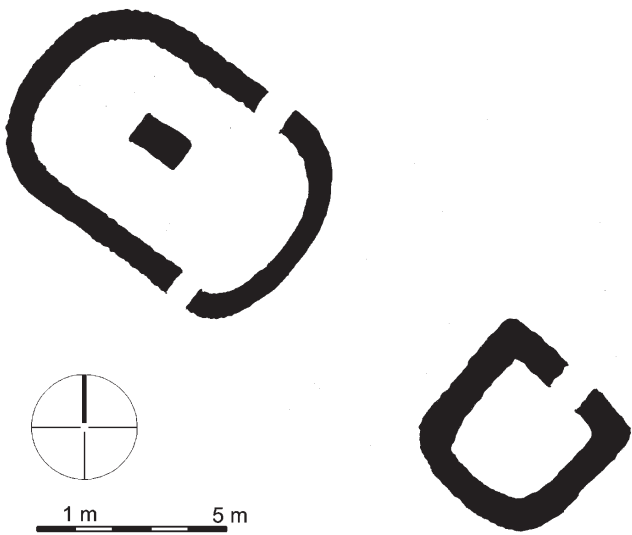


ARCHAEOLOGY

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ABANDONED HOUSES SITE 19

House A

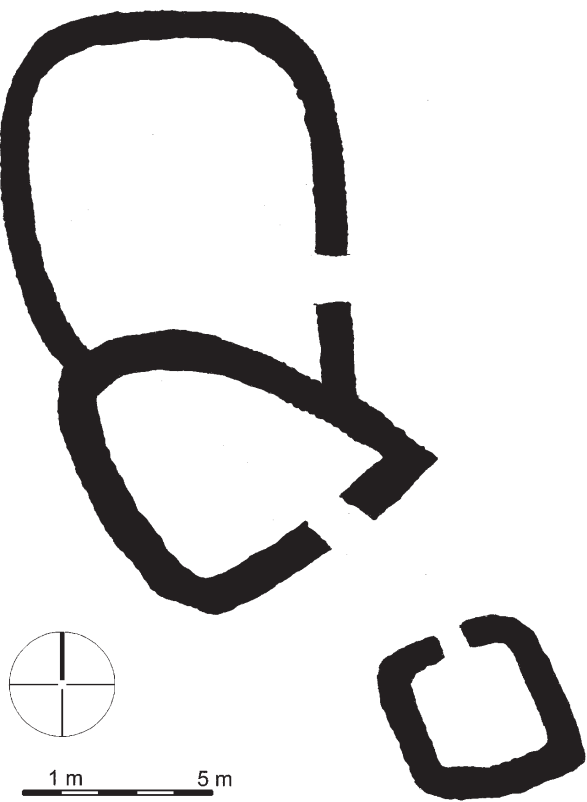


House A



House A

House B



House B



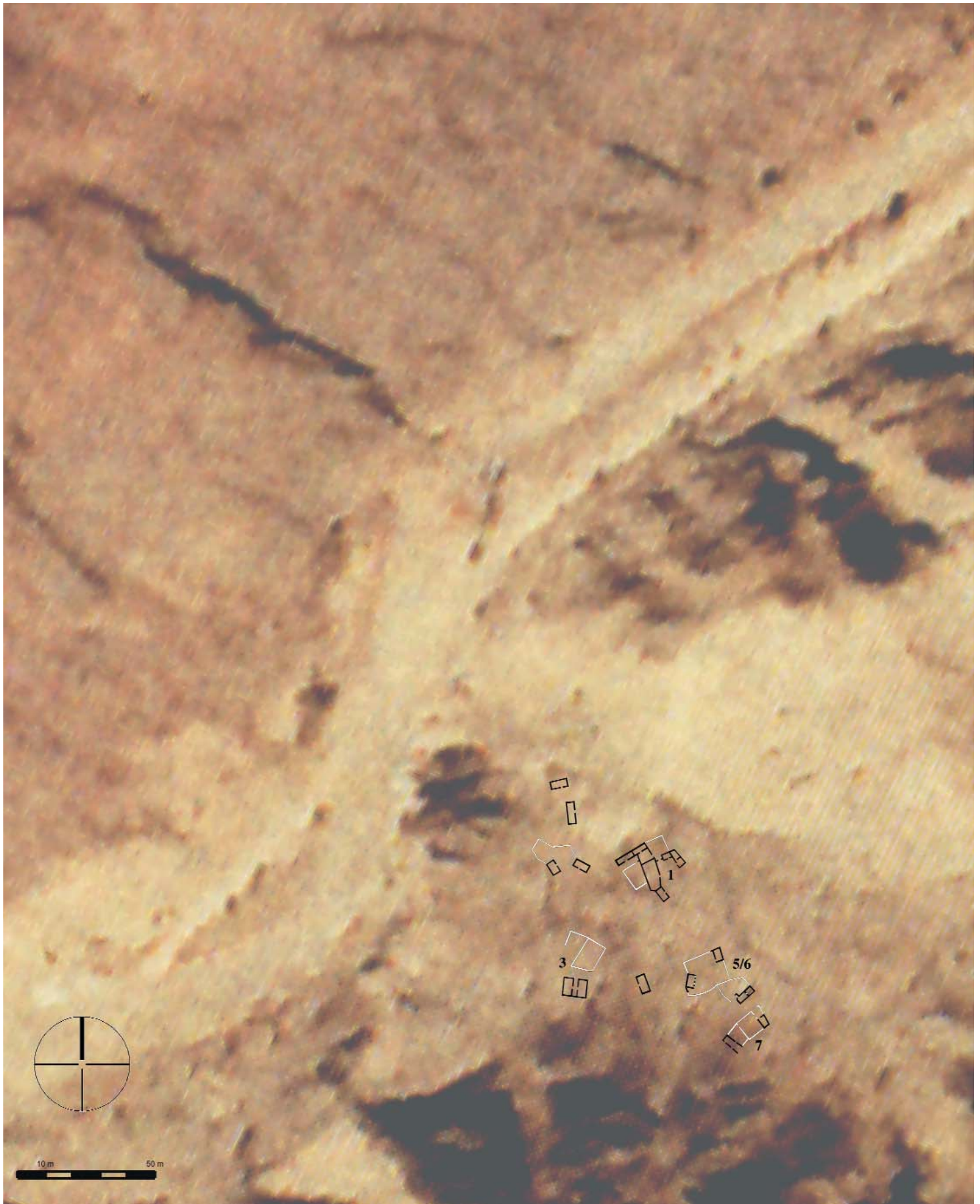
House B



# ARCHAEOLOGY

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## ABANDONED HOUSES SITE 24

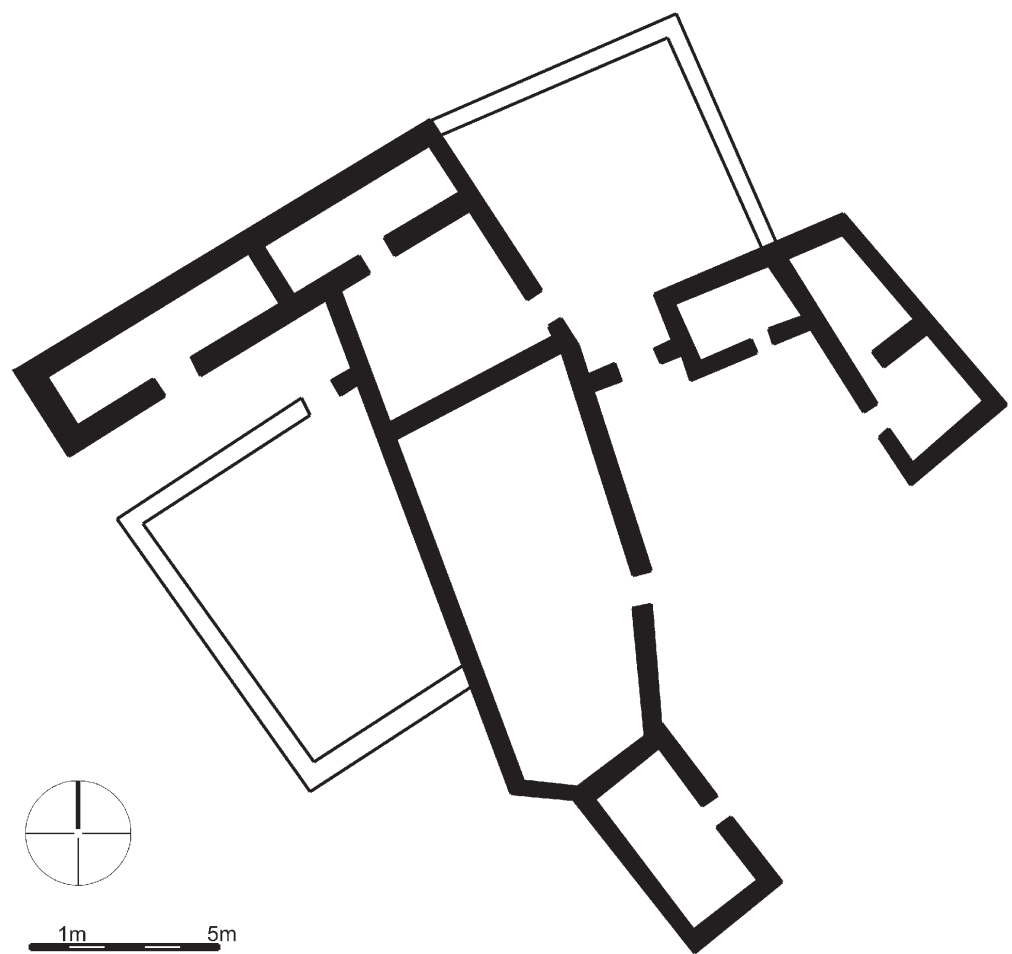




# ARCHAEOLOGY

## ABANDONED HOUSES SITE 24

House No 1



House No 1

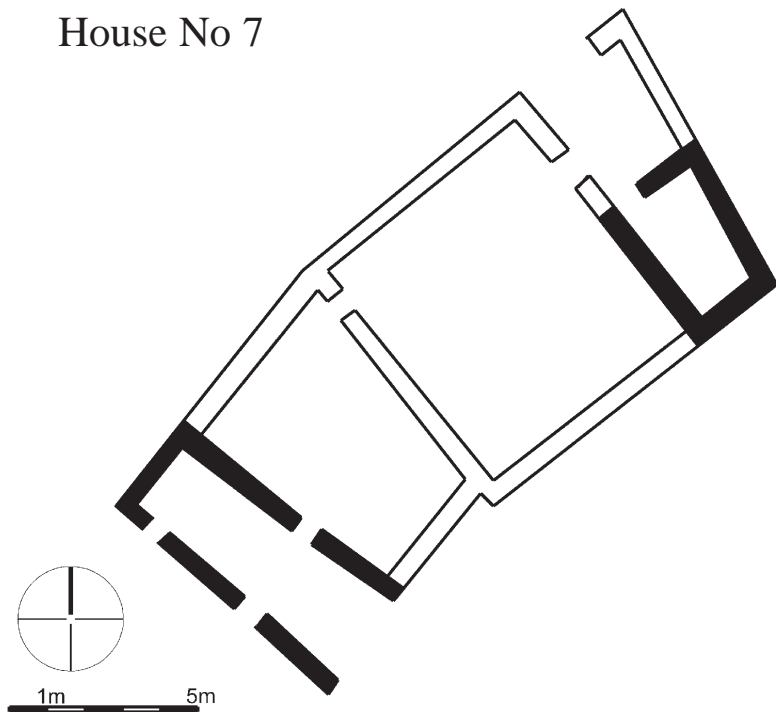


House No 1



House No 1

House No 7



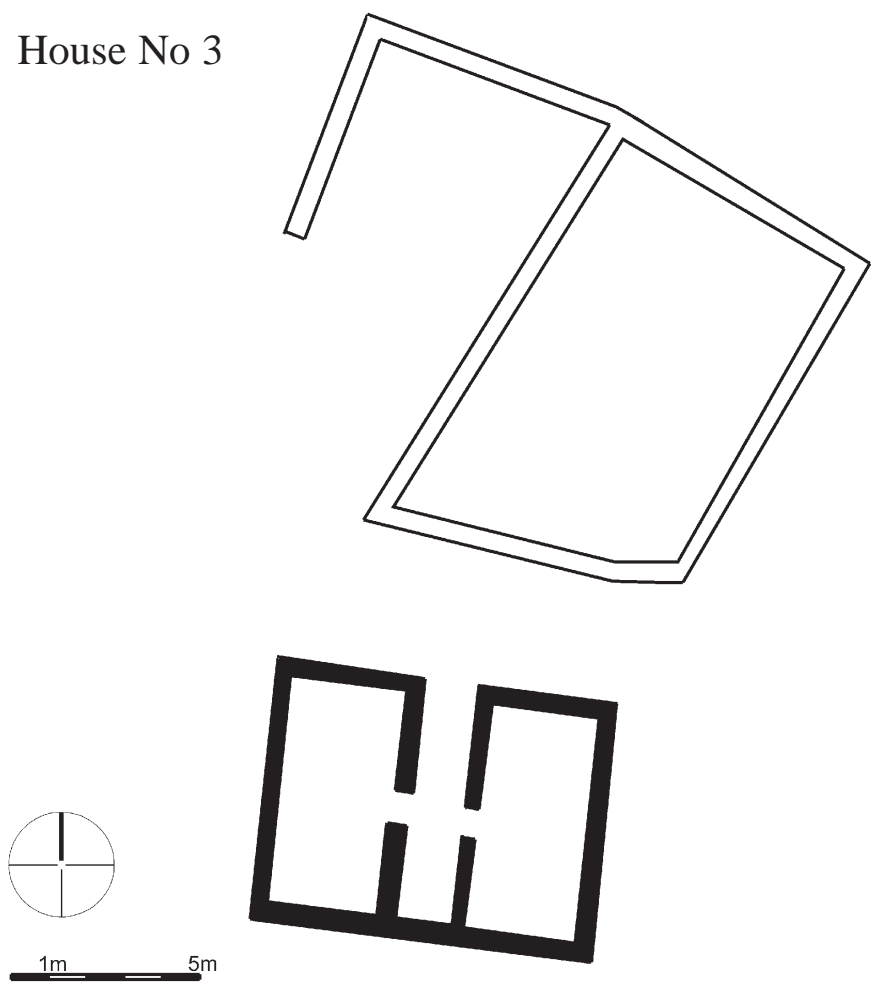
House No 7



# ARCHAEOLOGY

## ABANDONED HOUSES SITE 24

House No 3

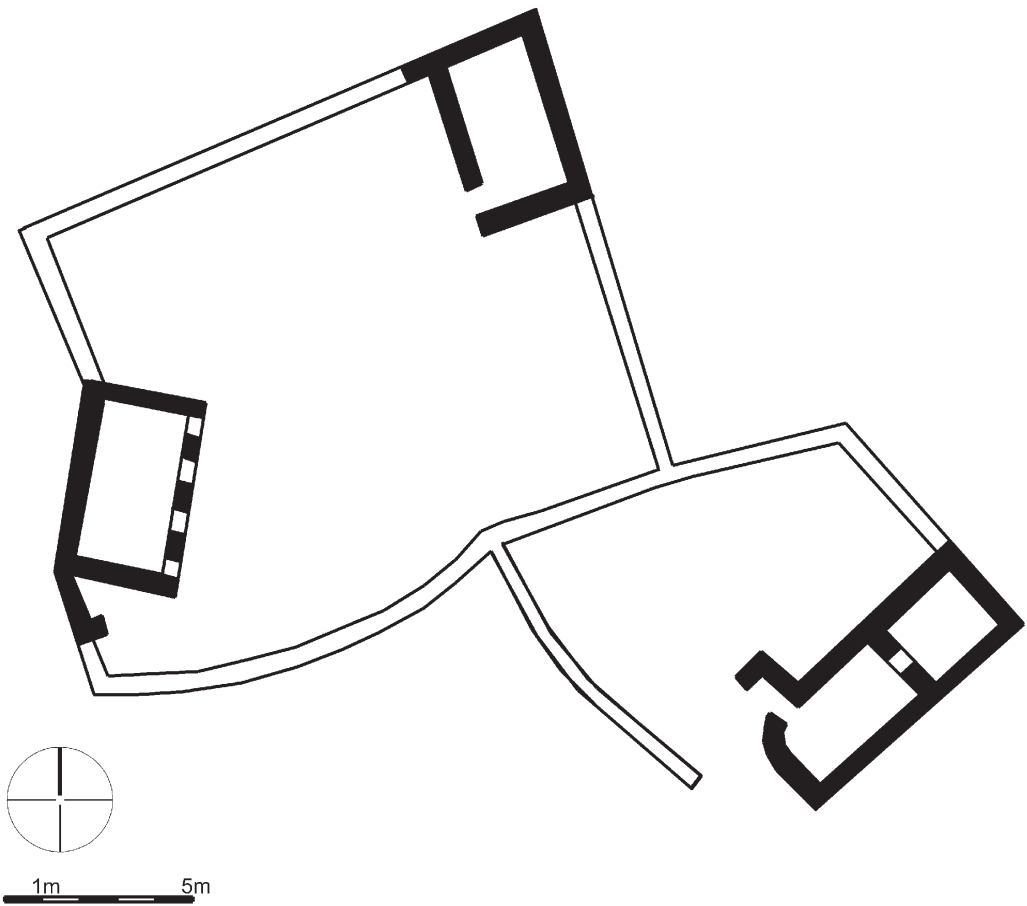


House No 3



House No 3

Houses No 5/6



Houses No 5/6



Houses No 5/6



# HISTORY DOCUMENTS





# URBAN ANALYSIS

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## AL HAMRA





## URBAN ANALYSIS AL HAMRA

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## URBAN ANALYSIS

### AL HAMRA

Al-Hamra, the traditional center of the Abriyin, was founded in the mid-17th century following the construction of the falaj. This falaj which is led to al-Hamra from the west determined the structure of the settlement into its very detail. The funnel-shaped oasis, the palm-gardens in the west, the grain and vegetable fields in the east, the layout of the parcels of land all depend on the irrigation system.

The historical city was built along a rocky slope next to the gardens in order to save cultivable ground. As much as the layout of the gardens and fields, the settlement structure was determined by the falaj. The position of the mosque and the souq, of the washing and bathing facilities and of richer and poorer houses depended on the availability and the division of drinking, washing and waste water. Along the falaj was the main road which served as the city's main axis, with some of the oldest houses. The alleys which lead to the main road are all interconnected. The street grid shows an approximately orthogonal pattern. Cul de sacs are only observed within larger building blocks. In the middle of the settlement an almost straight street leads through the built up area. This street marks the edge of the old settlement nucleus.

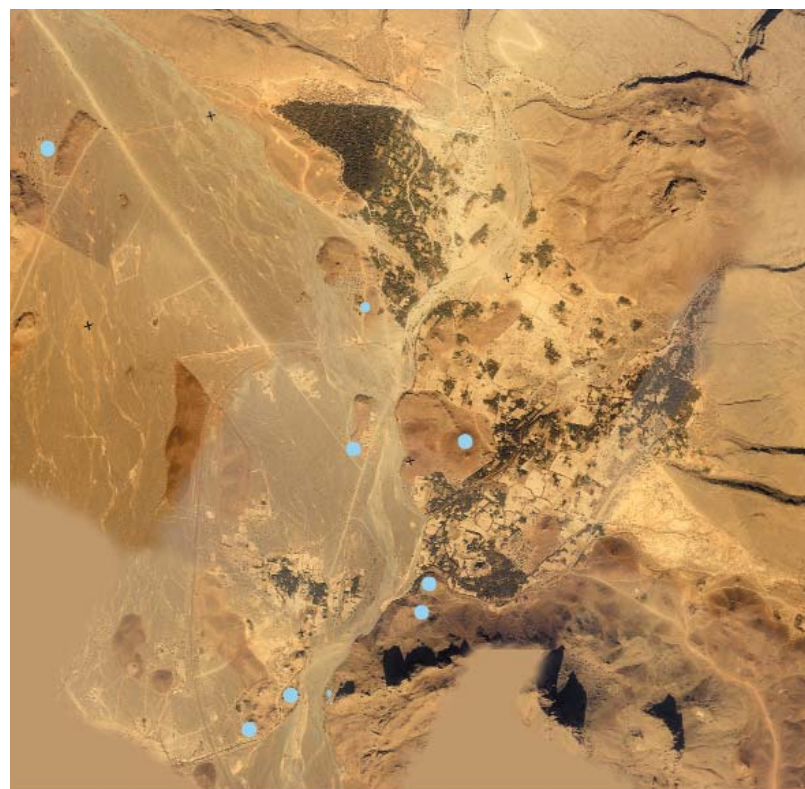
Al-Hamra has grown in several, still visible phases. The old settlement nucleus extended over ca. 7 hectares and 200 houses. With an estimated household size of 8-10 persons, the population might have numbered around 2000 inhabitants. The density of 300 persons per hectare was thus relatively high.

The analysis of the house-forms revealed that houses in al-Hamra have only small or no courtyards at all. They present a compact house type with an interior stair case and ventilation shafts in adaptation to the area's extreme summer temperatures for which even the classical courtyard house is inadequate. The mud-brick houses are vertically organized, with the dark, lower floor used for storage purposes, the upper floors for living purposes, and the roof terrace taking the place of the missing courtyard. On the constructive level, the building serves its different functions: the defensive, up to 80 cm thick walls of the ground floor are tapering towards the upper floors and give way to an almost fragile structure with numerous windows and niches, and the parapets of the roof terrace.

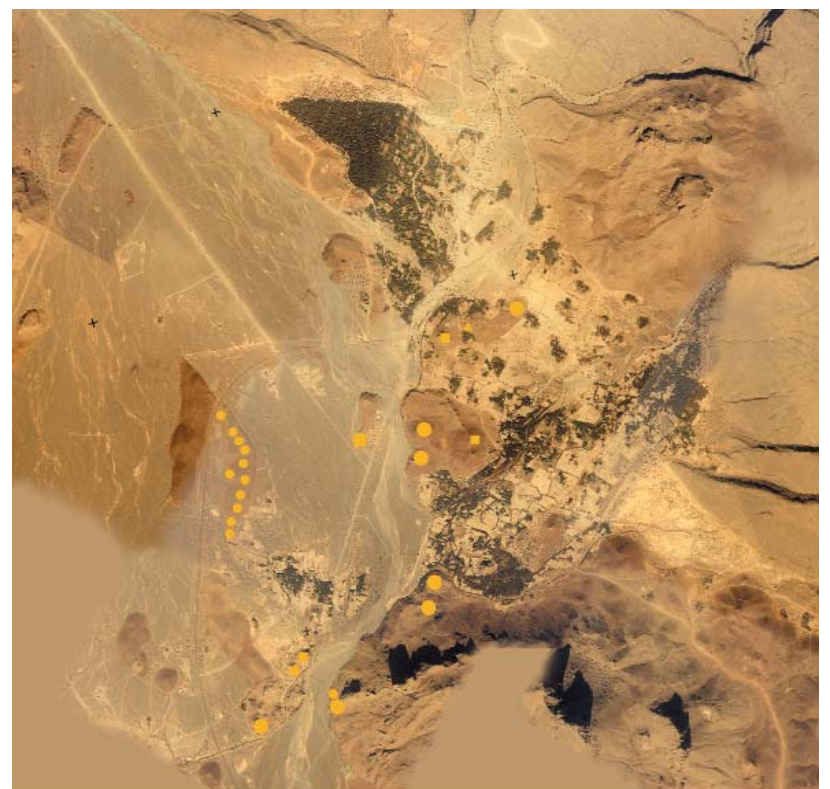


# URBAN ANALYSIS

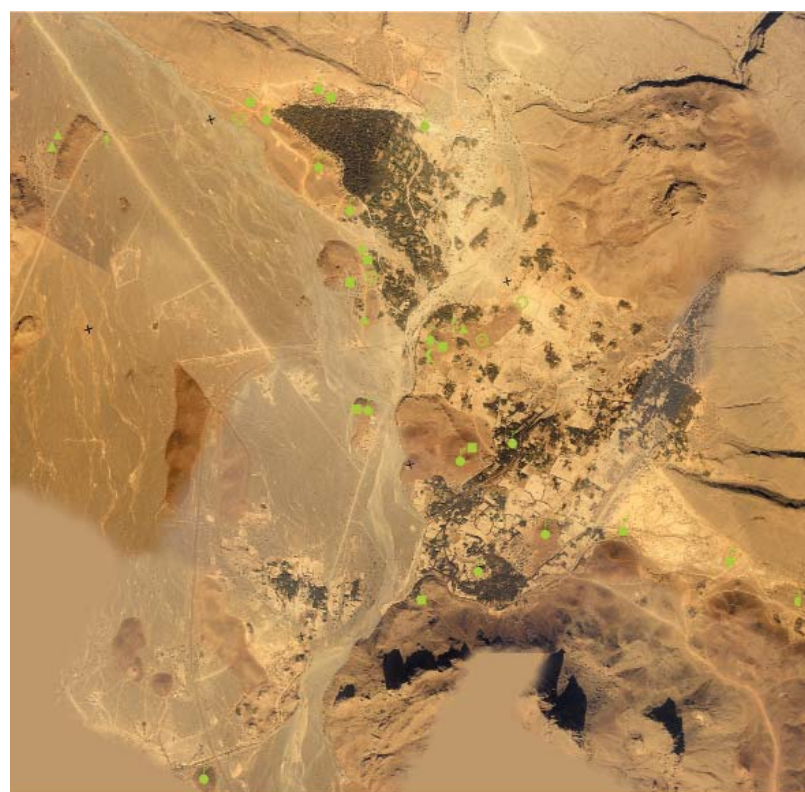
## AL HAMRA - ARCHEOLOGICAL SITES



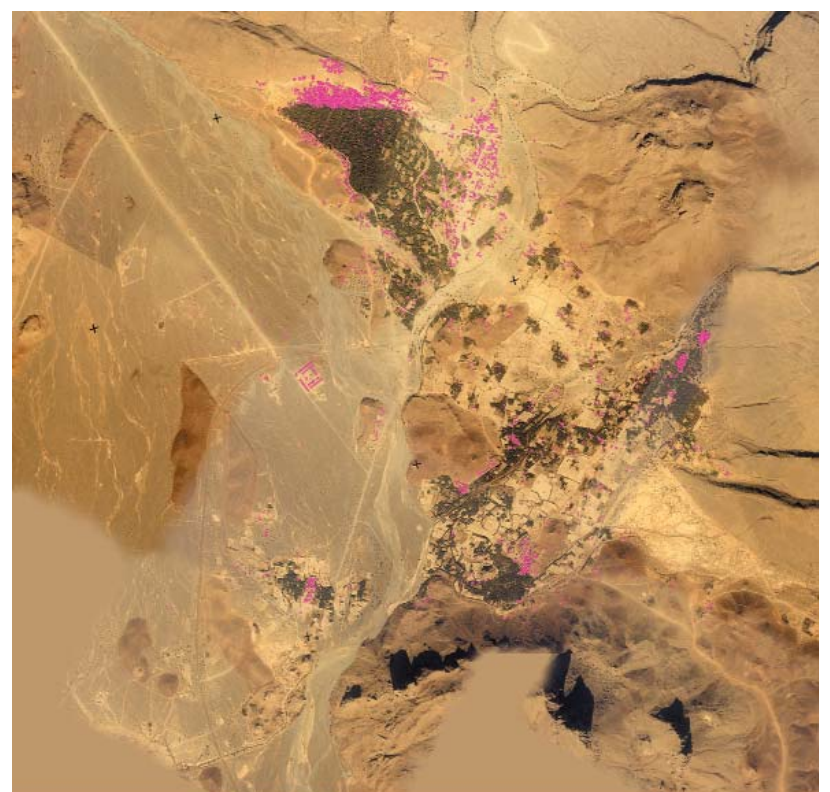
Prehistoric Sites:



Iron Age Sites:



Islamic Sites:



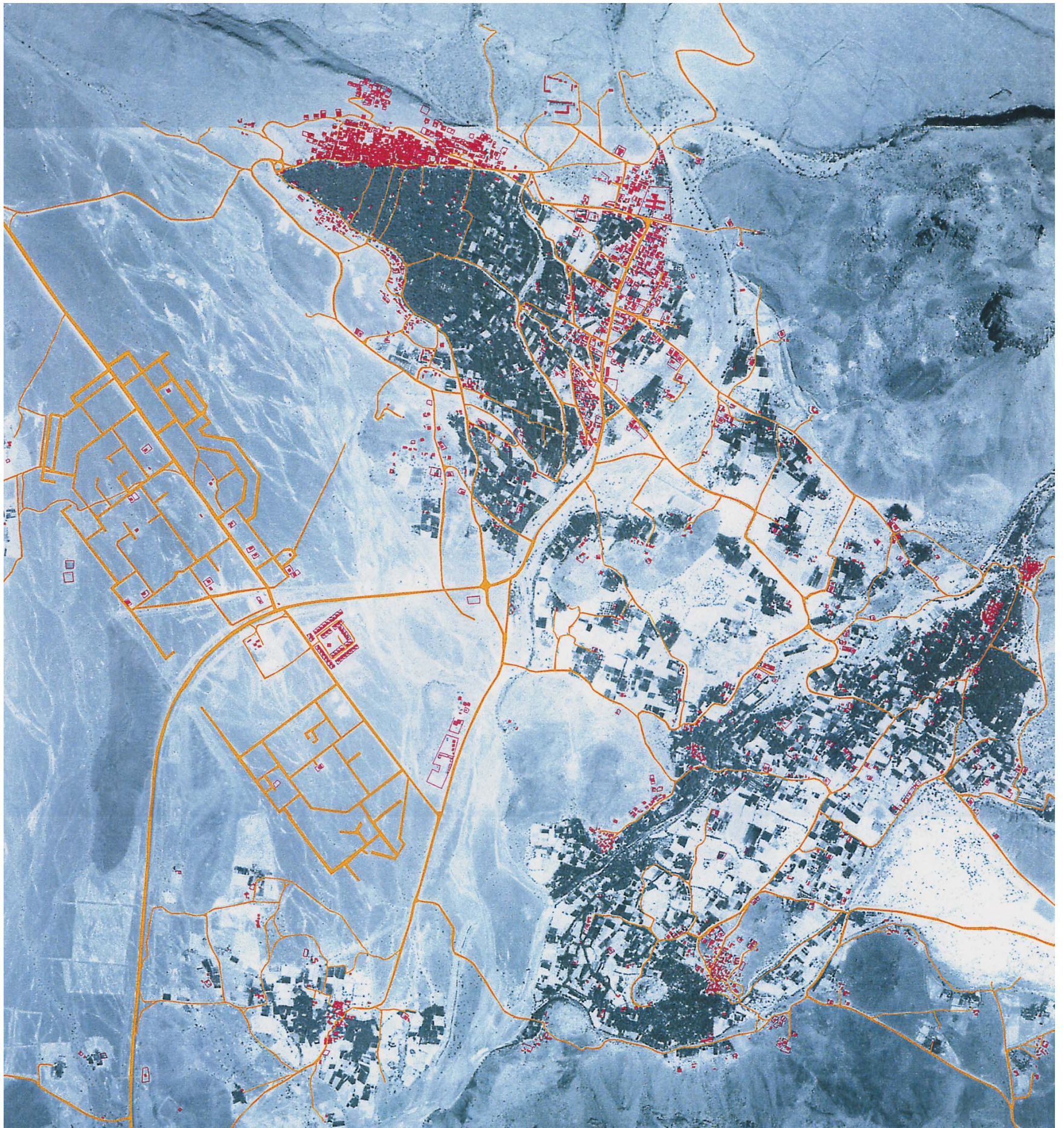
Settlements 1995:



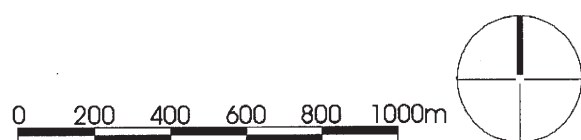


# URBAN ANALYSIS

## AL HAMRA - PRESENT SITUATION



Urban Structure 1995





# URBAN ANALYSIS

## AL HAMRA



View



Aerial Photo (high altitude), 1985

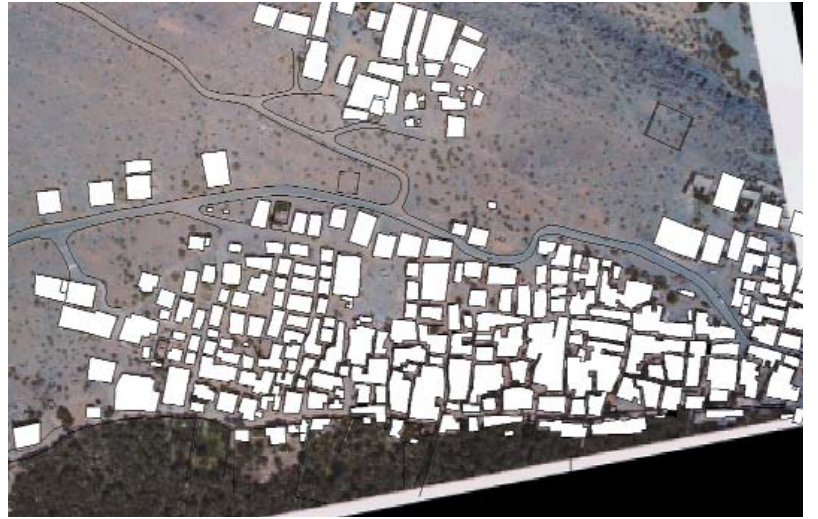


# URBAN ANALYSIS

## AL HAMRA



Aerial photo (low altitude)



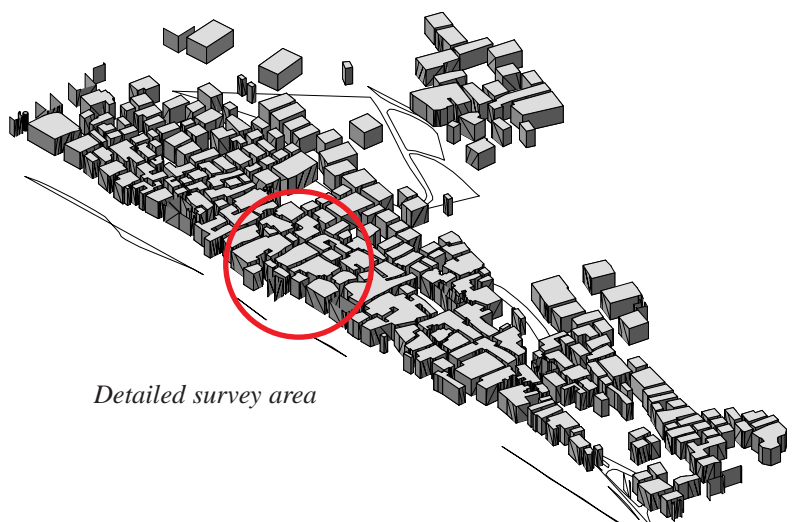
Georeferenced and rectified aerial photo



Topography



Built up area



Isometric view

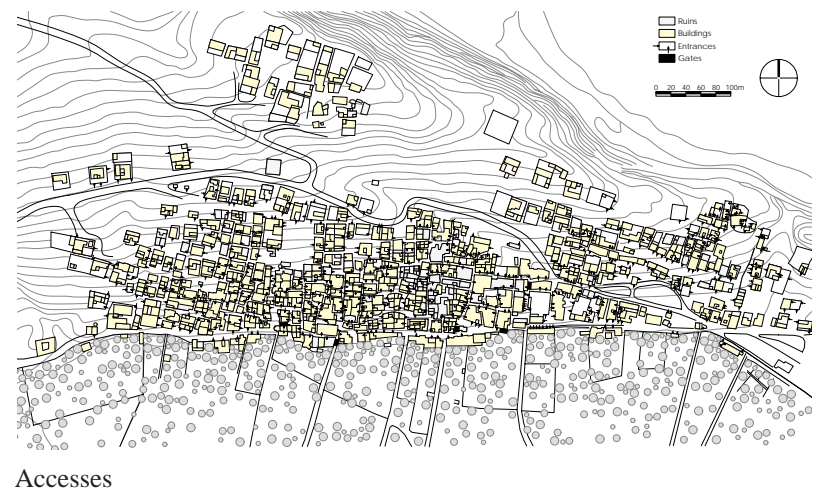
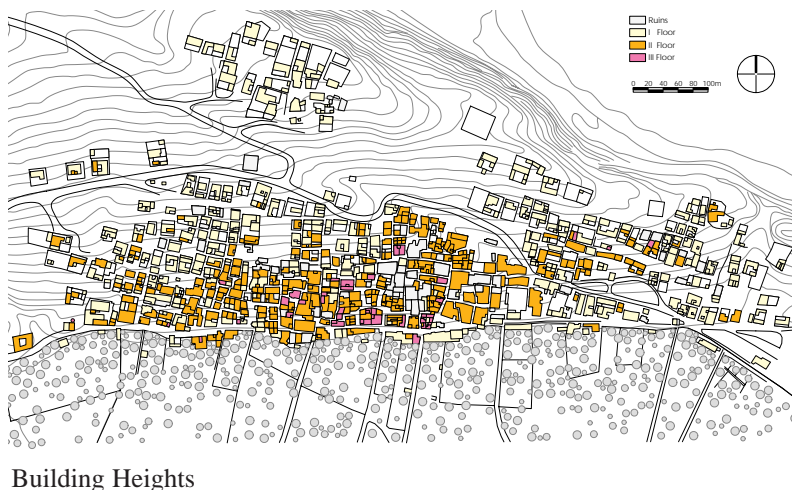


Public space



# URBAN ANALYSIS

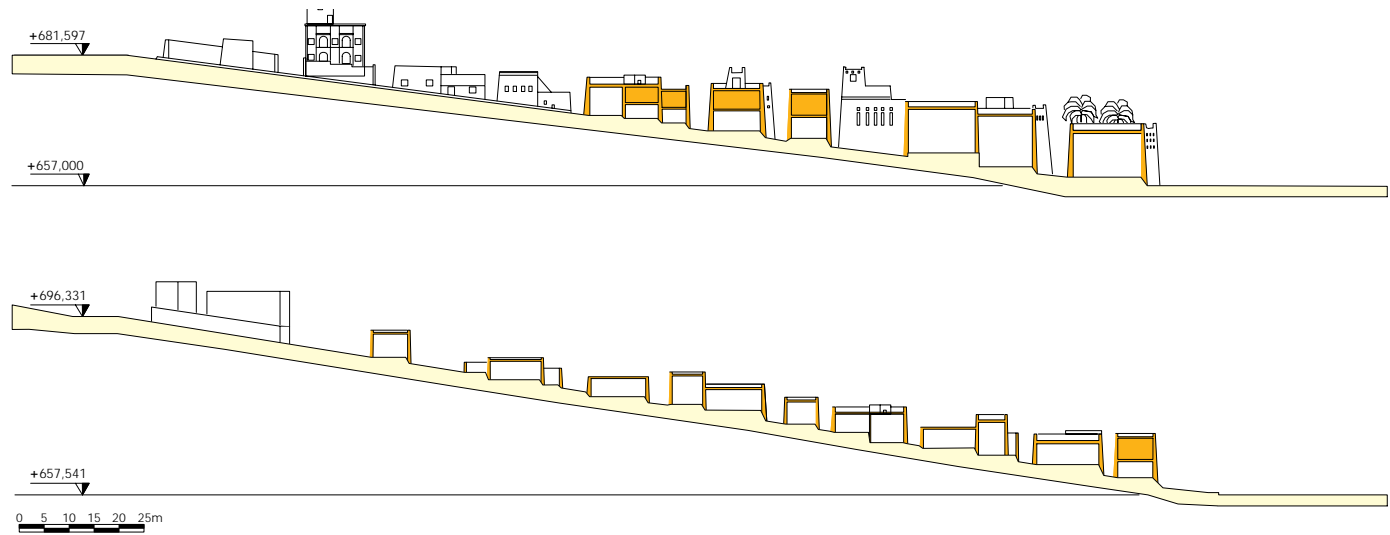
## AL HAMRA





# URBAN ANALYSIS

## AL HAMRA



Detailed Survey, Level 0



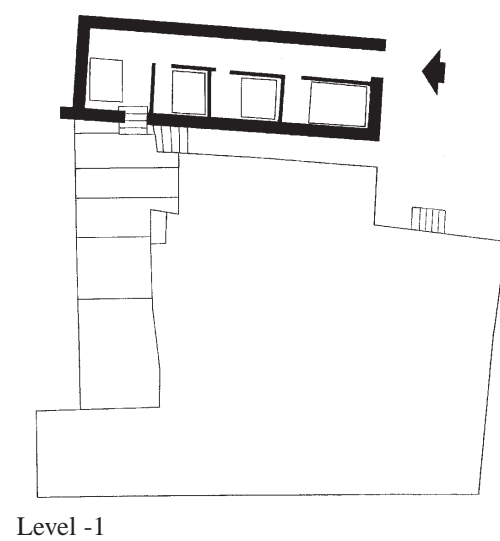
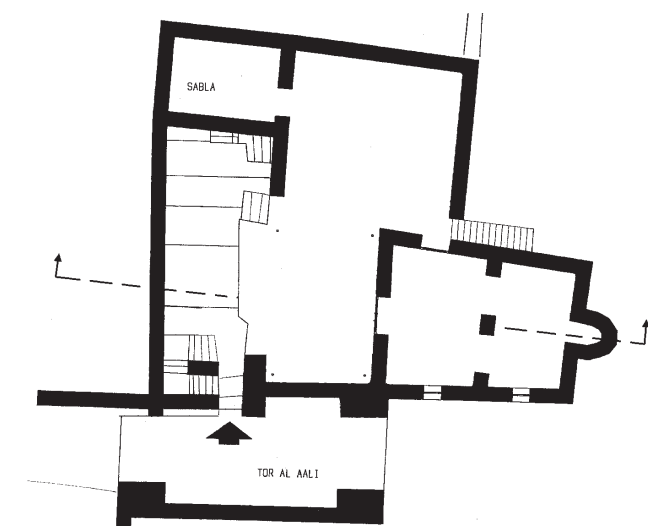
Detailed Survey, Level +1



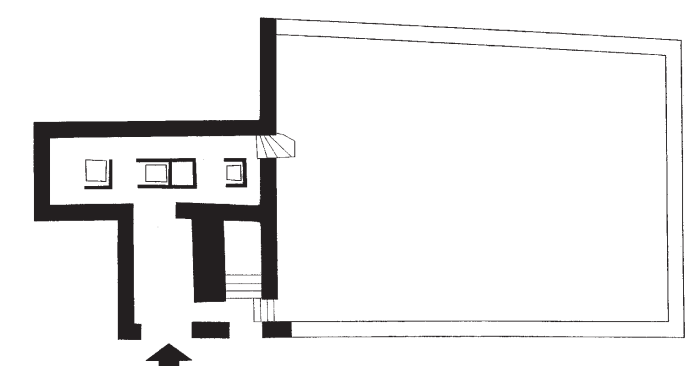
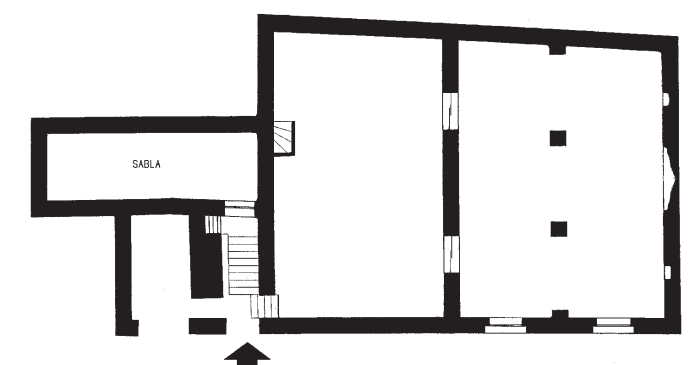
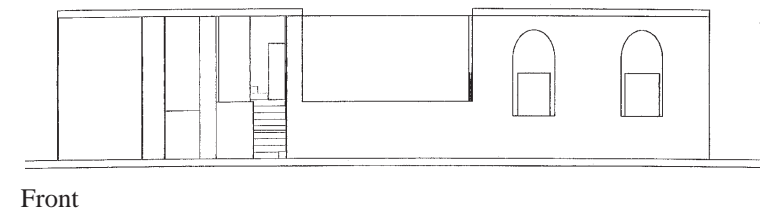
# T TYPOLOGY

## AL HAMRA - MOSQUES

Mosque Al Al i (Nr. 77)



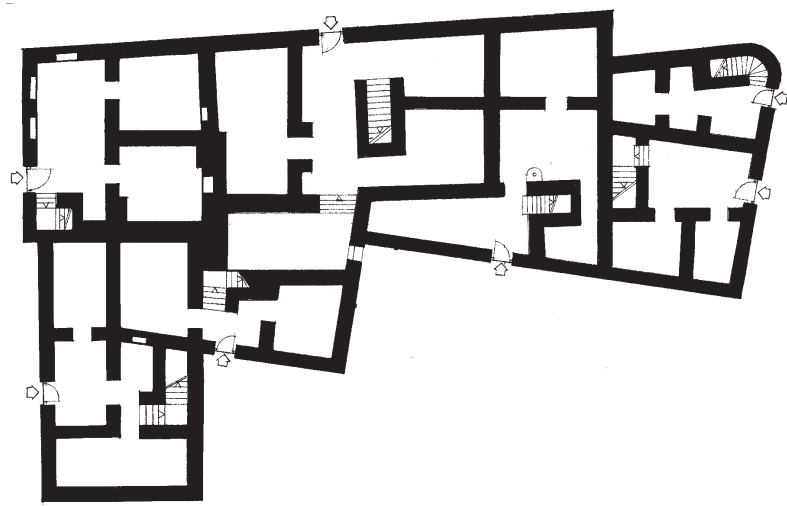
Mosque Al Salaf (Nr. 113)





# T TYPOLOGY

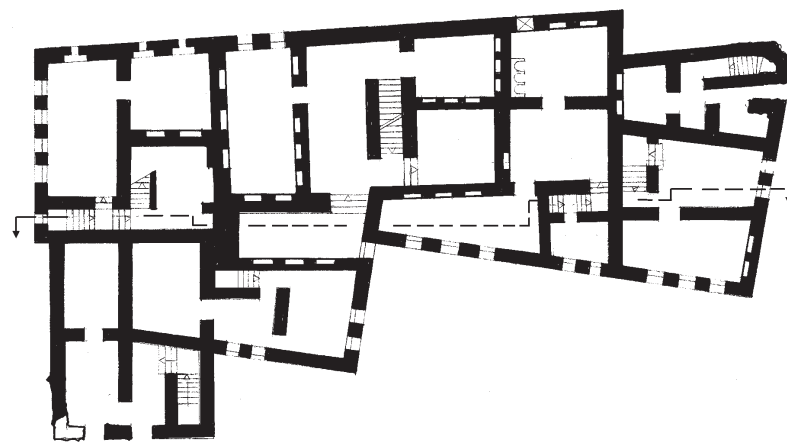
## AL HAMRA - HOUSE 89



Level 0



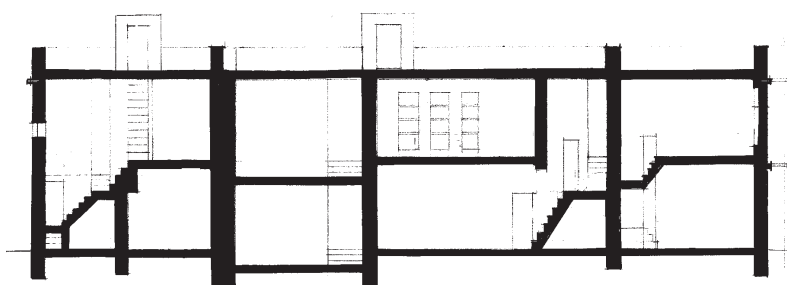
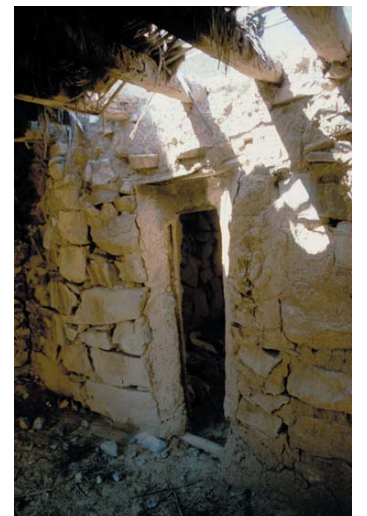
View from South



Level +1



View from West



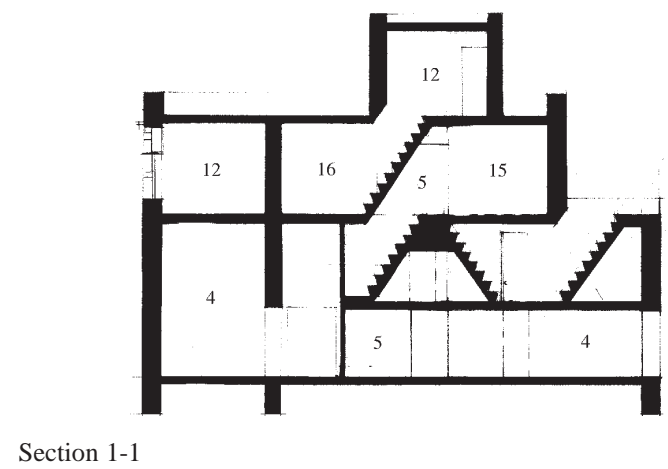
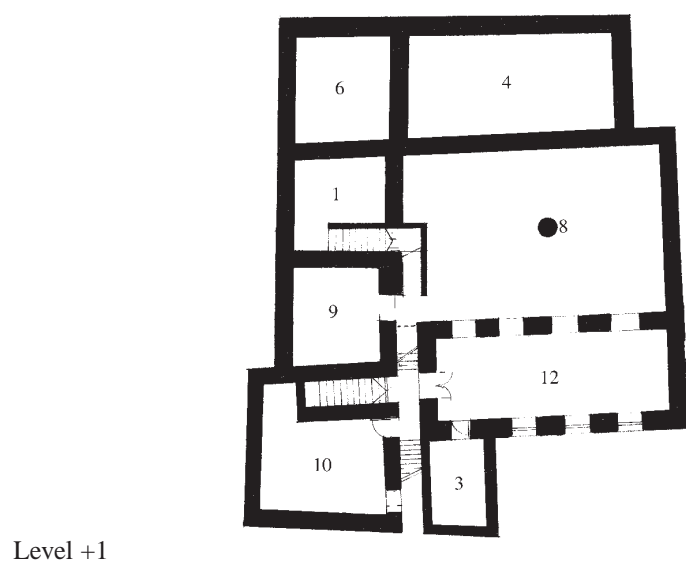
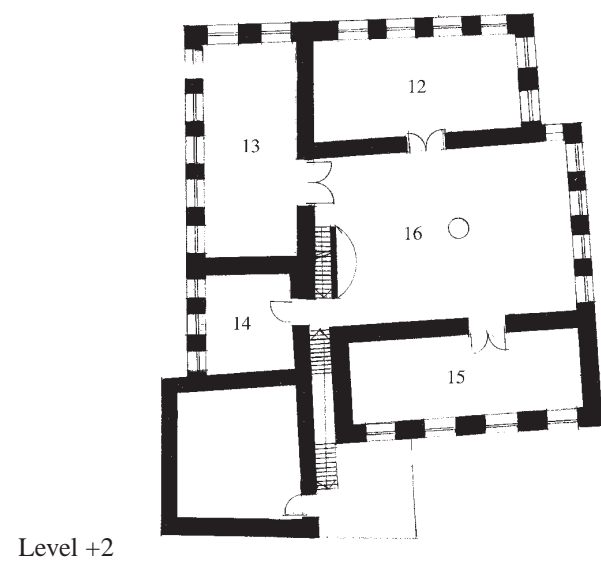
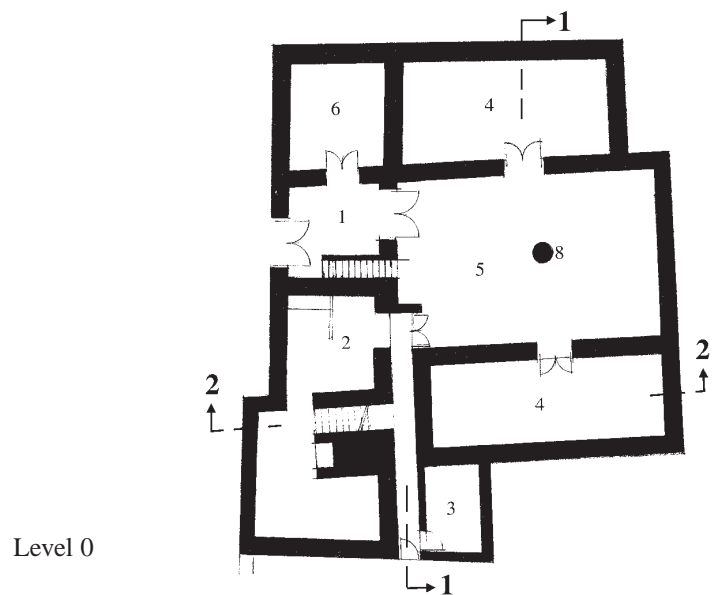
Section



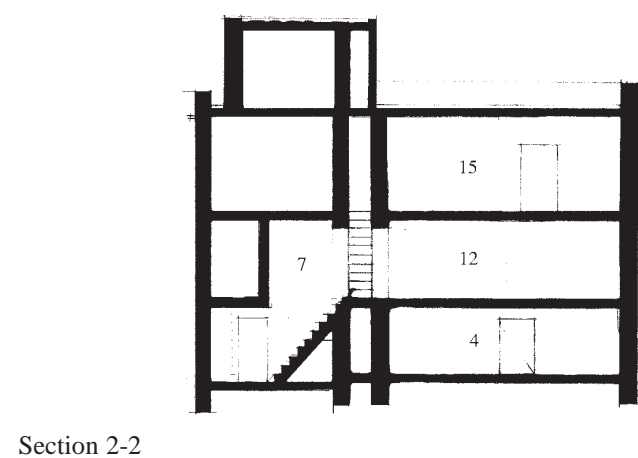


# T TYPOLOGY

## AL HAMRA - HOUSE 112



- |                                   |   |
|-----------------------------------|---|
| 1 sabah<br>receptionhall          | 10 gamera (sarga)<br>store (for fruit)              |
| 2 magaza<br>bathroom              | 11 gurfe<br>bedroom (in winter)                     |
| 3 matraba<br>toilet without water | 12 gurfe<br>rooms with windows on the upper floors  |
| 4 dars / surdja<br>stable         | 13 matbakh<br>kitchen                               |
| 5 dahriz<br>entrancehall          | 14 gurfe al al i, sabnat<br>room towards the hill   |
| 6 suffa<br>store                  | 15 al-gurfe al-garbiye, sabanat<br>room to the west |
| 7 durge<br>stairs                 | 16 gurfet al-mal, sabanat<br>gurfet-as-safil        |
| 8 santwane<br>column              | room towards the palm tree-<br>gardens              |
| 9 sabla<br>private entranceroom   | 16 magl is (arsa)<br>central room                   |





# TYPOLGY

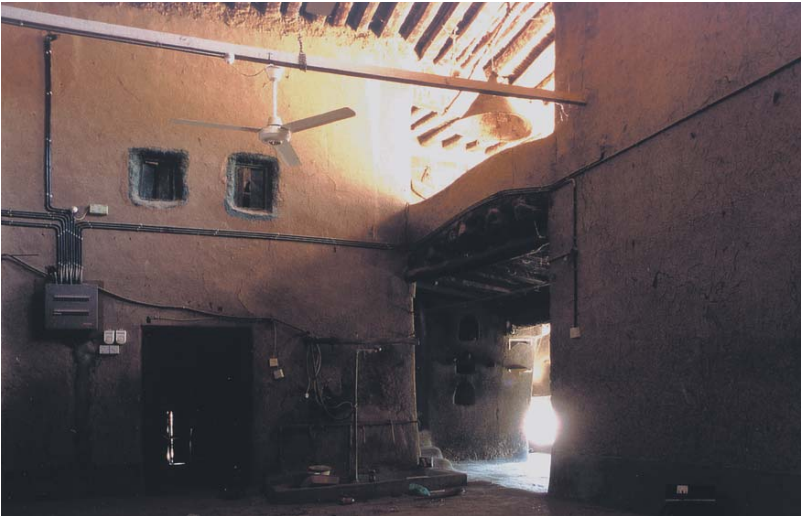
## AL HAMRA - HOUSE 118



Dahriz



Roof



Arsha



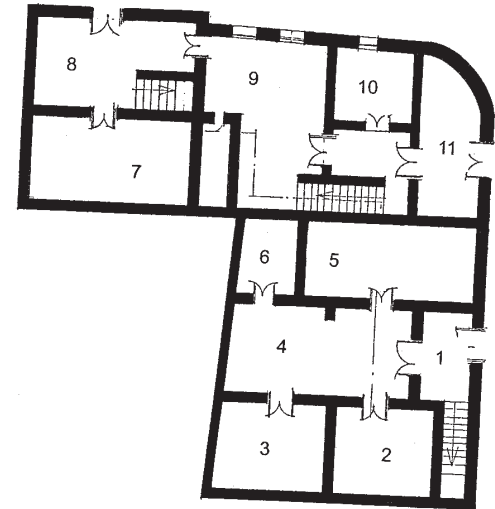
Staircase



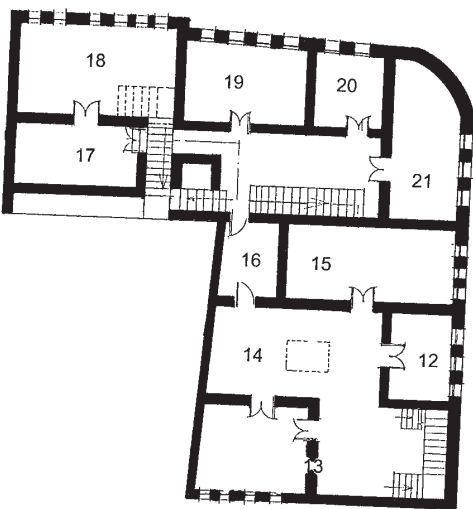
Inscription door



Inscription



Level 0



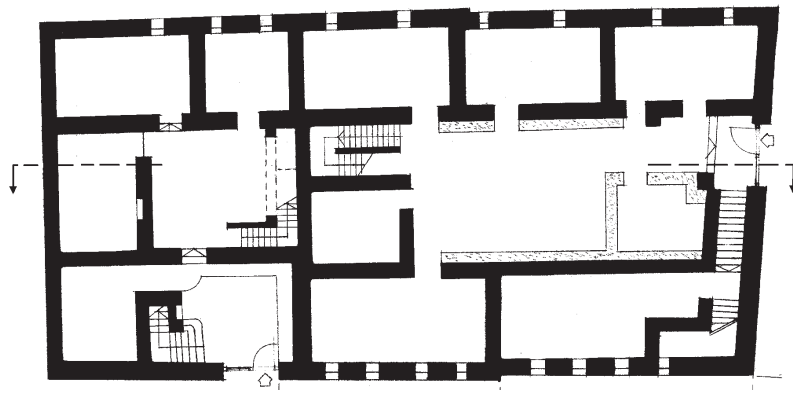
Level +1

- |                 |                |
|-----------------|----------------|
| 1 dahriz        | 12 hudjrat nom |
| entrancehall    | bedroom        |
| 2 hammam        | 13 hudjrat nom |
| bathroom        | 14 arsha       |
| 3 suffa         | reception hall |
| store           | 15 hudjrat nom |
| 4 dahriz        | store          |
| 5 suffa         | 16 makhtaf     |
| 6 suffa nadd    | corridor       |
| store for dates | 17 matbakh     |
| 7 dars / surdja | kitchen        |
| stable          | 18 dining room |
| 8 dahriz        | 19 hudjrat nom |
| 9 dahriz        | 20 hudjrat nom |
| 10 store        | 21 hudjrat nom |
| 11 dahriz       |                |

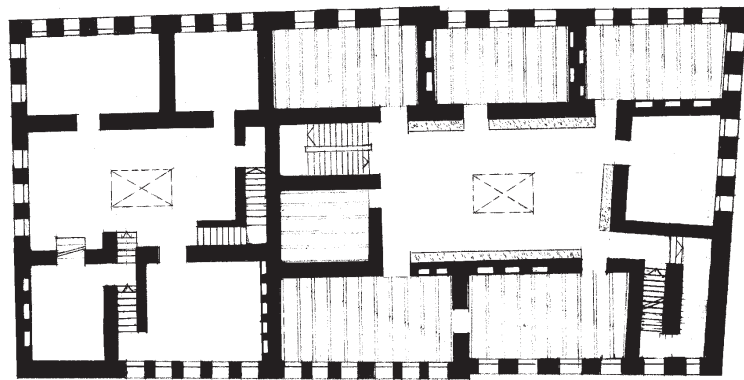


# TYOLOGY

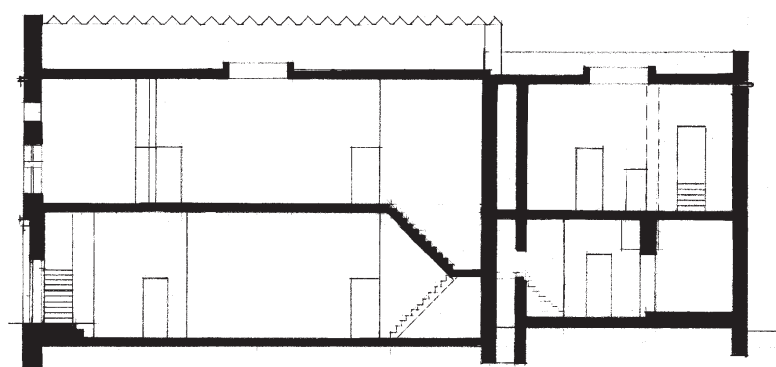
## AL HAMRA - HOUSE 119



Level 0



Level +1



Section





# URBAN ANALYSIS

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## BALAD SEET





# URBAN ANALYSIS

## BALAD SEET





## URBAN ANALYSIS

### BALAD SEET

Balad Seet is the largest village of Wadi Bani Awf. According to the population census of 1993 its population numbers 654 inhabitants belonging to 80 households living in 91 housing units.

The archaeological investigations carried out in and around the present village confirm the information of oral history: Balad Seet is an old settlement. Already during the Iron Age II (1100-600 BC) two settlements existed in this ecologically favorable location and in the early Islamic period (630-1055 AD) a settlement is likewise attested.

Whereas new settlement quarters have developed in the south-west and west of the oasis since the 1970's the settlement nucleus with its stone buildings is situated on the western slope of a hill towered by an ancient fortification and surrounded by terraced fields and palm gardens.

The street network is characterized by an irregular system of narrow alleys running approximately north-south with intersecting stepped alleys leading to the up-slope parts of the village. The street network and settlement structure are determined largely by the topography and the growth of the settlement.

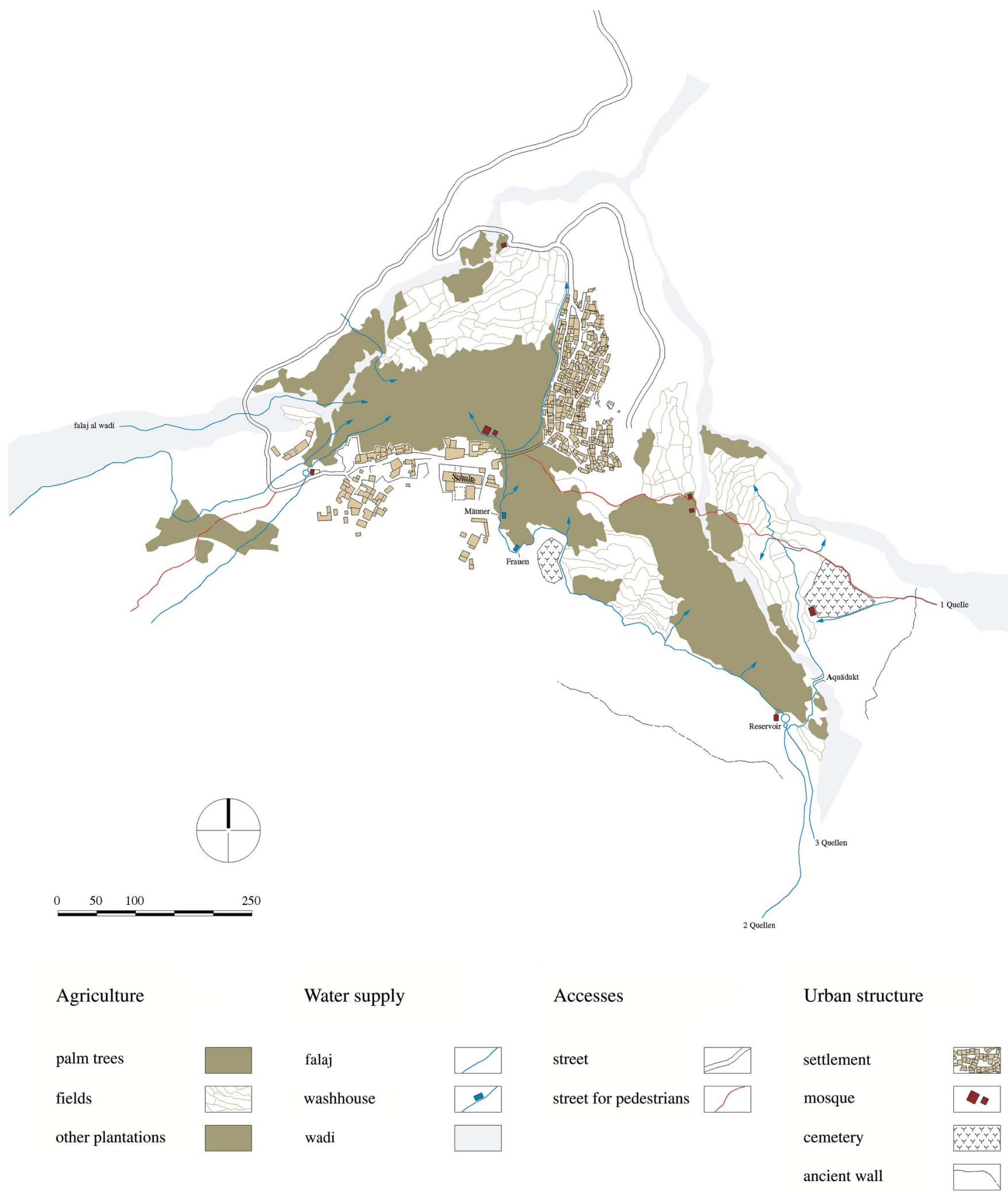
Balad Seet is neither walled nor protected by fortified gates. Other than the small fort overlooking the village it is the geographical and topographic location which have in the past acted as a natural means of protection. The massively built stone houses themselves, however, are definitely defensive in character with few openings in the street facing facades of the ground floor.

Like in Misfat al-Abriyin, most of the old houses display different building phases. Generally speaking, only the last two of these, recent modernizations and rooms built or restored by the father or grandfather may be approximately located in time by their inhabitants. The remainder of the house is referred to as going back to the time of the forefathers, *judud*. In many cases one house compound consists of a ruined part and inhabited parts of varying conditions of maintenance. As in Misfat houses in Balad Seet are of a compact type with roof terraces substituting the missing courtyards.



# URBAN ANALYSIS

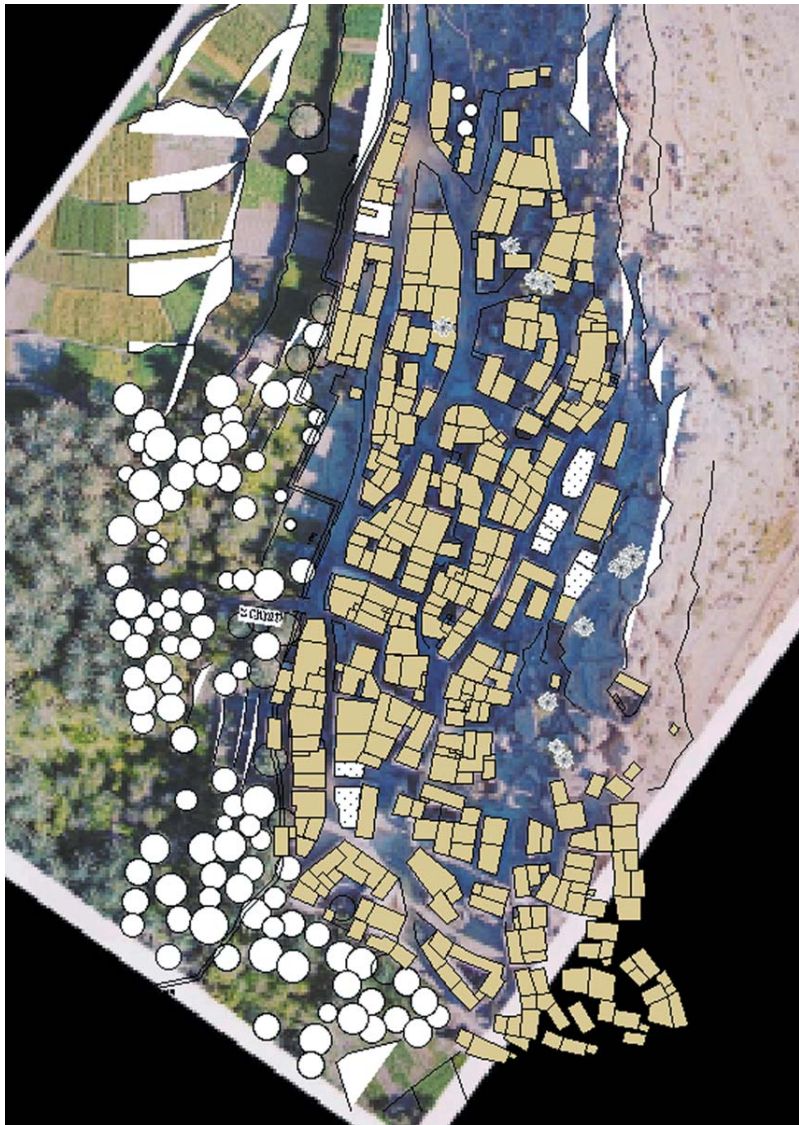
## BALAD SEET



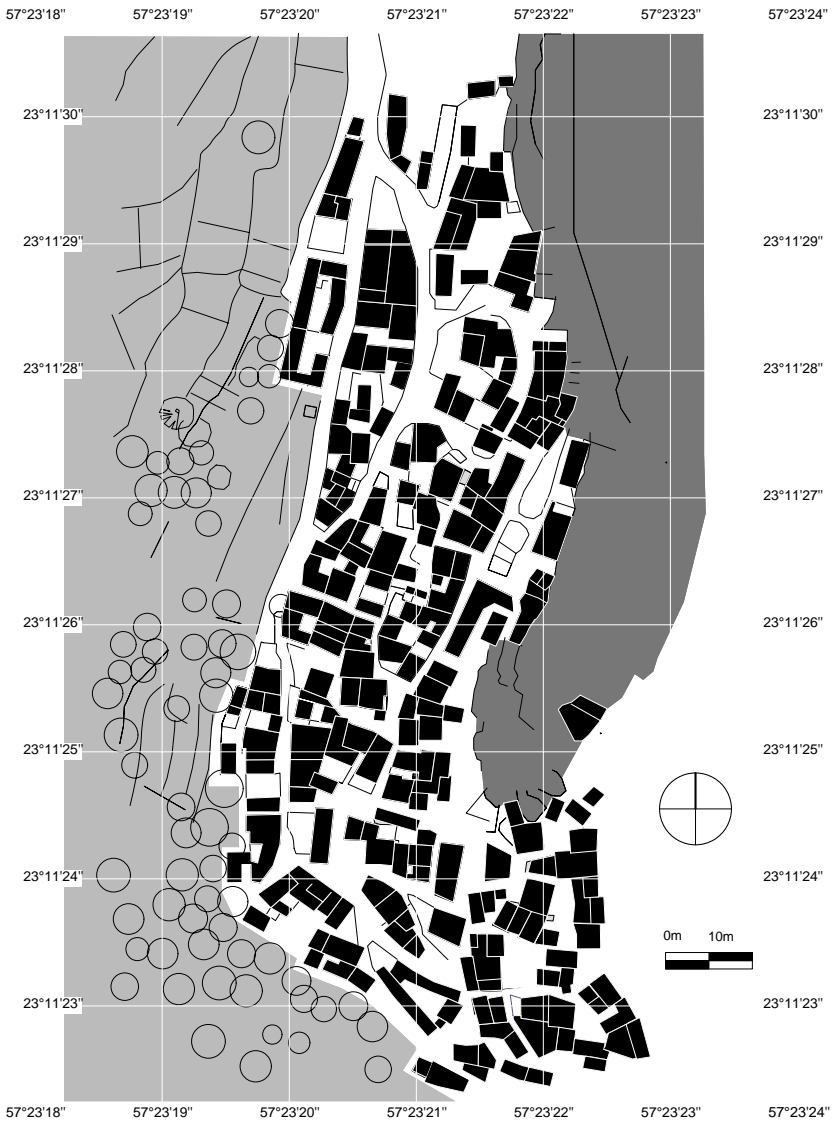


# URBAN ANALYSIS

## BALAD SEET



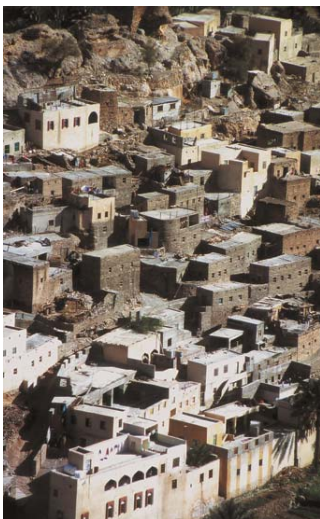
Georeferenced and rectified aerial photo



Built up area



View



Residential area

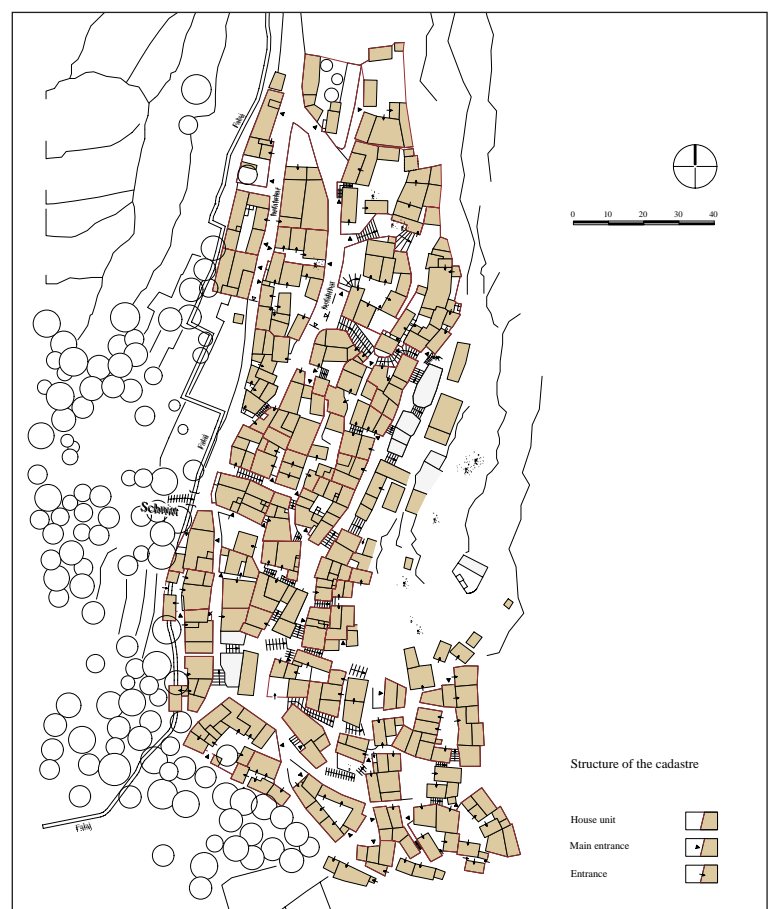
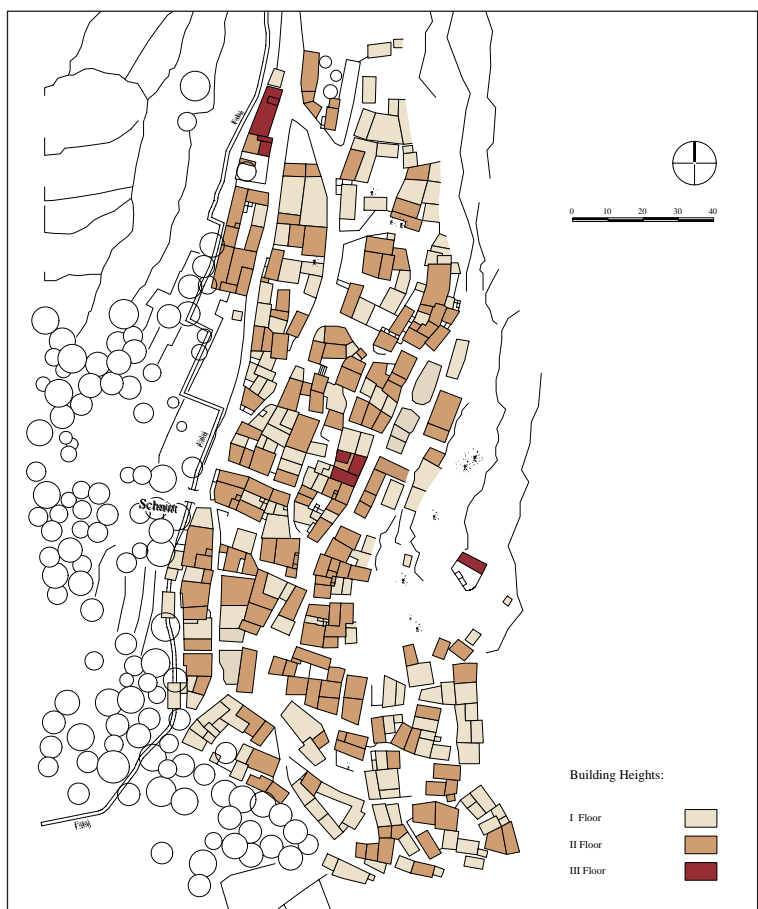
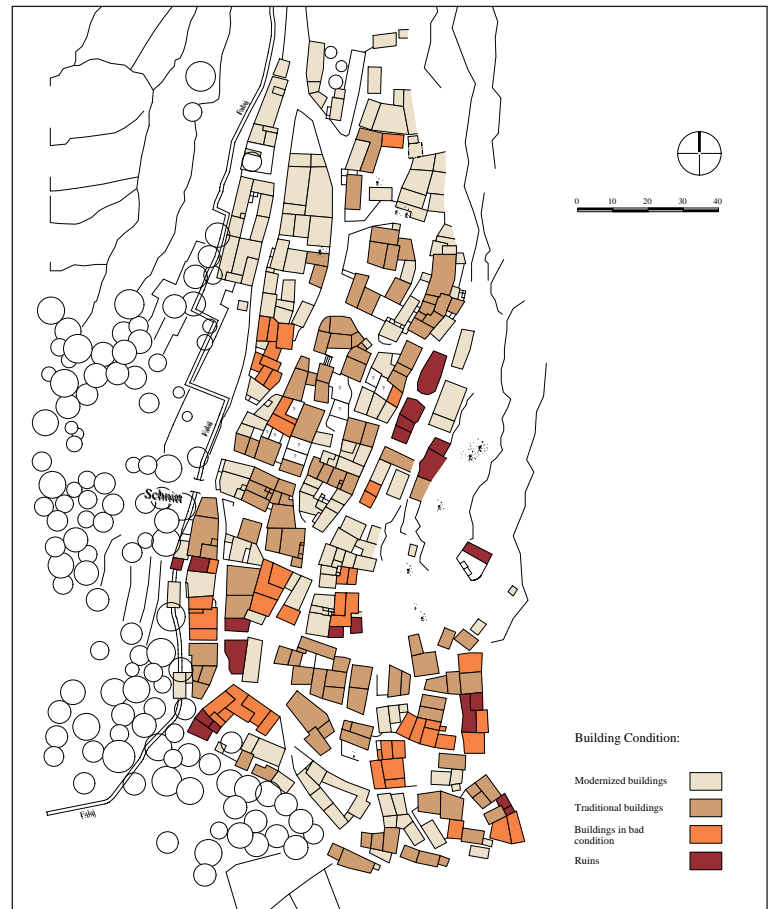
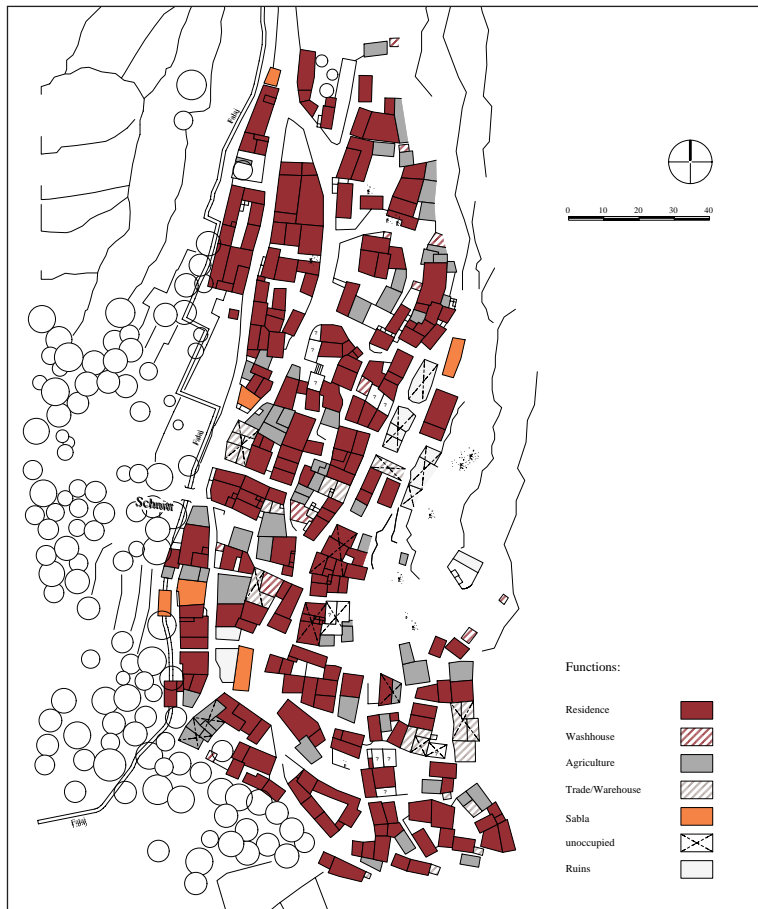


Housing



# URBAN ANALYSIS

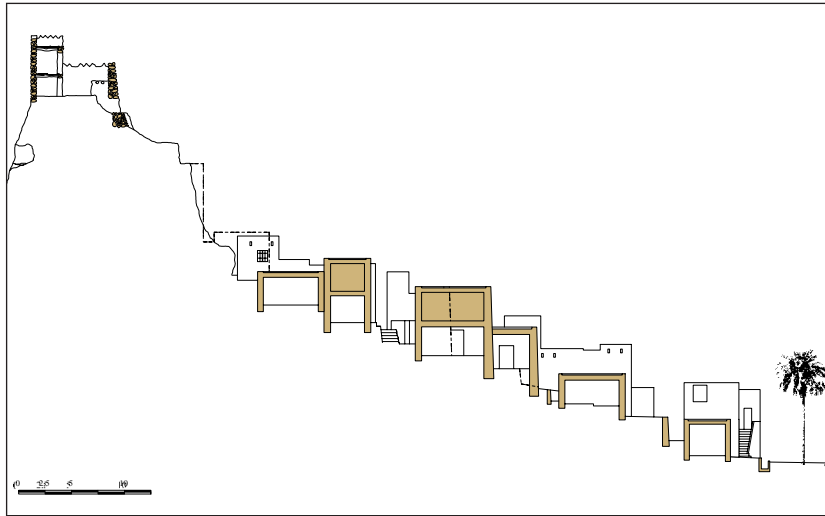
## BALAD SEET





# T TYPOLOGY

## BALAD SEET



Section



Level 0

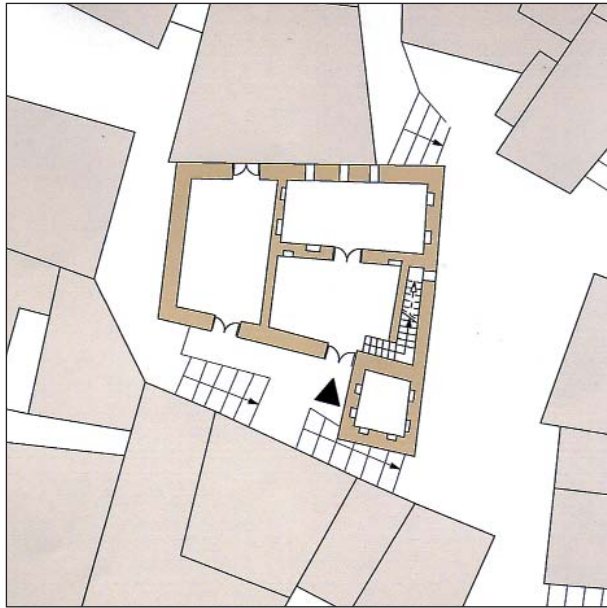


Level +1

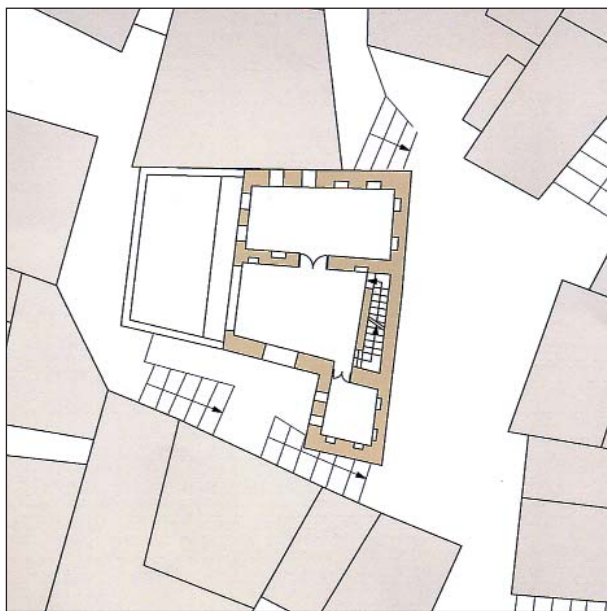


# T TYPOLOGY

## BALAD SEET - HOUSE 1



Level 0



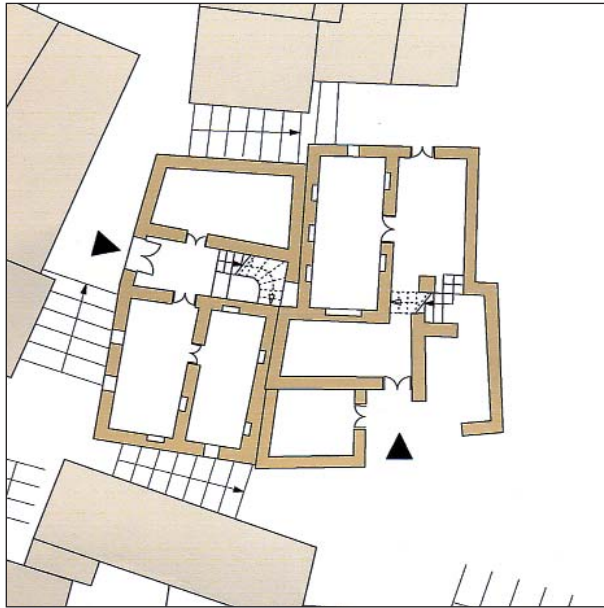
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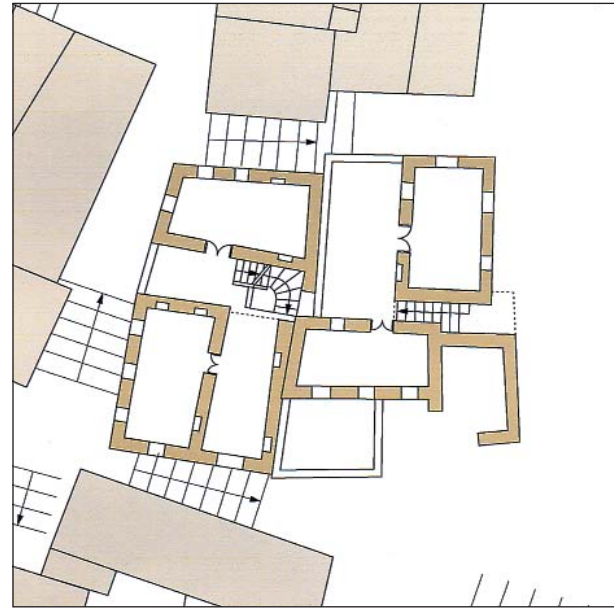


# TPOLOGY

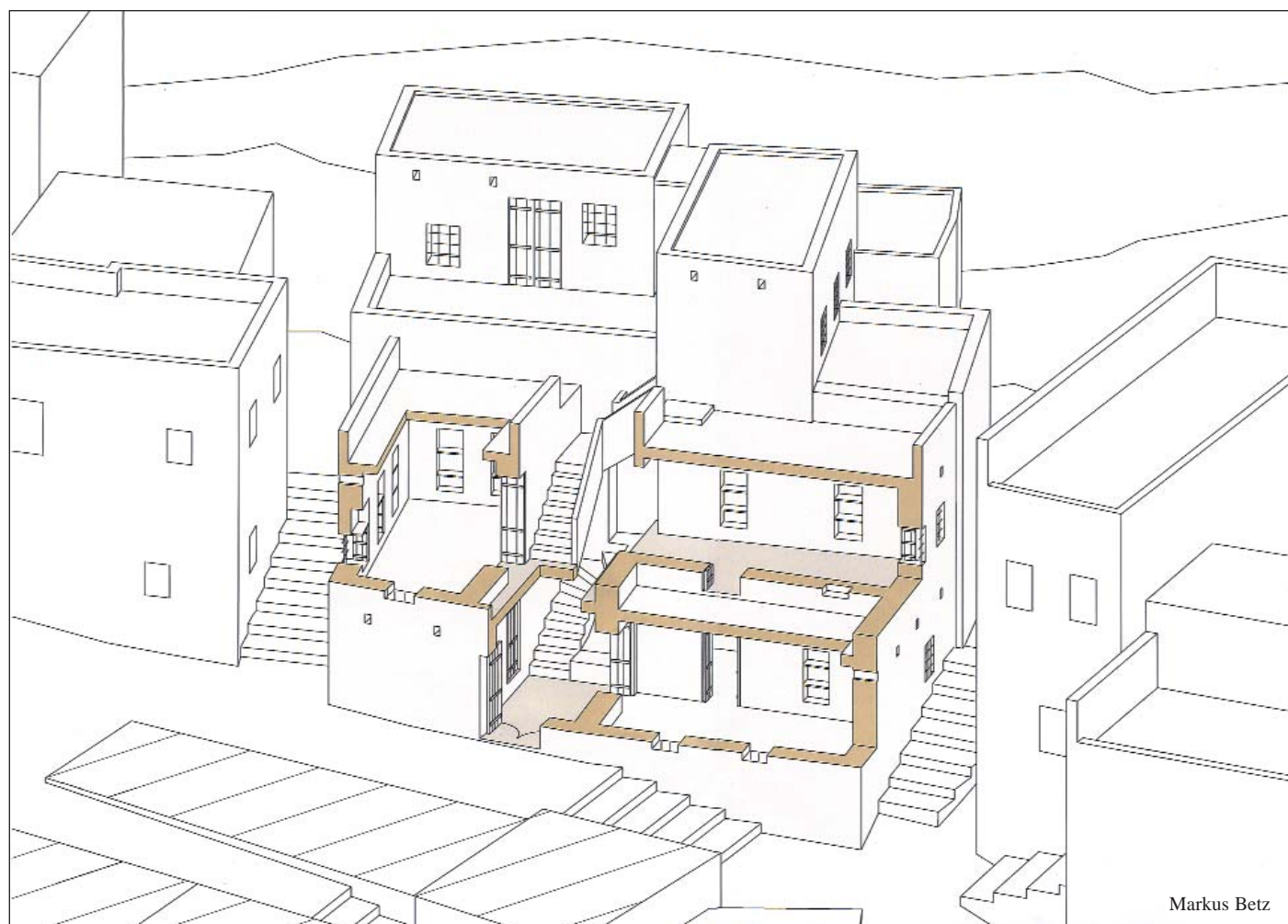
## BALAD SEET - HOUSE 3



Level 0



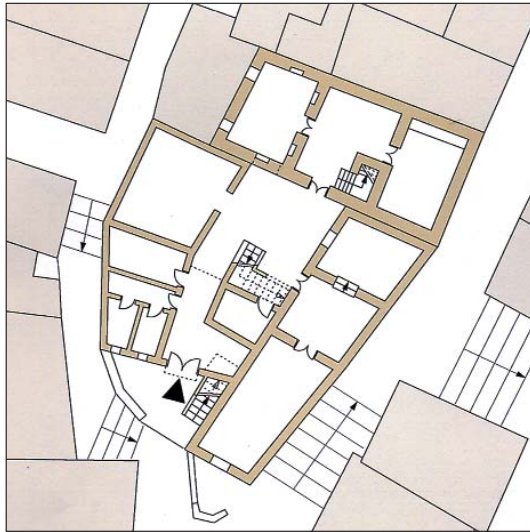
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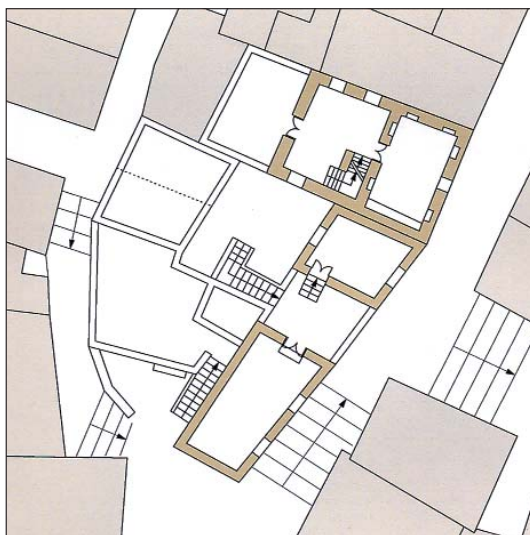


# TYOLOGY

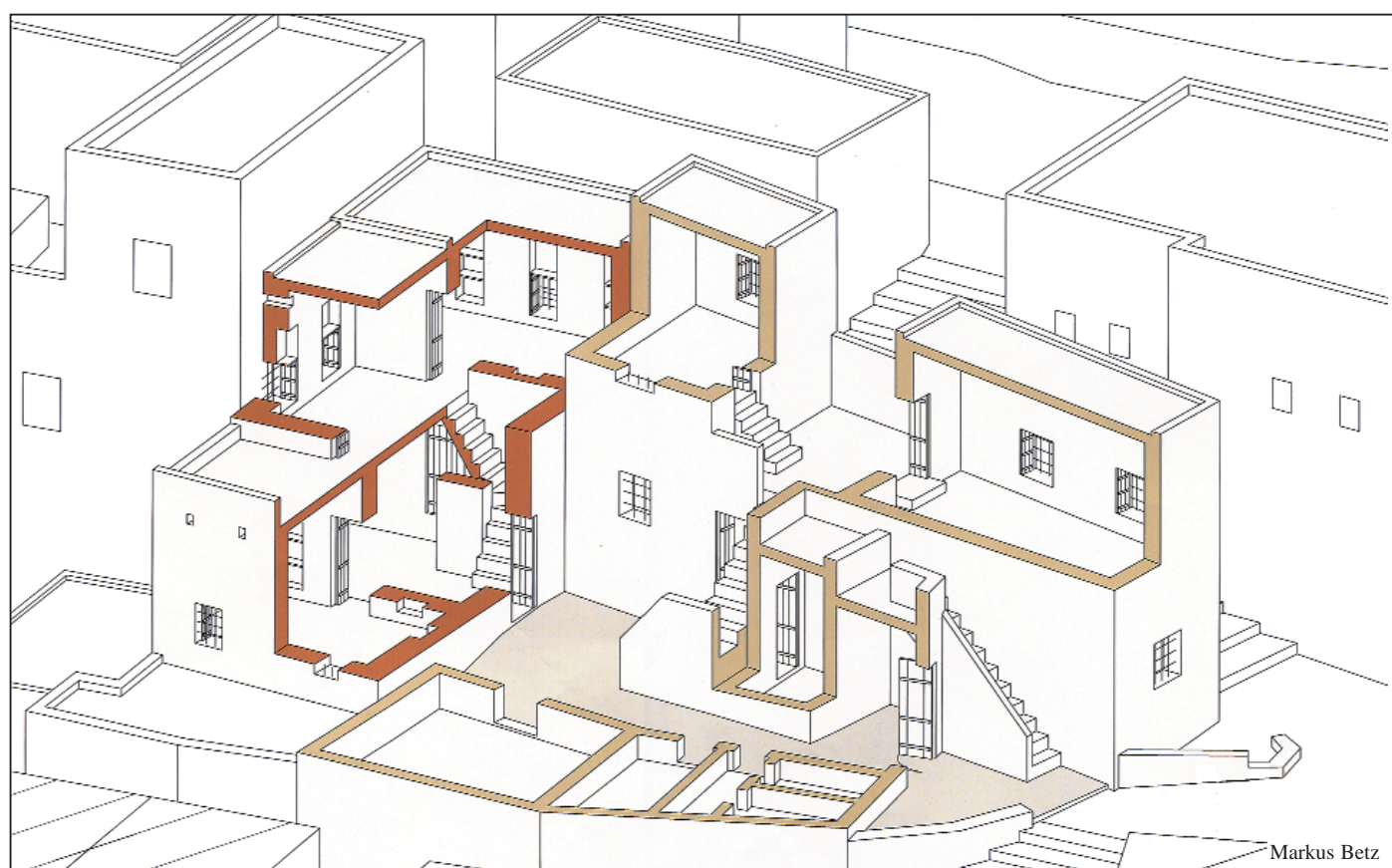
## BALAD SEET - HOUSE 4



Level 0



Level +1





## URBAN ANALYSIS

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### MISFAT AL-ABRIYIN

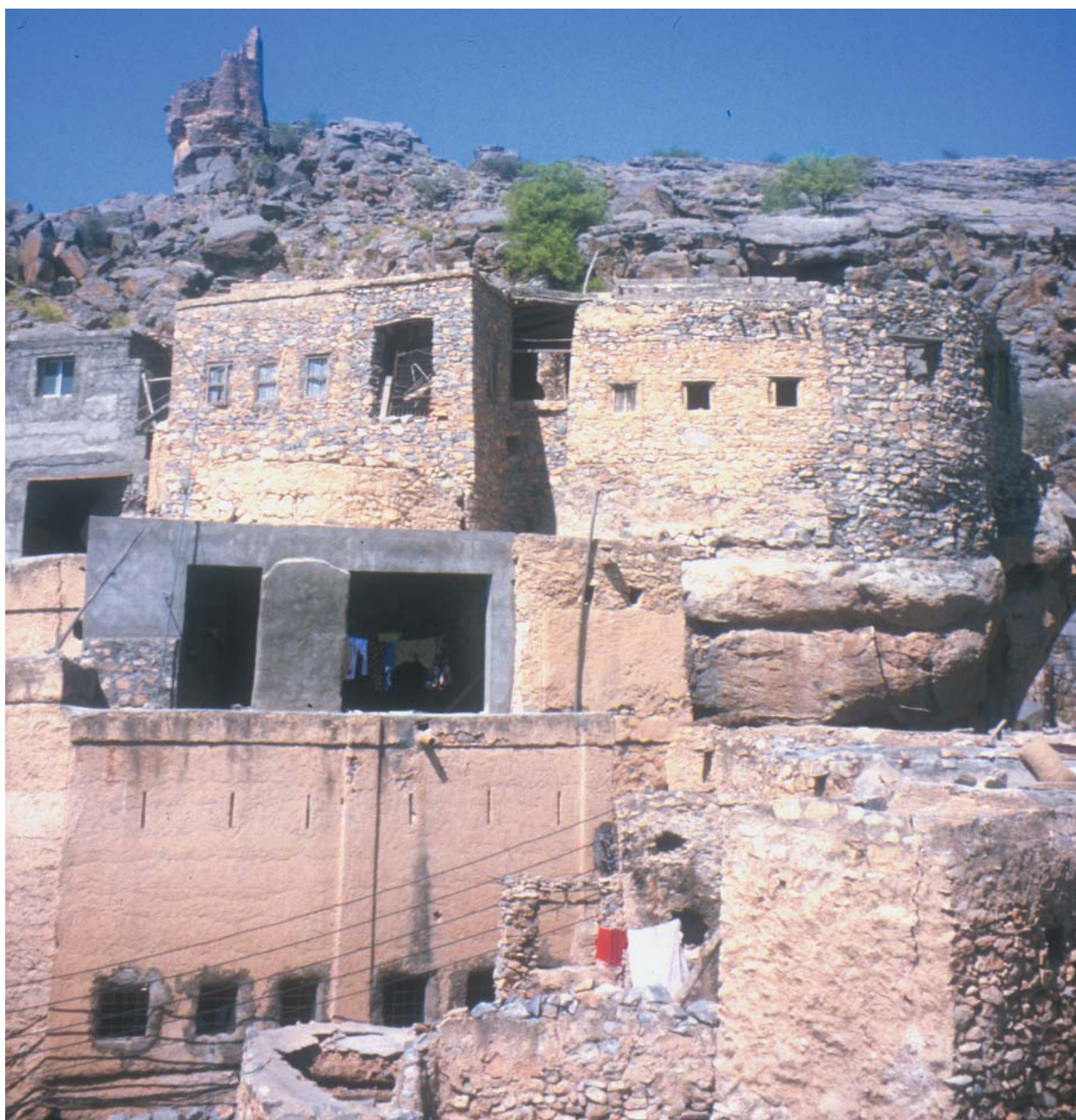




## URBAN ANALYSIS

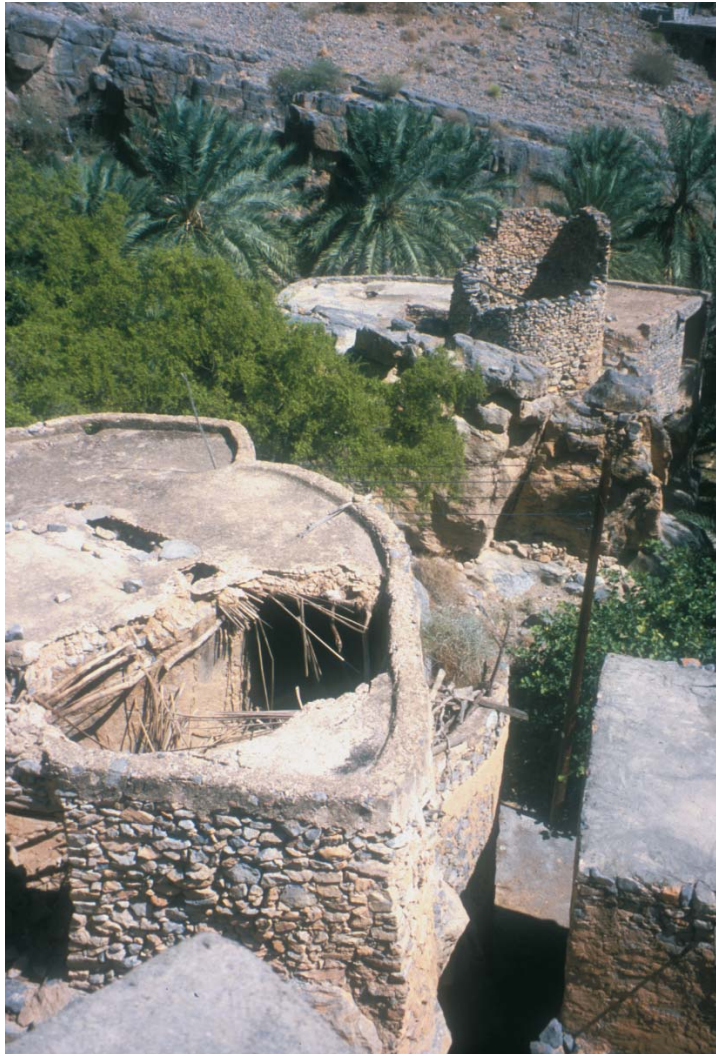
### MISFAT AL-ABRIYIN

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## URBAN ANALYSIS MISFAT AL-ABRIYIN





## URBAN ANALYSIS

### MISFAT AL-ABRIYIN

Misfat al-Abriyin is located at a short distance from al-Hamra at ca. 950 m above sea level on the steep banks above the intersection of two wadis. According to the population census of 1993 it is a village of 580 inhabitants living in 106 housing units. Misfat is an old settlement, the beginnings of which are not historically attested, but are likely to go back to preislamic times. The name of the fortification towering the village is fortress of Roghan, whom the people consider to have been a Persian general.

The old village quarter is a nucleated settlement with several fortified entrances. It is located above the falaj and a huge water basin. The falaj is fed by a spring in the wadi supplying a continuous flow of water even in times of drought when other aflaj in the area, such as the falaj of al-Hamra have dried up.

The street network follows an irregular pattern, determined by the gradual growth of the village and the topography. At several locations the streets are roofed with first floor rooms spanning between two houses across the street. In this way both additional living space and shaded street areas are provided. Where the latter are located at an entrance to the village, they are called sabah and are equipped with narrow benches formerly used by the guards. Other vaulted alleys accommodate communally used mortars, consisting of rock into which a mould has been carved. These are used to grind spices and the like. From the main street which extends from north-west to south-east direction leading to a fortified gate at either end, smaller streets and alleys partly ending in cul de sacs branch off.

The spatial development of Misfat al-Abriyin seems to have begun with the buildings along the main road. Prominently among these oldest houses figure the bait al-baitain, bait as-safa and bait al-aqd. The settlement is organized in different quarters, harat. One of the old quarters, the harat al-shuwa, is illustrated in the following maps, where it is designated as unit 1. In the open space in the middle of this quarter the communal oven for the baking of the shuwa, meat during the religious festivals is located. In one of the adjoining rooms a communal grain mill was located, the remains of which are still visible. The quarter was thus a place of intense social interaction of the village families.

The settlement structure is distinguished by its being strongly determined by the local topography and taking advantage of the large free standing rock boulders for the foundation of houses. In a great number of surveyed house units, the building process had started with the first rooms on top of a boulder, access being through an external staircase. This building nucleus on the first floor would be extended by building ground floor and further first floor rooms against the rock boulder. Eventually more rooms were added as a second floor. In consequence, the structure of buildings and the size and shapes of rooms are very much determined by the natural topography, a fact which has greatly complicated the procedure of surveying and mapping the houses.

The buildings in Misfat al-Abriyin were all constructed in the local stone, which was quarried from the rocky slopes above the village, in addition to traditional saruj mortar, and palm-trunks for room ceilings, whereas juniper and wild olive wood was used for statically sensitive parts of the

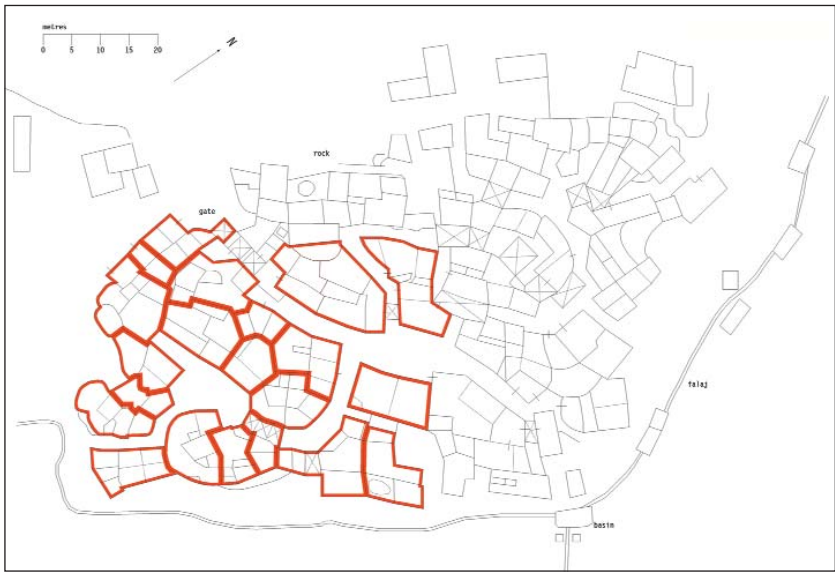


# URBAN ANALYSIS

## MISFAT AL-ABRIYIN



Land-use



House Units



Building Heights



Street Network



# T TYPOLOGY

## MISFAT AL-ABRIYIN



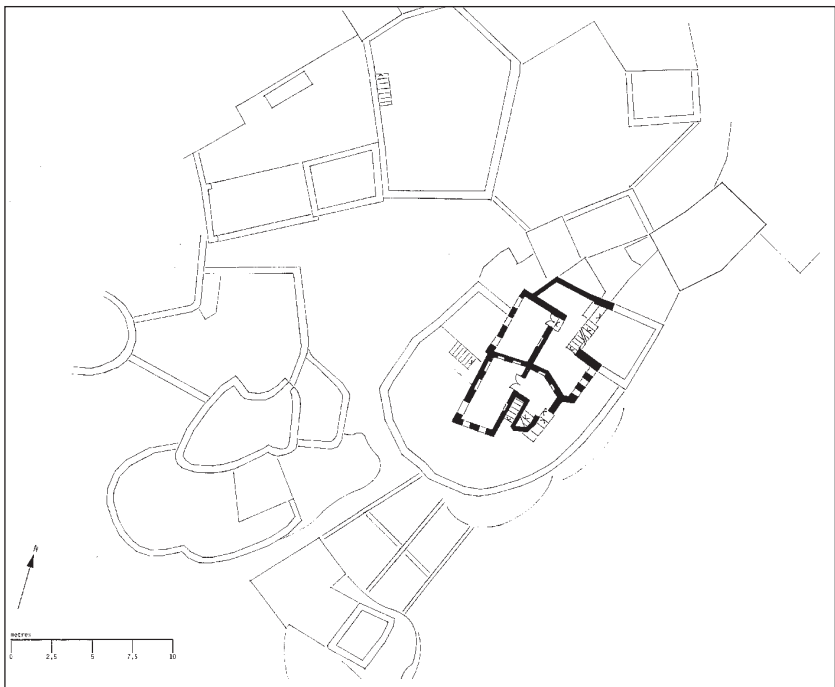
Level 0



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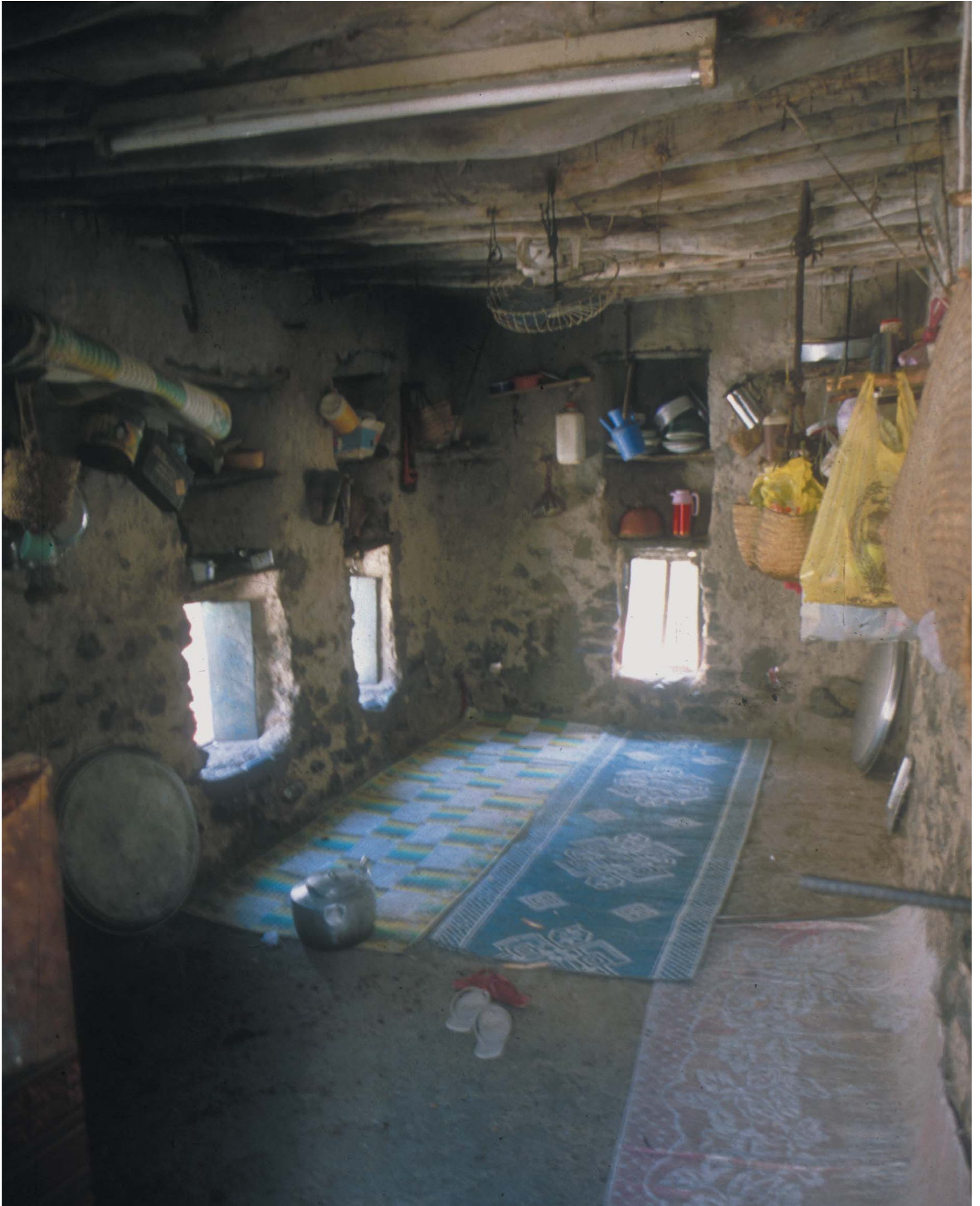


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Level +3







## **Documentation of traditional ways of life**

The aspects of traditional mixed farming economy, domestic and social life, settlement patterns, material culture, and of indigenous knowledge are currently undergoing rapid changes. These data are obtained through surveying, recording of oral history and participant observation. Oral history was recorded in form of informal and unstructured interviews, partly through structured interviews of both male and female inhabitants of the studied settlements. Whereas the male informants particularly contributed to our knowledge of land-use, local history and settlement patterns, the female informants combined with information collected during participant observation of domestic, social and other activities provided data on domestic life and traditional mixed farming economy, such as food and environmental resource management, the use and function of space on the level of the dwelling and of the village. Likewise information on patterns of regional and supra regional exchange and interaction were collected. These sets of data will allow for a more thorough reconstruction of how traditional oasis communities functioned and provide models for the interpretation of archaeological material. This research will furthermore provide a basis for the evaluation of the tourist potential of oasis settlements as a particular destination for cultural tourism in Oman and the study of tourist development strategies on the community level.

## **Women's role in the traditional mixed farming economy of Balad Seet**

As the village herds of goats and sheep are herded by professional shepherds who take them out into the environs twice a day, women and girls are not involved in herding. But they are responsible for the stabled animals. Most households own a milk-cow or two, and in many houses a few goats and sheep are kept in the house, furthermore there are chickens and sometimes pigeons kept in a pigeon-house on the roof. One of the time-consuming female tasks related to animal keeping is the feeding of stabled animals and milking the cow four times a day. The day's milk is collected in a plastic pail, and usually at the end of the contents of the pail are processed. A part of the yoghurt is turned into butter by churning. Churning is done traditionally in a goat-skin which is hung from a tree or some other support and rhythmically shaken hence and forth. Recently these hide-churns are mostly substituted by cylindrical churns made from aluminium. Lately even semi-automatic washing machines are used for this purpose. The butter is turned into a preserve by cooking it into ghee samne. Yoghurt, butter and samne are kept in glazed ceramic jars, closed with a piece of cloth and hung from pegs in the storage rooms.

The small quantity of milk obtained from sheep and goats considered to be of greater nutritional value and digestibility is reserved for the exclusive use of small children. Cows are fed before milking with a mixture of grain (qam , sayf), alfalfa qatt, barsim, qashi (dried sardines), and dates from last year. Other fodder includes a variety of wild grasses collected by the women in the mountainous environs of the village, such as hashish, sanut, saffa, khadr, marjal iye, wad a, halfa, khashna for the cows, and atm, (or attam al-ghanam) (wild olive twigs, which are considered a rich fodder for the goats. These collecting and gathering activities which also include the collecting of brushwood and other fuel in general are no daily activities, but may consume a significant amount of time. Women usually leave in small groups early in the morning after feeding the cows and preparing breakfast for the family. Equipped with a sickle shaped knife, a special large net or an old lesu shawl, a plastic water



a basketry container they search the mountains for grass, herbs, tree-branches and other plants, to return back to the village after several hours. In the past the sale of wild fodder plants and fuel to economically better off herd-owners constituted a main source of income for poorer families.

Women also are in charge of periodically cleaning the stable once the straw is soaked with animal refuse and quantities of dung have accumulated. The straw and dung are emptied into a heap on the street in front of the house and loaded into big palm-fiber baskets, which are then carried to the fields and gardens for fertilization baskets. In agriculture, women share men in the harvest of dates, grain, vegetables and fodder plants, as well as weeding the fields. Grain is usually harvested with the hands only, by either plucking the entire plant or picking the fears.

## **Plant and Animal Food Management**

The conservation of seasonal food items as a strategy of food management played an important part in domestic economy prior to the advent of electricity. The village of Balad Seet, was not connected to electricity at the time of the field campaigns.

## **Meat preserves**

On the occasion of the two main religious feasts, in particular the Id al Kabir, large amounts of meat are processed. When a family slaughters a cow only a limited amount of the meat will be consumed immediately. A large portion is set aside for preservation to be consumed during the year, and the meat is prepared and preserved by the women in different ways:

1. as taql iye or qal ile: fried kidneys, liver, heart, meat, and fat seasoned with salt, black pepper, paprika and cumin and stir-fried in a copper pot. A part of the dish is stored as meat preserve in a clay pot.
2. hamis: cooked stomach, meat and bones, seasoned with salt, pepper, and turmeric are hung to dry for later use.
3. mashakik: roasted skewers of meat seasoned with the mentioned spices, garlic and turmeric. They are served with honey and bread. A part of the mashakik are threaded and dried for consumption over the following months.
4. shuwa: big pieces of meat seasoned with khamra (a kind of date vinegar to which salt, pepper, garlic, cumin, ginger and turmeric are added), wrapped in sacks, banana leaves and bound together with flexible young palm-rips. The parcel weighing around 10 kilograms or more is baked in the communal shuwa oven.
5. Raw or cooked qala id (necklaces): Raw variety, raw meat and bones are rubbed with salt and turmeric, threaded on a string made from palm fibre and left to dry in aired, shaded space for later



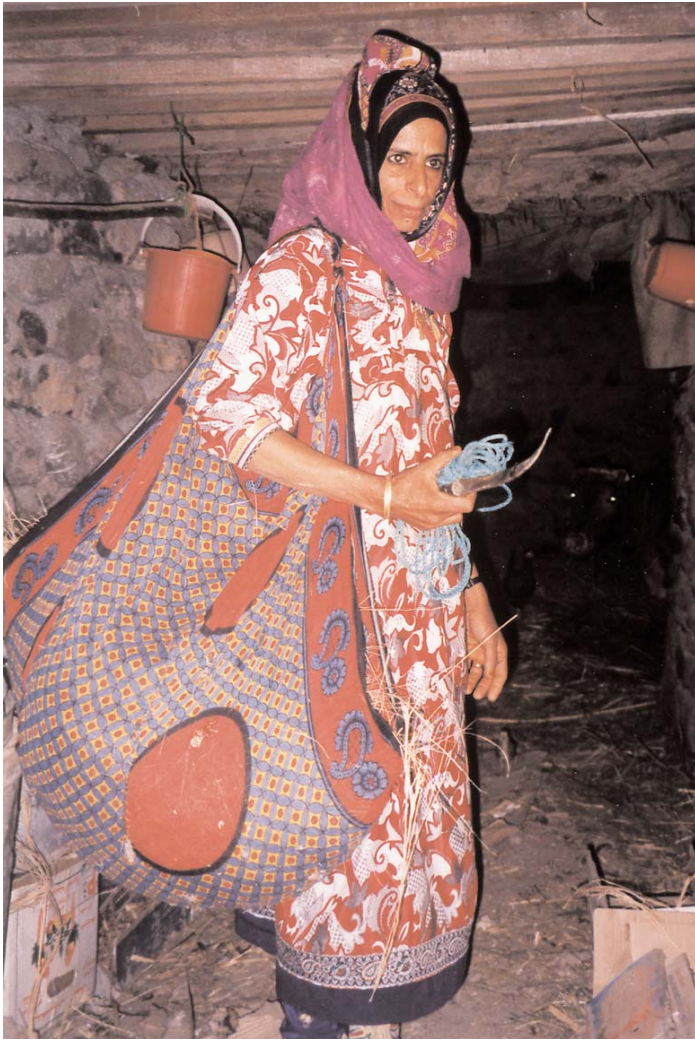
### Plant preserves

The main plant preserves in the area are produced from dates, limes, grain and pulses. As some vegetables are grown throughout the year, they are usually harvested for daily consumption such as salads, spring onions, carrots or reddish, and it is not considered important to conserve them. An exemption are onions and garlic, which are harvested and stored in a dry place. Ripe and unprocessed dates are stored in palm-leaf sacks and ceramic jars, as well as in plastic pails. They are used for human consumption for a period of one year. After the date harvest, last year's dates are designated as *sahh hawl* and then only used to feed the animals. Smaller amounts of dates are also fried in ghee, sprinkled with sesame to be served during the coffee ceremonies. They are stored in small metal containers. Important for the preparation of shuwa meat is the local vinegar *khamrat ash-shuwa* made from fard dates left to ferment in a glazed jar (*khars sini*) for 20 days. On the Id salt, pepper, garlic, *jaljalan* (ginger), cumin and tumeric are added. The *khamra* is also served as a dip for oranges during the coffee ceremony and can be preserved for some period. Limes which, due to the broomstick disease by which most trees in Balad Seet and Misfat are infected, are harvested in ever smaller amounts, are either dried as *lumc* to be used in cooking or the juice is extracted and preserved with salt and kept in glass bottles. Locally grown wheat burr is stored in sacks and mostly used for the preparation of traditional meals, such as *jarish* or *asida*. For bread-baking, flour is bought from the market. Wild grass and herbs which women periodically collect from the mountains to feed the animals are kept with the cultivated fodder in the stable, or in storage room for agricultural products.



# ETHNOLOGY

## FARMING ECONOMY OF BALAD SEET



### Women's role in the traditional mixed farming economy of Balad Seet

The responsibilities of women in Balad Seet covers the whole range of household and child rearing tasks, such as preparing food, cleaning the house, the clothes, washing the dishes, maintaining clothes, fetching water from the falaj (before the houses were provided with running water), child care, care for the sick and the old family members. Their role is however not restricted to these tasks but includes other responsibilities which are crucial for the functioning of the mixed farming economy of the village.





ETHNOLOGY

MEAT PROCESSING AND PRESERVATION



System of Meat Preparation, Processing and Preservation  
As observed during the ‘Id al-Kabir in Balad Seet

Time schedule	Activities		
pre-‘Id days	Choice of cattle to be slaughtered	collect palm-rip tips	- carve skewers collect fuel for shuwa preparation
1.day of ‘Id	slaughter animal  cut, wash and sort meat into portions for shuwa, mashakik, guts, fat and bone-marrow		
	cook guts	prepare shuwa tannur and fire season and pack shuwa parcels load tannur with meat parcels and start baking	
2.day of ‘Id	guts meal		cooking fat and bones preservation and storage  string qala’id of raw meat air-dry in shaded space
3.day of ‘Id	prepare mashakik and roast over open fire	shuwa continues baking	
	mashakik meal		
	distribute mashakik dry remaining mashakik in shaded airy space	remove shuwa parcels from oven shuwa meal	
post-‘Id days	shuwa meals string remaining shuwa meat and hang to dry in shaded airy area  dry meat is stored in hides, carton, cloth bags. Fat is stored in jars, or hung inside the rooms, qala’id are usually hung from wooden beams underneath the ceiling		
Remaining period until next ‘Id	cooking of dry meat, use of fat for food preparation and to smear udder of the cow before milking		

\* The time table as to when activities such as slaughtering, shuwa and skewers making are performed may vary considerable from one village to the other.





# ETHNOLOGY

## TRANSHUMANT PASTORALISM



### Transhumant Pastoralism

Transhumant pastoralists, called *shawawis*, traditionally played a significant role in the regional exchange system of goods and services. The *shawawis* have always been in close interaction with the settled village people with whom they exchanged their products such as organic fertilizer, wood, charcoal, plants and fruits collected in the mountains against dates, other agricultural and crafts products. Furthermore they were often employed as shepherds for the village herds.

In the area of the transect from Wadi Bani Awf to Al Hamra their settlement pattern was distinguished by semi-permanent, seasonally occupied settlements. The houses, constructed with dry stone-walls from whatever stones were locally available, are characterized by ground-plans which are different from the village houses: Open courtyards, with some shaded areas and small rooms attached dominated their settlements. Typically the ratio of space serving as animal shelter versus space for human occupation is high.

An abandoned *shawawi* settlement in the middle course of Wadi Bani Awf, probably dating to the early 20th century, was surveyed and mapped by students of the Department of Archaeology at Sultan Qaboos University.





# ETHNOLOGY

## TRANSHUMANT PASTORALISM



### Honey production in al-Jafr

A vital part of the economy of more pastoral oriented groups is bee-keeping. The bees are housed in *tubl*, hollowed palm trunks which are stacked one upon the other on a stone pedestal, and kept in place with small stones. The local honey produced by the so-called big honey-bees is of high purity where bee-keeping is done in the traditional way, that is the bees are sheltered, protected from the deadly hornet, and offered water, but they are not fed. Instead, the bees feed on local plants. In consequence the quantity of production depends on climatic and other environmental factors. The honey is highly prized, and famous for its medical benefits. *Shawawi* groups who do not have date-palms often rely on the carbohydrates in the honey and also offer honey instead of dates as accompanying food for the coffee ceremony.





# ETHNOLOGY

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## TRANSHUMANT PASTORALISM



**Mapping of Abandoned *Shawawi* Settlement in Wadi Bani Awf, Archaeological Site 24**

In February 2000 female students from the Department of Archaeology at Sultan Qaboos University did part of their work for the course Archaeology in the Field under the supervision of Dr. Mershen in abandoned settlements in Wadi Bani Awf. This work consisted of collecting and analyzing sherds and surveying architectural remains. Several of these villages were entirely surveyed and mapped. Examples of this work are shown on the following pages.









# AGRICULTURE

## MODES AND ROLE OF AGRICULTURE IN OMAN



Traditional Omani irrigation systems



Falaj-based mountain oasis of Zammah



Capital-intensive modern irrigation agriculture in Al-Batinah



Due to the aridity of its climate 99.9% of the total territory in the Sultanate of Oman are unsuitable for rainfed agriculture and remain uncultivated. Wherever agriculture is practised outside Dhofar, it entirely depends on the reliability of irrigation systems which distribute 94% of the country's renewable water resources and may be grouped into the following categories requiring different levels of infrastructure and financial or labor investment:

### Traditional Omani irrigation systems in valleys, foothills and mountainous areas

- Well derived (Tawi; small scale but 74% of the entire irrigated area)
- Spring derived (Ain; medium scale, < 1%)
- Falaj derived (Kanat; large scale, 15%)

### Capital intensive high tech systems in the Al-Batinah

- Sprinkler irrigation
- Drip irrigation

For millennia and irrespective of the changing political settings, irrigated oasis agriculture provided the major staples to the large majority of Oman's human population through date palms (*Phoenix dactylifera* L.), wheat (*Triticum aestivum* L.), barley (*Hordeum vulgare* L.), sorghum (*Sorghum bicolor* L.), maize (*Zea mays* L.) and vegetables and to animals through the use of alfalfa (*Medicago sativa* L.) and crop residues as fodder. The combination of annual and perennial crops with sedentary and nomadic animal production in oasis agriculture created a unique setting that fostered Oman's typical social traditions and cultural heritage.

However, with the onset of the petroleum industry in the 1970s, the role of agriculture in Oman has undergone major changes. As most of the major staples can be produced much cheaper in other regions of an increasingly global economy with more favourable climatic conditions and in large scale settings, food imports eroded the economic basis of traditional oasis farmers which also were confronted with new opportunities to earn their living outside agriculture. In contrast to intensive and economically competitive irrigated cultivation in the Batinah, the traditional oasis-based agricultural production has nowadays lost much of its economic role even for those 3% of the population who are still involved in it. Exceptions are the production of dates and meat from small ruminants which have a high traditional value and are still being produced by village elders.

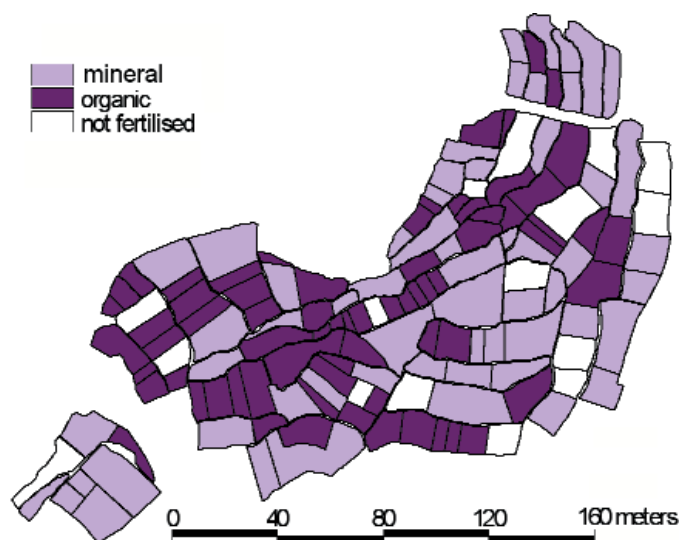
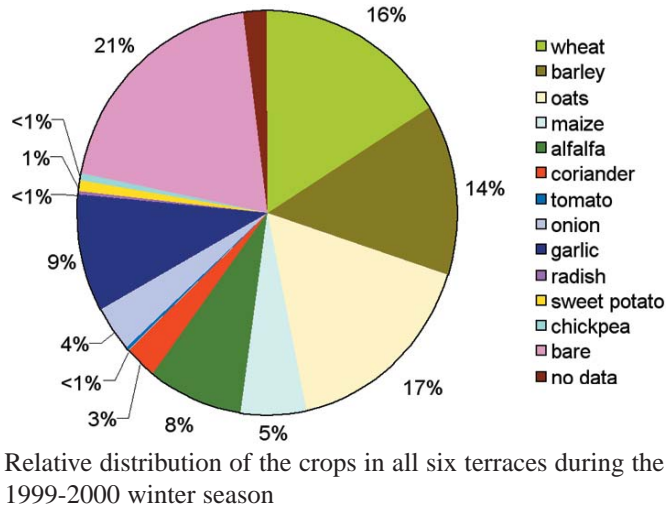
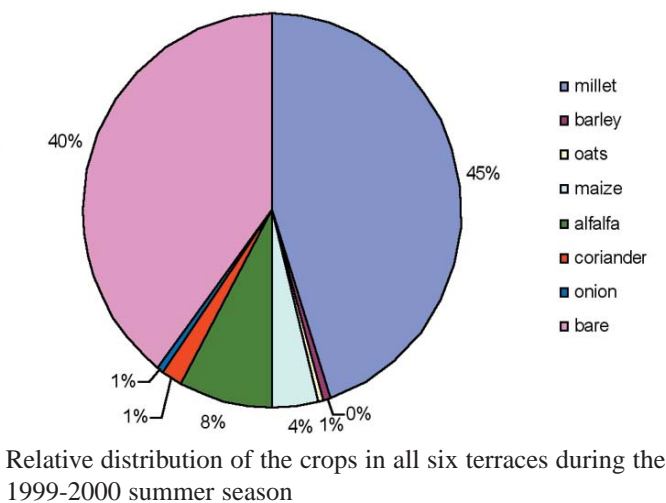
While traditional oasis agriculture is still practised in remote areas due to heavy direct and indirect governmental subsidies, many of the large oases have degraded into zones of uncontrolled land development for sprawling towns. While providing space for a house in the green may be a charming option for former agricultural land, this trend leads to the abandoning and subsequent destruction of villages at a large scale, threatens Oman's traditions and cultural heritage at the whole and could certainly do away with ancient, ecologically sound and very effective systems of





# AGRICULTURE

## NUTRIENT FLUXES IN BALAD SEET



Nitrogen applied with animal manure (left) and urea (right) to the northern terraces during the 1999-2000 winter season

**Results**

The oasis comprises 650 inhabitants distributed in 80 households who rent land in and out. Fields are divided into six terrace systems total ing 4.6 ha and in palm gardens covering 8.5 ha. Due to price/cost relationships between imported cereals and locally produced meat, at present the large majority of the land is dedicated to feed ruminants, whereas for their own consumption farmers buy grain externally. The application of manure from about 200 small ruminants leads to annual nutrient inputs of up to 300 kg N, 120 kg P and 400 kg K ha<sup>-1</sup> in addition to mineral N fertilizer. However, the distribution of these inputs varies greatly throughout the year and across fields which is reflected in a spatially unequal distribution of negative versus positive nutrient budgets. The scarcity of irrigation water led to its selective distribution biased towards the prime agricultural land in the immediate proximity of the houses. While the calculation of nutrient and water use efficiency requires further research, it is evident that the sustainability of the current land use system heavily depends on external incomes of the farmers extended families.



# AGRICULTURE

## NUTRIENT FLUXES IN BALAD SEET

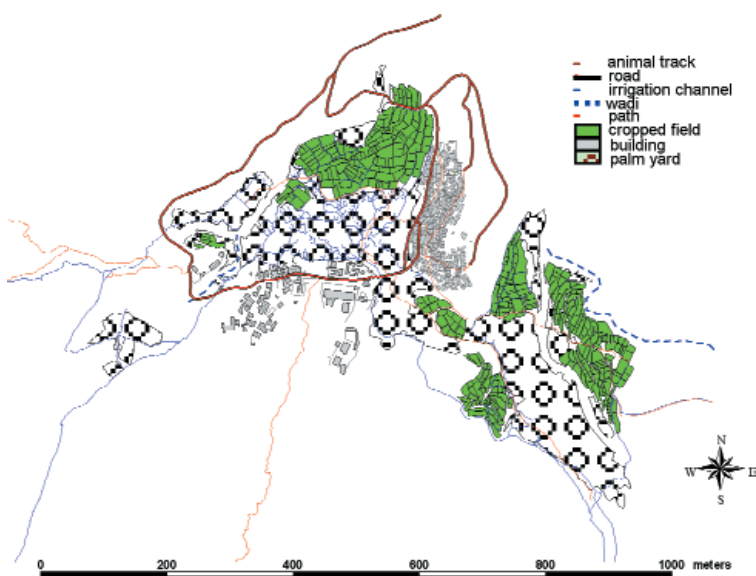


### Introduction

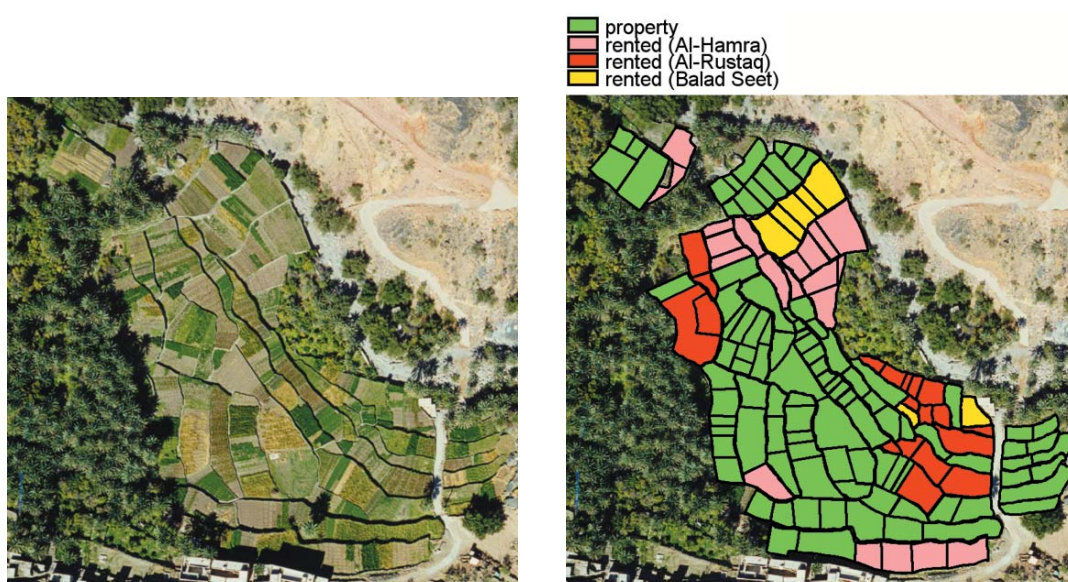
To document the traditional agricultural land use system and nutrient fluxes in a traditional desert oasis of Northern Oman (Arabian Peninsula) data were collected from 1999 and 2000 at Balad Seet (23.19° N, 57.39° E, 970m) located at the upper end of Wadi Bani Awf in the western Hajar mountain range of the sultanate. The aims of the on-going research are (i) to gain a process-oriented understanding of the functioning of oasis systems, (ii) to assess their sustainability by deriving efficiencies for the use of nutrients and water and (iii) to use this knowledge to derive options for the future role of agriculture in such systems.

### Materials and Methods

Non-destructive survey methods such as aerial photography and informal interviewing as well as conventional plant sampling were used to collect data on the infrastructural setting, crop yields, nutrient supply and uptake and on land ownership. All information was georeferenced using a Differential Global Positioning System (DGPS) and transferred into a Geographical Information System (GIS).

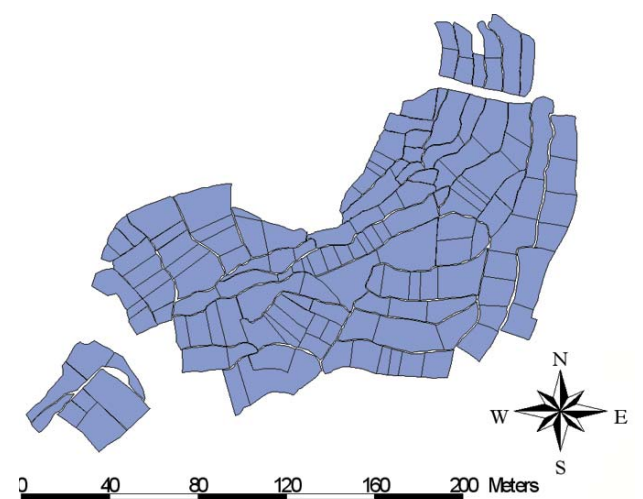


Infrastructure, terraces and palm yards at Balad Seet



Aerial photo of northern terraces at Balad Seet

Digitised boundaries and property status of fields



Georeferenced fields of northern terraces using a Geographical Positioning System (GPS) and Geographical Information System (GIS)

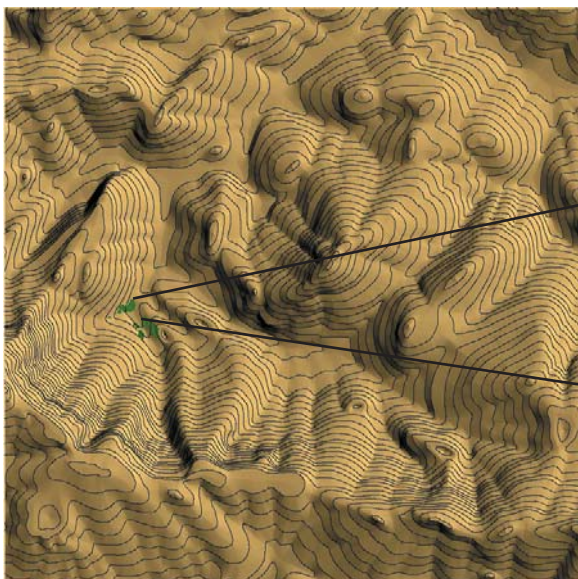


# AGRICULTURE

## MONITORING OF OASIS SYSTEMS IN OMAN

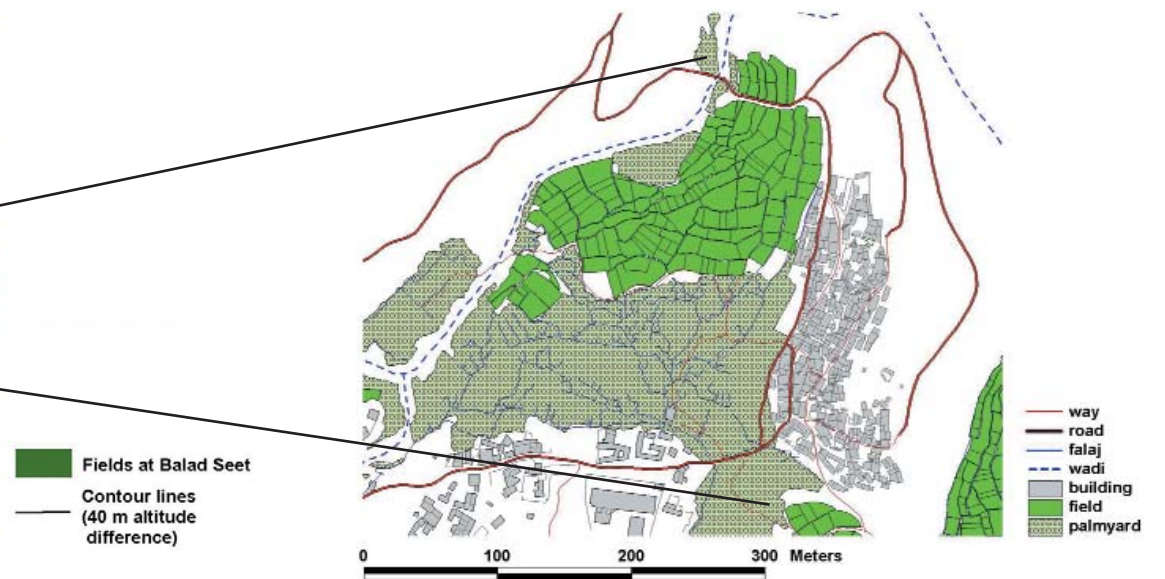


Hot-air and gas balloon suitable for aerial photography



High resolution aerial photography from a balloon or kite and ground truth data collection based on Differential Global Positioning Systems (GPS) allow to obtain precise non-destructive records of infrastructure and agricultural activities in remote areas such as the mountain oases of Oman. These records are necessary for a process-oriented analysis of today's functioning of these systems. In combination with historic data and archaeological findings this may also help to understand their role in the past and develop options for their future.

In times of profound cultural change, the knowledge about the functioning and rapid transformation processes of oasis agriculture in Oman may help to preserve national identity, to appreciate unique century-old, sustainable modes of land use and to generate income by developing a culturally acceptable tourism.



Digital elevation models derived from topographic maps and verified by ground measurements allow an understanding of the physico-geographical setting of a traditional Omani mountain oasis and the efficient use of and adaptation to this environment by its agro-pastoral population.





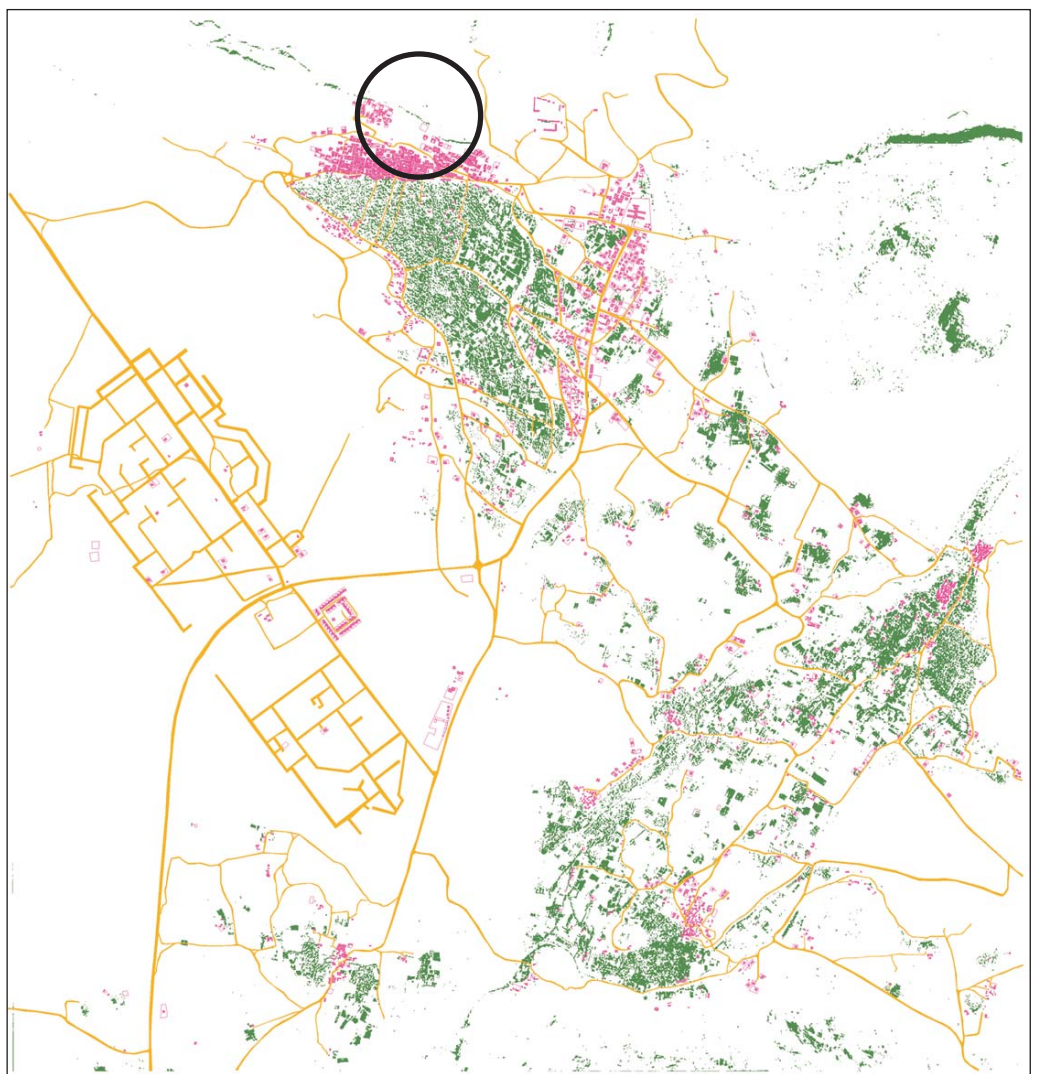


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The topography, the climatic conditions and the existing resources of the different regions determine the settlement structures and the typology of houses. As the examples of the transect shows the geographical and historical context causes also different functions and different structural and architectural forms of the oasis-settlements.

Along a rocky slope the traditional center of Al Hamra was founded in the 17th century. In our days this part of Al Hamra is abandoned and a lot of houses are destroyed. Employment facilities and the provision of a modern infrastructure have since the 1970's promoted people's move out of traditional settlements. At the same time new architectural and spatial approaches to housing emerge. The old mud-brick settlement once given up by their inhabitants, deteriorated and eventually collapsed.

The objective of the university project is to identify solutions to rehabilitate some of the traditional quarters. Two sites in Al Hamra were chosen for projects: the eastern entrance of the old town in the neighbourhood of the abandoned souk and a part in the north-west of the old town near by the old threshing place. Both sites are accessed by a traffic road where new residential quarters were built. Due to this there is a chance of some sort of coexistence between the old and new quarters together with some touristic institutions (small hotel / little museum / vocational training center) and new housing areas, adapted to the traditional houses, but with new comfort. One example shows the restoration of a mud-brick house according to modern standards.

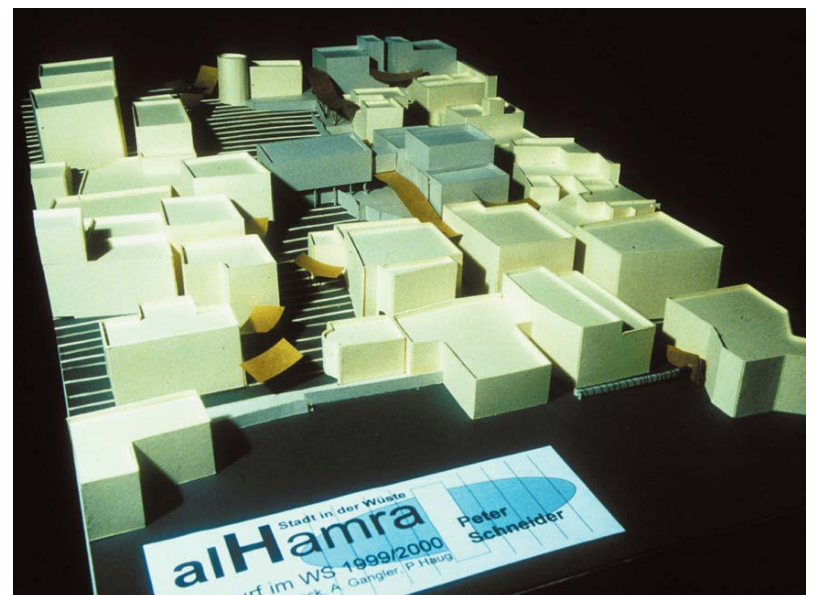
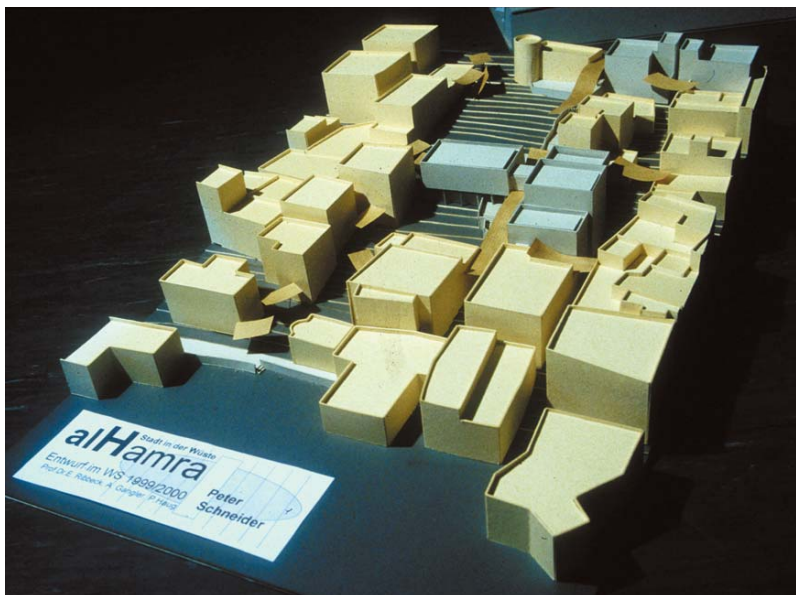
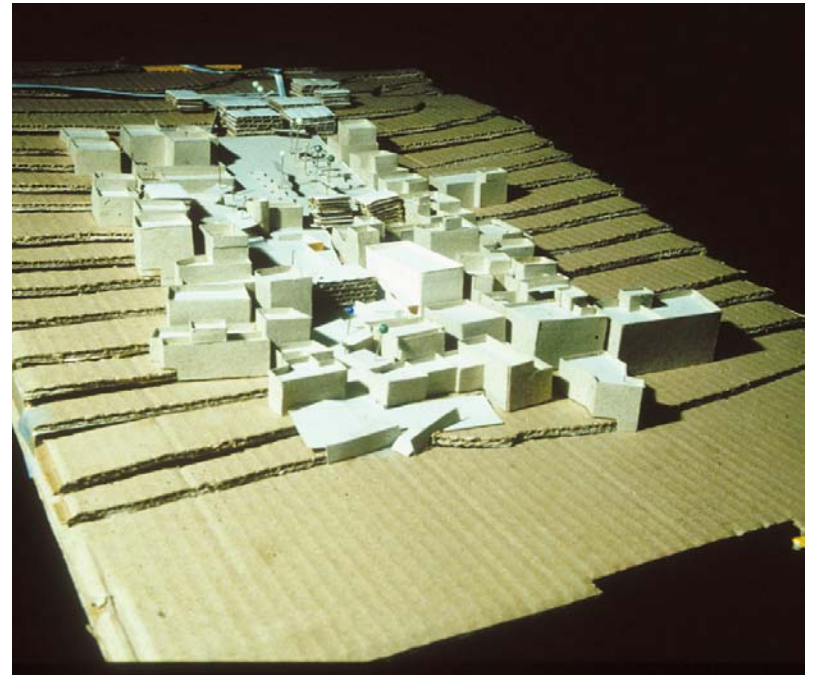
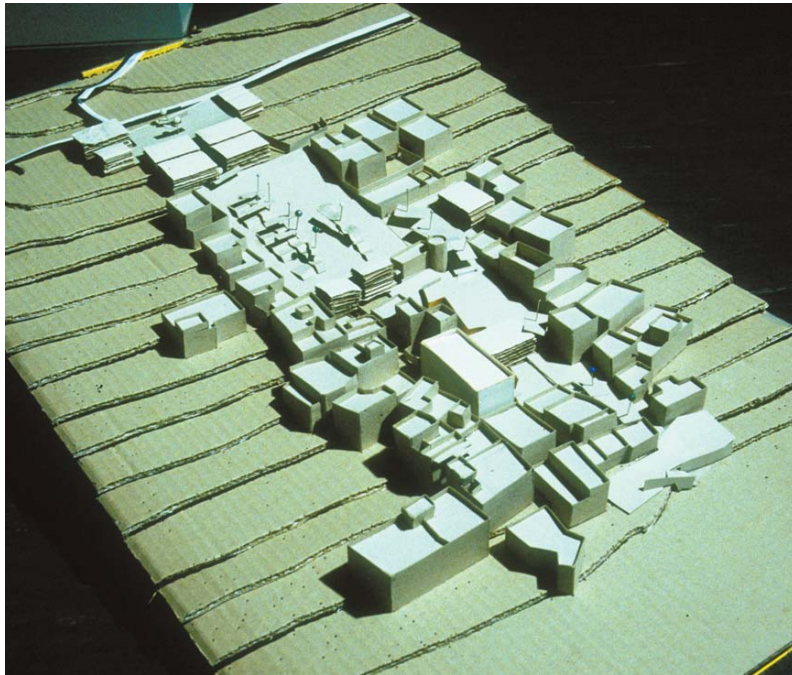


General situation



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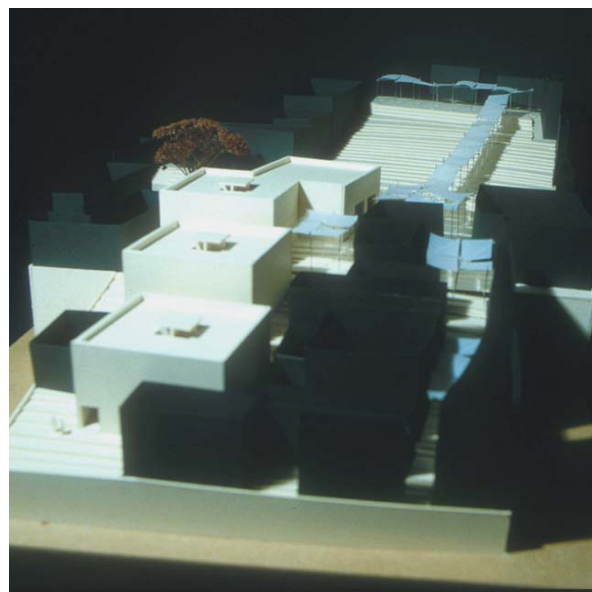
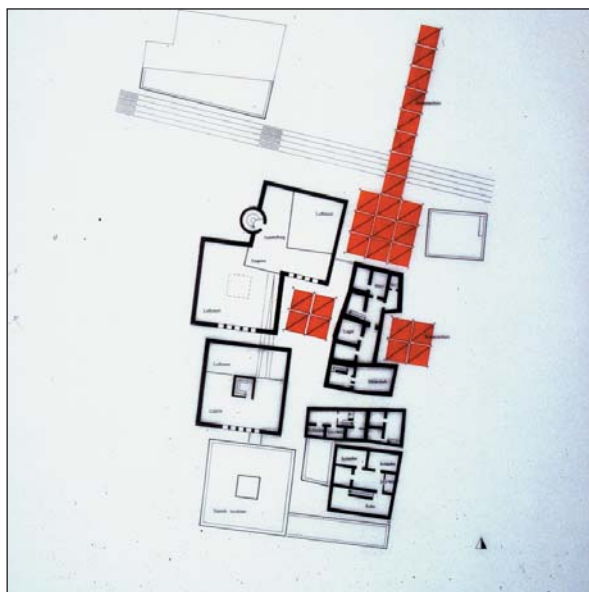
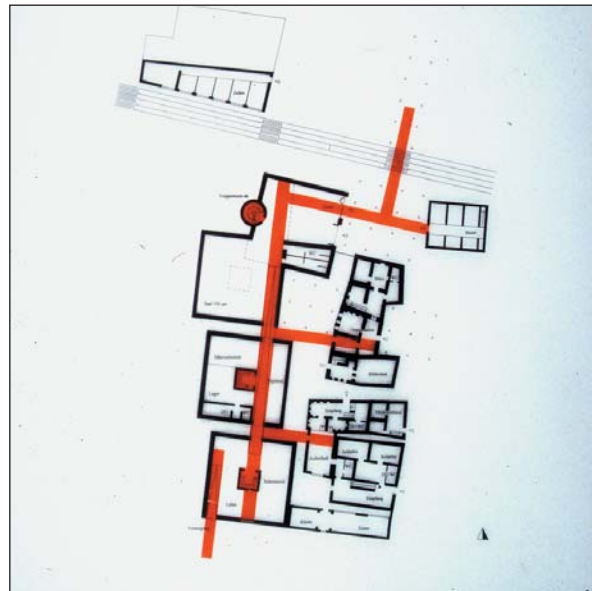
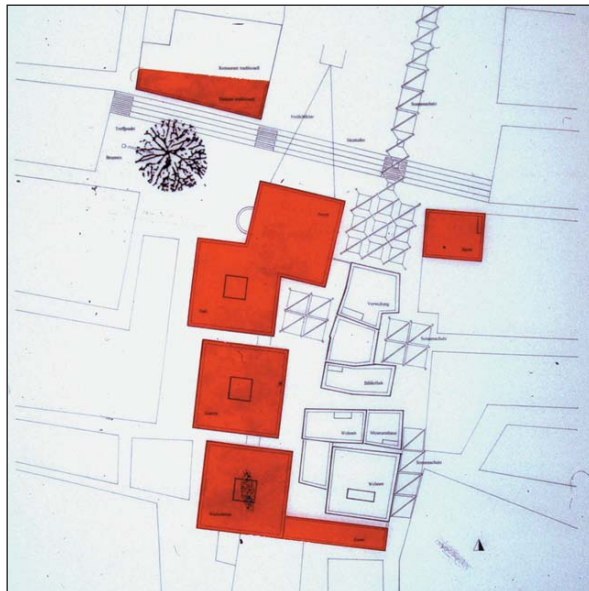
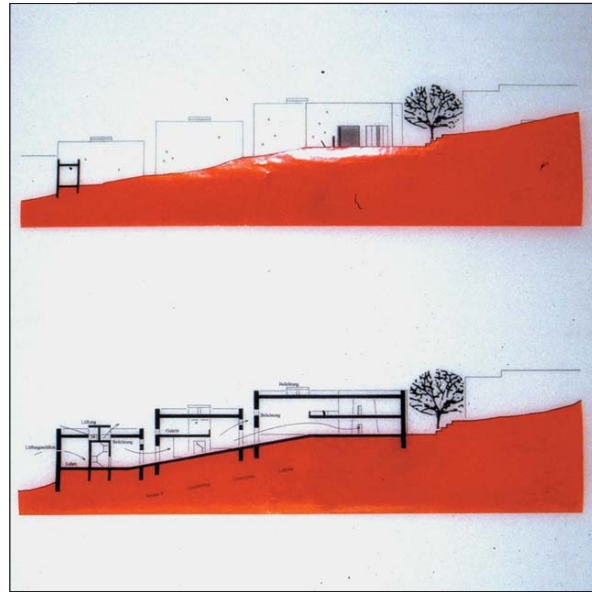
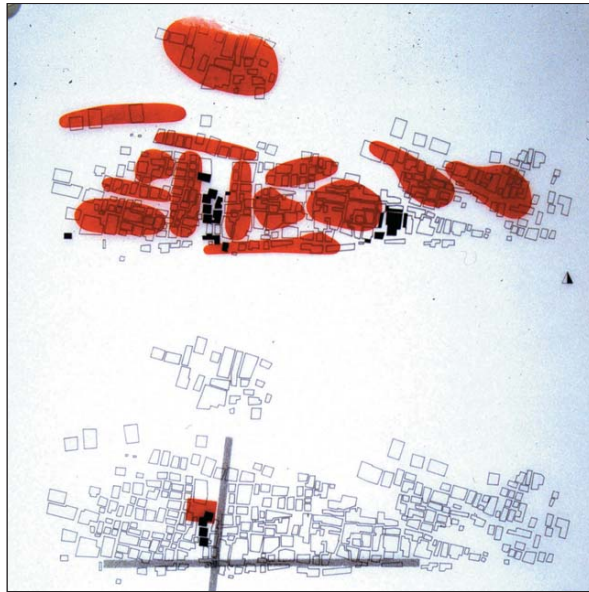
Peter Schneider





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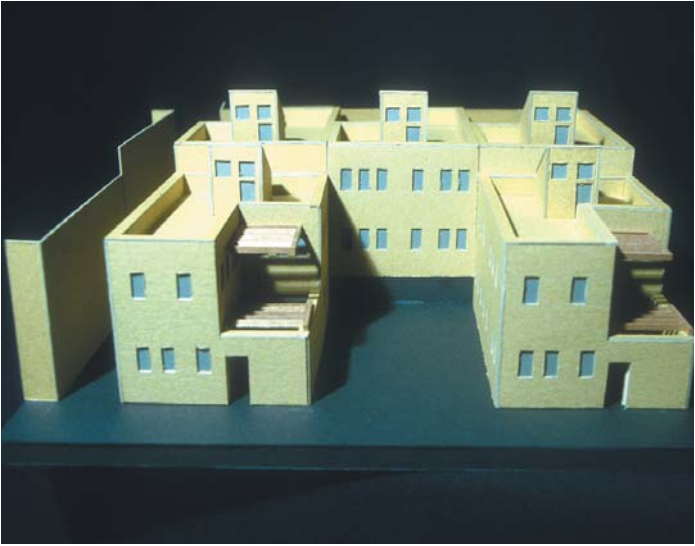
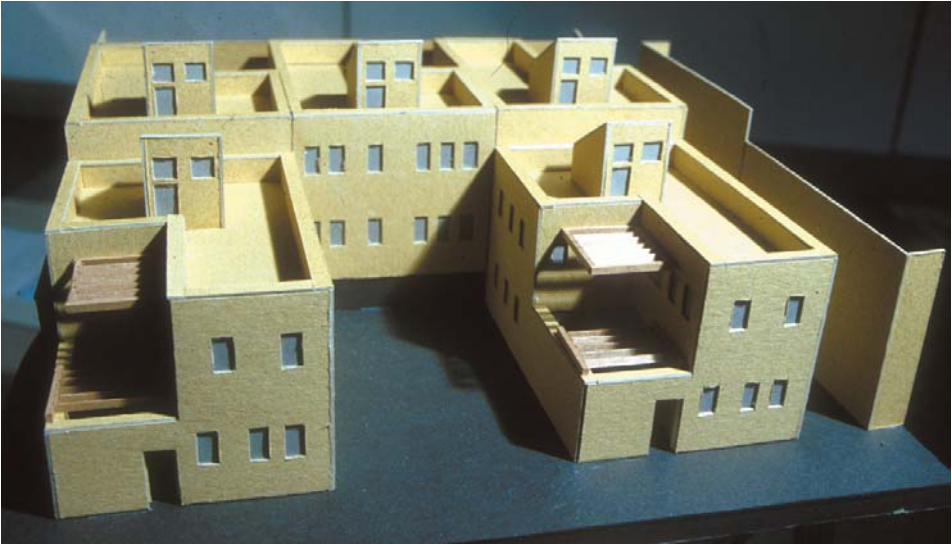
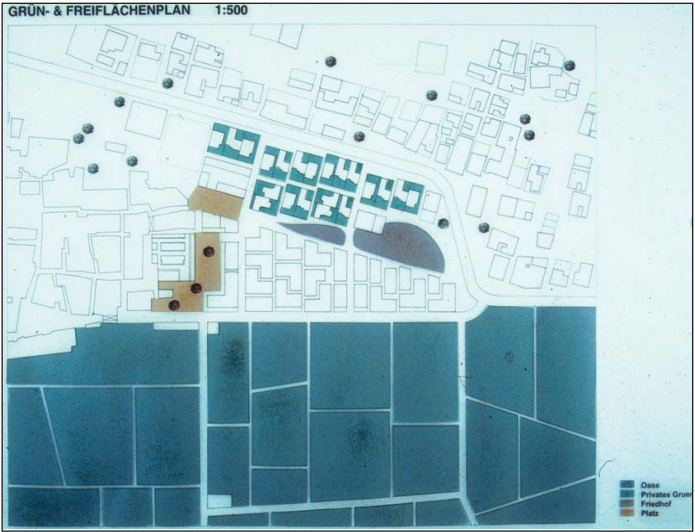
Andreas Burr



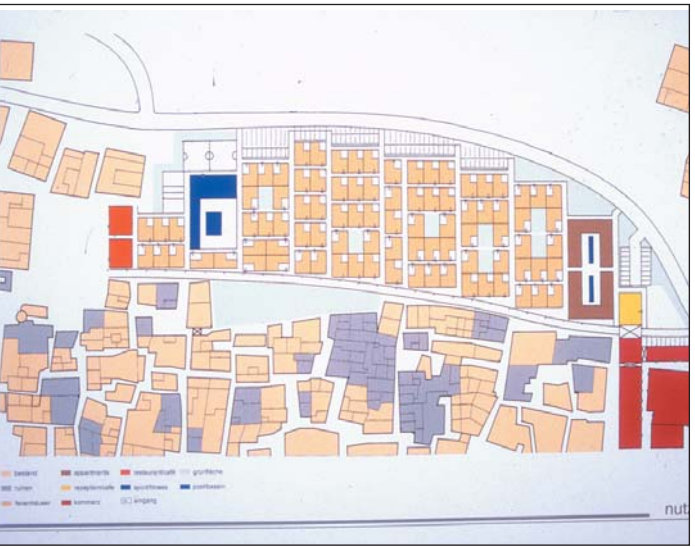
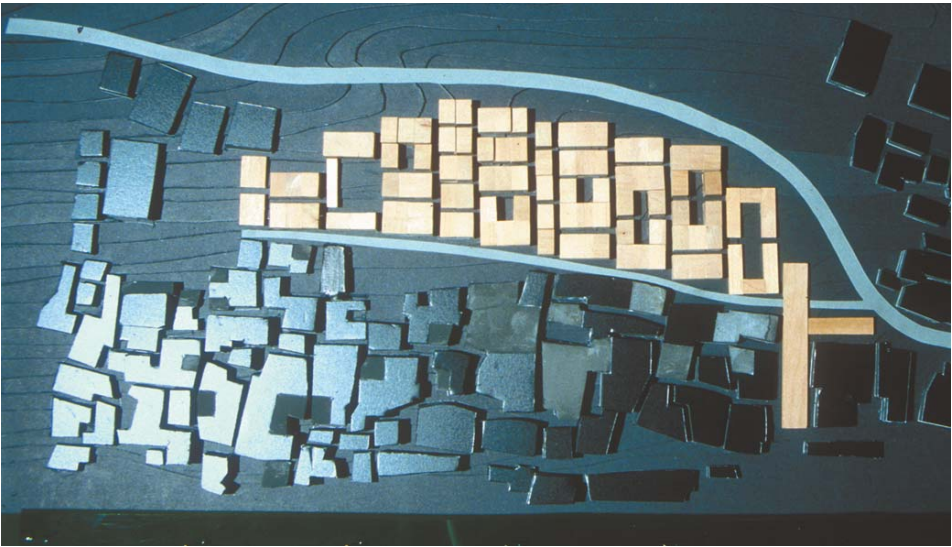


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Tobias Graf / Andrea d ell Antonio



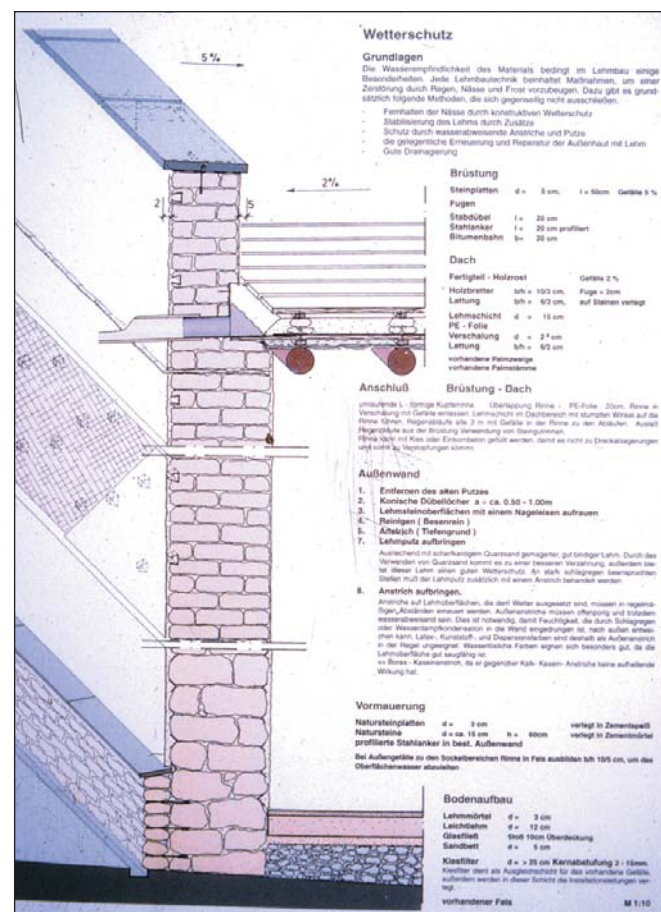
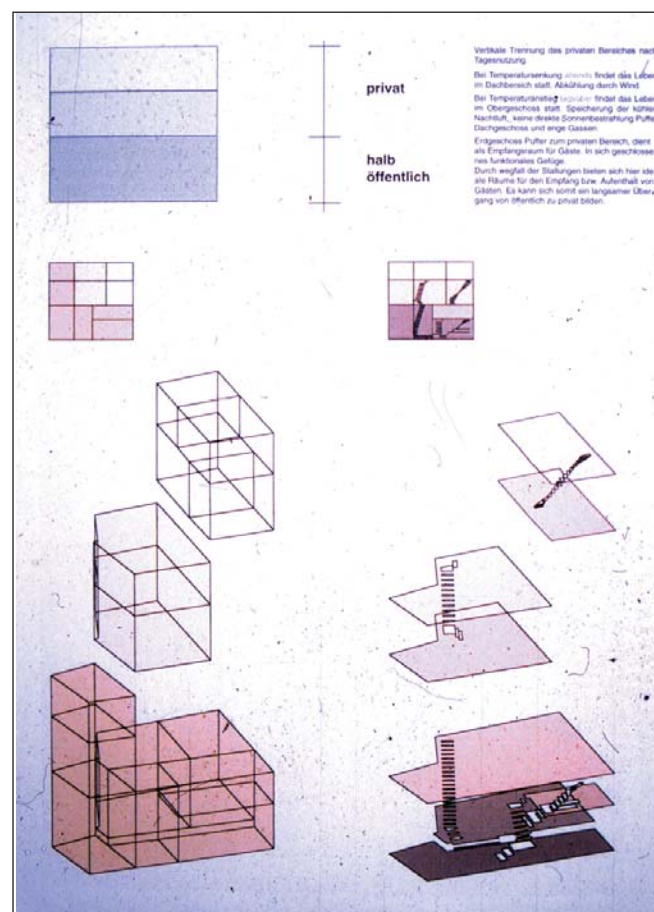
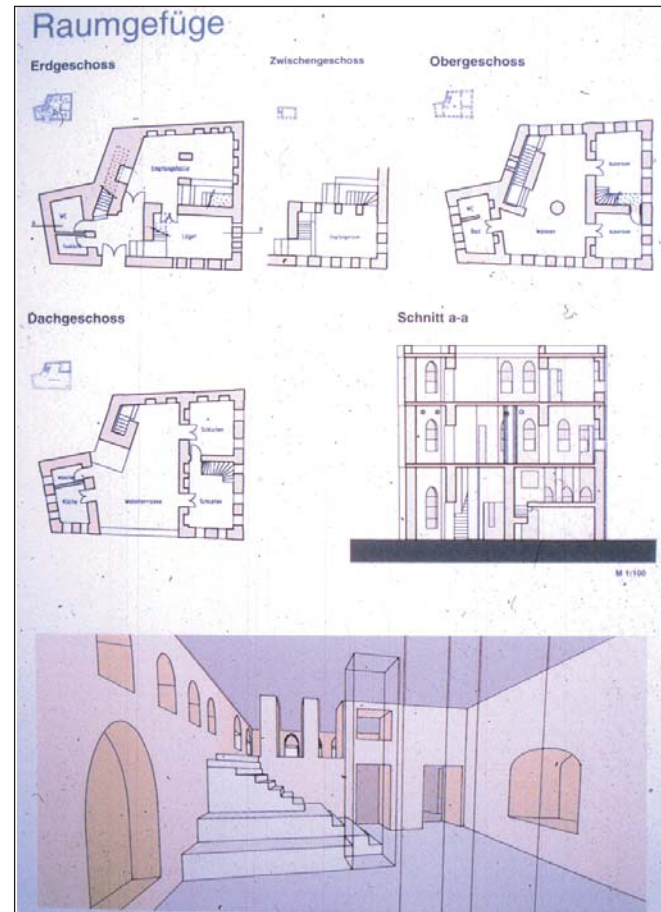
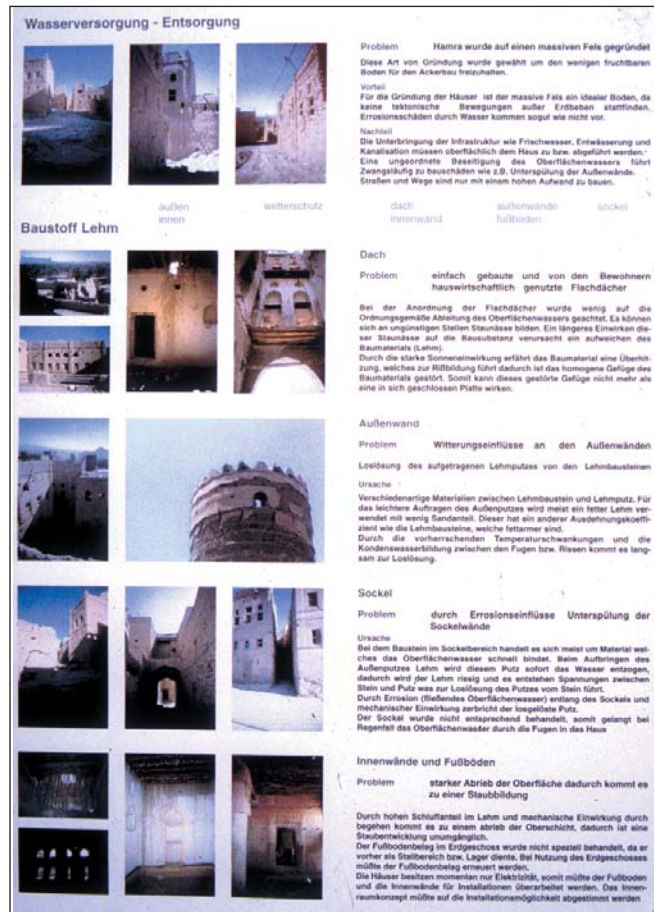
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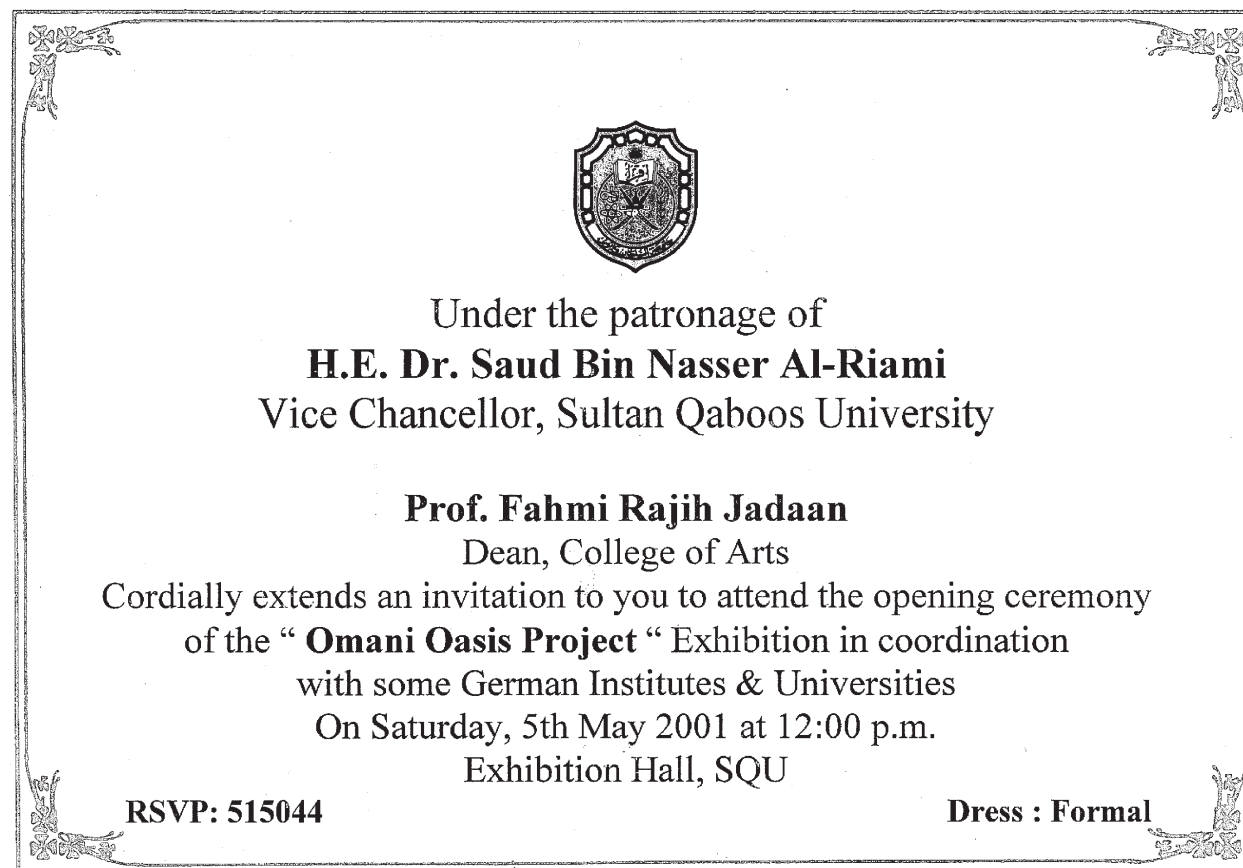


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## يجسد نتائج الأعمال الميدانية حولها «مشروع الواحات العُمانية» معرض في جامعة السلطان قابوس

وحتى القرن العشرين، وتضم منطقة العمل الميداني سبعة عشر موقعاً سكنياً وحقولاً زراعية وستة وأربعين موقعاً سكنياً مهجوراً وقلعة، إضافة إلى ست عشرة مقبرة من العصور الإسلامية «القرن الثاني عشر وحتى القرن العشرين». وكشف العمل الميداني أيضاً عن عدد كبير من الأفلاج وما يتصل بها من صهاريج وقنوات ومنشآت ويضم أحد المواقع مجموعة من الرسوم الصخرية التي يصعب تاريخها الآن.

ويتضمن التقرير الحالي أيضاً تحليلاً أولياً لطبيعة المواقع وتاريخها وكذلك نظم التغذية النباتي والحيواني كما تشمل إيجازاً حول تحليل التخطيط الحضري لمواقع الحمراء أجراه معهد التخطيط الحضري في جامعة شتوتجارت ويدرج التقرير قائمة تفصيلية بالمواقع التي تم الكشف عنها والبيانات المتصلة بها.

ويتخلل التقرير مجموعة من الوسائل الإيضاحية بما في ذلك خرائط للمقطع التجريبي وصوراً جوية ومخططات مختارة لعدد من المواقع الرئيسية التي أجريت فيها الدراسة الميدانية بما في ذلك القارع والطبخة والزامة وبلاد سبت ومسفاة العبريين والحمراء وتبين بعض المخططات تحليلاً للمراحل الإنشائية في كل من بلد سبت وبلدة الحمراء، وبعد الانتهاء من المشروع التجريبي سيقوم الفريق بإعداد خطة عمل للمشروع على نطاق أوسع ويمتد لعدة سنوات.

الجدير بالذكر أن مشروع الواحات العُمانية قد تم تنفيذه بالتعاون مع الوزارات والمؤسسات الوطنية العمانية المعنية بالتطوير والتخطيط والتراث القومي والسياحة والمساحة.

ولقد جسد التقرير الأولي لهذا المشروع نتائج الأعمال الميدانية منذ أن تقدمت جامعة تبوينجن عام ١٩٩٧م باقتراح لتأسيس مشروع مشترك حول الواحات العُمانية، وكانت نتيجة الزيارات الميدانية اختيار مقطع من الحجر الغربي ابتداءً من وادي بني عوف عبر بلد سبت ومسفاة العبريين حتى الحمراء ويشمل هذا المقطع واحات مختلفة الأحجام والارتفاعات ولها خلفيات تاريخية وتجارب متباينة لكنها متباينة تنسج صورة تراثية معبرة. كما تضم المنطقة المشار إليها عدداً كبيراً من المواقع الأثرية ابتداءً من عصور ما قبل الإسلام وحتى وقتنا الحاضر.

وتهدف الدراسة الميدانية إلى توثيق المخلفات الأثرية بأشكالها المختلفة وأحوال المباني التقليدية وأنظمة الزراعة والري والمياه والحرف وأشكال التغير، هذا بالإضافة إلى أن المشروع يهدف إلى مشاركة الجهاز الأكاديمي والفني في قسم الآثار وكذلك تدريب طلاب من جامعة السلطان قابوس وعدد من الجامعات الألمانية وأجراء دراسات علمية تتصل بتراث عُمان وتاريخه في موضوعات ذات أهمية بالغة. وهناك هدف علمي وواقعي للمشروع يتصل بخدمة المجتمع من خلال وضع تصور مبدئي على دراسة ميدانية لخدمة المؤسسات الوطنية الأخرى ذات العلاقة بالتخطيط والحفاظ على التراث والمرافق الشبابية والسياحية، ويعني هذا المشروع أيضاً بزيادة الوعي في التراث المعماري لدى المجتمع العماني.

ومن أهم النتائج التي تمخضت عنها المساح في المنطقة التجريبية هو اكتشاف عدد كبير من المواقع الأثرية يفوق كل تصور سابق، تضم المواقع مستقرات سكنية وحقول ومدافن وبقايا منشآت زراعية وأنظمة مياه، ويمتد تاريخ هذه المواقع من الألف الثالثة ق.م

أفتتح بجامعة السلطان قابوس صباح أمس معرض «مشروع الواحات العُمانية» الذي نظمه قسم الآثار بكلية الآداب تحت رعاية سعادة الدكتور سعود بن ناصر الرياضي نائب رئيس الجامعة.

ويجسد هذا المعرض نتائج الأعمال الميدانية حول توثيق الواحات العمانية التي يتولاها قسم الآثار بجامعة السلطان قابوس بالاشتراك مع عدد من الجامعات الألمانية مثل جامعة تبوينجن وجامعة شتوتجارت وجامعة هوهنهايم إضافة إلى معهد الآثار الألماني. ويأتي إقامة مثل هذا المشروع من الاهتمام الراسخ لجامعة السلطان قابوس في دعم مشاريع التراث العماني.

ويهدف هذا المشروع بشكل أساسي إلى إنقاذ التراث المعماري من حيث ترميم المباني في الواحات القديمة بالإضافة إلى عمل توثيق منهجي للمواقع المختلفة يتبعه توصيات محددة بشأن إعادة استعمالها في إطار خطة عمانية شاملة بعد أن بدأ السكان هجر مواقع الواحات والاتجاه إلى المدن مما يمكن أن يؤدي إلى فقدان التراث المعماري المتصل بالهوية الاجتماعية والتاريخية للشعب العماني.

هذه العوامل دفعت إلى الإعداد لهذا المشروع المشترك الذي يحمل عنوان «مواقع الواحات العُمانية» حين بدأ النقاش الجاد حول هذا الموضوع عندما استضافت جامعة السلطان قابوس في عام ١٩٩٥م فريقاً من أساتذة وطلاب الدراسات الشرقية في جامعة تبوينجن حيث قام الفريق بزيارات ميدانية تضمنت مسوحات أولية تهدف إلى بلورة أبعاد المشروع بما في ذلك خطوات التوثيق الضرورية وإعداد وتصنيف للواحات والأحوال التي مرت بها وذلك بهدف وضع خطط لصيانة مجموعة مختارة منها.