

Climate - responsive Design in Lebanon

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**Advanced Seminar on Bioclimatic Architecture in the Mediterranean June
2006**

- 
- Introduction
 - Vernacular buildings
 - Contemporary buildings
 - Development of local awareness
 - Design Guide

Introduction

Location

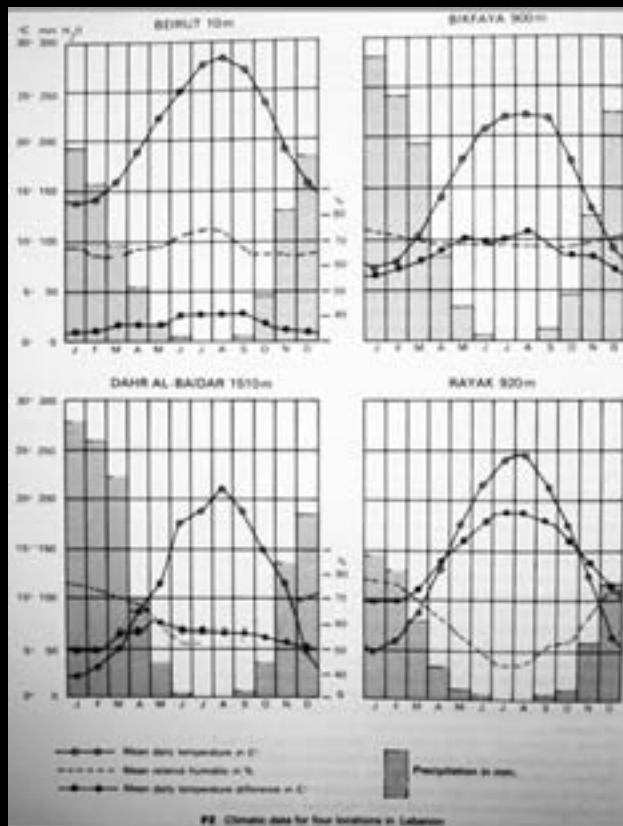


Introduction

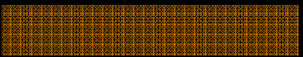
- **Geography**

- Coastal zone
- Two mountain ranges with the Beqaa valley in between

- **Climate**



Climate - responsive approach to buildings



Over the past 200 years, the relationship between climate – responsive design and energy use has been reciprocal. As buildings are becoming less responsive to climate (and context) they are using more energy.

The following slides will illustrate this development.

Climate – responsive design

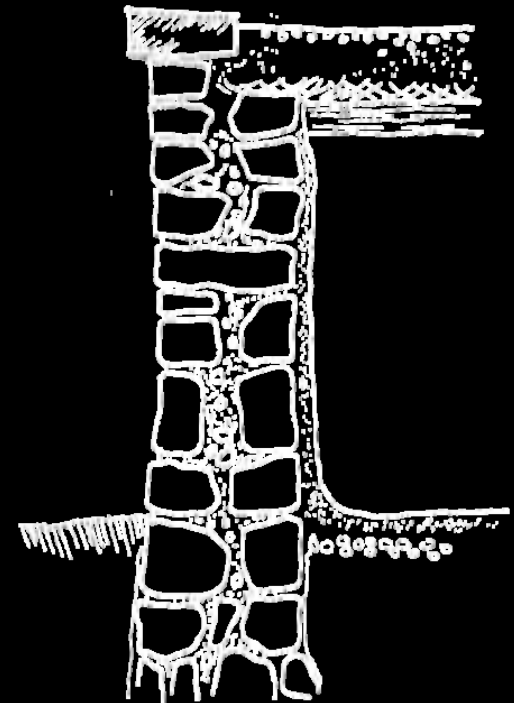
The development of buildings from a sustainable perspective is examined as per the following time intervals:

- Vernacular
- 1910 – 1940 : between the world wars
- 1940 – 1965 : the “modern” era
- 1965 – 1975 : pre civil war
- 1990 – 2006 : contemporary projects

Vernacular

House in Ghbale

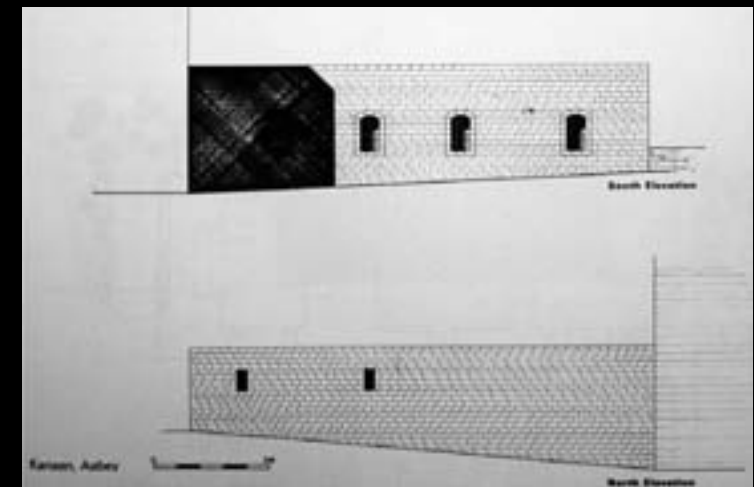
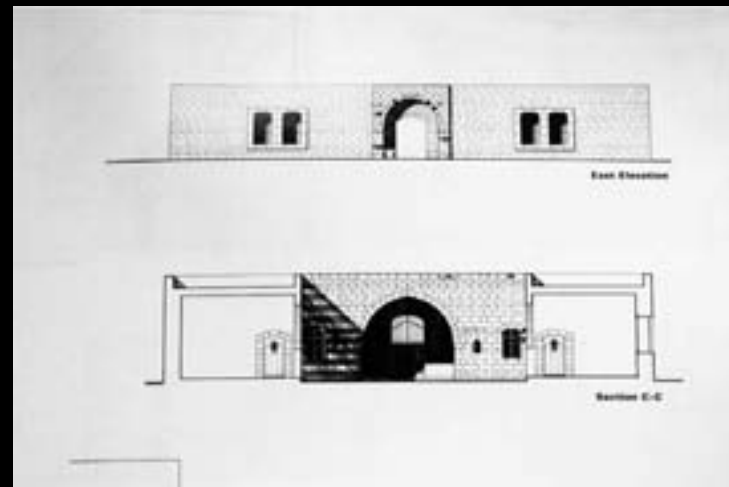
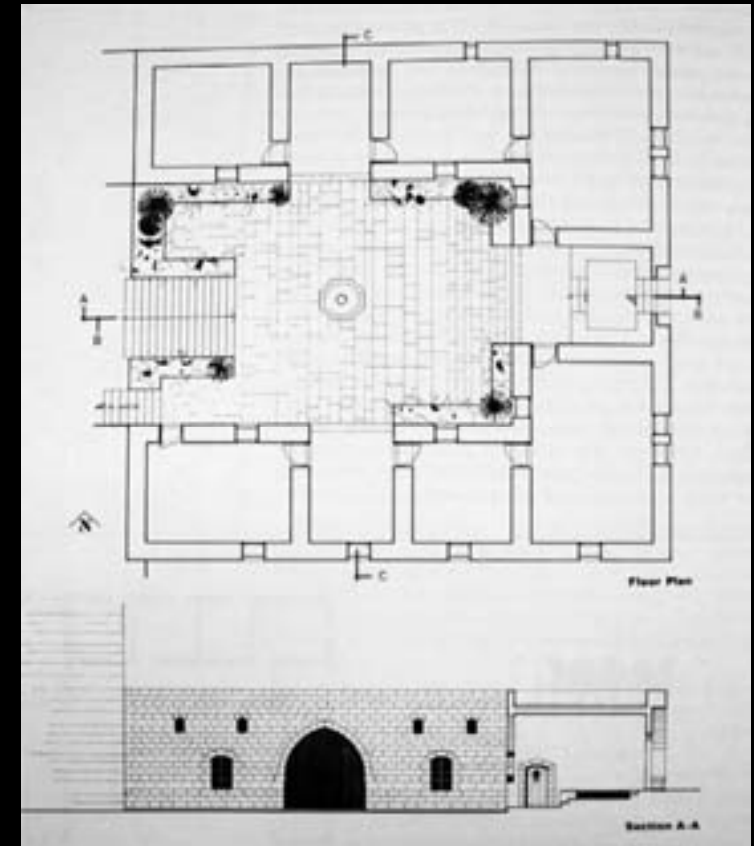
- Relationship to site
- Thermal mass
- Shading strategy
- Size and position of openings / ventilation
- Materials



Vernacular

Kanaan House in Aabey

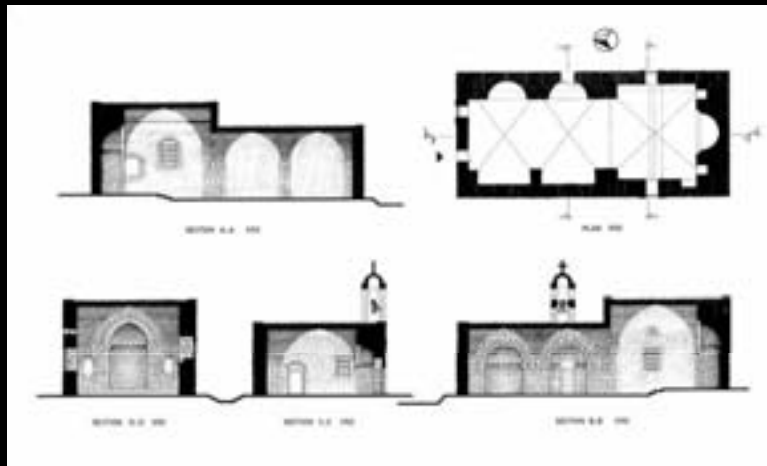
- Relationship to the valley
- Courtyard with fountain
- Thermal mass
- Size and position of openings / ventilation (liwan)
- Materials



Vernacular

Church in Ghbale

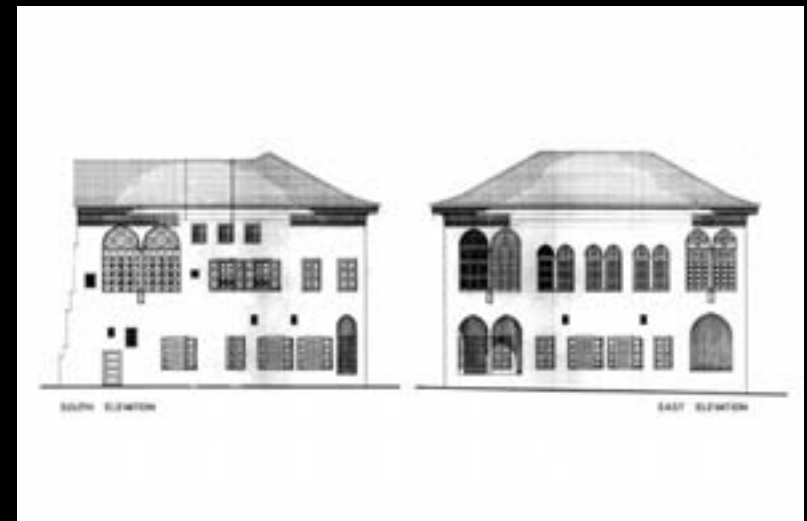
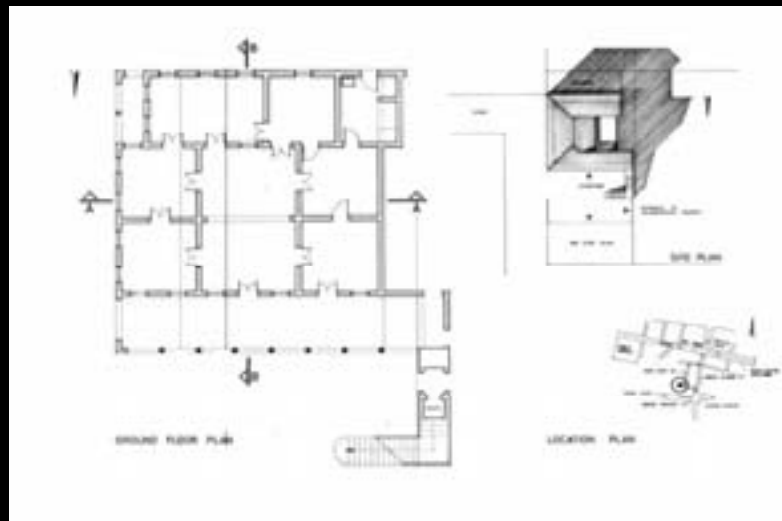
- Thermal mass
- Materials



Vernacular

Central Hall House

- Integration in site / orientation
- Natural cross ventilation
- Daylight
- Materials



1910 - 1940

Building on Spears Street

-Natural cross ventilation

1 - In the central hall

2 - In the rooms

-Recessed (shaded) loggias

-Daylight quality



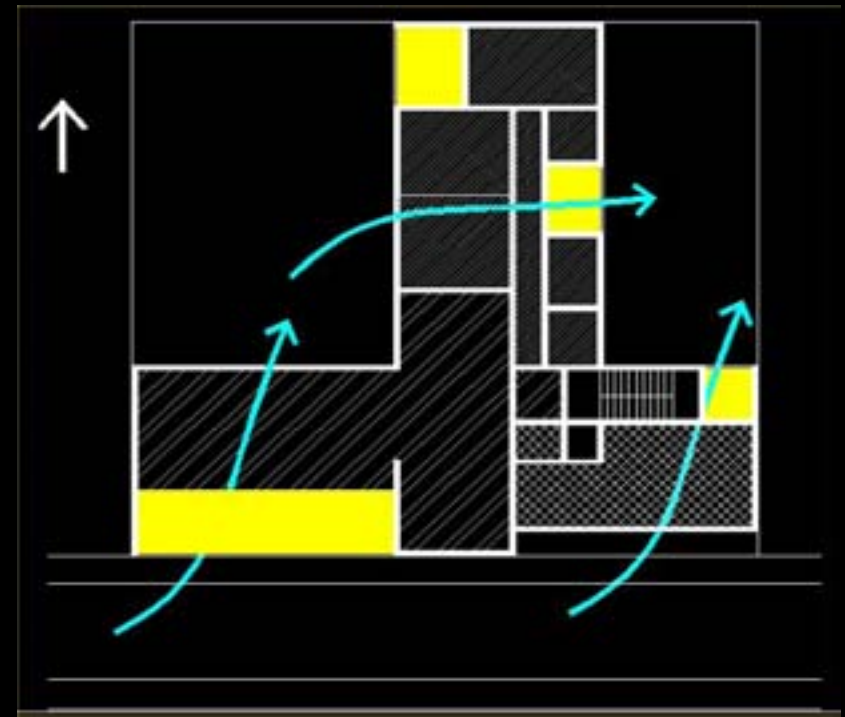
Ref: Dr. Robert Saliba

Lebanese Architecture 1914-1940

1940 - 1965

Zahar Building (1957) Architect : George Rais

- Orientation
- Natural ventilation
- Recessed balconies



Ref: Archive of Dr. George Arbid

1940 - 1965

Other buildings

- Ventilation strategy
- Shaded loggias



Building on Hamra street
early 1950s



Khoja Building, Ferneiny and Limberis
1950 - 1954



Khatib Building, E. Jeanho
1950 - 1951

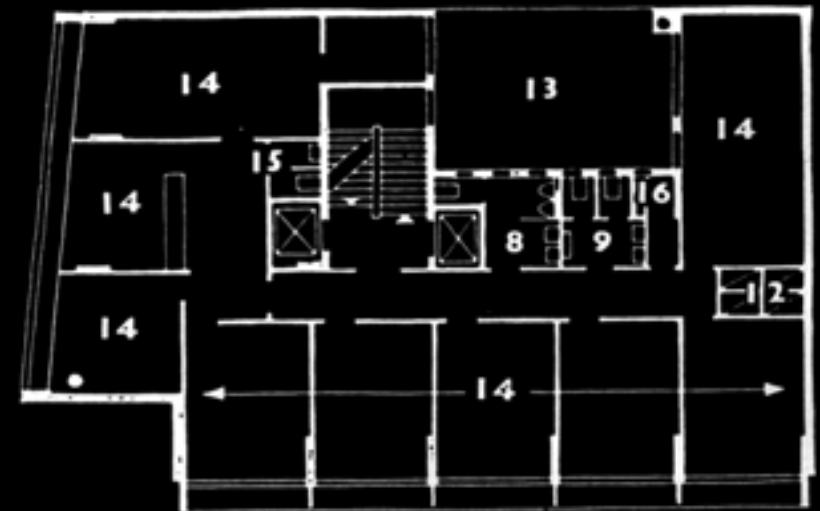
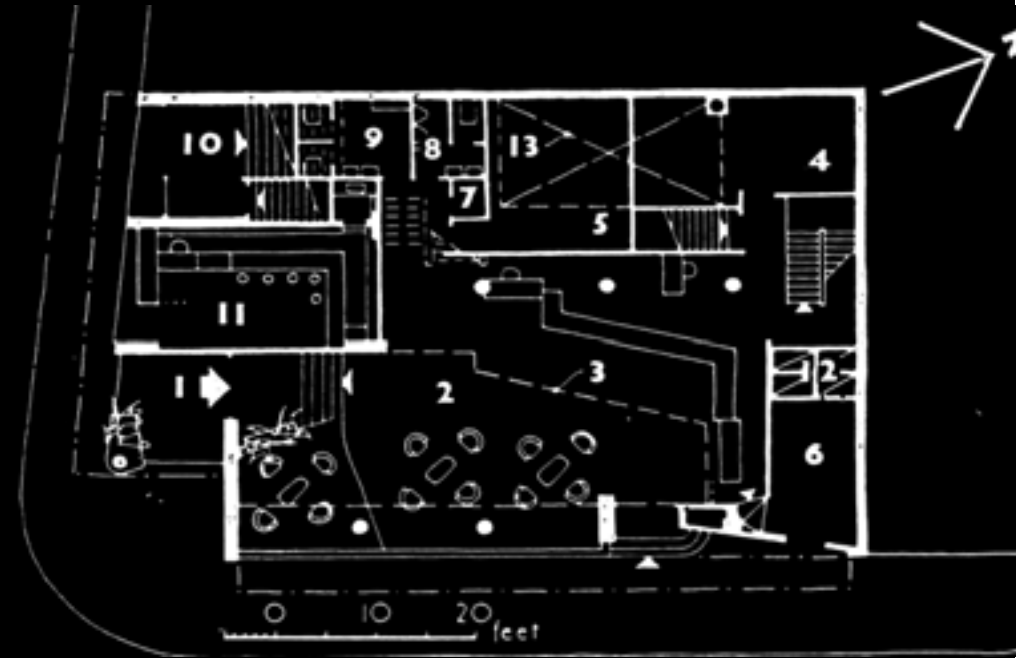
1940 - 1965

Pan American Building

Architect : George Rais

East elevation shading strategy

-South elevation shading strategy



1965 - 1975

Concorde Galleria – Verdun

Architect : Pierre Neema

- South-west elevation shading strategy



1965 - 1975

House in Adma

Architect Raoul Vernet

- Relationship to site
- Shading strategy
- Cross ventilation



1965 - 1975

Nicely Hall - American University of Beirut

Architect : Samir Khairallah

- Shading strategy
- Recessed circulation
- Materials



1990 - 2006

Beirut



1990 - 2006

Deir el Kamar, house by AAA

- Orientation
- Relationship to site
- Natural ventilation
- Green roofs
- Materials



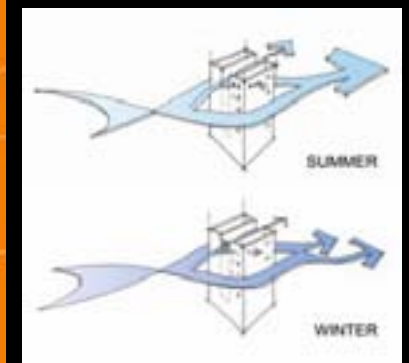
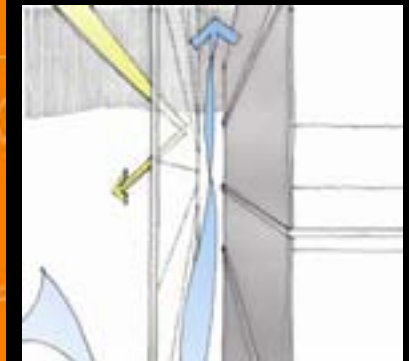
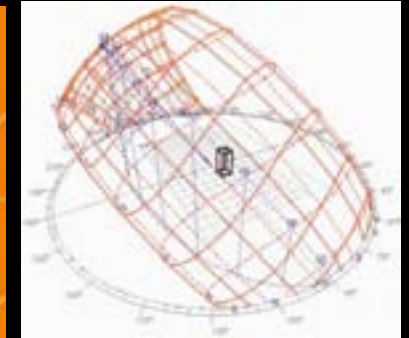
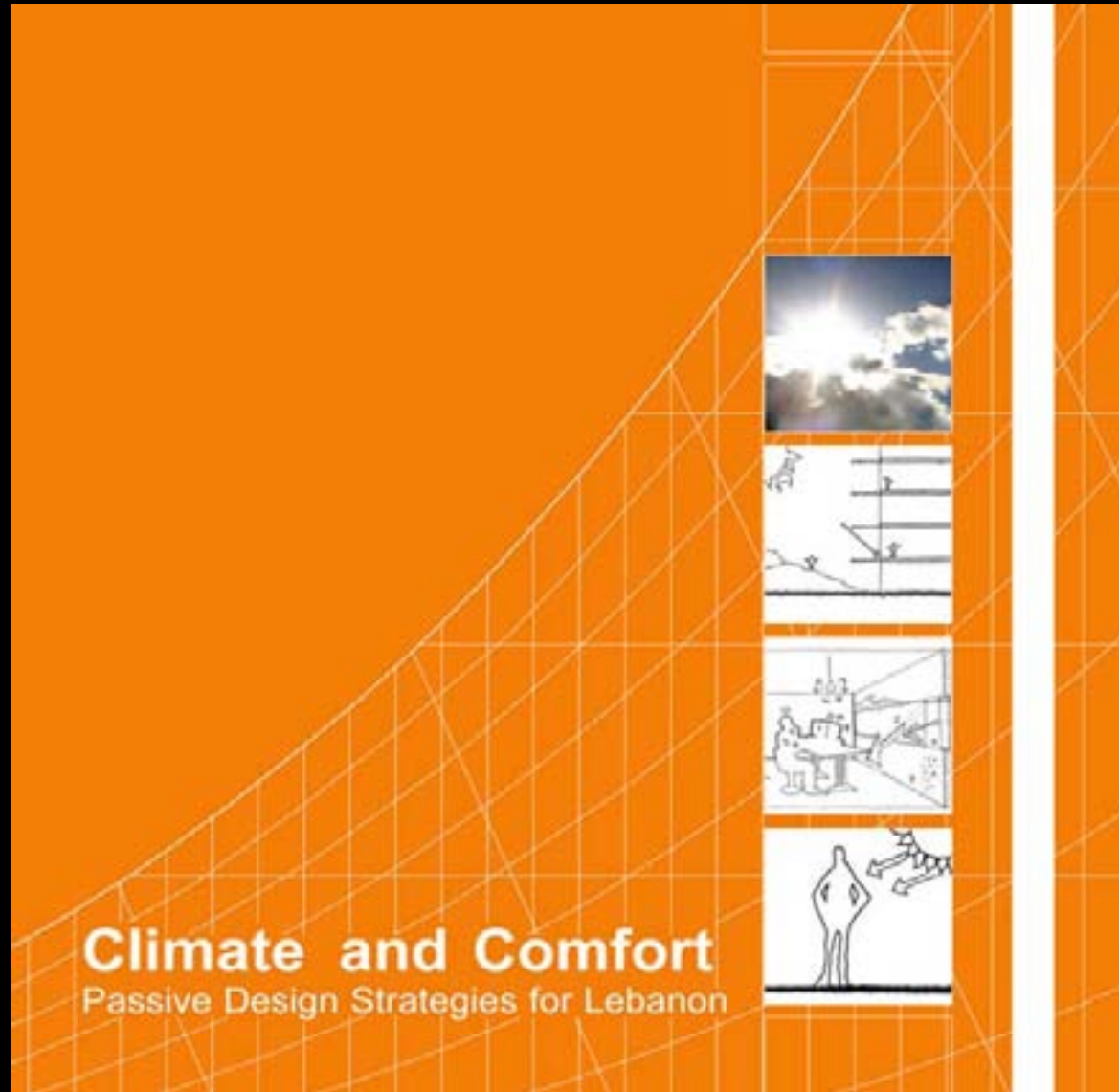
Development of Local Awareness

- Several ministries (Environment, Public Works) are currently promoting issues relating to improvement of the environment.
- Banks are offering low attractive loans (low interest rates) to people that install solar panels.
- The UNDP is managing several projects that involve enhancing the awareness of the citizens in terms of housing, transportation and industry. One project includes the Design Guide and Thermal standards for buildings

What follows is a brief overview of the Design Guide which is addressed to architects and engineers.



Design Guide



1990 - 2006

Downtown Beirut



1965 - 1980

Jreidini Building

By K. Khoury



