

Moroccan Architecture, traditional and modern

- A field study in Casablanca, Morocco



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Abstract

This thesis is about traditional and modern architecture in Casablanca, Morocco. Morocco is located in north-western Africa and Casablanca is the country's largest city with a population of 3.3 million (2011). Morocco has a long history with many different rulers which have left its mark on the country's architecture. The old, traditional architecture of Casablanca is in the old medina, Medina Qdima, which was built in the late 18th and early 19th century. The medina and the traditional Arabic houses that it is composed of are very similar to those in other Arab countries, and the structure of the medina and the houses follow the Islamic laws on private and public areas. The public areas are commercial streets and squares and the private are residential blocks, all the streets in the medina are narrow and winding and the size of the streets varies with how private or public they are. The buildings in the Medina stand very dense and the residential areas are built around a street from where dead-end alleyways go out, along these alleyways are clusters of dwellings. The traditional Arabic houses are perhaps better known as houses with courtyards, but they are also called *dar*. The courtyard is very important and all the rooms are surrounding the courtyard, all openings in the house is towards the courtyard and there is usually no windows facing the street, in order to keep it as private as possible and to minimize the risk of people looking in. Usually, the courtyard has a large opening in the roof that let in air and sunlight, and the opening modifies the indoor climate in the rooms.

Between 1912 and 1956 Morocco was a French protectorate, which has affected the modern architecture to a large extent. A new city was built around the old medina during the French rule, called Ville Nouvelle, which resulted in strong European influences in the modern areas and buildings. Much of the French culture persisted even after Morocco gained independence and the neighbourhoods and buildings built after the protectorate period, also have south European influences. In the modern areas there are wide avenues and high rise buildings, and the modern houses often have large windows or entire glass facades, many of the buildings have not only European design, but sometimes also some Moroccan details.

The purpose of this thesis was to study the differences between traditional and modern architecture in Casablanca, Morocco. The study aims to find out how traditional and modern houses and the neighbourhoods are different, are they adapted to Casablanca's climate and can differences be distinguished between the residents' comfort and wellbeing? To answer these questions, we did a literature study and a field study in Casablanca. The literature study treated Morocco, the country's history and climate, as well as the traditional Arabic house, the modern villa, modern and traditional neighbourhoods in Morocco but also in the rest of North Africa. In the field study modern areas and the

old, traditional medina as well as traditional and modern homes was studied. During the field study observations were made of the neighbourhoods, interviews with residents in the old traditional houses and apartments and residents in modern homes, as well as studies of the houses/apartments. Much of the architecture involves climate considerations in buildings and urban environments, therefore, this has great importance in our report.

We concluded that the main differences between modern and traditional buildings are the design of windows and openings. The traditional houses follow the Islamic laws on private and public areas and thus separate the houses from the street by having little or no windows facing the street, while the modern houses are much more European-influenced. Between the traditional medina and the modern neighbourhoods there are many significant differences, the planning of streets, width of the streets and height of the buildings. The traditional Arabic houses have been shaped according to Islamic law but over the years, they have also been climate adapted, however, they work best in a climate that is hot, dry and arid, which Casablanca's climate is not all year round. In Casablanca, one can conclude that the modern houses, although their climate-adaption is not especially good, yet they are better than the traditional ones. Most of those interviewed thrived where they were regardless of the area they lived in, but the humidity was one of the most common complaints in the old houses. Some of the traditional houses in the medina that were visited had been converted, resulting in very poor indoor climate and no openings out.

In the medina solar radiation into the streets are minimized because of how narrow and winding they are this also minimizes the ventilation, while in the modern areas the streets are wide and straight, maximizing both solar radiation and ventilation. The urban design in the medina is primarily suited for hot, dry climates. In the humid climate of Casablanca the moisture does not dry out because of the narrow streets and the poor ventilation.

Keywords: Moroccan architecture, Casablanca, Climate considerations, The Medina, The traditional Arabic house

Sammanfattning

Detta arbete handlar om traditionell och modern arkitektur i Casablanca, Marocko. Marocko ligger i nord-västra Afrika och Casablanca är landets största stad med en befolkning på 3,3 miljoner (2011). Marocko har en lång historia med många olika styren vilket har satt sin prägel på landets arkitektur. Den gamla, traditionella arkitekturen i Casablanca finns i den gamla medinan, Medina Qdima, som byggdes i slutet av 1700-talet och början av 1800-talet. Medinan och de traditionella arabiska husen som den består av liknar mycket de i andra arabländer, och uppbyggnaden av medinan och husen följer Islamska lagar om privata och allmänna områden. De allmänna områdena är handelsgator och torg och de privata är bostadskvarteren, alla gator i medinan är smala och snirkliga och storleken på gatorna varierar med hur privata eller allmänna de är. Byggnaderna i medinan står mycket tätt och bostadskvarteren är uppbyggda med en gata varifrån det går mycket smala återvändsgränder, längs dessa gränder finns bostäderna i kluster. De traditionella arabiska husen är kanske mer kända som hus med en innergård, men kallas även för *dar*. Innergården är mycket viktig och det är runt denna som de andra rummen finns, alla öppningar i huset är mot innergården och det finns oftast inga eller mycket små fönster ut mot gatan, detta för att hålla det så privat som möjligt och minimera insyn. Oftast har innergården inget tak eller en stor öppning i taket som släpper in luft och solljus och den har som funktion att modifiera inomhusklimatet i rummen.

Mellan 1912 och 1956 var Marocko ett franskt protektorat vilket har påverkat den moderna arkitekturen till stor del. Under franskt styre byggdes en ny stad runt den gamla medinan som kallades Ville Nouvelle vilket medförde att de moderna områdena och byggnaderna i dessa områden har starka Europeiska influenser. Mycket av den franska kulturen fanns kvar även efter att Marocko blev självständigt och de stadsdelar och byggnader som byggts efter protektorat tiden har även de sydeuropiska influenser. I de moderna områdena finns breda avenyer och mycket höga hus, och de moderna husen har ofta stora fönster eller hela glasfasader, många av byggnaderna har inte endast europisk design utan har ibland också vissa marockanska detaljer.

Syftet med detta arbete var att studera skillnaderna mellan traditionell och modern arkitektur i Casablanca, Marocko. Studien syftar att ta reda på hur de traditionella och moderna husen samt områdena skiljer sig åt, är de anpassade efter Casablancas klimat och kan skillnader mellan de boendes trivsel urskiljas? För att besvara dessa frågor gjordes en litteraturstudie samt en fältstudie i Casablanca. Litteraturstudien behandlade Marocko, landets historia och klimat såväl som det traditionella arabiska huset, den moderna villan samt moderna och traditionella områden i Marocko men även i resten av Nord Afrika. I fältstudien studerades moderna områden och den gamla, traditionella

medinan såväl som traditionella och moderna bostäder . Under fältstudien gjordes observationer av områdena, intervjuer med boende i gamla traditionella hus och lägenheter och boende i moderna bostäder samt studier av husen. Stor del av arkitektur innebär klimatanpassning av byggnader och urbana miljöer därför har detta fått stor vikt i vårt arbete.

Vi kom fram till att de största skillnaderna mellan moderna och traditionella byggnader är planeringen av fönster och öppningar. De traditionella husen följer de islamska lagarna om privata och allmänna områden och därmed avgränsas husen från gatan genom att ha små eller inga fönster ut mot gatan medan de moderna husen är mycket mer europeiskt influerade. Mellan den traditionella medinan och de moderna områdena finns många stora skillnader, planering av gatorna, storlek på gatorna och höjd på husen.

De traditionella arabiska husen har formats enligt islamska lagar men under åren har de även klimatanpassats, dock fungerar de bäst i klimat som är heta, torra och arida, vilket Casablancas klimat inte är året runt. I just Casablanca kan man komma till slutsatsen att de moderna husen, även om de inte är bra klimat anpassade, ändå är bättre än de traditionella. De flesta av de som intervjuades trivdes där de var oberoende av vilket område de bodde i, dock var fuktigheten en av de vanligast klagomålen i de gamla husen. Några av de traditionella husen i medinan som besöktes var ombyggda, vilket har resulterat i mycket dåligt inomhusklimat och inga öppningar ut.

I medinan minimeras solinstrålningen på gatorna av att de är smala och snirkliga, detta minimerar även ventilationen medan i de moderna områdena är gatorna breda och raka vilket maximerar både solstrålning och ventilation. Den urbana design som använts i medinan är främst lämpad för varmt och torrt klimat. I det fuktiga klimatet i Casablanca gör de smala gatorna och dåliga ventilationen gör att fukten inte torkar ut.

Nyckelord: Marockansk arkitektur, Casablanca, Klimatanpassning, Medina, Traditionella arabiska hus

Foreword

This Bachelor thesis is the last part of our 3 years education in Civil Engineering, specialized in Architecture at LTH School of Engineering at Campus Helsingborg. It was conducted in spring of 2012, during 15 weeks which of 3 weeks were spent in Casablanca, Morocco.

The distribution of the work during the process has been divided by different responsibilities. Tove has had the overall responsibility for the literature study, she has been responsible for the information about Morocco and the country's climate and history, the chapters Traditional Architecture and Modern Architecture, and the chapter Climate Considerations in Building Design in the literature study, and she was also responsible for the Urban Casablanca chapter in the field study. Sanaa has been responsible for the contact with people in Morocco, she performed the interviews with the residents of the buildings that were visited, and she was responsible for the Climate Consideration in Urban Design in the literature study and the Buildings in Casablanca chapter in the field study, which is based on the interviews.

We would like to thank our examiner Erik Johansson, Housing Development & Management, LTH and our supervisor Johnny Åstrand, Director of the department for Housing Development & Management. We would also like to thank Khalid El Harrouni, Professeur Universitaire, Ecole Nationale d'Architecture in Rabat, Morocco who helped us with literature and information during our 3 weeks in Morocco.

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We would also like to thank the families who welcomed us in to their homes and participated in our interviews.

Thank you.

Tove Brunzell and Sanaa Duric, May 2012.

Explanation of terms

Medina - The word “Medina” means *city* or *town* in Arabic, and the medina are the old, walled part of most North African cities.

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1 Introduction

The background for this thesis and the choice of subject are a shared interest for architecture abroad and specially in North Africa. A big part of why we chose Morocco to conduct our study is Sanaa's heritage; she is originally from Morocco and speaks French, Moroccan and a bit of Arabic. This helped our fieldwork in Casablanca enormously; the interviews were done in Moroccan and/or French, and then translated to English.

From the beginning the idea with this thesis was a more architectural approach to the differences between traditional and modern but after attending a course in International Sustainable Development in Built Environment, much of which treated climate considerations of buildings and urban areas in different climates it changed, and our work took on a more climate-focus than it was initially intended. Climate adaption and consideration in buildings and urban environments is a large part of today's architecture.

The modern buildings in Morocco are inspired by the villas in south of Europe, and the older more traditional buildings are Arabic houses in the same style as in many other North African countries. The modern apartments in Morocco are also very European-influenced but often with some Moroccan touches while the traditional Arabic houses are what might be known as the courtyard house, which is a house with a courtyard in the middle with the rooms symmetrically surrounding the courtyard.

1.1 Research questions

The traditional Arabic houses have throughout the ages been adapted to the climate and traditions of Morocco and the rest of North Africa, as well as the old neighbourhoods that have been built to follow Islamic laws and not modern rules of climate consideration in the urban environment, and they are often very densely built. While the modern houses and neighbourhoods are being built without following the strict Islamic laws but possibly with a better knowledge and understanding of climate consideration of buildings and urban areas.

So with this in mind the problem definition for this thesis is: How do the modern and traditional buildings and neighbourhoods differ? Are the modern houses, buildings and neighbourhoods better adjusted to the Moroccan climate and the modern life than the traditional? How do the residents feel about their houses and can differences be distinguished between the residents' comfort and wellbeing in the different types of houses?

1.2 Objectives and aims of the study

The aims of this thesis were to do a study of Moroccan architecture, traditional and modern. With the study we hoped to develop an understanding for why the traditional houses are built as they are, and how or if traditions and beliefs affect the building's design or if it exclusively or partly depends on the climate. We also hoped to gain an insight into the differences between modern and traditional by making this study and a comparison of the old and new building designs.

We also looked at the different urban areas, the Old City in Casablanca also known as the Medina, the Ville Nouvelle, which is a modern city surrounding the Medina that was built during the French protectorate, and a neighbourhood from the late 20th – early 21st century in Casablanca. With this we wished to get extra knowledge how modern and traditional differs in Morocco.

In this thesis we also address climate considerations in urban design and building design, with this we hoped to gain insight to how this affects the design of the different building types and neighbourhoods or if it plays any part in the design at all.

We hoped to be able to create a theory about why the different houses are designed as they are, if the different designs can be reflected in the residents' comfort and what the major differences between the various houses and the different urban areas are. As well as suggest improvements to climate adaptation of the buildings and the urban environment.

1.3 Method

We attended a class in International Sustainable Development in Built Environment in the beginning of spring 2012, which gave us an overall understanding in the subject and broadened our architectural interest.

Many different methods were used during the work with this thesis. Literature studies about Morocco, history and different facts about the country that has affected the architecture, the climate and the urbanisation in the country. We also researched the traditional Arabic house, the more modern villa, and old and modern neighbourhoods in Morocco and in North Africa.

In Morocco we conducted a field study where we visited families who lived in apartments and houses in the old medina, Medina Qdima in Casablanca, and we visited families who lived in apartments and houses in the more modern neighbourhoods. We studied their houses and apartments and conducted

interviews with them to see how they felt about the different neighbourhoods and types of homes. We also studied the different urban areas in Casablanca.

After the 3 weeks long field study we analysed the interviews and our observations, and compiled the collected information so we were able to draw conclusions and answer the questions in our problem definition.

1.4 Limitations

The study focused on Casablanca, Morocco and the field study was done during 3 weeks in March. In this study 2 apartments and 2 houses in the medina and 3 apartments and 1 house in a modern neighbourhood were studied in reality and served as basis for our theories.

2 Morocco

Morocco has a population of 32.3 million. (Holmén¹, 2011)

The differences in living standards between urban and rural areas are big. In the Moroccan countryside the living conditions can be considered similar to those in Africa's poorer countries, south of the Sahara. But in the urban areas the living standard is often much better and can many times be compared to European standards. (Hansson & Holmén¹, 2012)

2.1 Geography and Climate

Morocco is located in North Africa and has an area of 459 000 km², this without counting Western Sahara. Western Sahara has been occupied by Morocco since 1976 but the region is still disputed. Morocco is bordering to Western Sahara in the south and Algeria in east and southeast. It has a coastline on the Atlantic Ocean and the Mediterranean Sea. The political capital in Morocco is Rabat, with 1.8 million inhabitants, but Casablanca is the largest city in the country with 3.3 million inhabitants. (Holmén¹, 2011)

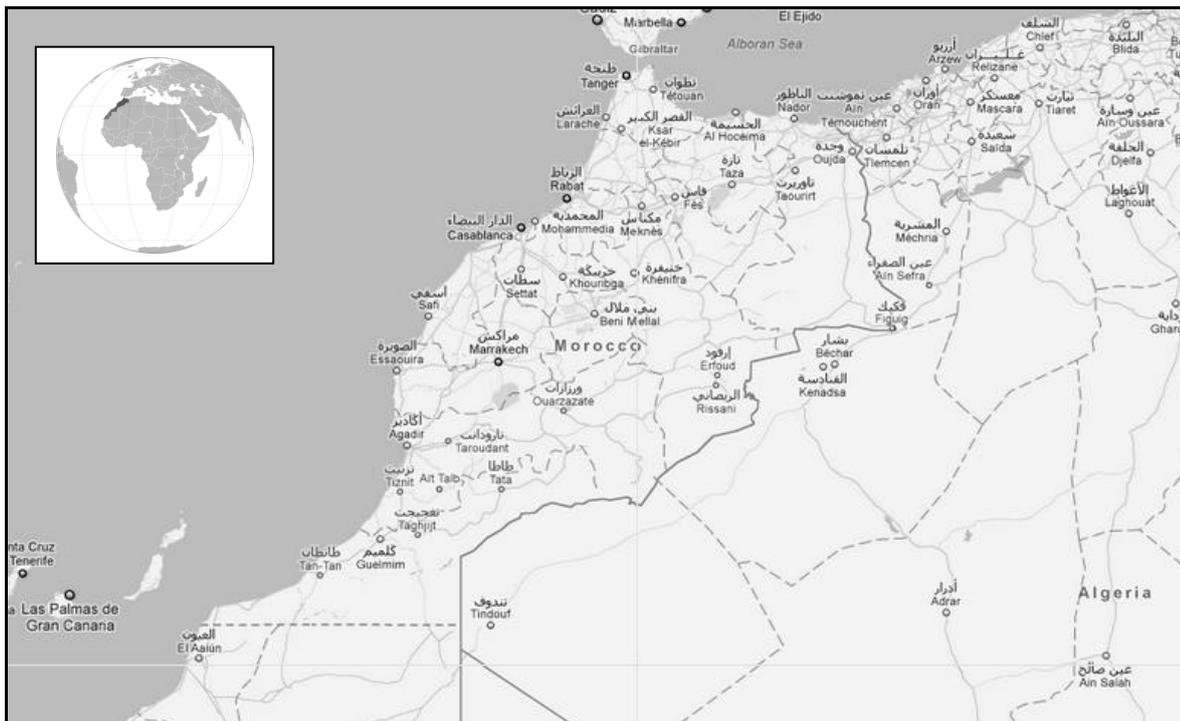


Fig 1. Map of Morocco.

(Google Maps, maps.google.se)

Large parts of Morocco is mountains, in the north bordering the Mediterranean are the Rif Mountains with the highest peak at 2 456 m, further south and running from southwest to northeast is the Atlas Mountains with peaks up to 4 165 m. Morocco is a seismic active area and are frequently

affected by earthquakes which result in damages in buildings and sometimes human casualties. (Behrens, 2012)

The northern parts of Morocco have a temperate, Mediterranean climate while the inner- and south parts of the country have a dry and semi arid climate. In the inland and the south parts of the country desert winds can give temperatures between 35-40°C. In the north average temperature in January are 12°C and in August 23°C and in the inland it is 10°C and 28°C. In the mountains the temperatures may vary considerably, the winter temperature can go as low as -20°C and during the summer the temperature can go up to 40°C. Since there are different climates in north and south the precipitation are very different. In north the annual precipitation is about 1200 mm/year, this falls in the winter between November and January. In the south the annual precipitation are often less than 250 mm/year. (Behrens, 2012)

2.2 Language and Education

Morocco's official language is Arabic; there are a few different dialects and the majority of the population speaks Arabic Maghrib dialect. Since the French Protectorate, French has been an important language in Morocco and still is. French are still used in education, business and media and Morocco still have strong ties to France. In the more rural areas Berber dialects are still in use, there are three main dialects; Tachelhit, Tarifit and Tamazight. In the north of Morocco they also speak Spanish. (Dahl, 2012; Gordon, Talbot, & Simonis, 1998)

In 2008 26% of the state budget was put towards educating the young in Morocco. In primary school the education is in Arabic and higher up it is in Arabic and French. In 1963 mandatory schooling was introduced. Elementary school starts at age six, and it includes six plus three years. There are also private and foreign schools, the foreign are mostly French. (Hansson & Holmén², 2012)

In 1997 education was highlighted as an area in need of urgent reform in a memorandum from the World Bank to the Moroccan government. Special attention was given to the need for basic education of women and girls in rural areas. It is estimated that 56 % of the adult population in Morocco is literate. There is a big difference between urban and rural literacy, 23% of people living in the country and 64% in the cities can read and write. (Hansson & Holmén², 2012; Gordon, Talbot, & Simonis, 1998)

Morocco has 14 state universities. The biggest university in Morocco is Hassan II in Casablanca and the world's oldest university is al-Qarawiyin that is located in Fès and was founded in 859. (Hansson & Holmén², 2012)

2.3 Religion

The state religion in Morocco is Islam, which covers 99% of the population. In addition to Islam there is Christianity and Judaism. Sunni Islam is the dominating branch of Islam in Morocco.

There are about 70 000 Christians in Morocco, most common are Roman Catholics. Judaism is rare in Morocco, since the 1950s most of the Jews have immigrated to Israel, and now there are about 6 000 Jews left and most of them live in Casablanca.

(Halldén and Holmén, 2012; Gordon, Talbot, & Simonis, 1998)

2.4 Economy

2011 the GDP per capita was 3 162 US dollar. Agriculture, tourism and the export of phosphate is important for Morocco's economy. Still the country has a growing national debt and because of this, the rapid increase in population and other factors Morocco is considered one of the poorest Maghreb states.

Also the unemployment and underemployment in Morocco is substantial.

(Holmén³, 2012)

2.5 History

Morocco's early history and the history of the rest of North Africa, known as the Maghreb, is pretty much the same. Phoenicians, Romans, Vandals, Byzantines and Arabs have all sometime throughout history invaded the area. The area that now is Morocco has been split in several different ways between various invaders and also the native people who has become known as the Berbers. The Berbers are thought to be descendants from the Oranian and the Capsian lines of the human race. (Wikander, Aringberg-Laanaatza & Holmertz, 2012; Gordon, Talbot, & Simonis, 1998)

Phoenicians were the first to invade the Maghreb, they were traders from Tyre, in modern Lebanon. One of their first bases in North Africa was the famous Carthage, in modern Tunisia. Carthage has been dated back to 8th century BC. In Morocco the Phoenicians had three posts near today's Tetouan, in Tangier and in Essaouira. In 146 BC Carthage fell to the Romans, but the Morocco-area was by then part of the Mauritanian kingdom. The Mauritanian king died and left the kingdom to the Romans, who at around 40 BC divided the area into two provinces, Mauritania Caesariensis (modern Algeria) and Mauritania Tingitana (modern Morocco). Thanks to the Rif Mountains and The Atlas mountains the latter of the two provinces were pretty much cut off from the rest of Roman North Africa and the Berbers who lived in the mountains kept their independence. In the later parts of the 3rd century the Romans abandoned all of Mauritania Tingitana except Tingis (Tangier) to local tribes. In the beginning of the 5th century the Vandal people had taken

over the North African provinces, but the native tribes harassed them and the Vandal rule was ended. In 533 Byzantines ruled in North Africa, but by 649 they had been defeated by the Arabs. The Berber tribes in North Africa resisted the Arabs but then Musa bin Nusayr took control of the Arab army. Instead of trying to defeat the Berbers he befriended them. With the Arabs came Islam, many of the Berbers embraced Islam as a religion and some converted. But the Arab rulers treated the Berbers like lower beings, so the Arab lords were not liked by the tribe people and by 740 they had managed to evict all the Arab governors. Although large parts of the Arab people remained, Morocco was never again under eastern Arab rulers. Then Morocco was part of several different dynasties, the first was Idriss who's dynasty is considered to be the first Moroccan state. And between 1056 and 1147 there were the Almoravids, they founded Marrakesh in 1062 and by the end of the 11th century they had unified empire from the Senegal River to the Ebro River on the Iberian peninsula. Then there were the Almohads, Morocco's greatest dynasty, who conquered the whole Almoravids Morocco but also large parts of the rest of North Africa. In 1269 the Almohads dynasty collapsed and the area was divided, Morocco fell under the Merenids who rule until 1465. By the 16th century Morocco was divided yet again, the Wattasides in Fès and the Saadians in Marrakesh. By 1515 Portugal had several bases along the Moroccan coast and Spain had already taken Melilla, in 1578 the Portuguese were forced to leave Morocco. In the 1660s the Alawites secured the sultanate. In the 18th and 19th century European countries began to occupy neighbouring countries and trying to get a foothold in Morocco. France moved in on Morocco and on the 30 March 1912 the treaty of Fès was signed, and there by Morocco was a French Protectorate, however Spain still controlled the north part of the country. The Berbers revolted against the French and the Spaniards and it took five years before the Berbers were defeated. By 1929 over 100 000 foreigners were living in Morocco, and the French built roads, railroads, the Casablanca Harbour and they built New Towns next to the old medinas. In 1944 the Istiqlal party wanted and demanded full independence. In 1956 Morocco gained independence from both France and Spain. (Wikander, Aringberg-Laanaatza & Holmertz, 2012; Gordon, Talbot, & Simonis, 1998)

2.6 Casablanca

Casablanca is a city in Morocco, situated in the west about 100 km south-west of the capital Rabat and by the Atlantic coast. Casablanca is Morocco's biggest city with a population of about 3.3 million. The port of Casablanca is one of the most important in Africa, near three quarters of Morocco's foreign trade passes through Casablanca. More than half of the industrial production takes place in Casablanca, the main industries are oil refining, cement-, food- and textile industries and chemical industries.

The medina in Casablanca is an old Arabic neighbourhood, with traditional buildings. Around the medina has a modern and European-influenced city emerged. These two different cities within Casablanca are called the old city and the new city. The old city has, as mentioned, more traditional buildings while the new city has high rise buildings, and industrial and residential areas. (Holmén³, 2011)

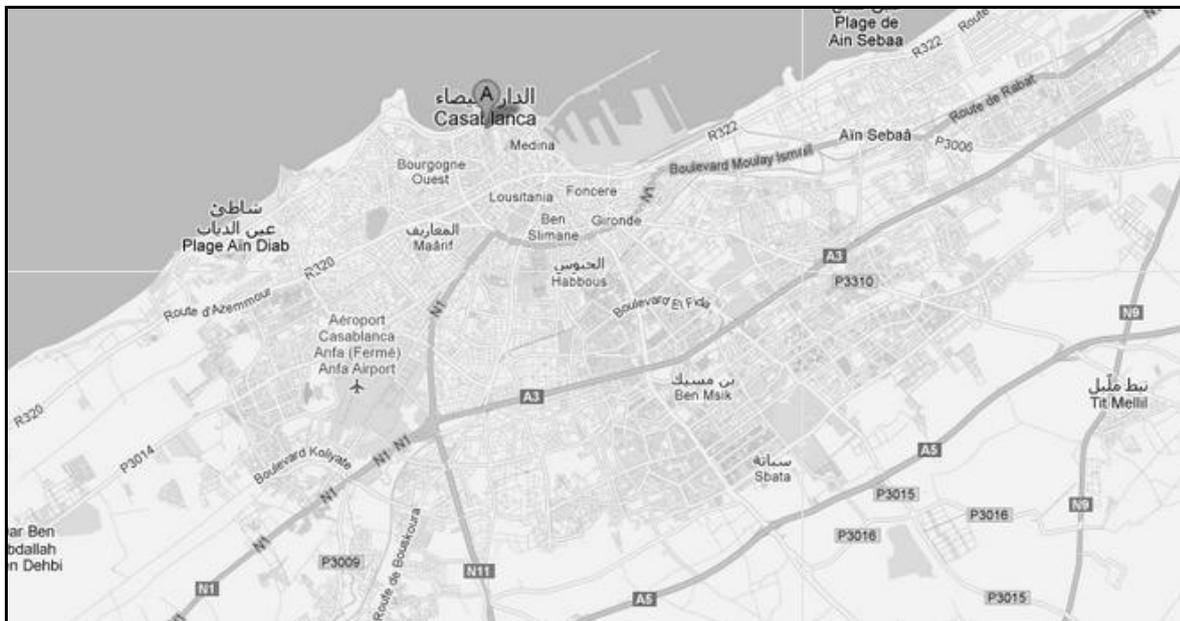


Fig 2. Map of Casablanca
(Google Maps, maps.google.se)

During the 20th century migration into Casablanca was extensive and the city has grown rapidly. As a result Casablanca is surrounded by large slums and shantytowns, known as *bidonvilles*. (Holmén³, 2011)

2.6.1 Climate

In Casablanca the climate is temperate, Mediterranean climate, the Atlantic Ocean has a cooling affect that makes the climate along the coast relatively mild. According to the Köppen's climate classification Casablanca has a 'Csa' climate which means warm, dry summers and cool, wet winters, and the lower case letters implies that there is a "dry season in the summer of the respective

hemisphere” and that there are hot summers where the warmest month has a average temperature over 22°C. (World Weather, 2012; Behrens, 2012)

Monthly mean	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec
Max Temp. (°C)	17,1	18,8	21,3	19,7	22,2	24,4	26,2	26,7	25,5	22,1	19,8	19,7
Min. Temp. (°C)	7,2	10,5	12	12,6	16	18,6	20,1	21,2	19,3	15,1	11,5	10,9
Sunshine (hours/day)	5,5	6,2	7,3	8,7	9,5	9,8	10,0	9,7	8,9	7,3	5,7	5,4
Max RH (%)	94	95	94	95	92	93	92	92	95	93	94	94
Min RH(%)	65	68	68	72	69	75	72	74	72	69	68	69
Precipitation (mm/month)	65	53	55	38	20	2	0	1	6	39	57	87
Wind (m/s)	2,6	2,6	3,1	3,6	3,6	3,6	3,6	3,1	3,1	3,1	2,6	2,6

Fig 3. Climate data

(Numbers from MarocMeteo.ma, WorldWeather.org, Windfinder.com and Climatetemp.info)

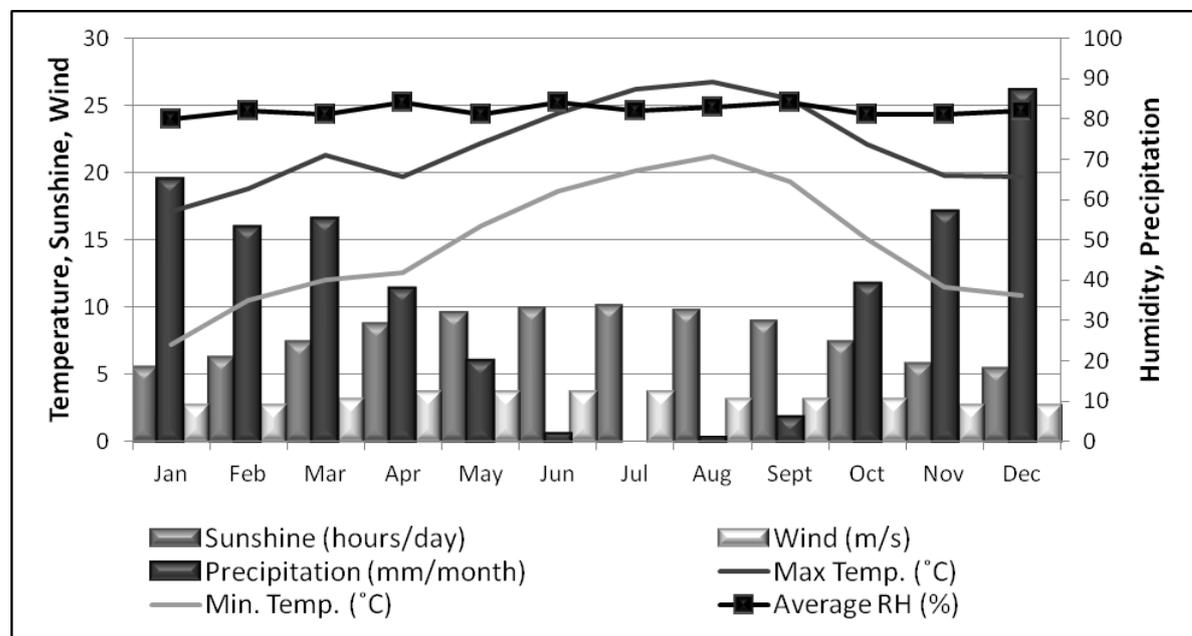


Fig 4. Climate chart.

(Numbers from MarocMeteo.ma, WorldWeather.org, Windfinder.com and Climatetemp.info)

2.6.2 History

Before Casablanca there was the city of Anfa, situated at the same location. Anfa was in the 13th century a commercial harbour, its history before and who founded the city is disputed. Some claim that it was a Roman city, or a berber village and some that it was founded by the Zenatiyins.

In 1468 the Portuguese destroyed Anfa completely, they built a military fortress of the ruins and called it *Casa Branca* which means ‘white house’. (El Azhar, 2006; Skansjö, 2012)

In 1775 Casablanca was hit by an earthquake, and was destroyed again, Sultan Sidi Mohammad Ben Abdellah rebuilt the town and called it Dar-El-Beida, which is “Casablanca” in Arabic.

During the 19th century Spanish and French merchants settled in the city and Casablanca slowly developed commercially. In the early 1900s Casablanca was divided in three blocks; Medina Qdima, which is the part of the town that Sultan Sidi Mohammad Ben Abdellah built, the mellah and the third was the tnakar area. (El Azhar, 2006; Skansjö, 2012)

1907 Casablanca was occupied by the French and between 1912 and 1956 it was a French Protectorate.

The French wanted to make Casablanca “a prestigious witness for French energy and initiative”. By developing the port and thus get more French and European companies settled in Casablanca, the town grew rapidly. This also attracted workers from neighbouring areas, which quickly led to an overcrowded city. The French sought to maintain segregation of housing, which would result in two cities in Casablanca, one European and one Moroccan. They built a modern city and a traditional Moroccan city. The Moroccan town was called medina jadida and resembled Medina Qdima and most other Moroccan cities in both design and architecture. (El Azhar, 2006; Skansjö, 2012)

Casablanca was an important strategic port during World War II and hosted the Casablanca Conference in 1943, and after the war Casablanca witnessed an economic boom which led to even more migration towards the city.

Morocco regained independence from France in 1956. (El Azhar, 2006; Skansjö, 2012)

The migration from all over Morocco continued and in the 1970s Ministry of Housing and Urbanism was founded. The authorities didn’t have time to provide everyone with homes despite an ambitious housing program, and the slums known as bidonvilles around Casablanca are part of the result.

In Casablanca lives nearly one seventh of the Moroccan population and the city have become the largest city and the main port in the country.

(El Azhar, 2006)

3 Moroccan Architecture

The fundamentals of the building process in North Africa can be said to derive from Islam, and the guidelines related to it. The early development of building and urban design was parallel to the development of Islamic law.

(Hakim, 1988)

3.1 Traditional Architecture

Traditional building design in Morocco and the rest of North Africa, as mentioned, can be traced to Islam. Islamic customs and laws have originally contributed to the planning of houses and neighbourhoods in Morocco.

(Hakim, 1988)

3.1.1 The Medina

The medinas in North Africa often resemble each other in structure and planning, however, they differ much from the European urban areas, there is not any symmetry to the planning and it may look quite chaotic. The medinas are often divided into the public space and the private space, and around the medina runs the city walls that creates a social entity and separates the old town from the newer on the outside of the walls. The roads in the medina vary in size depending on what their function is, they are rarely straight and together with the houses they form a maze. Because of the deep and narrow streets the sun rays can't reach the streets during the day. Common building materials in the medinas are materials that are easily accessible, such as stone, wood and earth. (Bianca, 2000; Gordon, Talbot, & Simonis, 1998)

The public space follows a hierarchy with the city centre, where the mosque, the souq, the médersa (religious university) and the funduqs are, then there is a second level inside the residential area where there are schools and the hammam, which is the public bath, and the third public space is the public street inside the residential area where there are shops for the residents' every day supply.

The souq is the market or bazaar of the medina where the streets often are covered with awnings or fabrics to keep out the heat of the sun, there are some openings that let in light and keep the streets ventilated. Also here there is a hierarchy; the shops are grouped after what they sell, in the centre there are the shops that sell things that have importance in the Muslim culture and the religion, it then descends until it reaches the city walls, where you find the craftsmen.

Funduqs are caravanserais, they were often built along big trade routes and functioned as motels for the travelling merchants. They housed some shops,

stables and accommodations for the people. Nowadays they are usually not functioning as motels but in some there are still stables and shops.

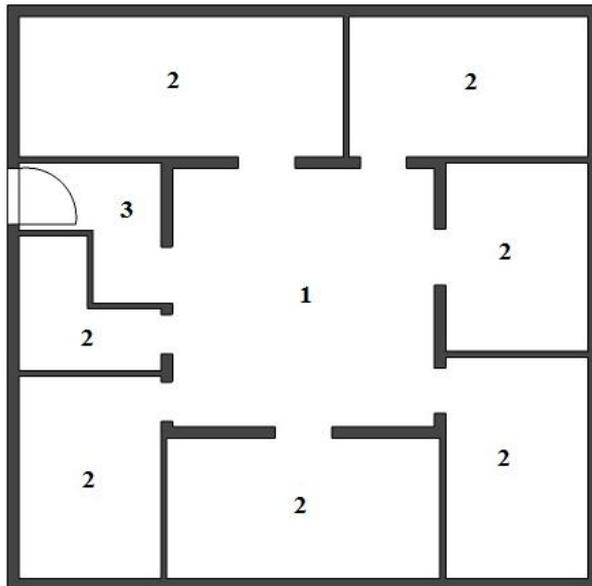
The design of the public space allows a high degree of interaction between various social activities. (Bianca, 2000; Harrouni, 2002; Gordon, Talbot, & Simonis, 1998)

The private space is in the residential areas around the city centre where the dwellings are located in clusters along dead-end alleyways. These clusters can be called residential quarters and are located along a somewhat bigger street. The dead-end alleyways are known as *Derb* and are often narrow and the beginning of a *derb* is often marked by thresholds or arches between buildings to provide a more private feel. The houses are dense in the residential districts with walls that provide protection against insight and leave the houses as anonymous buildings. In this way the residential areas are shielded from the public areas and the public life. How the houses are placed along the *derb* also follows a hierarchy; the further in the house is situated the more shielded and private it is. (Bianca, 2000; Harrouni, 2002)

3.1.2 The Traditional Arabic House

The traditional Arabic house is known as *dar* or as a house with an interior courtyard. The main characteristics of the *dar* are the central courtyard that has no roof or has an opening in the roof, and the rooms that symmetrically surrounds the courtyard. The ceiling height in the rooms is very high and the rooms are often quite elongated. The corridor from the front door and into the house itself is often angled to minimize the view from outside into the various rooms. The use of the rooms is often non-specific and can be used for various purposes. There are usually very few or no windows facing the street, but almost all the openings and windows are facing the inner courtyard. The few windows that are facing the street are small and are fairly high up, so people on the street can't look in, resulting in a facade that is very simple, with high walls to minimize visibility from the street. The opening in the roof lets in light and air, and in dry and hot climate, the opening is important because it modifies the indoor climate and contributes to natural ventilation. It also serves as protection from sun and wind, because the walls are quite high the sun's rays doesn't reach the courtyard until the afternoon and then the warm air rises, and convection is created which ventilates the rooms. However, studies have shown that the roof opening in the inner courtyard can be negative, especially in hot and humid climates. In hot humid climates, the temperature in the courtyard can be higher than outdoors because there is little wind and it can become stuffy inside the house.

(Hakim, 1988; Harrouni, 2002; Gordon, Talbot, & Simonis, 1998)



*Fig 5. A plan of a Traditional Arabic House known as Dar.
 1. The courtyard,
 2. The rooms surrounding the courtyard,
 3. Entrance, angled to obscure view into the courtyard.*

3.2 Modern Architecture

The modern architecture in Morocco and the rest of North Africa can easily be linked together with European architecture and its development. In Morocco, there is much French-influenced architecture, both from the early 20th century, and much later than that. During the protectorate time a lot of new neighbourhoods were built and France left its mark on the country, even after the independence the European influence in modern architecture remains. (Holmén¹, 2011; Skansjö, 2012)

3.2.1 Modern Neighbourhoods

Modern neighbourhoods and districts in Morocco are very different from the old medinas, planning of roads and neighbourhoods are very European influenced, with big, wide avenues, square blocks, and they follow a structured pattern. The most common building materials in the modern areas are reinforced concrete and steel. (Bianca, 2000; Harrouni, 2002)

During the French protectorate the French created the new cities that were built on the edge of the city walls of the medina, these are now called the Ville Nouvelle. In early protectorate time Henri Prost was the city planner in Morocco, he wanted to create one of the most modern cities of that time. However, the idea was that the Moroccans should live in the medina and the Europeans in the modern cities. (Bianca, 2000; Harrouni, 2002)

In the Villes Nouvelles are French colonial architecture common, with embellishments in the form of large columns and arches and in the later parts

of the city the European modern architecture is recognizable in the high-rise buildings and large avenues. (Holmén¹, 2011; Bianca, 2000; Harrouni, 2002)

3.2.2 The Modern Villa and Apartment

The modern buildings in Morocco are either villas, often located in separate residential areas, urban apartment buildings or what they call cheap housing, which means small houses that was built as individuals but due to the nature of urban overpopulation has been converted into apartments. The modern villas in Morocco are contemporary, or from the time of the French protectorate, and they are often influenced by South-European architecture, but with some typical Moroccan features. They are usually detached with a terrace and / or balcony, and a small garden around the entire house or only around parts of it. The modern apartment buildings are also often from protectorate time or later, and provides a strong European feel in terms of orientation and direction, layout and the large window areas. (Harrouni, 2002)

3.2.3 Bidonville

Bidonville is the French name of shantytowns and directly translated means tin can cities. Bidonvilles often occur on the outskirts of large cities, and are often full of people who emigrated from the country in hopes of a better life and instead found an already overcrowded city. In these shantytowns there is not always access to running water, sewer or electricity since the areas are not planned and often are illegal. The dwellings are built of the material the residents have access to, or find, which often are sheet metals, plastic and stone. Some homes are more temporary than others, some are masonry while others are only pieces of sheet metal leaning against each other to provide protection against the elements. (United Nations Human Settlements Program, 2003)

3.3 Climate Consideration

Climate considerations in urban and building designs differ quite substantially, in urban design it's about how to get a more comfortable outdoor environment, while it's about how we can achieve a comfortable indoor climate when it comes to building design. (Givoni, 1998)

3.3.1 Climate Considerations in Urban Design

The urban design aims to provide architectural solutions for indoor and outdoor thermal environment and human comfort.

In regions with Mediterranean climate, the solar heat on summer days is the main issue that affects people's activities.

The town or the neighbourhood should be placed in good ventilated places with lower temperatures. The buildings height and the width of the streets are significant details to create shade for pedestrians and playing kids. Buildings need to be high and the distance between them can be eliminated (row houses). An additional option to minimize the solar radiation for pedestrians is to build houses with protruding upper floors. In order to reduce solar emission during the summer and maximize it in winter, the direction of the facade should be north and south. Streets need also to be oriented in the north- south direction to block solar radiation. Casablanca is a windy city which creates a pleasant cooling in the east and west orientation. Vegetation may provide shade against solar radiation on the streets and may have climate controlling features. (Givoni, 1998; Givoni, 1996)

3.3.2 Climate Considerations in Building Design

A building's indoor climate depends largely on the architecture and design of the building. Layout of the building, location and colour of walls, location, size and orientation of windows and the buildings ventilation ability largely determines the climate in the building but also the building materials matters. Building materials can affect through thermal capacity and thermal conductivity. (Givoni, 1998)

The climate data from chapter 1.6.1 fig 3 were used to do a climate analysis with the Mahoney table and Givoni's bioclimatic diagram.

According to the Mahoney results from the analysis, buildings in Casablanca should follow these criteria for best indoor climate.

- Layout: Orientation north and south (long axis east-west)
- Spacing: Compact layout of estates
- Rooms should be double banked, with temporary provision for air movement
- Walls: Light walls, short time-lag, low thermal capacity
- Roofs: Light, well insulated roofs
- Openings: Medium openings, 25-40 %
- Position of openings: In north and south walls, at body height on windward side, openings also in internal walls

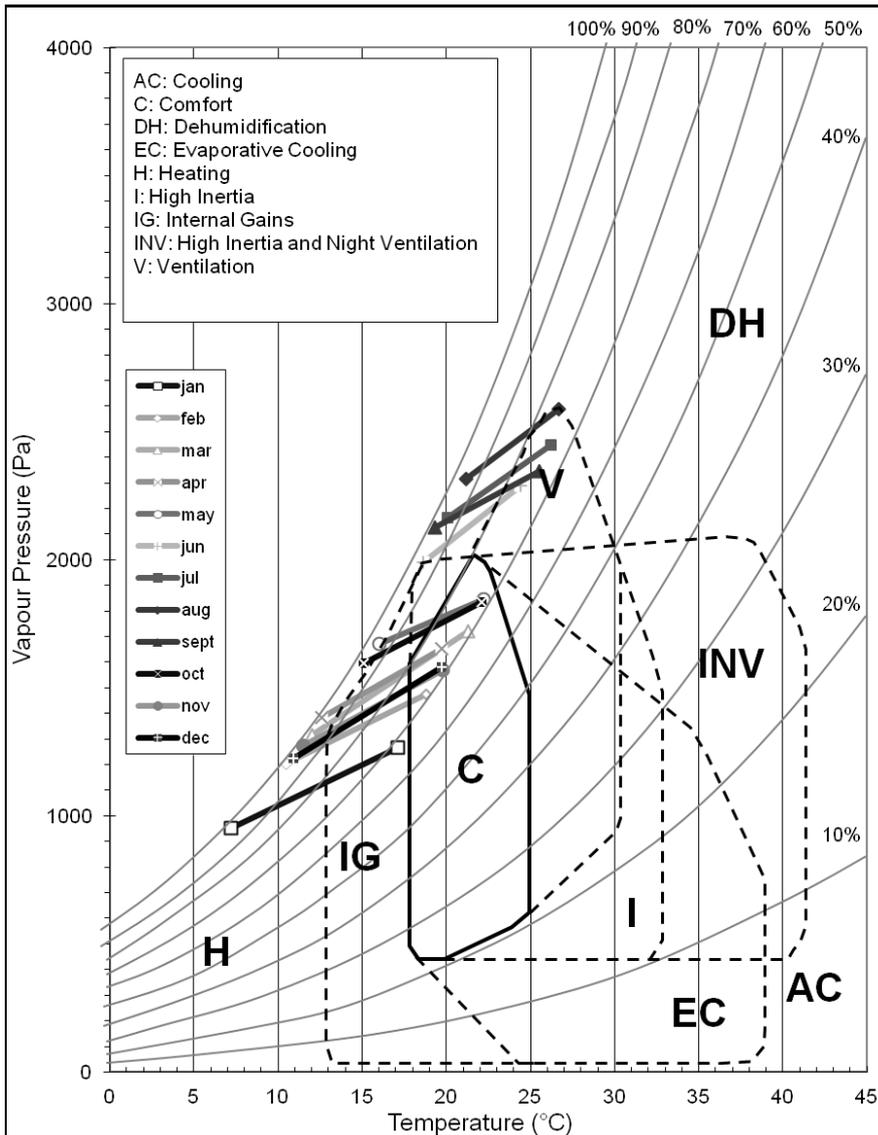


Fig 6. Givoni's Bioclimatic Diagram for Casablanca, Morocco. (Using numbers from 1.6.1 Fig. 3 Climate Data)

According to the Givoni bioclimatic diagram the comfort zone can be extended by using heating in January, in the rest of the winter months one can obtain a comfortable indoor climate with passive methods (internal gains). According to the diagram dehumidification can be used during the summer months but this is not something that is used. Because of the mild climate in Casablanca ventilation is enough during the summer although the buildings must be designed with good ventilation possibilities and protection against solar radiation during the summer months. Since the relative humidity is less than 80 % there are no real problems with the comfort, the moisture in the buildings are a bigger problem.

4 Field Study

In the field study of traditional and modern architecture in Casablanca the urban environment in the old medina, Medina Qdima, and two more modern areas were studied. The more modern neighbourhoods range from the modern French neighbourhoods that were built during the time of the French protectorate and neighbourhoods built in more recent years. These two modern areas represent different types of modern neighbourhoods in Casablanca and have many similarities but also many differences.

The field study also addressed the buildings in the medina and the newer neighbourhoods, where interviews were carried out to study how the residents perceived the indoor climate, the building and their own living situation. The floor plans of the houses or apartments were also studied.

4.1 Urban Casablanca

The urban areas in central Casablanca vary considerably, there is the old Medina Qdima with its narrow and winding streets and traditional architecture, the Ville Nouvelle built during the French protectorate time and has a strong European influenced architecture and then there are the really modern town with high-rise buildings, huge glass facades and wide streets.

4.1.1 Medina Qdima in Casablanca



Fig 7. The main entrance in the south wall of Medina Qdima



Fig 8. The south wall and the clock tower of Medina Qdima

Medina Qdima in Casablanca is situated on the seafront near the harbour. It was built by Sultan Sidi Mohammed Ben Abdellah in the end of the 18th century. Medina Qdima is currently being modernized, new sewers are being dugged, etc.

As mentioned before so are the streets very narrow and winding, the road network is very different from those we're familiar with, where the neighbourhoods and streets often are in some sort of grid, road network in the medina is so far from that one can get.

The surfaces of the roads are mostly sand and gravel, but some are beautifully paved. Because of the modernizing of the sewers they have dug up many of the paved roads and replaced the stones with gravel when they were done. In the wider streets, one can see a few cars drive but the most common means of transport in addition to walking are motorcycles or mopeds. Motorcycles and mopeds are also very common outside the walls of the medina.

The buildings stand very densely inside the medina walls, and the most common buildings in the medina nowadays is apartment houses, in these apartment houses it is common that there's only one apartment per floor. The larger, Arabic and traditional houses were more common in the past but when the medina became somewhat of a slum and overcrowded, most were rebuilt or demolished.

Common building materials for houses in the the medina is stone, bricks and other building blocks. Wood is unusual and rarely used to build with, there are not that large supplies of wood in Morocco and the damp climate means that it does not last as long. The windows are often small and there are rarely many windows on the ground floor. Almost every window in the medina has shutters that give a beautiful and a sort of quaint impression. Everywhere you can see electrical and phone wires hanging along and between the houses, which in some areas makes it look unsafe and tangled.



Fig 9. A street in Medina Qdima.



Fig 10. (Upper left corner) An alley in Medina Qdima.

Fig 11. (Upper right corner) Electric- and phone wires in Medina Qdima.

Fig 12. (Bottom) Windows of a house in Medina Qdima, and the square holes that function as ventilation in the stairwell.



Fig 13. A crocked pillar, holding up an extension of the first floor.

4.1.1.1 Climate consideration

We mentioned in previous chapters that the streets are very narrow, the main streets are perhaps 3 m, while the smallest is not even 1 meter. This makes the streets of the medina almost always shaded, the sun only reaches the streets when it's at its highest at midday. Because the streets are so winding the ventilation in the streets is very little to nonexistent sometimes, most streets are made of sand and gravel, which, if the wind had the possibility to, could lead to small sand clouds.

The vegetation in the Medina is very limited as well, there are a few small squares where there are trees and plants, but otherwise there are very few in the public areas and streets.

The buildings in Medina Qdima are often 3-4 stories high and there are almost no variations in building height that could help push the wind into the streets and squares.



Fig 14. One of the broader streets in Medina Qdima, showing the amount of sunlight that reaches the streets in the middle of the day.

4.1.2 The New City in Casablanca

There is as said also various modern areas which in itself has many similarities but also many differences.

4.1.2.1 Modern French Neighbourhoods

The modern French neighbourhoods were built by the French during the time of the French protectorate which was 1912-1956.

The road network in the more modern areas are much more similar to what we are used to, the streets are large, straight, paved with asphalt with large roundabouts and a lot of traffic. The streets are planned in much more of a network system than it is in the medina. Traffic on the roads is very busy and you very often hear cars honking. The traffic on the major streets in the city is

dense and you get the idea that they sometimes drive as they please without rules.

The streets of the various modern areas are very similar but the differences lie in the buildings that line the streets. The urban design is not as dense as inside the medina and the main streets creates a more airy impression. Also, the fact that the houses are often much broader than those in the medina makes it not feel as crowded.

The typical architecture of the French neighbourhoods is very European-influenced. The houses are large, high and often have many embellishments. The windows are large and many of the houses have several large balconies. In many of the houses the ground floor works as facilities for shops, cafes, restaurants, banks, etc. whereas there are apartments or offices on the floors above. The most common is that the houses are of stone and has an outer layer of plaster or stone.

The pictures are taken around Avenue Hassan II, Boulevard de Paris and Boulevard Mohamed V.



Fig 15. Boulevard Mohamed V, the street looks never ending. The buildings on either side have protruding upper floors that create shadow on the sidewalks.

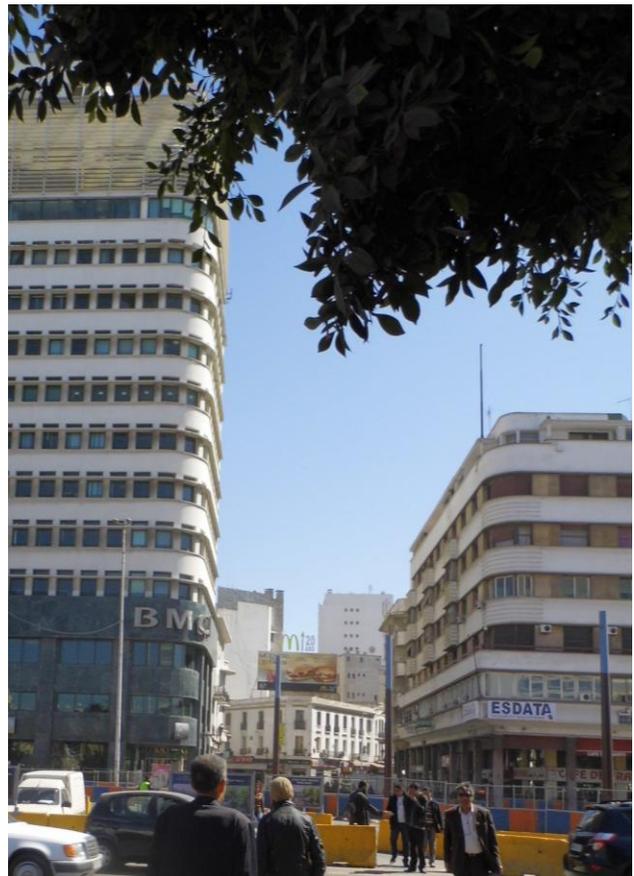


Fig 16. (Top) Boulevard de Paris.

Fig 17. (Lower left corner) A building in a big intersection.

Fig 18. (Lower right corner) Boulevard Mohamed V, right across from the medina walls.



*Fig 19. (Top) Avenue Hassan II.
Fig 20. (Bottom) Rue du 16 Novembre .*

4.1.2.2 Modern Neighbourhoods from the late 20th and early 21st century

These neighbourhoods were built in more recent years and are similar to most big cities around the world.

The road network in these modern neighbourhoods are very similar to those in the French neighbourhoods, only thing is that the roads in these areas is even slightly wider.

The urban design is not so dense, just as in the French area, but on the other hand a little different. Buildings are often very high, with large glass facades and much more strict architecture. There is not much decoration but the beauty lies in the huge windows and clean lines. Many of the buildings serves as offices and along the streets there are several luxury hotels and restaurants that share the area with modern fast-food restaurants and cafes. On the side of some buildings, one can see gigantic advertising signs. The architecture is very similar to that found in most large cities today, but with a few Moroccan touches in some houses that remind one of where you are.

The pictures are taken around Boulevard d'Anfa, Mohamed Zerkouni Boulevard and Boulevard Massira Khadra.



Fig 21. The roundabout at Boulevard Abdelkrim Al Khattabi, Boulevard Bir Anzarane and Boulevard Ibnou Sina .



Fig 22. (Upper left) Casablanca twin center, at the crossroads of Mohamed Zerktouni Boulevard and Boulevard Massira Khadra .

Fig 23. (Upper right) Same roundabout as in fig 21.

Fig 24. (Middle) Boulevard d'Anfa.

Fig 25. (Lower left) Mohamed Zerktouni Boulevard

4.1.2.3 Climate Consideration in the Urban Environment

The problems with the streets in the modern areas are not that there is not enough ventilation or that the sun doesn't reach the streets at all, but quite the opposite. Because the streets are so wide and straight the wind is almost always blowing and during the day it can also be relatively difficult to find shade. Cafés along the streets often have outdoor seating which usually is protected with awnings or something similar but for people walking on the sidewalks it may be difficult. The wind cools but it can generate dust and sand clouds and during the summer when it's dry and the sun is very strong and hot, it can be almost uncomfortable to walk along the streets.

There is more vegetation in the new neighbourhoods than there are in the medina, however, the trees found along the streets provides very little shade. There are some really beautiful parks in the city where one can seek protection from the sun under large trees, but even there are problems, which are more social, since many of the parks is also home to the homeless, and / or drug addicts who live in the city. Some of these people can be very unpleasant and even dangerous, especially if you are a woman.

In the French neighbourhoods several of the houses are built with protruding upper floors with supporting columns, creating shadows on the sidewalks.



Fig 26. The vegetation in the modern areas and the lack of shade in the streets, the picture is taken along Boulevard d'Anfa.

4.2 Buildings in Casablanca

We have visited houses and apartments in the old medina and the modern neighbourhoods, where we have studied the floor plans and interviewed the residents to obtain their views on how the house / apartment is, according to them. Those who were interviewed have agreed to be mentioned by first name.

The complete interviews can be found in Appendix chapter 7.2 *Complete interviews with answers*.

4.2.1 In Medina Qdima

The buildings in Medina Qdima are interesting as they differ from the “normal” we are accustomed to. Angles are rarely 90 degrees and there are usually very few or no windows.

Some of them have been split up from being houses to becoming several apartments, which sometimes have produced very strange layouts and tight spaces. Some, however, are still large and beautiful.

The apartments and houses in the medina often have very high ceilings which mean that in the summer it is not so hot in the rooms, however, it is often cold in the winter when the heat rises towards the ceilings.

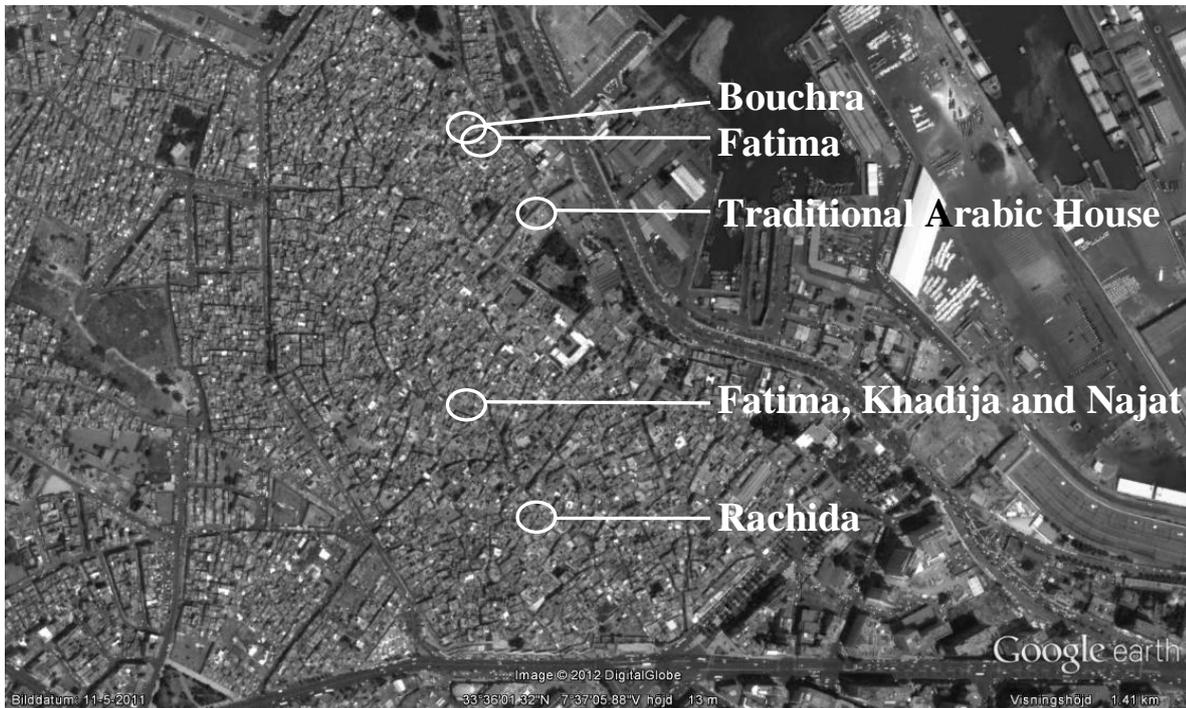


Fig 27. Google Earth View over Medina Qdima, the houses in the next chapters are circled.

4.2.1.1 Family 1- Rachida

Rachida and her family live in an old apartment on the ground floor, in a house that's been converted into apartments. Rachida and her family rent the apartment.

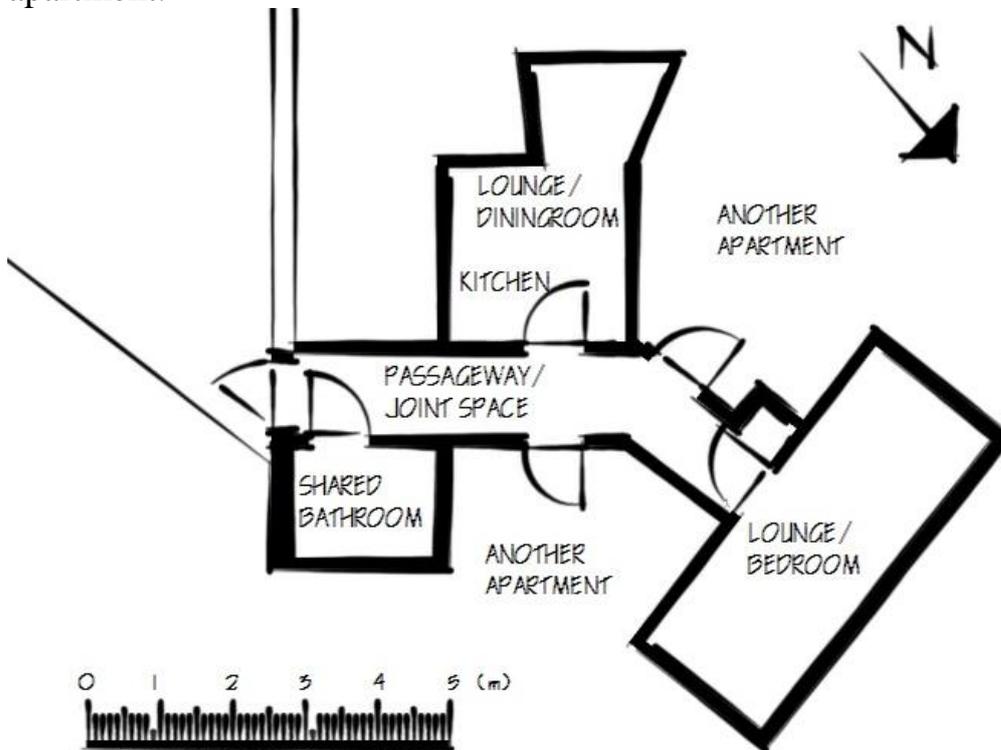


Fig 28. The plan over Rachida and her family's apartment.

The layout of Rachida's home is the most quirky, as they share the corridor and the bathroom with two other families and the rooms of their apartment is not connected to each other. The apartment is quite small and lacks windows. Right now, there are five people living in the apartment, Rachida and her husband, their daughter, the nanny and their grandson. Rachida's older children have moved out and Rachida and her husband have lived in the same apartment for the last 32 years.

Rachida thinks that the apartment's layout is poor and points out that there is no real bedroom but that they sleep in the same place as they receive guests in. The kitchen is too small and there is simply not enough room, she believes that it does not really suit them but that their economy can't handle anything else right now. The ventilation in the house is very poor and they have a really hard time when it's raining, but better when it's sunny. The passageway has no roof and when it rains, water comes in through the open roof and it floods the rooms. But during summer when it's sunny the openings lets in light. In winter they cover the openings in the passageway's roof and open it up in the summer. By doing this they contain the warmth during winter and during summer they get a little bit better ventilation and the sunlight can reach in to the corridor. Since there are almost no windows the ventilation in the actual

rooms is really bad. Rachida has put in a small window above the door in the lounge/bedroom so they, in her own words, don't suffocate.

The house is very damp and Rachida mentions that their clothes and other fabrics go mouldy fast. They have to repaint every year because of the humidity. About living in the medina Rachida says that the location is good; all they need is close by. But living so close together with the neighbours is not good, sharing a bathroom and a front door is something she really doesn't like. She would like to move if they had the money, she says she would like to live somewhere that is nice and clean. According to her people can sometimes thrive in the medina if they have their own house or apartment with its own front door and don't have to share a house in the way they do.

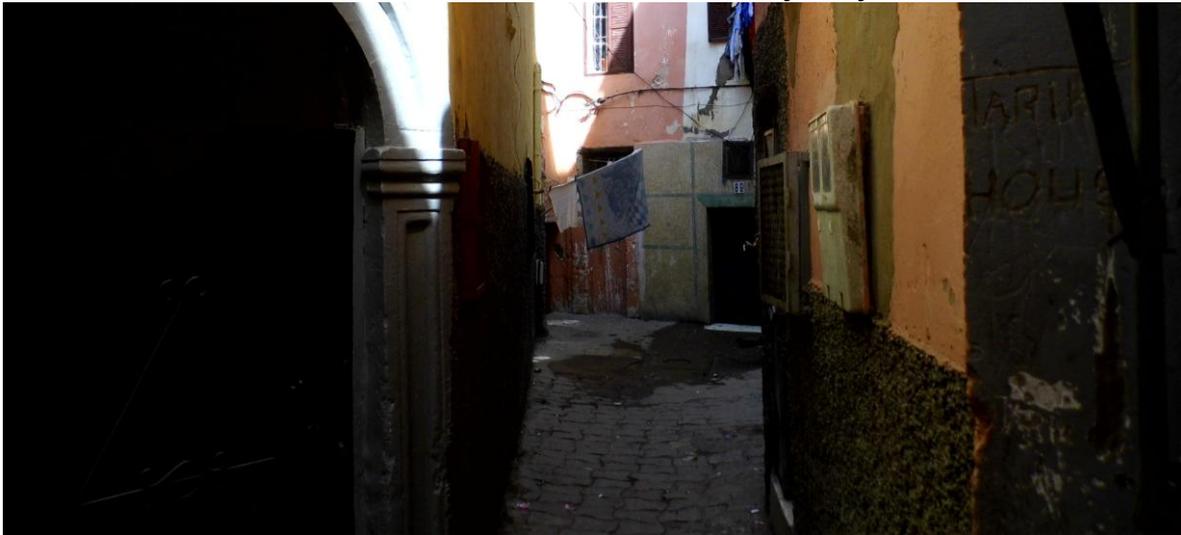


Fig 29. (Top) The alley outside the house.

Fig 30. (Lower left) The shared passageway, towards the exterior door.

Fig 31. (Lower right) The same passageway but in the other direction, to the right the bathroom window and the entrance to one of the other apartments, straight ahead the door to the other apartment, to the left the door to Rachida's kitchen.

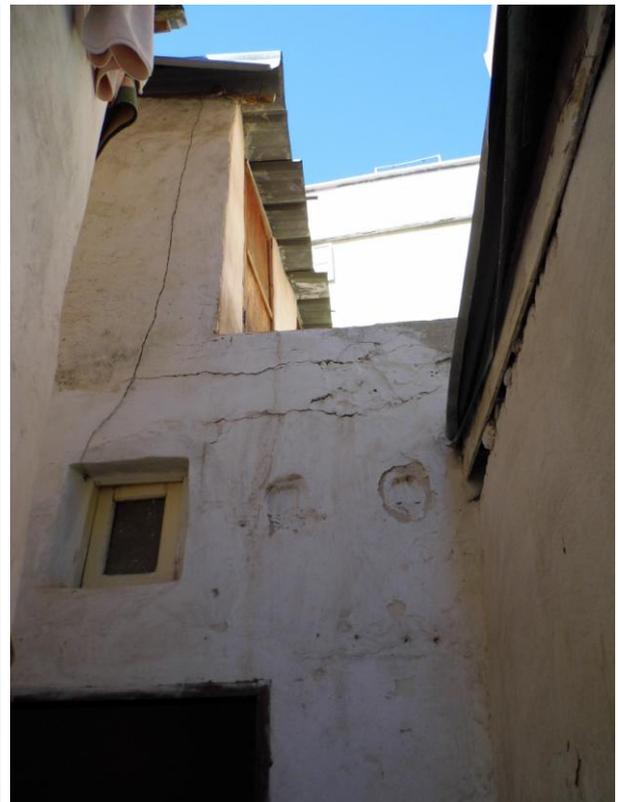


Fig 32. (Upper left corner) The small kitchen.

Fig 33. (Upper right corner) Looking up from the passageway, above the kitchen.

Fig 34. (Lower left corner) The window that Rachida put in, to get some light and air into the room.

Fig 35. (Lower right corner) Looking up from the passageway, above one of the rooms, you can see the little ventilation window.

4.2.1.2 Family 2- Bouchra

Bouchra and her family lives in an apartment on the ground floor in a traditional Arabic house converted into apartments. During the French protectorate the house functioned as a hotel, and it is still owned by a Frenchman. Bouchra and her family rent the apartment.

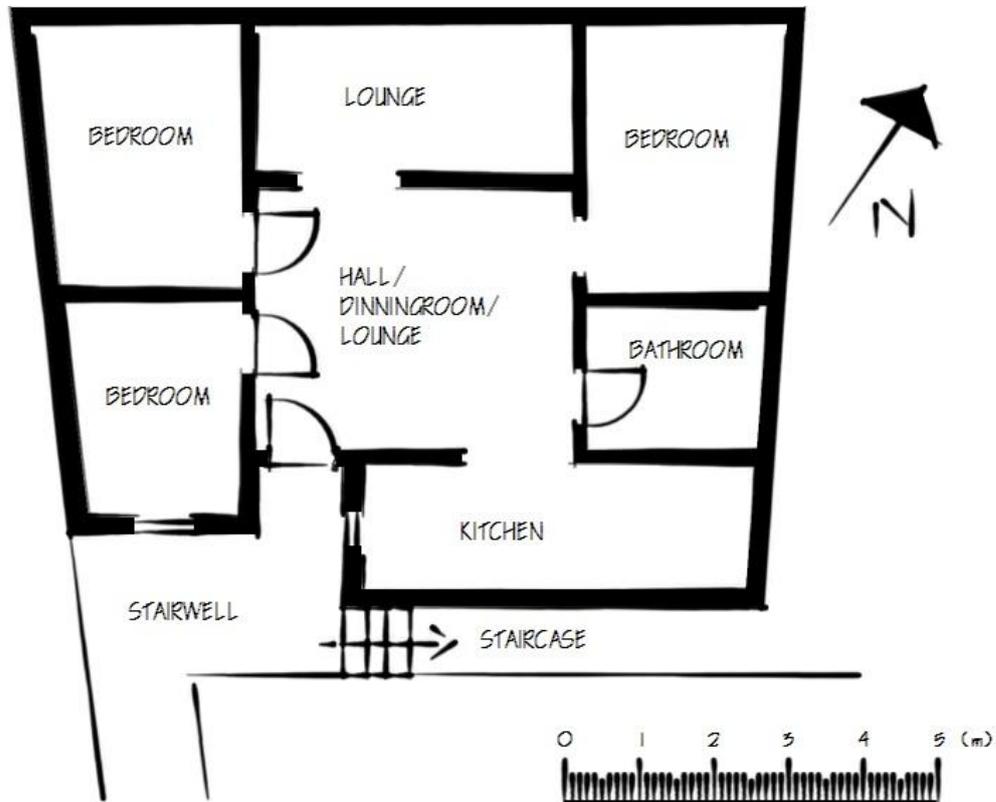


Fig 36. The plan over Bouchra and her family's apartment.

Bouchra's apartment has one window, with glass and one ventilation window that does not have any glass just bars. These are both out towards the stairwell and because of that they don't let in any sunlight. The apartment has really high ceiling but since it used to be a house with a courtyard in the middle it also used to have an opening in the ceiling. The opening was closed up when it became an apartment building and now there's the neighbour's apartment above. Because of all this it's quite dark inside the apartment.

Bouchra lives in the apartment with her husband, their daughter and their two sons. Her husband's mother grew up in the house and Bouchra's husband moved back in to the house in 1974.

Besides that the apartment is very dark, Bouchra feels that it's big enough for them and the rent is cheap. Since the apartment is surrounded by other houses and apartments it doesn't get so cold during the winter and during summer the day temperature inside is quite comfortable although in the evenings it gets

really hot and stuffy, she says. The ventilation is poor because of the lack of windows but she has replaced the old door to the apartment to one with a window in it (no glass, only bars) to try to enhance the ventilation a bit. She says that their biggest problem is the lack of sunlight and that it's quite damp. Her son has developed asthma because of the high humidity and all of their clothes and fabrics mould and have to be washed all the time.

Bouchra renovates and remodel the apartment a little every year, as the budget allows her to she says. Mostly superficial things, she has put tiles on all the walls because it lasts longer than paint. Painting the walls doesn't last long since the paint keeps falling off, because of the damp.

Bouchra likes the neighbours and the neighbourhood, it's a social neighbourhood but the downside is that there are a lot of noises, both day and night. But she would like to move to a small apartment in a more modern area, one that gets a lot of sun, but as it is now they can't afford it and everything has gotten so expensive. She hopes that when her children grow up, they might have the money to buy them a newer apartment.



Fig 37. The centre room/hallway, towards the boys bedroom, the bathroom and furthest to the right the kitchen doorway.

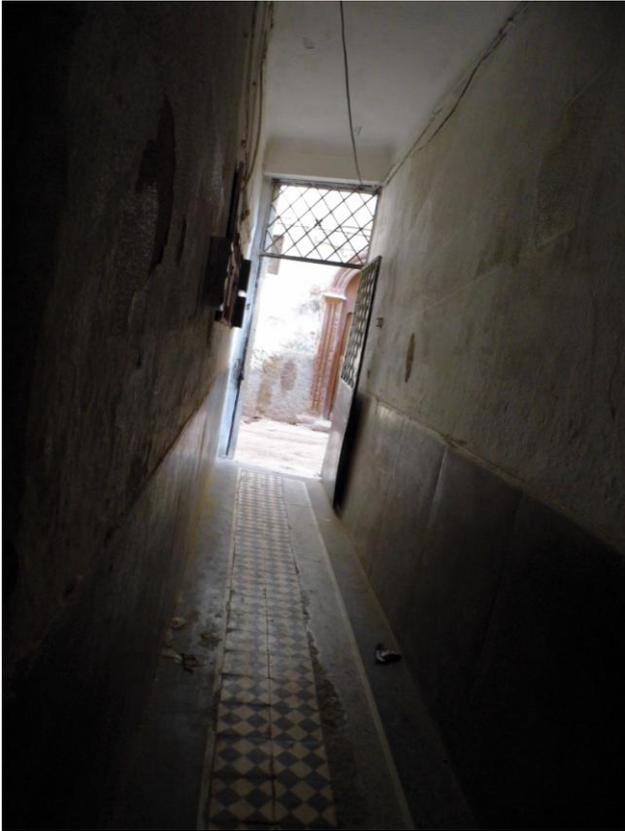


Fig 38. (Upper left corner) The corridor from the stairwell out towards the street.

Fig 39. (Upper right corner) The window in the girl's bedroom, taken from the stairwell.

Fig 40. (Bottom) The lounge and its beautiful arches, looking from the centre room/hall.



Fig 41. (Upper left corner) The door, looking from inside the apartment.

Fig 42. (Upper right corner) The ventilation opening between the kitchen and the stairwell.

Fig 43. (Bottom) The ceiling in the centre room/hall. Used to be open before the house was split into apartments. You can see the neighbours through it.

4.2.1.3 Family 3- Fatima

Fatima lives in an old apartment on the second floor. Fatima and her family own the house, and share it with the whole extended family, the second floor she shares with her sister.

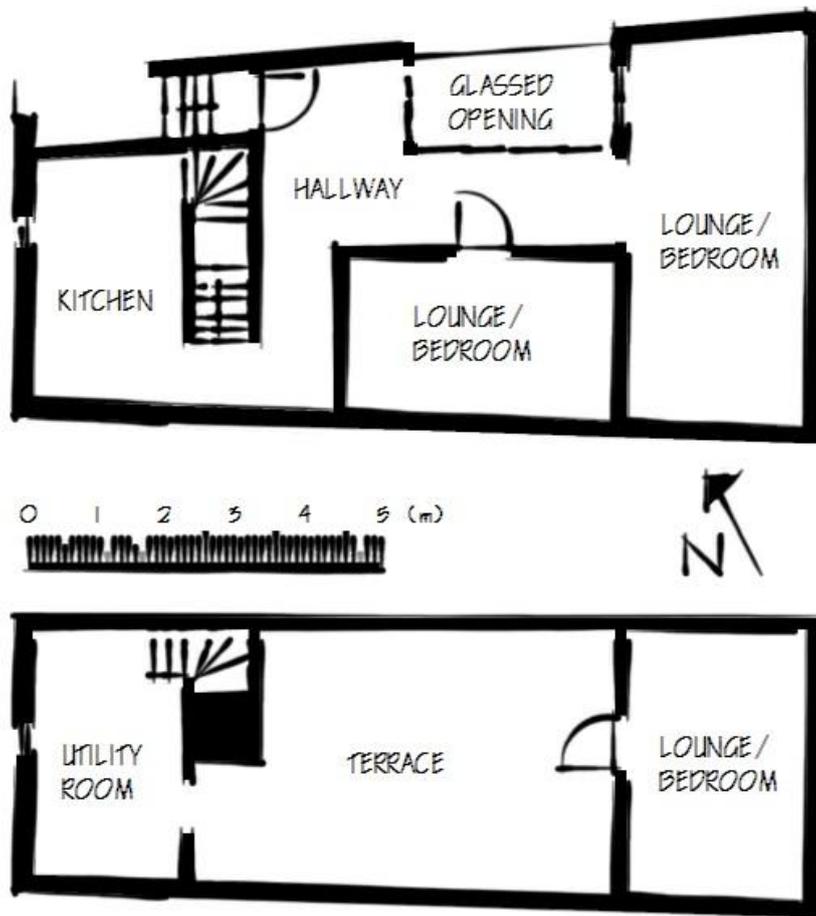


Fig 44. On the top is the plan over the floor that Fatima shares with her sister and on the bottom the plan of the terrace.

The interview was with Fatima so there are no plans for the rest of the house. There are a beautiful “hole” through the whole house with glass windows that give the house light and air. In total, they are 13 people living in the whole house, Fatima, her brother, his wife and three kids, Fatima’s mother and father, her sister, her other brother and his wife and two kids. Fatima doesn’t work and the brothers support the whole family. They have divided up the floors between them and Fatima shares one floor with her sister, they all share the terrace and there’s not a bathroom on every floor.

Fatima’s family bought the house in 1956 and they have lived there since then, so Fatima, her brothers and her sister have grown up there. Fatima like that the whole family lives together, they have the building for themselves and can feel like home in the whole house. She’s proud of living in the old medina and likes it there.

When asked about the indoor climate in the house Fatima said that the building's very sunny and bright, and because of the opening that goes through the whole house it's also good ventilated. During the winter it's pretty warm inside, as long as we keep the windows closed. During summer the building keeps a cool temperature, especially on the ground floor. It's not especially damp. But they do have some problem with humidity in the walls, and have to repaint now and then. According to Fatima they have to renovate constantly, the walls crack and have to be fixed quite often, they have put tiles on some of the walls so they won't have to repaint as much.



Fig 45. The hallway with the glassed opening, straight ahead is one of the two lounges on their floor.



Fig 46. (Top) The view from the terrace, overlooking the roofs of the medina.

Fig 47. (Middle left) The glassed opening.

Fig 48. (Middle right) The kitchen.

Fig 49. (Bottom) One of the lounges.

4.2.1.4 Family 4- Fatima, Khadija and Najat

Fatima, Khadija and Najat live in an old traditional Arabic house, with a centre room and opening in the ceiling but without a garden or courtyard, in the medina. Fatima, Khadija and Najat with the rest of their family rent the house.

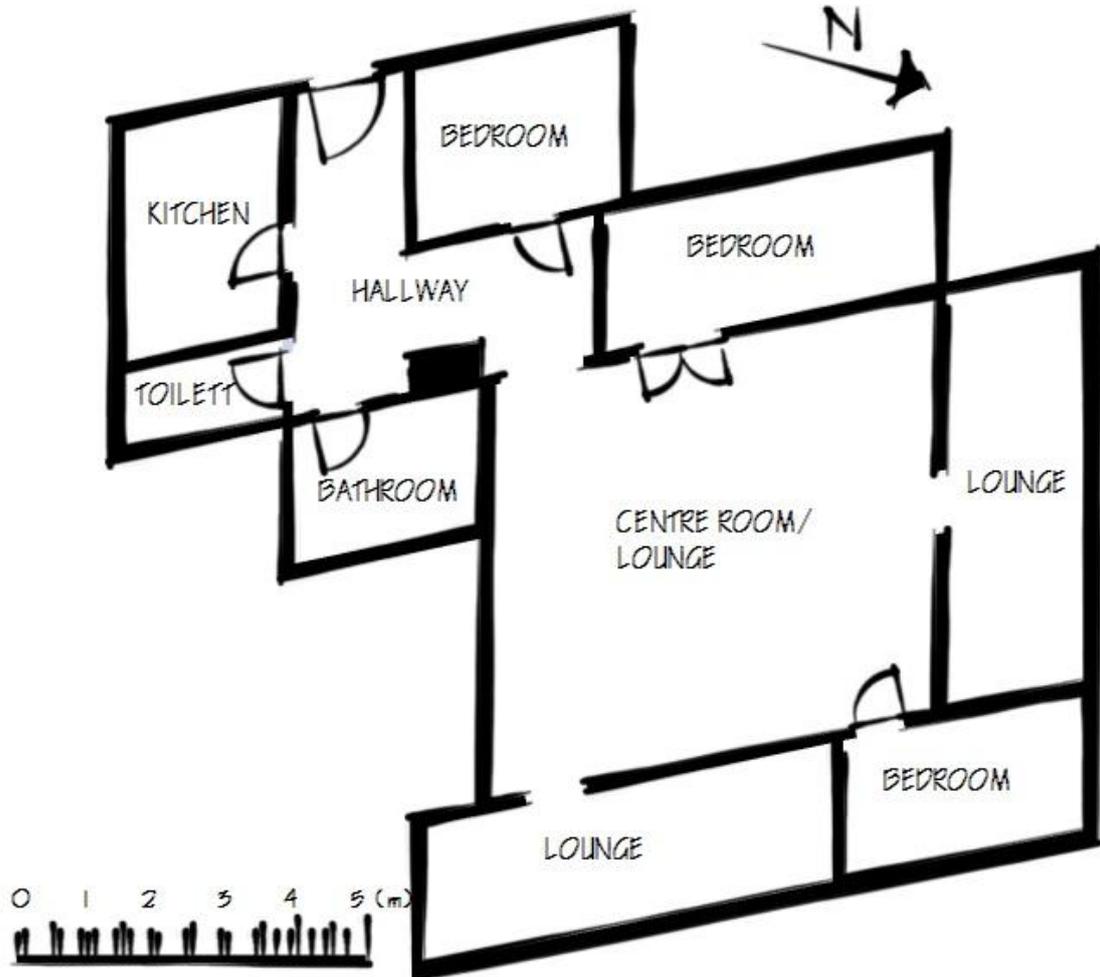


Fig 50. The plan over Fatima, Khadija and Najat's house.

This is a more traditional Arabic house although it's only one story high, it does not have a courtyard in the centre room with a garden but they have an opening in the ceiling that lets in lots of light and air. There are very few corners that are in a straight angle, almost every wall is somewhat askew. The house and all the rooms are quite large but there are no windows except for the large opening in the ceiling.

Now it's Fatima, her granddaughter Khadija, Najat and the two children. But Fatima used to live here with her whole family, which then consisted of her 6 children, husband, uncle, brother, Fatima's daughter's husband and her 4 children. Fatima has lived in the house for the last 45 years.

The indoor climate is cold during the winter season. During winter, early spring and late fall they cover the opening in the ceiling with a hard-plastic roof, so it won't rain in, but during summer it's open to let in the sun and some

air. There are no windows but the roof opening lets in lots of sun and air, so it's quite bright and good ventilated. But it's quite humid, Fatima has gotten asthma from the damp. They've done some renovations to the house, replaced doors that was damaged by the humidity, put up tiles on the walls so they won't have to repaint as often. She says that some renovations they have to do maybe not every year but almost because of the humid winters. The tiles they've put up has last long but are now starting to crack. Fatima mentions that they've been thinking about putting in a courtyard garden in the middle of the centre room, she also says that there's a well underneath the house.

She likes living in the medina where she grew up, and having a nice, big house where her whole family can come and visit at once if they like to and she's never considered moving.

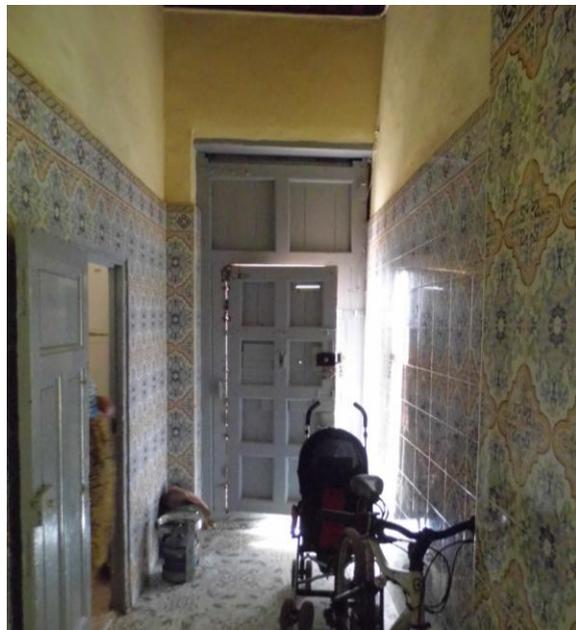


Fig 51. (Upper left) The front door, from the street.

Fig 52. (Upper right) Hallway towards the front door, to the left in the picture is the kitchen doorway.

Fig 53. (Bottom) The opening in the ceiling, that's covered during winter and early spring.



*Fig 54. (Upper left corner)
In the hallway, the
bathroom doorway and the
sink.*

*Fig 55. (Upper right
corner) The hallway,
looking in to one of the
bedrooms.*

*Fig 56. (Middle) The
centre room.*



*Fig 57. (Bottom) The
centre room, towards the
hallway and one of the
bedrooms.*

4.2.2 Traditional Arabic House in Casablanca

The traditional Arabic house is quite rare in the medina in Casablanca. Many has been torn down and demolished to make room for apartment houses, or they have been split up to apartments, or turned in to different social facilities where they have weddings etc.

We visited an old traditional Arabic house, where the owner didn't want to participate in an interview but let us come in and take some photographs. This house is 115 years old and has been used as a social gathering place but is now inhabited by the owner.



Fig 58. The centre room.



Fig 59. The first floor.

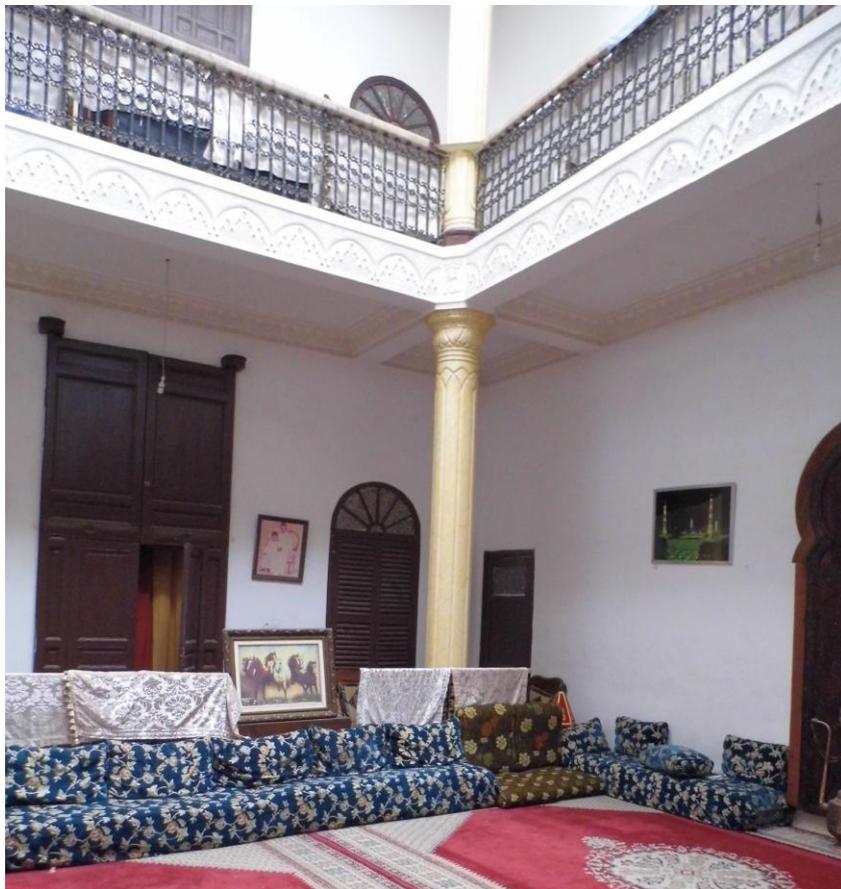


Fig 60. Downstairs, looking up.



Fig 61. (Left) Downstairs, looking up at the first floor and the opening in the ceiling above the centre room.

Fig 62. (Lower left corner) The first floor and the opening.

Fig 63. (Lower right corner) The marble staircase.



4.2.3 In The Modern Neighbourhoods

The buildings in the modern neighbourhoods that we visited are modern but often have a Moroccan touch and the people living in them have decorated with traditional furniture.

The big difference between the houses and apartments in the modern areas and in the medina are the windows, that in the modern areas are significantly more and lets in lots of light and contributes to much better ventilation. The humidity problems that exist in the medina are much rarer in the modern areas.



Fig 64. Google Earth View over Haj Fateh, the first of the houses in the next chapters is circled.

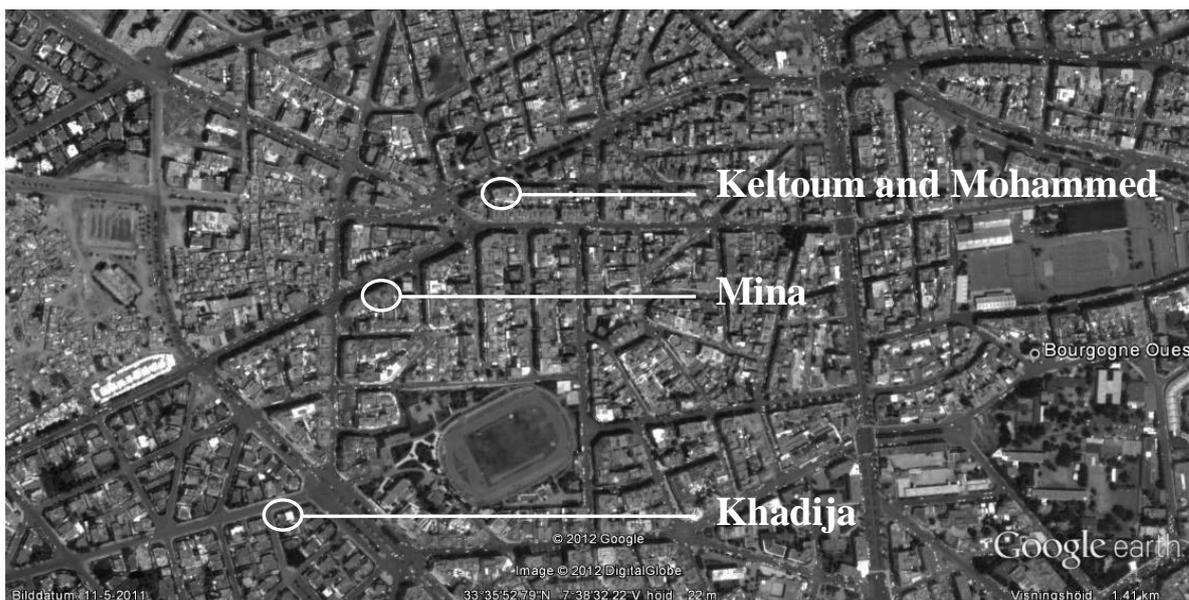


Fig 65. Google Earth View over Bougogne, the other 3 houses in the next chapters is circled.

4.2.3.1 Family 1- Zineb

Zineb lives with her adoptive daughter in a fairly modern apartment in the neighbourhood; Haj Fateh. The apartment is on the first floor and Zineb owns it.

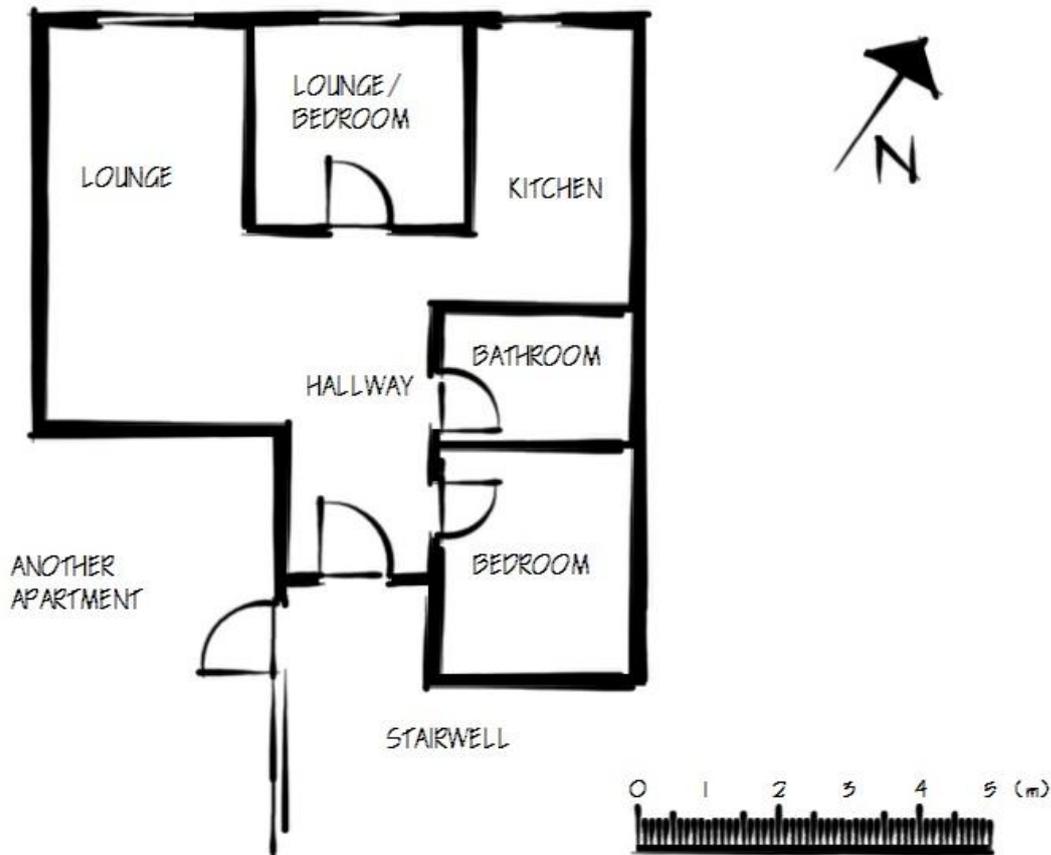


Fig 66. The plan over Zineb and her daughter's apartment.

Zineb adopted her daughter after her son died for around 13-14 years ago. Zineb bought the apartment soon after the adoption and they have lived there since then. They used to live in a one-storey house close to the sea that they rented, the house was in bad shape even though the neighbourhood was beautiful, close to the beach and restaurants. In this neighbourhood, it is mostly apartment houses with a few shops. It's far from the sea but that also means that it's not as damp and humid, Zineb says.

When we talk about the indoor climate Zineb says that during the winter the apartment is actually warm, but during the summer it gets a little too warm but with the natural draft that is created by opening the windows it becomes a bit more comfortable. The apartment is very sunny and she also says that they have no problems with humidity in the building, they only have one problem now and that's the tiles on the living room floor that have come loose, she believes that they were poorly made.

The apartment is a little small and they share the roof terrace with the neighbours in the building, Zineb would like to have a little bigger apartment with more bedrooms, her own terrace and a bigger kitchen but for now they can't afford it and despite that wish they like it where they are. The neighbourhood is very different from where they lived before, the neighbours here are nice but keep to themselves, it's not as social as the neighbourhood by the sea that they used to live in. She says that here no one know if you're dead or alive, and that its better when everybody mind their own business.



Fig 67. (Left) The facade of the house.

Fig 68. (Right) Stairwell, the door to the apartment.



Fig 69. (Top) From the hallway in to the big lounge, where the tiles on the floor has come loose.

Fig 70.(Middle left) The big lounge.

Fig 71. (Middle right) The bathroom.

Fig 72.(Bottom) The bedroom.

4.2.3.2 Family 2- Khadija

Khadija and her family lives in a modern two-story house in the neighbourhood of Bourgojne, the house was built in 1974. Khadija and her family own the house

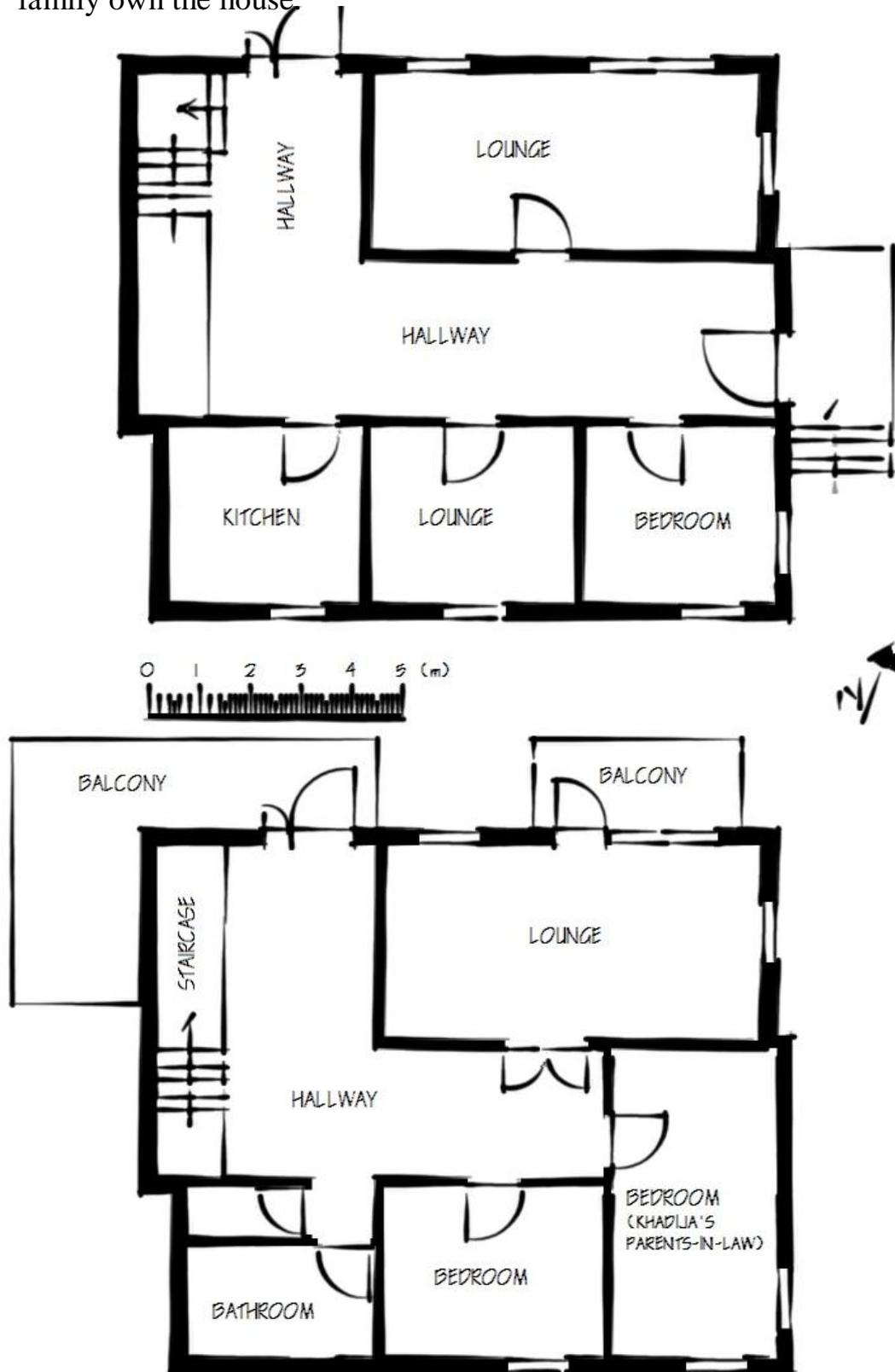


Fig 73. The plan over Khadija and her family's house, on the top the downstairs and on the bottom the upstairs plans.

The house has windows in every room and is very sunny and bright, there is a small front yard, a back yard with a garage, a utility room and an outdoor lounge. There are two balconies, one of which is relatively large, and there is also a patio at ground level. The house is surrounded by a wall that separates it from the street and the sidewalk, as is every house on the street.

Khadija lives there with her husband, their daughter, their son and Khadija's mother- and father-in-law.

Khadija's parents-in-law bought the house and moved here in 1974 when the house was just finished. The neighbourhood is calm and quiet and everybody likes living there, the kids have to share room and would like their own rooms, but except that the house is perfect size according to Khadija.

Khadija says that the indoor climate is quite good. When it's cold outside it can get pretty chilly inside too, and during summer when it's really sunny it gets nice and warm but the ventilation is very good so it doesn't get too warm. There are plenty of windows that give lots of light and good ventilation. They have almost no problem with humidity or dampness, even though the house is so close to the sea.

When asked about the neighbours and the neighbourhood Khadija says that they have some contact with the next door neighbours but not much with the rest of the street, but she thinks everyone is nice anyway and they all just want to keep to themselves, they as well.



Fig 74. The house from the street, there's a wall that separates the house from the sidewalk.



Fig 75. (Upper left corner) The garden in front of the house.

Fig 76. (Upper right corner) The utility room in the backyard.

Fig 77. (Middle) The street outside.

Fig 78. (Bottom) The front door of the house.



Fig 79. (Top) The garage.

Fig 80. (Middle left) The upstairs lounge.

Fig 81. (Middle right) The small lounge, ground floor.

Fig 82. (Lower left) The parents' bedroom.

Fig 83. (Lower right) The kitchen.

4.2.3.3 Family 3- Keltoum and Mohammed

Keltoum and Mohammed live in a modern apartment on the first floor in the neighbourhood of Bourgogne. Keltoum and Mohammed own the apartment.

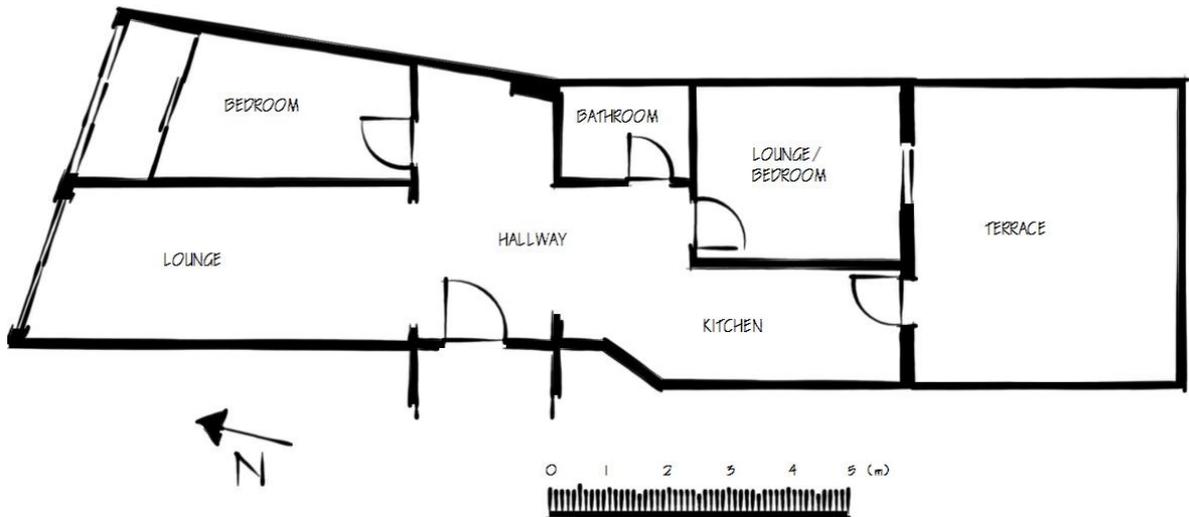


Fig 84. The plan over Keltoum and Mohammed's apartment.

Keltoum and Mohammed's apartment has both a balcony and a large terrace, which they don't share with anyone. This apartment has some angles that aren't so common in the modern buildings, they are often very square with only 90 degree angles but that is not the case with theirs. The larger lounge has a big window that cover the whole length of the wall, the balcony is glassed, the smaller lounge has a window facing the terrace and the kitchen has a bared opening as a ventilation opening towards the terrace as well. So the apartment is very sunny and well ventilated. Before they moved to Bourgogne they were living in Oasis, which is a residential neighbourhood in Casablanca.

They are at the moment 5 people living in the apartment, Keltoum, Mohammed, their daughter and their two sons, but two of their children will be moving out soon. The children are all over 30 years old. They bought the apartment when it was brand new in 1998. The children were all adults when they moved here, so they counted on them moving out sooner than later. Although now it's later and some of them still live there, so it's a little crowded, says Keltoum. Two are out and soon two more is moving. They think the apartment is a good size, but they're planning to build another bathroom on the terrace sometime in the future.

The whole Bourgogne area is cold, windy and humid. During winter it's cold and some days they have the radiators on to heat the apartment. During summer it's good, the apartment is well ventilated thanks to the natural draft that's created when the windows and doors on both sides of the apartment are

open. In the evenings it can get a bit warm, when the sun has heated the walls and all the lights are on in the apartment. And they don't have any problems with the humidity according to Mohammed and Keltoum.

All the neighbours are quiet and keep to themselves. The building has only two apartments per floor and there are not many different people living there or running around. Keltoum says that they like living there, a lot, and they like the apartment, the building and the neighbourhood. There are no noises, no disturbances, or messy neighbours. They like having their own place and not having to share it with anybody. The area is a much nicer area, and much more social than where they lived before, she says.

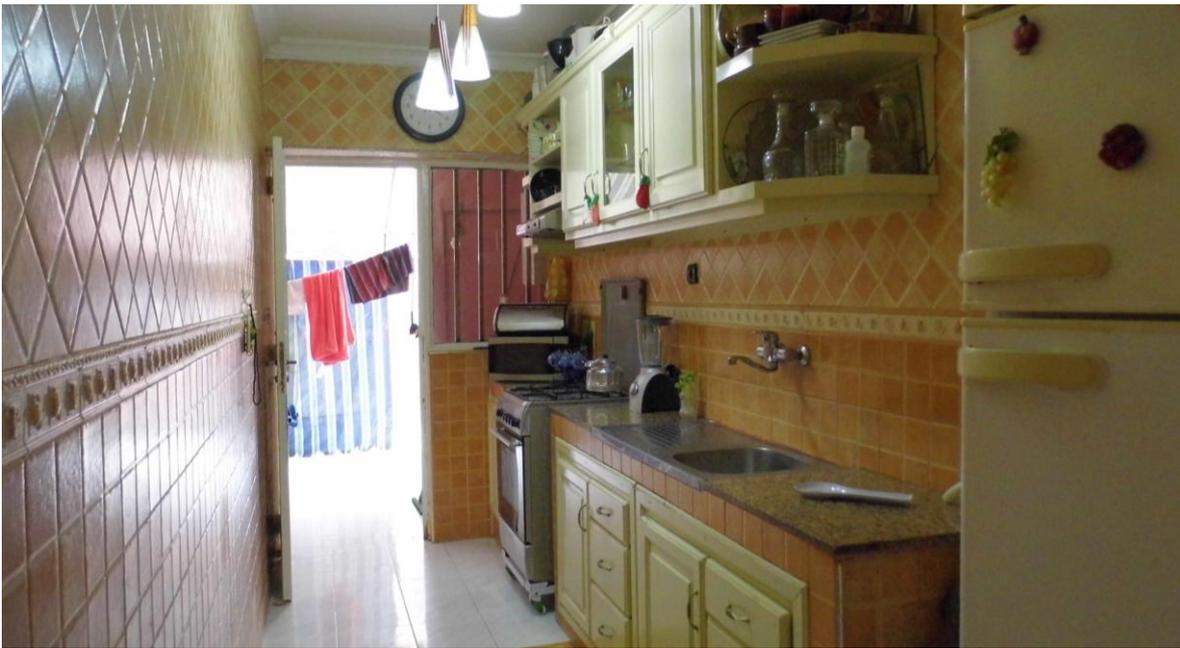


Fig 85. (Top) The kitchen with the door out to the terrace.

Fig 86. (Bottom) The lounge, towards the hall.



Fig 87. (Left) The doorway to the bedroom, with the balcony.

Fig 88. (Right) The small lounge.

4.2.3.4 Family 4- Mina

Min and her family lives in a modern apartment on the fourth floor in the neighbourhood of Bourgogne. Mina and her family own the apartment.

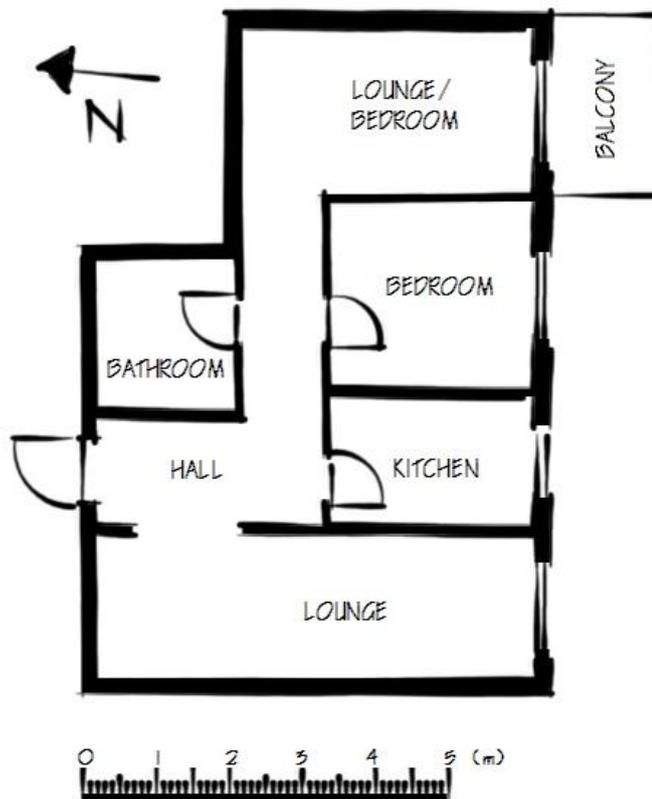


Fig 89. The plan over Mina and her family's apartment.

Now they're 6 people living in the apartment, Mina, three sons and her two daughters. They've lived there for 13 years, Mina and her husband bought the apartment before he passed away. When they bought it the building wasn't

even entirely finished. Bourgogne is a beautiful, tranquil and well-known area. One of the best in Casablanca, according to Mina, nowadays there are very rarely an apartment for sale there, and it's very expensive if you find one that's for sale. The apartment is well planned out and square, but Mina thinks there are some things that need changing and renovation. She wants to split up the big lounge into two rooms with some kind of partitioning wall, and have one room with Moroccan decor and one with a more European. By splitting up the lounge they could also gain another bedroom.

Mina says that during winter they don't get so much sun into the apartment, only a little in the mornings and it's often quite cold the rest of the day. The neighbourhood is close to the sea and the winds are very cold, even when it's sunny during the day it gets really cold at night. During summer it's very hot, it doesn't matter if the windows are open or not. The air feels stuffy and all the windows are always open all day. Despite that Mina considers the apartment pretty well ventilated and she says that it's not humid despite the short distance to the sea.

She likes the neighbourhood and all the neighbours are kind, some do not talk very much with each other and others are more social. Every person or family in the building have their own personality. The walls are quite thin and badly made so they often hear the neighbours, but despite that the neighbours do not disturb them much, she says. Across the road there is a slum neighbourhood that some of the people living in Bourgogne don't like, but Mina says that they have no problem with it and it doesn't bother them. They don't cause any problems and they stay in their area, mostly anyway.

Since Mina and her family moved there they have expanded the neighbourhood and built quite a lot of new buildings and houses. There is a big difference from how it was when they moved here and how it is now. It was much calmer and quieter then it is now. And Mina doesn't want them to build any more because, according to her, there are already enough people living there.



Fig 90. The kitchen.

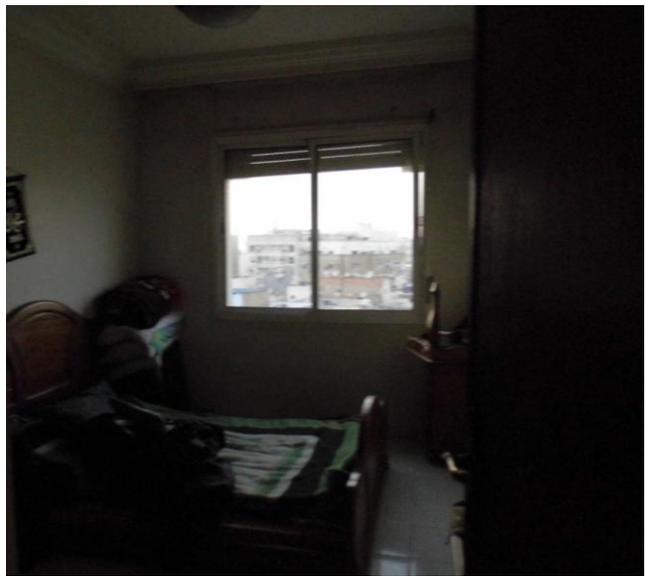
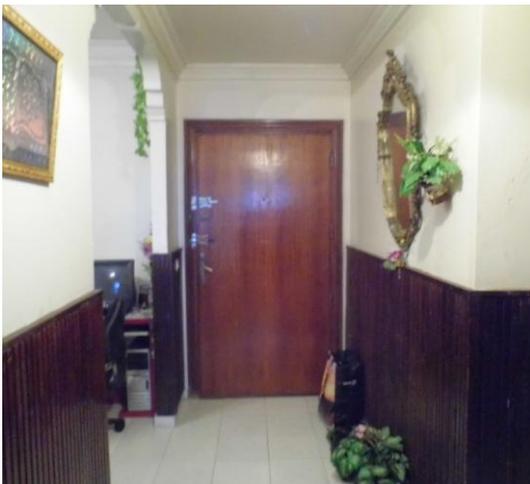


Fig 91. (Upper left) From the hallway in to the big lounge.

Fig 92. (Upper right) The small lounge/bedroom with the balcony.

Fig 93. (Middle left) The hallway and front door.

Fig 94. (Middle right) The bedroom.



Fig 95. (Lower right) The hallway, with the doorways to the bathroom, bedroom and the small lounge/bedroom.

5 Analysis

The Moroccan architecture has influences from many different periods, cultures and countries, the country's history can be linked to the varying architecture. The traditional medina is constructed in the same way as in many other countries in North Africa and has been shaped by Islamic laws and traditions. The medina is divided according to the public area and the private and within each area of the medina there is a hierarchy, which may not be apparent at first. The buildings in the medina has been built so that the outside barely gives a hint of what's inside, the holy family life is protected from outsiders by the minimal windows and high walls. All this follows the strict Islamic laws on public and private life, including the fact that all the decoration of the house is on the inside and from outside the buildings are simple and modest.

The old traditional areas and the buildings are very different from the new modern, which are European-influenced and structured in a very different way than in the medina. The modern areas may also be linked to Morocco's history, however, in the latter part of it, the French culture has put great tracks in Morocco's but mainly Casablanca's architecture. Differences between public and private are not as big and clear as in the medina, even if they do exist. The protection against people looking in is an important part in the traditional architecture but it does not play as large a role in the modern, and the buildings are not as modest on the outside, but usually have several kinds of decorations. Although the decorations can be very different between the different types of modern areas, columns, ornamented balconies or large windows and beautiful facade materials are common in the different types of modern neighbourhoods.

In the various urban areas, the width of the streets and the planning of them is by far the biggest difference, but the buildings are also very different from each other. In the modern areas the buildings are often very high, but they often also differ in size and height, while buildings in the medina often are about the same height.

The traditional buildings and modern buildings have many significant differences, the planning of the apartments and houses are very different. The old houses are planned according to the Islamic laws and therefore has very few windows facing the street that let in light, but they all have openings towards the courtyard and all the rooms are often planned, around the courtyard, however, there are apartments that look very different, where they have divided the different rooms and several families share the house. The opening in the courtyard's ceiling in the traditional Arabic house is also intended to modify the indoor climate. The modern apartments and houses are

often much more square planned and has several large windows outwardly oriented, they also have no inner courtyard.

The beautiful old traditional Arabic houses are few in Casablanca's medina since many have been converted into flats or been demolished to make room for apartment buildings. This may possibly be due to how the medina became somewhat of a slum in the latter half of the 20th century, due to over population, and during the Protectorate period when the French city planners built new cities for the Europeans but the Moroccans were supposed to live inside the medina.

The climate in Casablanca is temperate Mediterranean climate which means that there are substantial differences in both temperature and precipitation during the different seasons. Climate adaptation of areas and buildings in this type of climate can be difficult, at the same time Casablanca is near the ocean, which means that the wind speed can be quite high and also the relative humidity is high all year.

Climate adaptation of buildings is not a priority in Morocco and there are several problems with the climate considerations of the buildings. The residents often experience thermal discomfort, which can be connected with the mentioned climate conditions, the thermal quality of the material in the buildings, poor ventilation, and that the air in the building moves minimally and is not replaced, the orientation of the houses and a big problem that only exists in some of the houses are the lack of solar exposure.

The climate adaptation of the buildings that were visited during the field study can be said to vary considerably. In the medina many complained of moisture problems while in the modern areas people didn't feel that they had any problems with humidity. A major problem with some of the houses that were studied in the medina was that they had been converted from dar-houses to apartments, because they have done so they have closed the opening that used to exist in the courtyard/centre rooms ceiling. The opening adapted the indoor climate but was also the major source of light in the house. The fact that several of the apartments that were in the medina had no real windows that could help with the ventilation of the building meant big problems for the residents. At the same time the fact that the temperature inside the house does not vary so much during the seasons as it does in the modern houses, where there are large windows that in the summer can make the indoor temperature relatively high. The traditional Arabic house has good climate adaptation, but mostly for hot and dry climates where the opening in the courtyard's ceiling work really good, but in north-west Morocco the climate is a temperate Mediterranean climate with high relative humidity.

If one looks at the results of the Mahoney table it says that the layout of the houses should preferably be compact and that they should have medium-sized windows and openings. In the medina the buildings are compact but they have very few windows, especially those that have been converted from dar to apartments while in the modern areas the buildings are not situated as closely together but have significantly much larger windows.

In terms of the urban environment in the different districts, the differences are very big and there are not many similarities between the construction of the medina and the modern areas. Important in the climate adaption of the urban areas in the Mediterranean climate is shade for people on the streets, this has been achieved inside the medina, where the streets are narrow and buildings are relatively high so the sun's rays do not reach the streets, however, the ventilation in the streets of the medina is limited because the streets are narrow but also that they are winding. In the modern neighbourhoods, it is mainly large avenues which compiles the street system, where the sun's rays reach the streets most of the day at the same time the ventilation is good, however, the wind velocity in these streets can become larger than desired. The buildings in the modern areas are high and create some shade on the streets and in the French neighbourhoods, the buildings often have protruding floors that create shade on the sidewalks.

Several of those interviewed liked their residence, even if several would consider moving elsewhere if they could afford it. Some of those who lived in the medina would love to move even though all those we talked to felt that the medina was a nice and social neighbourhood, through the interviews it can be interpreted that the modern neighbourhoods are not as social as the old neighbourhoods are. In the modern areas people keep to themselves while in the medina they often live so close together, which possibly contributes to making it more social. The biggest problems with living in the medina seem to be the humidity and that they have to renovate so often. Most of those interviewed seem to thrive in their neighbourhood but also in their houses, some more than others though.

6 Conclusions

The main differences between modern and traditional buildings are the planning of windows and openings. The traditional houses follow the Islamic laws on private and public areas, and thus separate the houses from the street by having little or no windows on the ground floor facing the street, while the modern houses are much more European-influenced and often have large windows regardless of which floor it is on. Also, the modern houses are often much more square planned than the traditional houses.

Between the traditional medina and the modern areas are many significant differences, the planning of streets, and width of the streets and height of the houses. The medina also complies with the Islamic laws in terms of planning, all aspects of the medina follow a hierarchy and there are different levels of public and private areas. The modern areas, the same as the buildings, are very European-influenced.

The traditional Arabic houses have been shaped according to Islamic law but over the years, they have also been climate adapted, however, they work best in a climate that is hot, dry and arid, which Casablanca's climate is not all year round. If you look only at Casablanca and not the rest of Morocco, one can conclude that the modern houses, although their climate-adaption is not especially good, yet they are better than the traditional ones. The houses that were visited in Medina Qdima had relatively poor indoor climate and humidity is one of the most common complaints the residents of the traditional houses had. Some of the traditional houses in the the medina that were visited had been converted, resulting in very poor indoor climate and no openings out. If you look at the urban environments, there is much that is both good and bad in both the modern neighbourhoods as in the medina. In the medina solar radiations into the streets are minimized because of how narrow and winding they are this also minimizes the ventilation, while in the modern areas the streets are wide and straight, maximizing both solar radiation and ventilation. The urban design in the medina is primarily suited for hot, dry climates. In the humid climate of Casablanca the moisture does not dry out because of the narrow streets and the poor ventilation.

Climate adaptation of buildings and urban areas does not always come first in Casablanca, but tradition and the almost always urgent need for housing, together with the high traffic load in central Casablanca will usually come before any climate considerations.

Most of those interviewed thrived where they were regardless of the area they lived in, although several of them wanted to move to something else or to

something bigger. One cannot conclude that those who lived in modern areas thrived more than those in the the medina although the modern flats/houses were better adapted to the climate. Many of those living in the medina wanted more sunlight into the house and complained about the humidity, but they made the best of it and liked it despite complaints.

Improvements to the climate adaptations of buildings in Casablanca are that there should be openings or windows that can create draft and ventilate the house, while letting in sunlight which can create warmth during winter. Sunlight and heat can dry out the moisture in the walls. Good ventilation is very important in the summer and some sort of heating may be required during the winter season to improve the indoor climate. Materials with low thermal capacity should be used in the walls and the roofs should be well insulated. In the urban environments the streets and sidewalks should be protected from too much exposure to sun, and the streets should also be ventilated as long as the winds cannot reach too high velocities. In wide streets, as in the modern neighbourhoods it is very good if the buildings along the streets have protruding upper floors.

6.1 Suggestions for further studies in this subject

For further studies on this subject we propose to study a traditional Arabic house in more detail and possibly take measurements of the indoor climate or do simulations of buildings. Or further study the differences between the medina and the Ville Nouvelle, in Casablanca or other Moroccan cities.

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8 Appendix

8.1 Interview starting questions

1. What do you do for living?
2. How many are living here? How old are you and your family members?
3. How long have you lived here?
4. Why did you choose to live here in the Medina/the New City? Have you grown up here? (Have several generations of your family lived here?)
5. How do you feel that the house/apartment is adapted to your family's needs and traditions?
6. What is your opinion of the indoor climate in the building? Does it differ with the outdoor climate and the seasons?

8.2 Complete interviews with answers

8.2.1 Family 1 in Medina Qdima - Rachida

An old apartment on the ground floor, in a house that's been converted into apartments. Rachida and her family rent the apartment.

What do you do for living?

I'm a janitress at the BMCE Bank, and my husband is a tailor.

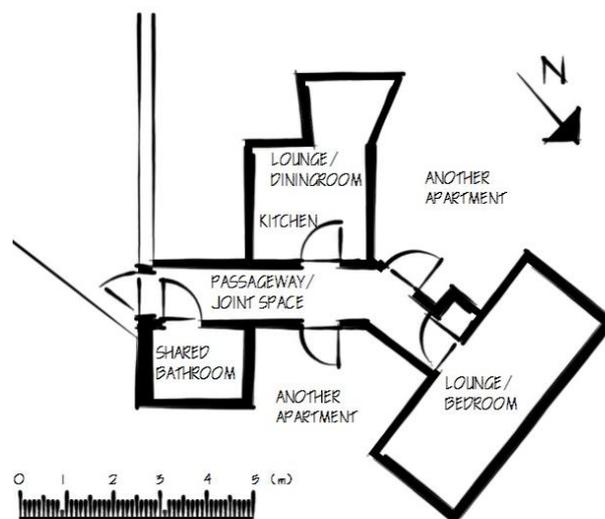
How many are living here? How old are you and your family members?

Me, 53 years old, my husband, 61, my daughter, 22, the nanny, about 14 years old and our 6 months old grandson.

How long have you lived here?

32 years.

Why did you choose to live here in the Medina?



We didn't really choose to live here, our finances made that choice for us. We could not afford any better. Most people that move to the medina don't have much money.

Do you feel that the apartment is adapted to your family's needs and traditions?

We share a bathroom and the passageway with two other families. There is no bedroom, the kitchen is very small and there is no place to relax. Guests that come here sit in the same room that we all sleep in at night. So no I don't feel that it fits either or needs or traditions.

What is your opinion of the indoor climate in the building? Does it differ with the outdoor climate and the seasons?

We have a really hard time when it's raining, but better when it's sunny. The passageway has no roof and when it rains, water comes in through the open roof and it floods the rooms. But during summer when it's sunny the openings lets in light. Because of the passageway with open roof we freeze a lot in the winter. In winter we have to cover the openings in the passageway's roof and open it up in the summer. By doing this we can contain the warmth during winter and during summer we can ventilate a bit better and let light flood in to the corridor. It's very hard to ventilate the rooms because we have almost no windows. There is one window, there (pointing to a small window above the door), which I put in myself to get some air and light into the room. Before this the room was dark and in the summer the ventilation was very poor.

The other rooms have no windows either?

No.

How do you cope with the poor ventilation during summer?

During the summers we usually sleep with the door open, so we can breathe. If we close the door we almost suffocate.

How is the humidity indoors?

The house is very damp and our clothes go mouldy fast.

We have to repaint every year because of the damp, we would like to renovate even more then what is urgently needed every year but our finances doesn't allow us to.

Have you done any remodelling or renovation before, other than the repainting?

We have put tiles on the floor, because there was none, and we have replaced the doors. Everything is bad but as mentioned our economy is not good enough to fix all that we would like to fix.

We have also built a new room, where there used to be an area to hang clothes and for the kids to play, when our family grew we needed more space. The new room is the one that now contains the kitchen. The neighbours have also extended their apartments but they have built a second level on top of the existing rooms.

How is the frame of the house? What is it built of and is it stable?

The walls are made of stone and the roof is of concrete. The walls are stable but the roof is not. Sometimes bumps emerge in the ceiling, and if I take something and poke the ceiling it crumbles and small bits and parts fall down.

What do you think is positive about living here in the medina?

The location is good; all we need is close by, shops, bakeries etc. But living so close together with the neighbours is not good. You need your own accommodations with your own front door to be able to really relax and feel like home.

What do you think is negative about living here?

The building is badly planed out, crooked walls and a shared bathroom, it's not good. The building requires a lot and constant repainting and renovating. It is hard to feel comfortable when you don't like where you live, but the cheap rent fits our economy.

Would you like to move to another neighbourhood or building?

I would have liked to move if we could afford it, I would like to live somewhere that is nice and clean. People can sometimes thrive in the medina if they have their own house or apartment with its own front door and don't have to share a house in the way we do.

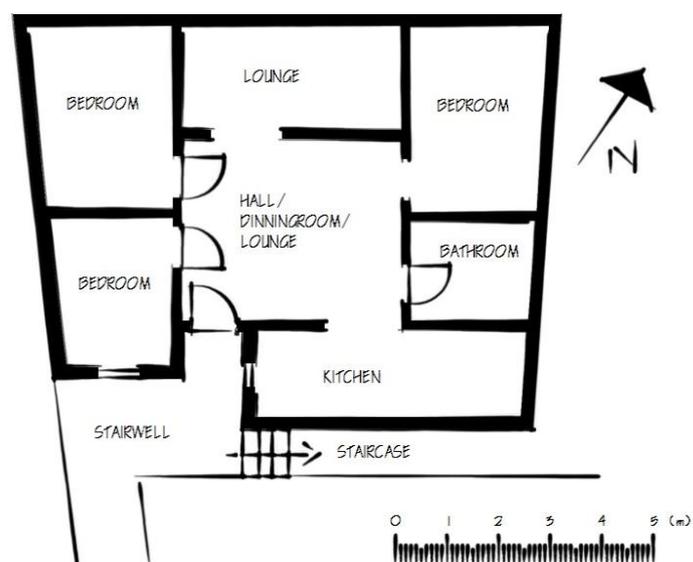
I think that houses in the medina can be big and comfortable if you don't split them up to rent out the rooms. For example this house was from the beginning supposed to be one house, for one family, but the owner has split it up and is now renting it to us and two other families. This house is actually 90 m² and if you compare it to new apartments it is big, the newer apartments is usually not much bigger than 50 m². Sometimes when one owner of a house dies the owner's family that inherits the building splits it up to apartments and thus they own one part (one apartment or room) each.

8.2.2 Family 2 in Medina Qdima - Bouchra

An apartment on the ground floor in a traditional Arabic house converted into apartments. During the French Protectorate the house functioned as a hotel, and it is still owned by a Frenchmen. Bouchra and her family rent the apartment.

What do you do for living?

I don't work but my husband work as a customs officer at the border.



How many are living here? How old are you and your family members?

I live here with my husband, our daughter and our two sons.

I'm 44 years old, my husband is 59, our daughter is 20, our oldest son is 15 and our youngest is 10 years old.

How long have you lived here?

My husband has lived here since 1974 but I haven't lived here as long as he has.

Why did you choose to live here in the Medina?

I moved in with my husband because we couldn't afford any other place. But we actually like it here, or we think we do anyway.

Have several generations of your family lived here?

My husband's mother grew up here.

How do you feel that the apartment is adapted to your family's needs and traditions?

The apartment is big enough for our family but it's very dark, there are almost no windows. The two small windows, one in the kitchen and one in my daughter's room, are not in an outer wall, but towards the stairwell. And the opening in the ceiling that used to be in the center room before it was converted in to apartments has been closed up with glass blocks and above it is now our neighbours' apartment.

What is your opinion of the indoor climate in the building? Does it differ with the outdoor climate and the seasons?

During the winter it's quite warm. During the summers the temperature during the day in here is comfortable, but in the evenings it gets really warm and stuffy. The ventilation in here is not the best because of the lack of windows but I've replaced the door to one with a window to enhance the ventilation.

Our biggest problem is that we get absolutely no sun.

How is the humidity indoors?

My son has developed asthma because of the high humidity and all of our clothes and fabrics mould and have to be washed all the time.

Have you done any remodelling or renovations to the apartment?

I've done quite a lot of superficial renovations. Painting the walls doesn't last long since the paint keeps falling off, because of the damp. I've put tiles on all the walls in the apartment, because that lasts longer and I don't have to redo them every year. It seems like the damp doesn't affect tiles as much as it affects the paint.

Have you done all these renovations at the same time?

No, I do a little every year, as the budget allows me to.

Why have you done so extensive remodelling instead of moving somewhere else?

We have no place else to move. We rent this apartment really cheap, that's why we live here. My husband can't afford to buy me an apartment and we can't rent somewhere else because it's gotten so much more expensive. I hope

that when my children grow up, they might have the money to buy us a newer apartment.

So you would like to move?

Yes, definitely, somewhere sunny, quiet and peaceful.

How are the neighbours?

They are kind and nice but there are always a lot of noises, both day and night. The medina is a social neighbourhood, everybody know each other.

Do you like living here, despite some of the negatives?

Yes, it's enough for us right now, but as I mentioned I would like to exchange it to a sunny two bedroom apartment. All I really want is a sunny place, for me the sun is very important and we don't get any sun in here.

8.2.3 Family 3 in Medina Qdima - Fatima

Old apartment on the second floor. Fatima and her family own the house, and share it with the whole extended family, the second floor she shares with her sister.

What do you do for living?

I don't work, we live our whole family in this house, and my brothers support the whole family.

How many are living here? How old are you and your family members?

In total, the whole house, we're 13 people. There is me, my brother, his wife and three kids, my mother and my father, my sister, my second brother and his wife and two kids. The age varies, from the oldest at 89 and the youngest at 16 years old. We have divided up the floors between us and share the terrace and bathroom.

How does it work with the whole family living in the same house?

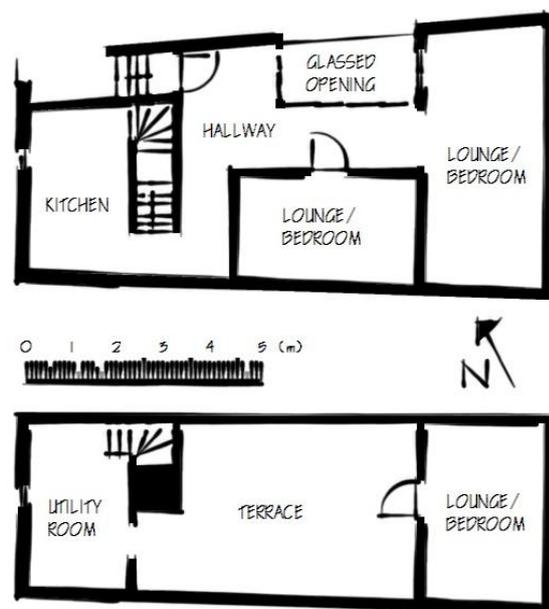
My brothers work and support our family, they give us money in the end of every month and they buy food. Everybody contributes to the family in different ways. We eat, live well and everybody is good with the situation.

How long have you lived here?

I have grown up here. My family bought the house in 1956 and we've all lived here since then.

How do you feel that the house/apartment is adapted to your family's needs and traditions?

I feel free here, we have the whole house and all the floors to ourselves, we have a terrace and we feel like home in the whole building.



If we want to barbeque, we can just go up to the terrace, if we need to do laundry or hang clothes, we don't have to stand in line or wait. We only have family members and not neighbours.

All the adults have their own room, and sometimes, when everybody is away at work, school, or something, I feel like it's very empty.

What is your opinion of the indoor climate in the building? Does it differ with the outdoor climate and the seasons?

The building is very sunny and bright, and because of the opening that goes through the whole house and has windows it's also good ventilated. During the winter its pretty warm inside, as long as we keep the windows closed. That's very nice. During summer the building keeps a cool temperature, especially on the ground floor.

How is the humidity indoors?

It's not especially damp, because of the sun. But we do have some problem with humidity in the walls, and have to repaint now and then.

Have you done any remodelling or renovations to the house?

We have to renovate constantly, step by step. The walls crack and we have to fix them quite often, we have put tiles on the walls, and we have to repaint every now and then. There are a lot of things that have to be replaced or fixed. We've repaired the roof because it was not strong enough. We take it a little at a time, as our economy and time allows until all is fixed, but then it's probably just to start over again there will always be something that needs fixing.

Do you know the building materials that the house is built of?

I think its concrete blocks, but I'm not sure.

How do you like living in the medina?

I like it here, and I'm proud of living in the medina. They have many planes on how to improve Medina Qdima, which is good. And I like that we're so close to the sea.

Some complain about the criminality and lack of safety in the medina, but I feel safe and there is no one that disturbs us.

Would you like to move somewhere else?

There have been pretty many requests about buying this building.

I may consider moving someday, but my demands are quite high. It has to be much better than this and the feeling I get from the new place has to be right. If I'm going to move someday it will be to a villa, because I want my own terrace and garden. I don't want to live in an apartment building where I have neighbours over and under me. I want freedom.

8.2.4 Family 4 in Medina Qdima - Fatima, Khadija and Najat

Old traditional Arabic house, with a center room and opening in the ceiling but without a garden or courtyard, in the medina. Fatima, Khadija and Najat with the rest of their family rent the house.

What do you do for living?

I'm a house wife and live of my husband's pension.

How many are living here? How old are you and your family members?

Now there's only me and I'm 76 years old, my granddaughter who is 25, and another woman that's staying here, I think she's 45 years old.

But before, I lived here with my whole family, my 6 children, my husband, my uncle, my brother, my daughter's husband and her 4 children.

How long have you lived here?

For around 45 years.

Why did you choose to live here?

We we're living really cramped, so we moved here because it was bigger.

Have you grown up here?

My children all grew up in this house, I didn't grow up in exactly this house but I grew up here in the medina.

How do you feel that the house is adapted to your family's needs and traditions?

We're happy with it, I raised my kids here, and the house is big. I don't like small, cramped apartments. I like having a nice, big house where my whole family can come and visit at once if they like to.

What is your opinion of the indoor climate in the building? Does it differ with the outdoor climate and the seasons?

It's cold during the winter season, we have a small electric radiator that gives some warmth, we move it from room to room. During winter, early spring and late fall we cover the opening in the ceiling with a hard-plastic roof, so it won't rain in, but during summer it's open to let in the sun and some air.

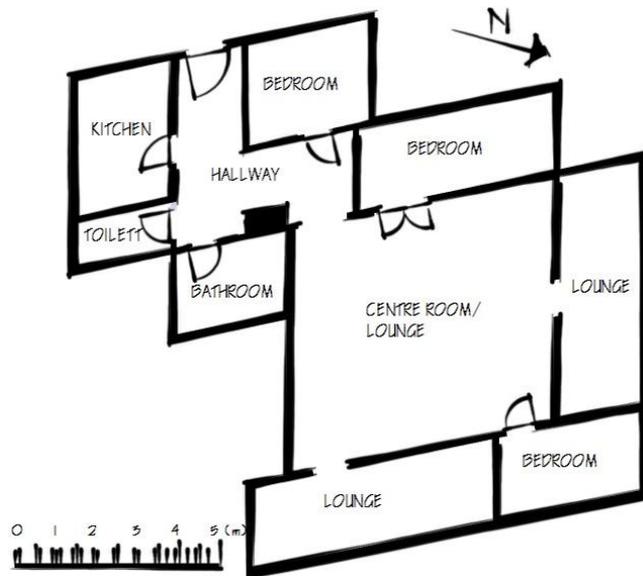
There are no windows but the roof opening lets in lots of sun and air, so it's quite bright and good ventilated.

How is the humidity indoors?

It's very damp, we've had to do some renovation because of the humidity. I've gotten asthma because of it to.

What kind of renovations have you done in the house?

We've done quite many renovations, we've put tiles on the walls, replaced the doors because they were old and damaged from the damp, and we put up wood panel in some of the rooms but we had to take that down pretty soon



after. Wood is not a good material to use in the houses here, the humidity is too high.

We haven't changed the layout of the house only superficial renovations and making it look better. Some things we have to redo maybe not every year but almost because of the humidity. The tiles we put up has last long but now it's starting to crack so we probably have to redo them soon. We've been thinking about creating a real courtyard with a small garden in the center room, there's a well under the house so I don't think it would be so difficult, and it would be beautiful. I actually think there is a lot of water in the ground under the medina.

Even though we have to renovate so often and the fact that I got asthma because of the humidity I still like it here and haven't ever and will never consider moving.

8.2.5 Family 1 in a modern neighbourhood - Zineb

A modern apartment in the neighbourhood; Haj Fateh, on the first floor. Zineb owns the apartment.

What do you do for living?

I don't work, my husband used to work in media but he is dead now.

How many are living here? How old are you and your family members?

I and my daughter, that I adopted after my son died. I'm 61 years old and my daughter is 13.

How long have you lived here?
We've lived here for almost 12 years.

Why did you choose to live here?

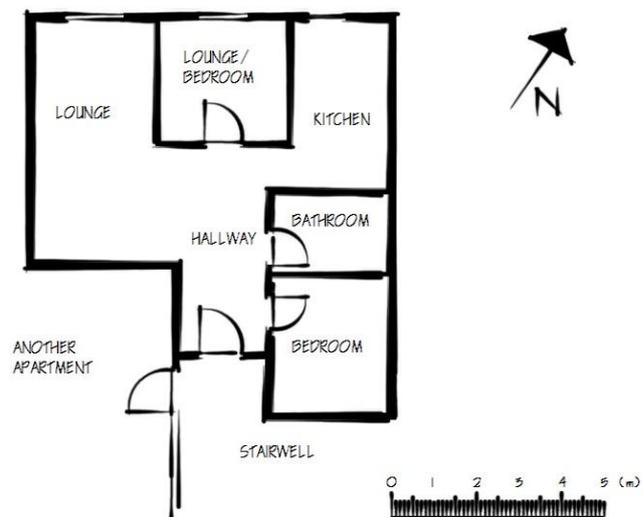
Before we moved here we rented our apartment, this one we own which is much better. Owning your own home is much better than renting because there are no rental fees or anything similar.

Have you grown up here?

No, we grew up in a different neighbourhood.

How do you feel that the apartment is adapted to your family's needs and traditions?

The apartment is not very big but it suits our budget. We're happy with it. We would like to have a bigger apartment with more bedrooms and a bigger kitchen, but we can't afford that. The kitchen we have now is small and I would like to have something larger, but we'll have to settle for what we have now.



Was the apartment expensive?

It was all right, we bought it when it was much cheaper than it is now. The apartment is worth much more now than what I paid for it.

What is your opinion of the indoor climate in the building? Does it differ with the outdoor climate and the seasons?

During the winter the apartment is actually warm, which is good. But during the summer it gets a little too warm but with the natural draft that is created by opening the windows it becomes a bit more comfortable.

How is the humidity indoors?

It's not damp or humid at all.

Is the apartment sunny enough?

It's very sunny; we have enough windows that let in light. One window in every room, except my bedroom.

And you have no problem when it's raining?

We barely notice when it rains, we open a window and see it but other than that we don't notice it.

Do you ever feel that you need air-condition during the summer?

The natural draft is enough, it doesn't get so warm that it's uncomfortable.

How is the frame of the house? Do you know what it's built of and if it's stable?

I don't know the building material and so far everything is great and we're happy and content with the apartment.

Have you done any remodelling or renovations?

We have done some changes after our own taste, not because something was wrong with the apartment. We have painted all the rooms, changed the tiles and the windows.

Have there been any problems with the apartment?

The only problem right now is the floor tiles in the big lounge, which suddenly came loose from the floor by themselves, some of them also broke in to several pieces. That's the only problem and I don't know why they have come loose. Poorly made I would guess.

Where do you dry your laundry, I see that all windows have security gratings?

We hang our laundry to dry on a terrace on the roof that we share with the whole building. I would like to have my own place to dry our clothes but we have no choice right now.

If you compare this apartment to how you lived before you moved here, is it better?

As I mentioned before owning your own home is much better than renting it. It's something that feels like your own and no demand from others. And the neighbourhood is much better. The neighbours are nice here but they keep to themselves. It's not a very social neighbourhood, the one we lived in before was. Here, no one knows if you're dead or alive.

Do you like that kind of relationship with your neighbours?

I feel that it is better to keep to yourself and your own chores.

What are positives and negatives about where you live now and where you lived before?

Before we moved here we lived in a one-story house, in bad shape by the sea. The neighbourhood was beautiful, close to the beach and restaurants. In this neighbourhood, where we live now, it is mostly apartment houses with a few stores. It's far from the sea but that also means that it's not as damp and humid, which is good.

8.2.6 Family 2 in a modern neighbourhood - Khadija

A modern two-story house in the neighbourhood; Bourgogne, built in 1974. Khadija and her family own the house.

What do you do for living?

I'm what's called an assistente de direction comptable.

How many are living here? How old are you and your family members?

We are six persons living here right now. It's me and I'm 42 years old, my husband who's 48, our daughter, 15, our son, 11, my father-in-law is 83 and my mother-in-law who's 65 years old.

How long have you lived here?

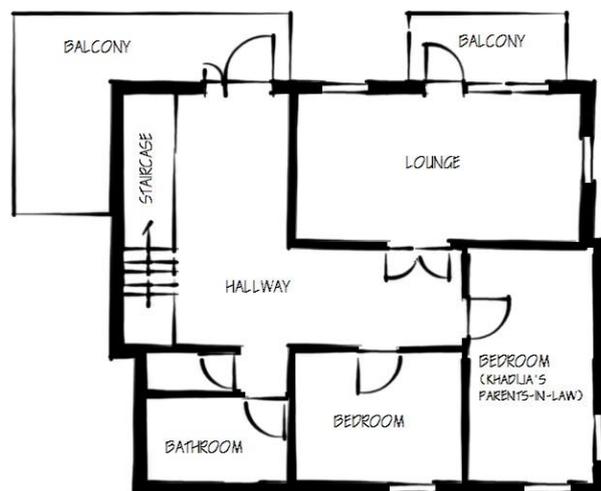
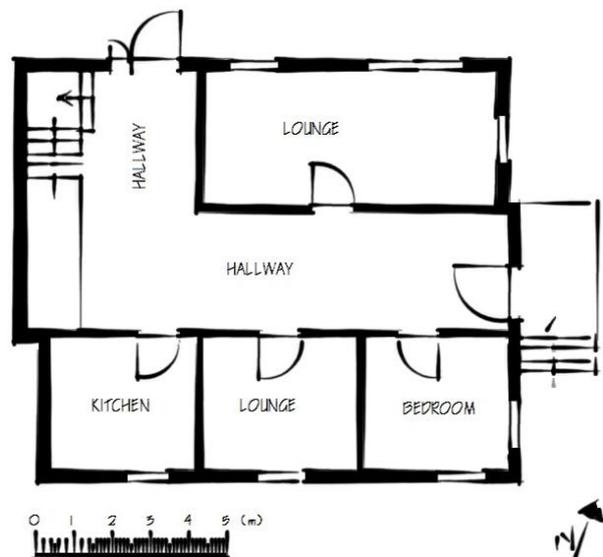
My parents-in-law moved here in 1974 when the house was just finished, and I moved in with them in 1995.

Why did you choose to live here?

It's a nice and luxurious neighbourhood and that's why we chose to move here. It's really calm and quiet.

How do you feel that the house is adapted to your family's needs and traditions?

The house fits us very well except that the kids share bedroom, they would like to have their own rooms. Everybody else still likes living here, and thinks the house is perfect size. We get a lot of sun and we have our own yard and a little garden. We have gotten comfortable with lots of room both inside and



outside. The kitchen in the house is good size and we also have an outdoor kitchen and utility room in the backyard and we have a garage with room for 3 cars.

Even though the house is modern you have a traditional decor and furnishing?
Yes, we like the traditional Moroccan decor and have gotten use to it.

What is your opinion of the indoor climate in the building? Does it differ with the outdoor climate and the seasons?

The indoor climate is quite good. When it's cold outside it can get pretty chilly inside too, and during summer when it's really sunny it gets nice and warm inside but the ventilation is very good so it doesn't get too warm. There are plenty of windows that give lots of light and good ventilation.

How is the humidity indoors?

We have almost no problem with humidity or dampness, even though we live close to the sea. The house gets a lot of sun so if there are any damp inside or outside it dries very quickly.

Do you know the building materials that the house is built of?

It was built with traditional material, yellow stone or something like that, I think.

Have you done any remodelling or renovating?

No, the house is exactly as it was when it was built, we haven't felt the need to make any renovating or changing anything with the house.

How are the neighbours? Is it a social community?

We have some contact with the people in the houses on each side of ours, but we have almost no contact with the other houses or families living in them on our street or neighbourhood. But everyone is very nice anyway, people here just want to keep to themselves, and so do we.

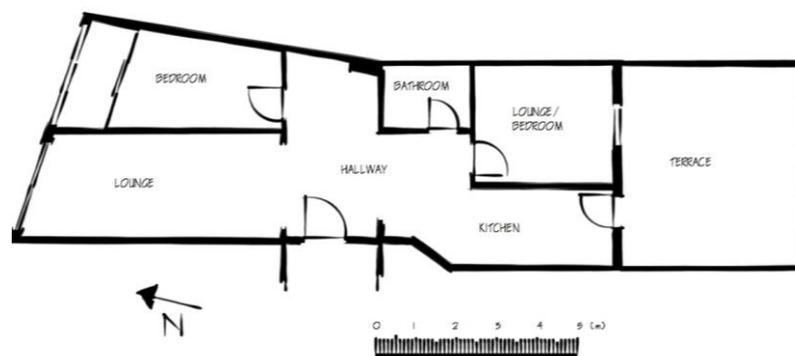
8.2.7 Family 3 in a modern neighbourhood - Keltoum and Mohammed
Modern apartment on the first floor in the neighbourhood; Bourgogne.
Keltoum and Mohammed own the apartment.

What do you do for living?

I don't work but my husband work at the train station (ONCF)

How many are living here? How old are you and your family members?

We are five people living here. Me, 68 years old, my husband Mohammed, 74 and our kids; Tarik, 40, Nabil, 38 and Hind 30. From the beginning we were 7



people, but two of our kids have moved out. Tarik and Nabil will be moving out soon to, they have recently bought their own apartments.

How long have you lived here?

We bought it when it was new, in 1998.

Why did you choose to live here? Did you grow up here?

We used to live in a villa in another neighbourhood, Oasis, here in Casablanca. It was Mohammed's parents, and we inherited it together with my husband's brothers. First we shared it with one of the brothers, but the other two brothers, who lived abroad, wanted their cut of the inheritance and we had to sell the house, split the money and then we bought this apartment.

I grew up in the old medina.

How do you feel that the apartment is adapted to your family's needs and traditions?

It's nice, it suits us. The children were all adult when we moved here, so we counted on them moving out sooner than later. Although now it's later and some of them still live here, so it's a little crowded. Two are out and soon two more is moving and then we'll be only three people living here.

We have our own terrace and a perfectly good size kitchen, we would like to have another bathroom and are thinking of building one out on the terrace sometime in the future.

What is your opinion of the indoor climate in the building? Does it differ with the outdoor climate and the seasons?

The whole Bourgogne area is cold, windy and humid. During winter it's cold and some days we have the radiators on to heat the apartment. During summer it's good, the apartment is well ventilated thanks to the natural draft that's created when we open the windows and doors on both sides of the apartment. In the evenings it can get a bit warm, when the sun has heated the walls and all the lights are on in the apartment.

How is the humidity indoors?

We don't have any problems with the humidity or damp.

Have you done any remodelling or renovations?

No, nothing big, we've just repainted some rooms once or twice but that's because we got tired of the colour. We don't have to repaint annually because of paint falling off as a result of dampness in the walls. We just want the apartment to look fresh and beautiful. We've also tiled the bathroom and kitchen because we didn't like the old tiles, it had an ugly colour.

How is the neighbourhood?

All the neighbours are quiet and keep to themselves. The building has only two apartments per floor and there are not many different people living here or running around. We like living here, a lot, we like the apartment, the building and the neighbourhood. There are no noises, no disturbances, or messy neighbours. We are thankful for the situation.

If you were to compare this apartment to where you lived before, is it better?

Yes, much better. We have our own place and don't have to share it with anybody, even if it was my husband's brother and his family and not strangers. The area is a much nicer area, and much more social than where we lived before. We have more contact with people from the neighbourhood now. In the old neighbourhood it sometimes felt like we were alone on the street. We like it a lot here.

8.2.8 Family 4 in a modern neighbourhood - Mina

Modern apartment on the fourth floor in the neighbourhood; Bourgogne. Mina and her family own the apartment.

What do you do for living?

I don't work, I'm a housewife.

How many are living here? How old are you and your family members?

Now we are 6 but we used to be 7 until my husband past away. He was 70 when he past. I'm 55 years old, my son Yassine is 33, my other son Khalid is 34, my daughters Nadia and Merim are 29 and 26, and my youngest son Mosa is 22.

How long have you lived here?

We've lived here for 13 years. We bought the apartment before the whole house was entirely finished, the ground floor was completely done when we moved in here.

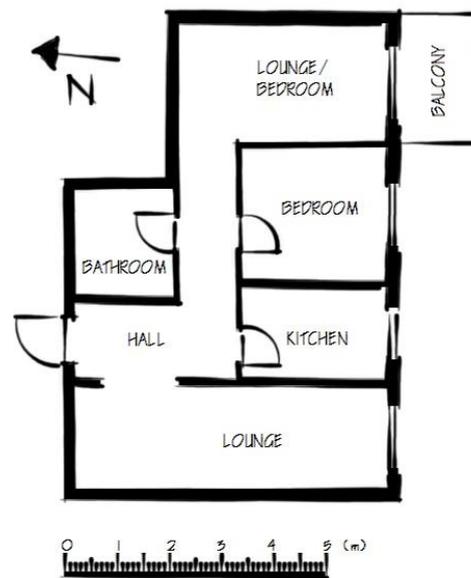
Why did you choose to live here?

Bourgogne is a beautiful, tranquil and well-known area. One of the best in Casablanca, now days there are very rarely an apartment for sale here, and it's very expensive if you find one that's for sale.

How do you feel that the apartment is adapted to your family's needs and traditions?

We are really happy with the apartment. My husband bought it so that the whole family could live together, and it's enough for us. The kitchen is big, and even if we're all in it t the same time it's all right. The bedrooms are not quite enough, the boys wanted one room, the girls one and my one. But I'm planning to fix that.

The apartment is well planned out and square, but there are some things that need changing and renovation. I want to split up the big lounge into two rooms with some kind of partitioning wall, and have one room with Moroccan decor and one with a more European. I really like the traditional decor and want to keep it but at the same time it would be nice with something else in one room. By splitting up the lounge we could also gain another bedroom. And I would



like to renovate the bathroom, we want a shower and we also want to change the colour of the tiles.

What is your opinion of the indoor climate in the building? Does it differ with the outdoor climate and the seasons?

During winter we don't get so much sun into the apartment, only a little in the mornings and it's often quite cold the rest of the day. We are close to the sea and the winds are very cold, even when it's sunny during the day it gets really cold at night. During summer it's very hot, it doesn't matter if the windows are open or not. The air feels stuffy and all the windows are always open all day. Despite that I think that the apartment is pretty well ventilated.

How is the humidity indoors?

It's not very humid, we get a lot of sun, except during the winter season.

How is the neighbourhood?

All the neighbours are kind and nice, some doesn't talk very much with each other and others are more social. Every person or family in the building have their own personality. I would say that the social people outnumber the ones that keep to themselves. The walls are quite thin and badly made so we often hear our neighbours, but despite that the neighbours doesn't disturb us much. Across the road there is a slum neighbourhood that I know that some of the people living in Bourgogne don't like, but we have no problem with it and it doesn't bother us. They don't cause any problems and they stay in their area, mostly anyway. I don't even lock the door when I go out if I know I won't be gone long.

Since we moved here they have expanded the neighbourhood and built quite a lot of new buildings and houses. There is a big difference from how it was when we moved here and how it is now. It was much calmer and quieter then it is now. I don't want them to build any more because I don't want the neighbourhood to get any bigger, there are already enough people living here.

Does the traffic on the street outside bother you?

Yes, it's quite noisy. Busses, cars and the schools across the streets, they all make a lot of noise. The traffic has increased since they built so many new buildings and so many people have moved here.