

Affordable Housing for the Future  
Competition: A Call for Innovative Ideas  
for the Design of a Model Water- and  
Energy-Efficient Low-Income Apartment  
Building in Abu Alanda, Jordan



# 07

## **Affordable Housing for the Future Competition: A Call for Innovative Ideas for the Design of a Model Water- and Energy-Efficient Low-Income Apartment Building in Abu Alanda, Jordan**

By the year 2050, nearly 80% of the earth's population will reside in urban centers. Applying the most conservative estimates to current demographic trends, the human population will increase by about 3 billion people during the interim. An estimated 109 hectares of new land

The approach to the design of Abo Alanda low-income apartment building has been to provide a passive low-tech and socially sensitive solution to the requirements set out in the brief

The major concern was to provide a passive efficient low-income outward housing apartment; at the same time it has to be socially accepted.

The primary design concept has been to create elevated farms to shelter the living units from the external environment, the resultant outwardly living unit's would focus around, and derive most of suns and grey water to irrigate the private elevated farm for each unit.

### **The Myth of the inward society**

We do live on a global land. Whether you like it or not whatever hits the world in a way or another we are influenced by it, the old saying of coming back to roots to our inward society is no more true or acceptable, we are free to move and free to modern ideas, Whoever still bet on the court as a gathering space is misleading himself, our new courts and gathering space are the streets.

Poor societies tend to more open for ideas than sophisticated rich people, they are very furious to anything that happens, they tend to socialize more often even more than rich society " the more the society gets rich the less interaction tend to occur"

Accordingly in our design we tend to focus more on the space between buildings to create a new means of communications that will suppose to happen while taking care of the garden, during this coincidence another neighbor could easily share his findings or ideas and socialize with each other

### **The Economics of Happiness – Eco community**

Poor people tend to use more cheerful colors than rich people, the more the people tend to get sophisticated they tend to move toward mono colors, accordingly we had used a number of cheerful colors in an acceptable manner.

### **A Potential Solution: Farm vertically - hanged gardens**

Aesthetically appealing garden is a necessity, but today's the needs for people are growing the need for a healthy vegetable for daily needs is getting more and more attention, we need to grow a edible landscape , in our scheme we had planned to enable each apartment of a small green space to enable its inhibitors to grow their daily use and the same time to act as a small garden, also we had planned to integrate a vertical farm at the lowest point of each apartment building, which will be at the basement level in most cases.



The plants in the elevated farms provide shade and humidity in the summer dry external air that enters the rooms through the windows.

## Environment

Space is our imagination. It's the ground reflecting the self. Space is nonexistent, its' without a beginning or an end.

The concept of indoor farming is not new, since hothouse production of tomatoes, a wide variety of herbs, and other produce has been in vogue for some time. What is new is the urgent need to scale up this technology to accommodate another 3 billion people. An entirely new approach to indoor farming must be invented, employing cutting edge technologies. The Vertical Farm must be efficient (cheap to construct and safe to operate).

Creating this type of garden will influence and empower women in an indirect way, will also influence in participation and small trade development by exchanges types of grown vegetables, it will also release pressure on environment.

From inside (at the corridor level), the intention was to create maximum external opening in a membranes of high thermal mass. It was also desirable for these membranes to be selectively permeable in order to allow the warm external air to be cooled down through the central core and corridors with overlapping voids or creating huge scary courts. Which will act as a (malgaf, or wind tower) these requirements provided two main obstacles. the first being that creating a high thermal mass in a conventional manner would affect the budget and that secondly, using minimal openings in a blank façade risks creating buildings with little external visual interest and simulation.

Air entering from the wind-catcher core cools as it travels down the shaded core, before aiding a cross ventilation through the units.

## An Eco Friendly Building:

Water conservation will be achieved through the direct use of grey water which is filtered and irrigate each elevated farm, and the rest goes to the master grey water reservoir then to irrigate the roof farm. This system use gravity to irrigate the private farms.

## Site layout

In the Abu Alanda region, it is important to provide natural outdoor conditions that are conducive to social activities in the urban context, in terms of adequate day lighting, shading from solar radiation and ample

ventilation. A cooler and brighter external environment will also contribute to the quality of the interior environment of individual buildings.

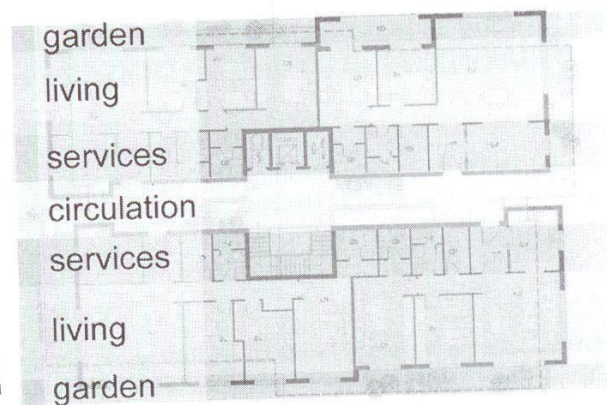
The intention was to avoid the monotony that frequently results from housing projects involving the repetition of a single unit type which is already colorful and cheerful, a level of articulation was required that would also create usable spaces between buildings; Which would play an important role in nourishing a sense of joy and comfortable and interactive building in the community among the residents.

The unit's have been arranged on the site to allow each unit maximum view, This affords shared benefits of casting shadow on each other and to be aesthetically pleasant , This also helps creating a lovely community identity through encouraging social interaction of communal ownership of these roof farms.

## Plan

All living rooms are overlooking the private elevated farm, the layout of the rooms is symmetrical around the central circulation for simplicity clarity and interchangeability of functions to suit variations in the,

3 m corridor ( will act as a thermal mass conduit ) ,  
3m services ( WC, laundry kitchen and storage )  
about 5 – 7 m living spaces (Guest room, dining & bedrooms ) , 1.2 to 1.8 m elevated farms, The inhabited rooms are located to the sides of the building with the utilities and circulation in the center, Placing services in the center in addition acting as a buffer between the public and the private zones , and the elevated farms play the same role as a buffer or a mediator land between in and out.

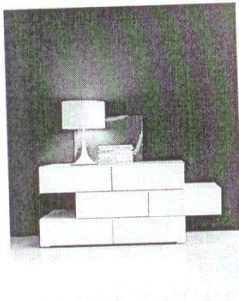


Each floor contain 4 unit's, 2 or 3 bedrooms, a kitchen, living space, dining and its utilities, all arranged in a way to maximize its view over the garden

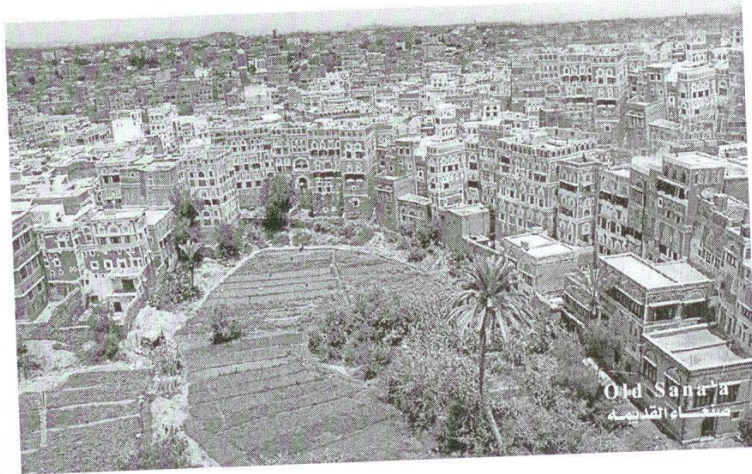
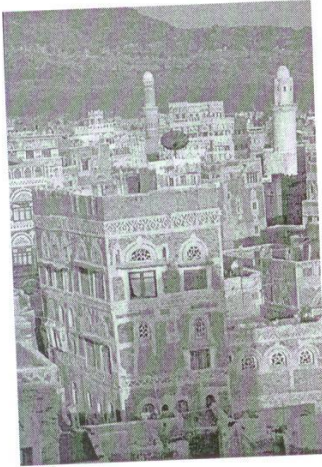
**Central wind catcher atrium**, the private wind catcher atrium provides microclimatic conditions at the heart of the building through cross ventilation to take a place to cool down

## Façade

A BRILLIANT STORAGE IDEA: IKEA, the main idea came out of one of IKEA's drawers what we had done is to open each drawer in a different direction; the overlapped space was utilized into a garden o a shading structure



It is easily to read the apartments from outside; each apartment is a unique extruded drawer or box which is clearly reflected on the exterior Arranged up on each other and the plants play an important role in the façade, each façade may include various types of plants.



The private farm is irrigated directly through the usage of grey water with a minimal filtration

**A space to express yourself:** At the bottom of each garden is the top of the garden below which will be a space free to paint, This is the additional benefits to encourage the residents to participate in the buildings process themselves by manually paint their homes from outside.

## Cost

The misconception that the costs of good design, construction, are prohibitive stands as one of the greatest barriers to the adoption of sustainable development. However, our design had adopted the normal well known way of construction that is very familiar to any contractor (beams and slabs) using a modular grid, the only new idea is adapting smart solutions, which is considered beyond conventional construction costs, this premium is more than compensated for over the lifetime of the building in concrete financial returns such as savings in utility bills, increased property values and employee productivity gains.

In our construction we had addressed the following:

- Whole-building cleaning and maintenance issues including chemical use.
- Ongoing indoor air quality
- Energy efficiency.
- Water efficiency.
- Exterior maintenance programs.

In our proposal the cost for constructing 1sq.m = 240 - 270 JD

Minimal increases in upfront costs of about 2% to support smart systems (Grey water, etc) design would, on average, result in life cycle savings of 15% of total running costs