Harvard Kennedy School Middle East Initiative

NEW ARAB URBANISM

The Challenge to Sustainability and Culture in the Gulf

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Preface

This draft of the final report is in fulfillment of a fieldwork project, conducted from January to February, 2010, and sponsored by the Harvard Kennedy School Middle East Initiative, funded by the Kuwait Foundation for Arts and Sciences. We are enormously grateful to our focus-group facilitators and participants in the three countries of the region we visited and to the generosity with which our friends, old and new, welcomed us into their homes and shared with us their deep insights into the challenges facing the region with respect to environmental sustainability and cultural identity, the primary foci of our research. This report contains information that hopefully will be of use to the peoples of the region but also to peoples elsewhere in the world grappling with urban development and sustainability.

We also thank our peer-review group for taking the time to read the report and to communicate to us their comments and criticisms. Their views are summarized in the Epilogue.

Steven C. Caton
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Introduction

In the last thirty years The Gulf[1] has seen a building boom the scale of which is unparalleled in the world today, but whose impact on the surrounding environment and societies remains largely unknown. In recent years there has been a small number of published works by architects and urban planners on the rise of urbanism in the region such as Yasser Elsheshtawy's two edited volumes, Planning Middle Eastern Cities (2004) and The Evolving Arab City (2008), and his own Dubai: Behind an Urban Spectacle (2009). Among historians of urban planning, Nelida Fuccaro's Histories of city and state in the Persian Gulf: Manama Since 1800 (2009) is also a significant recent contribution. Anthropologists such as Ahmed Kanna are now beginning to publish their field research on Gulf cities, bringing a badly needed socio-cultural perspective to our understanding of development (Kanna 2006, 2008, 2010). (The Bibliography contains a partial list of other important references to this region and the issues of sustainability and culture.) Through the Regional Organization for the Protection of the Marine Environment (ROPME), Kuwait, there has also been considerable research done on the degradation of the regional marine environment. The difficulty is in assessing the specific impact of urban development on the environment as opposed to human activity more broadly understood.

We hope our study, New Arab Urbanism in the Gulf (NAUG), will contribute to this burgeoning research on the development of Gulf cities through its focus on the environment, including the socio-cultural contexts in which this urbanism is taking place. We posed the following research questions: What has been the history of urban planning in the region and to what extent has it taken "green" principles into account? Has development incorporated such environmentally sustainable guidelines as LEED or the World Wildlife Fund "One Planet Living 10 Principles? What have been the impact of this vast building boom on the environment and the socio-cultural contexts of urban spaces and its architecture? What has been done to respond to those environmental impacts by the societies in question? Our efforts built on the findings of the Year One Pilot Studies of the Gulf Research Project (GRP) which concentrated on the United Arab Emirates and was funded by that country, in addition to a seminar Nader Ardalan, Fellow of CMES convened in April 2008 on development in the Gulf, its impacts on the environment and what could be done about them, held under the auspices of the Center for Middle East Studies at Harvard University.

Our research represents a departure from that undertaken by our colleagues mentioned above. For one thing, ours was team-based and collaborative rather than conducted by a single investigator, and it was self-consciously inter-disciplinary, involving an architect (Nader Ardalan) with over forty years of experience in the Gulf, an anthropologist (Steven Caton) who had worked extensively in Yemen on water sustainability issues though for whom this was his first research trip to the Gulf, and a recent graduate landscape architect (Gareth Doherty) who had completed a year of field research in Bahrain on the color green in Manama's urban design.

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[1] The body of water lying between southwest Iran and the Arabian Peninsula has been called the Persian Gulf while the Arab World has called it the Arabian Gulf. For convenience, it is called The Gulf in this research report. In 1978, the eight countries that border this water body mutually established the Regional Organization for the Protection of the Marine Environment (ROPME) and agreed to refer to it as the ROPME Sea Area (RSA).

It was thought necessary to combine the expertise of these three specialists because of the complexity of the research questions being posed. Our research also differed from that of our colleagues by being comparative in scope, entailing fieldwork in three Gulf countries – Kuwait, Qatar, and the United Arab Emirates – and the effort to compare the results obtained in them. Thus, our hosts in each of these places will be able to read what their counterparts are saying in their respective countries and to see what they are doing to meet the challenges of environmental and societal sustainability within their own particular contexts. In turn, we too try to come up with a narrative or interpretation of what they are doing singly and collectively that we hope will be helpful to policy makers and to researchers.

The scale of regional development has been such as to pose an immediate logistical challenge, which is how to reasonably narrow or focus on some aspects of the built environment over others in order to make the research project manageable. Another major constraint was time: we had a little less than a month (roughly February 2010) for the fieldwork. For these reasons we decided to concentrate on one particular aspect of the built environment, and our choice eventually fell upon institutions of higher education. This selection was partly guided by our own curiosity as educators about what was happening in the educational field in the Gulf, but also because the scrutiny of the built environment has so far been on shopping malls or other kinds of commercial developments; we wanted to encourage a new direction of inquiry. Educational sites, though they do not escape the pressures of commodity consumption and globalization, have more to do with a nation's aspirations for its young people (the demographic majority of most countries in the region) than perhaps any other architectural site, and for this reason is extremely important socially and culturally. That said, Qatar and the UAE are self-consciously reconfiguring themselves as "knowledge hubs" in which education plays a central role and which have everything to do with the visions of their futures.

We also decided to focus on decision-makers in the fields of environment, development, government planning, and education rather than to sample an array of groups differently positioned in the political and economic spectrums – the single exception being the interactions we had with male and female students at some of the local colleges – and this top-down approach had both its advantages and disadvantages. Two of the countries we visited – Qatar and the UAE -- are in the throes of intense urban planning efforts and as these are directed by the government leaders and the national and international cadre of technocrats hired to implement their visions, it was important to get an "insider" knowledge of what was happening at the highest levels of power. We are enormously grateful to the many well-placed and extremely busy people who took considerable amounts of their time to talk to us, often frankly and in substantive detail, about their thinking around urban development and the challenges they face. The disadvantages of this approach, of course, is that it does not get at the perspectives of the people who are at the receiving end of these high-powered decisions, a drawback we felt acutely throughout our research. We hope that what we learned from the decision-makers will help others who take a more "bottom-up" perspective to frame their research questions with some of our findings in mind.

To carry out these research goals, we implemented four fieldwork practices. The first, and arguably the most important, was the focus group, conduced with top decision

makers in the arenas of environment, development, government planning and education. In Kuwait, four focus groups were held, in Qatar three, and in the UAE five. (See Appendix B for these focus groups and their participants). We asked more or less the same set of questions across all groups (see Appendix B), with some variance to account for the particular interests of the group (for example, more emphasis on development questions for the development group, on educational questions for the educational group, and so forth). In that way we hoped to get comparative generalizations across all three countries. With permission from the focus group participants we taped all the sessions and then had them transcribed for our own study. Significant portions of what was said in them have been incorporated into this report, though without identifying the speaker in order to maintain confidentiality. An effort was made by one of the researchers at the end of each focus group to summarize what was said, an exercise that proved edifying not only for the researchers but for the participants as well. Supplementing the focus groups was the gathering together of useful materials such as government documents and other information related to the topic at hand. Site visits were also important, at which all three researchers took copious photographs. And lastly, there were interviews with individuals who were interestingly placed to give insights into the kinds of questions we were asking.

We began our fieldtrip in Kuwait. Practical and personal reasons were not alone in dictating this choice. Like Bahrain, Kuwait was one of the first countries in the region to modernize in a really big way and in the process became a model of development for the region as a whole (just like Dubai would be several decades later). By contrast, Qatar is very much at the forefront of the new urbanism in the Gulf, especially in relation to our focus on educational institutions. The UAE, in particular Abu Dhabi, for reasons that will become clearer, has developed more slowly or cautiously – indeed, in many respects has most of its major development yet to come – and thus represents the future. Dubai, on the other hand, represents an exception to this trend, as it was quick to start speculative developments and even more quick to succumb to the downturn. In a very real sense, what we were experiencing were different *temporalities* of development and their environmental impacts, which we have tried to capture in this report.

It is only fair to point out that the researchers did not always agree on how to define concepts and frame questions or on what was important in the research, a challenge that all inter-disciplinary teams face, and we made no attempt to conceal these differences in our fieldwork or our results. No more vexed question confronted us than that of cultural identity. For example - what is meant by the term? We agreed to focus on national-cultural identities rather than individual ones, but besides this found it difficult to delimit the term to our mutual satisfaction.

One of us, the architect, was interested in a notion of cultural identity akin to "civilization," as in the question, "What kind of civilizational world view of ultimate reality do you think the new built environments in your country or the Gulf reflect?" Corollary to this definition was that this civilizational "Gestalt symbolic image" was connected to the individual's and the society's shared sense of its "spiritual consciousness", based upon an inner/outer perception of self (traditionally expressed as the *batin* vs*. zahir* model of self identity). And if it wasn't, then this might reflect something potentially about the culture in question, indicating perhaps a lack of depth in a perennial and deeper view of Being, as expounded by the later philosophical writings

of the phenomenologist, Martin Heidegger . These ways of framing the question of identity are important to him, derived from a lifetime's worth of philosophical and psychological thinking that draws heavily on an array of cultural sources ranging from those interpretations of traditional belief systems by such notable thinkers as Ibn Arabi and Rumi in the 12th/13th centuries to more contemporary thinkers such as Henri Corbin, Titus Burckhardt, Annemarie Schimmel and Seyyed Hossein Nasr.

The anthropologist, on the other hand, tended to define culture in a more everyday sense, as the meaning-making people do in their environments through the use of symbols. This was captured in a question often asked at the focus groups, "Is there a building or something in the built environment that acts like a symbol to you, and if so, what does it mean?" His concept does not make a priori analytical judgments about one cultural identity being more interior or authentic than another, or that individuals lacking an "inner" identity may be somehow lacking in their selves. It does presuppose, however, that shedding or taking on identities will have effects on people and the contexts in which they live, the exact nature of which is determined by empirical research.

Truth be told, neither investigator was entirely reconciled to the way the other defined culture or identity, though each tried to remain respectful of the other's point of view. In fact, through dialogue during this research process, they conceded that these may be two aspects of approaching the issue and not contradictory. Instead the two approaches could be viewed as being complementary-the first proposing a traditional regional hypothesis and the second providing a contemporary means of measuring the hypothesis. Was this difference a flaw in the research design? Would it have been better if we had agreed ahead of time to a single, consistent definition? We think not. Indeed, this nuanced, complementary approach was healthy and in the end productive, in that it elicited a range of responses in our focus group interlocutors and enriched the general discussion.

Whichever definition of identity one applies, certain analytical questions can be posed about them. Does one have to have a cultural identity in order to have a supportive, sustaining urban context and to be a functioning social being? Most people would assume that having an identity is a social norm, yet this is not an established fact. It is also assumed that having a confused or mixed identity is psychologically problematic or socially debilitating, yet again there is no solid evidence to substantiate this. Does an identity have to be homogeneous or uniform or can it be fragmented and self-contradictory and still "work" for the individual? Lack of uniformity can be immensely creative and productive for one society and not another, but need not be a detriment; indeed, it is expectable in emerging societies such as those in the Gulf that are undergoing immense and rapid change. Therefore, if the research points to such fragmentation or inconsistency, it should not be taken to mean that the result is necessarily bad. Further psychological and sociological research would have to determine this and possibly contend with what are the sustainable ways of dealing with a global city with vastly diverse, multi-cultural inhabitants. This subject, for the time being has not been approached in any significant manner in the new societies of the Gulf region.

Another way in which the investigators may have disagreed is in what counts as the urban experience, and for whom it counts. There may have been an inadvertent bias

on our part against the built environment of the Gulf cities as they appeared to us, overlooking or ignoring ways in which some inhabitants of these cities have nevertheless made themselves at "home" in them and claiming them as their spaces. Perhaps we were too quick at times to judge these accommodations as "fautes de mieux" rather than considering them in a more positive and productive light. Fair enough, and this is a valid question that any follow-up research should consider.

With regard to the issue of sustainability of the new urbanism in the Gulf, there was general agreement by the investigators upon its definition and our assessment of sustainability was more or less based upon the excellent criteria established in the technical essay by Dr. Simos Yannas, Director of the Environment & Energy Studies Program of the Architectural Association of London, which can be found in Appendix A. Not surprisingly, however, diverse opinions were expressed by the regional participants on this subject - some viewed the short term need to clearly establish a base - a place from which to then grow into maturity, regardless of context or sustainability, while others were concerned that without a long-term view for suitable environmental and culturally adaptive urbanism the new settlement patterns would be doomed to an unsustainable future. Further, there were different opinions expressed about the definition of sustainability as it should be applied to the new habitats of the Gulf and the relevance of the subject to its inhabitants as most GCC countries heavily subsidize energy and water in their welfare states that are also free of taxes or apparent fiscal or regulatory limitations. The latter perception avoided the facts that the Gulf States have the highest energy and water usage per capita in the world, coincident with the highest carbon footprint.

Finally, let us say something about the format of this report, which again reflects something of the different approaches – this time in writing – of the two main researchers. The report is organized by a narrative ethnography and an architectural case study, each divided according to country. The anthropologist is more comfortable with an ethnographic mode that is narrative and interpretive, embracing the fact that what he has to say is necessarily his own way of trying to make sense of a very complicated situation based on his limited experience -- but is a way to make sense of it nonetheless. As a result he is less inclined to make specific recommendations except insofar as additional or future research is concerned. Furthermore, he was more concerned with what people had to say and with the diversity of their views rather than with material structures and concrete data. The architect is more comfortable with an objective report of specific factual history of urban development and with more limited conclusions tied to them. As such he feels more emboldened to say what is right or wrong about specific ventures because they are based on measurement and technical issues related to his particular research focus on the sustainability of the new urbanism. Some readers will feel more comfortable with one style, others with its opposite, and perhaps the conclusion will be that the lack of uniformity is a weakness or drawback of the report, just as the lack of agreement in other respects is too (noted above). But it would have been a mistake to subsume the epistemology of one under that of the other just for the sake of consistency, when in reality some inconsistency existed. And is it really a weakness of the report or a strength to suggest that there are different but equally powerful ways of looking at the same phenomena, depending on disciplinary knowledge and approaches? Obviously we think it is a strength. The essays and case

studies are structured by country (Kuwait, Qatar, and UAE) rather than by theme (development, socio-cultural identities, environmental sustainability, and education) in order that people from the region can more easily see what their counterparts are doing and learn from them. The epilogue contains some of our broad-based conclusions, including recommendations for future research and urban planning as well as the comments of our peer review.

By no means do we intend this report to be a definitive study of recent urban trends in the three countries we visited and their impacts on the environment. As has been noted, there were considerable constraints of time and funding that prohibited such an endeavor, but more importantly this would not have been our intention even had we had considerably more resources at our disposal. To put it simply, we came to listen – to listen as intently as possible – and to probe as politely but also as deeply as possible. And though we are critical from time to time, our intention is not to pass judgment and or be dismissive. It is more important that the people who live in these cities arrive at these judgments and if they have been aided by our findings in doing so, that is all we can hope for. There are many things we found positive in the new urbanism, and these are noted, just as we found many others that were troubling, and not just to ourselves but to our interlocutors. Indeed, very little that is in this report will come as much of a surprise to people who know the region well, though perhaps they have never quite heard it in the comparative way we have adopted. What it will provoke, hopefully, is the sense that so much more needs to be done in order to turn the grand experiments of the present into hopeful and more sustainable cities of the future.

In closing, we wish to thank the Kuwait Foundation for Scientific Research for a generous grant to support this research, and for Harvard's Kennedy School of Government – and especially the Director of its Middle East Initiative, Hilary Rantisi – for help with grant administration. We also would like to thank Alison Howe and Anna Kreslavskaya of Harvard's Center for Middle East Studies for administering the details of the budget and Mrs. Shahla Ardalan for organizing the research travel itinerary. Finally, our thanks to the regional facilitators and the dozens of people in the Gulf (too numerous to mention here, but whose names have been acknowledged in the Appendix A) who gave so generously of their time and their views during the course of our fieldwork; without their assistance none of it would have been possible, and we are deeply grateful to them.

PART ONE --- INTERPRETIVE ESSAYS

KUWAIT

Part of the anthropologist's visit to Kuwait was spent in a sea-side luxury hotel at the generous behest of Her Highness Sheikha Hussah al-Sabah and the Dār al-Athār al-Islamiyyah. My room overlooked an inviting beach hugging the sea, though when I later walked this silky strand, my progress was impeded by large concrete barriers marking off one private development from another. Despite signs forbidding the trespasser to climb on top of the barriers, I did so anyway and found the same parceling of the beach as far as I could see. I would spend the rest of my visit searching for this open sea front that the built environment, sadly, has made elusive to visitors and denizens of the city.

Westerners might suppose the central feature of the environment for Kuwaitis to have been the desert, but the source of its livelihood came from the sea. In the Gulf waters trade flourished and its shell beds yielded pearls of inestimable value. As another person put it in one of our focus groups, "Our love is only for the sea; that's where our livelihood came from, our food, our fish."

The old port with its commercial and residential districts lined the original harbor, and unlike today, it was possible for everyone to approach the sea easily by foot. As one person put it to us ruefully, "you can't see the sea anymore, and the sea is what makes Kuwait what it is. That's what I think. Otherwise, you could be in Riyadh, right in the middle of the desert. If you can't see the sea, it's pointless." Now the wealthy build villas along the highway outside Kuwait City to regain access to the sea, a solution with its own environmental problems.

Such is the nostalgia for a bygone era lived on the sea that today's young Kuwaiti males participate in an annual pearl-diving expedition. "Every year since 1986, in the scorching furnace of the Kuwaiti summer, the men, in their teens and twenties, board wooden dhows and sail roughly 60 miles south to the oyster beds on a 10-day hunt for the pearls that were once a pillar of the region's economy. . . 'This is our tradition. We must save it,' Mr. Ashkanani said." (The New York Times International, Friday, August 13, 2010, A9). Never mind that in the past it was slaves of Baluchi or African origin who did the diving, whereas today's reenactment is by descendants of their owners or employers, the pearl merchants (and in a badly polluted sea no less). The point of the exercise, at least according to Mr. Ashkanani, is to "toughen up" Kuwaiti young men who are presumably spoiled by a state that provides for almost all their needs. To others the event is a way of re-claiming a cultural identity that has become confused by rapid modernization. Still others are perhaps more cynical when they see the pearl-diving event as a way for a dominant class to celebrate its historical importance and thereby reaffirm its social status. No doubt all of these perspectives on the event have some credence; it deserves to be studied more systematically by anthropologists.

For all that the sea has historically been a source of bounty and beauty for Kuwaitis, the desert also has its allure (let us not forget that fortunes were made on real estate speculation in the desert during the Kuwaiti boom years), as attested by many who, like other Gulf societies, go there to breathe the fresh air, to escape urban noise and congestion, and to relive their Bedouin tribal past. This return to a "natural" way of life dependent upon the desert is, as in the case of privileged young men diving for pearls off the dhows, not without its ironies, neatly expressed by one participant in our ROPME focus group. "In the 80s I found more people going for picnics or spending time in the

desert. And camping was more random. Now, it's much mechanized, (with trailers) on the highways for block after block after block." Of course, not everyone would agree that the "mechanization" of the desert is necessarily a bad thing -- a matter of personal taste -- but the same commentator noted that the sands are badly shredded by tire-tracks causing increased sand storms and the rapid disappearance of the original desert flora and fauna. And the many desert land-fills, fourteen in all, containing Kuwait's urban waste is like a ticking environmental time-bomb waiting to detonate.

A major event in contemporary historical consciousness, at least for people who lived through it (a question might be whether young people who were born after Liberation attach quite as much significance to it), was the 1990 Iraqi Occupation of Kuwait. "During the invasion many architectural landmarks were damaged or vandalized. The well-known Kuwait Towers, the National Assembly Building, the Sief Palace and the International Airport were among the buildings which suffered. Hotels, office buildings, and private villas were also burnt or vandalized" (Maghoub, p. 170). This damage has been repaired through extensive reconstruction efforts, but it turns out that the more disastrous impact may have been on the natural environment, marine and desert. And in a more subtle way, the Occupation seems to have affected Kuwaitis psychologically, or at least that is how those who mentioned the Occupation talked about it to us. As far as we know, there has not been a study of the psychological effects of the Occupation (indeed, there has not even been a full social history written of it, that we are aware of), and therefore it is difficult to assess such claims. Many Kuwaitis, in any case, are fearful that there will be another act of aggression against their country in the near future, given the political instability in the Gulf, thereby jeopardizing everything that has been rebuilt, and we were told that some wealthy people prefer off-shore investments over riskier home-grown development projects. Kuwaitis seem to have lost their confidence or robustness of purpose and action they had demonstrated before the Occupation, though this attitude may hopefully be waning.

RE-IMAGINING A PAST: PRE-OIL KUWAIT AND EFFORTS TO RESTORE IT, A TOUR WITH EVANGELIA SIMOS ALI

A Kuwaiti once told me, "I was part of a delegation that greeted Prince Charles when he came to visit Kuwait. He asked me where I grew up in the city and I told him, and he then asked whether any part of it was still standing. 'Sadly,' I said, 'it does not.' 'Then I feel sorry for you,' he replied.

To get a sense of what the pre-oil City of Kuwait was like, our research team was treated to a richly informative historical tour by Evi Simos Ali, architect, architectural historian, conservationist for the Kuwait Municipality, and long-term Kuwaiti resident, who has devoted much time and energy to mapping and preserving what remains of the old city as well as reconstructing some of the major public buildings, mosques and even old neighborhoods with their stately seafront homes, Diwaniyas (male assembly halls) and local mosques. This important work is being done with the support of the National Council for Culture, Arts, and Letters.

To get us oriented, Evi showed us aerial photographs of Kuwait City taken by the British around 1952. They clearly show traces of the three walls that ringed the port, enclosing the Amir's Palace and Diwaniya, the central mosque, the Souq, and the

residential neighborhoods; but expansion beyond them was already evident by this time, with cement block houses in the area known as Murgab. Though not of the traditional mud brick and palm-thatch materials, these houses were still built in the older configuration with interior courtyards (for reasons of privacy) and were oriented to the sun and wind to minimize heat and dust and maximize air circulation for optimum passive design. They were huddled together along narrow streets for shade, and one-story tall for the most part so that people were not gazing into each others' homes, and with high parapet roofs that were occupied at night during the stifling summer months. The sole exceptions to this height limitation (which was mandated by custom rather than by law) were some non-Kuwaiti palaces and the residence of the British political agent. Though these were not Evi's words, one might describe this first example of oil-era construction as the extension of traditional building principles, adapted to a harsh desert climate, using modern materials.

Having been oriented cartographically to the old city, it was time to examine its few remaining traces up-close. Not surprisingly, Evi took us first to the gate that was part of the third wall, facing the desert. Stout walls with openings no bigger than slits to allow for rifle barrels and massive wooden gates bespoke of a time when city was a tiny, self-contained outpost that had to defend itself against marauding Bedouin. These gates would open to trading caravans that brought various goods from central and south Asia to the tribes of Najd and Iraq and other entry ports along the ancient silk route.

From the gate we went to see various old mosque complexes that have been restored by the National Council to appear as much as possible as they did in the pre-oil era: brick walls and plaster, with subtle interior decorations of shadings of pink, green, off-white and blue. "Every mosque had, as did most of the houses, an enormous concrete cistern in the middle of the courtyard. Rainwater got fed into that system directly." Evi did not realize the existence of these cisterns until she was doing the restoration of one of them "and the courtyard floor fell in, and we saw this enormous thing like a swimming pool underneath . . . and canals actually feeding it underground." From the cistern water flowed to the ablution area. Dominating the complex was a minaret, often with an external stair case that went up to a simple room from which the muezzin called the neighborhood to prayer. After their ablutions, the men would congregate in the nearby hall and pray towards Mecca, signaled by a mihrab, which was usually a simple niche in the wall.

These mosques and their attendant structures were part of a neighborhood, itself usually dominated by a prominent merchant family and their relatives and retainers, and the residences of the latter, along with their Diwaniyas, are restored in some of the alleys. "Only two of the beautiful old houses of Kuwait are still left standing," said Evi Simos Ali. We visited one of these and were graciously invited to stop for a chat and have some tea with an elderly gentleman, a relative of one of these families, who now serves as a kind of caretaker and local historian. He was asked, "How did he feel about the fact that so much is lost?" He did not answer the question directly but explained that in the 1950s and 60s the government gave families a lot of money for their land in the old city, along with new lands to which they could move on the city outskirts, in order that more modern buildings could be erected in the city center. They were told that this was progress and that everyone would benefit. Now some of those families, who had indeed grown wealthy from the oil boom, are returning to bring back the old neighborhoods

and live in them again. Evi later confirmed this information. "The family came back in the 1990s and said, 'Everyone else has a Diwaniya in their old house. We want our old house as our Diwaniya too.' So [the government] gave them one courtyard which was for the horses and the stables, and that became their Diwaniya, [though] the rest of it is still a government cultural center basically."

There is great potential for anthropological research here by interviewing these families about their memories of the past neighborhoods, their desires to want to restore them, and their experiences in working with the national authorities and professional architectural historians and restorers to do so. Is this only a memory project of the older generation or are they also prestige projects, which because of their locations near the Amir's Diwaniya, remind the public of the historical importance of these families to Kuwaiti society? A personal interview with one of the older families from the Al Sharq quarter was later held at their new Diwaniya, which has preserved the original carved teak wood door from their historic seafront Diwaniya. The family elder epitomizes the nostalgia for the memory of Kuwait's transformation from pre-oil to boom to the present.

And this is not the only project of heritage rehabilitation. A "heritage village" is going up near these old neighborhoods by the sea front, meant to be a recreation of a section of Kuwait as it looked in the past, though it may now be turning into something slightly different with fountains and modern building construction but with historic regional facades. This is not necessarily "bad" in that it might endeavor to create an urban space that combines the old and the new, but until it goes up, it is hard to say what it will be like.

Just opposite to this planned rehabilitation the Al Sharq Market Place and Traditional Fish Market were created some twelve years ago. The new landscaped development stretching nearly 2.5 kilometers along the Gulf allowed Kuwaiti residents and visitors a popular place to come out to the sea again in the Old Heart of Kuwait; to offer dramatic views back to the new city; to enjoy outdoor dining under shelter; to have the opportunity of experiencing traditional folkloric plays and celebrations; and a leisurely stroll by the sea, which had been one of the most popular past time for the residents. The Master Plan and design consciously explored the integration of the architectural themes and visual references of Kuwait and Gulf heritage with the new opportunities of a Festival Market Place. The climatically adaptive strategies situated the main buildings to the optimum solar-air orientation; minimized solar radiation gain by compactness of form and the use of arcades and porches (*Liwans*) to shade openings while creating outdoor places of dining. Other traditional architectural vocabularies of place making based upon the covered *Souq*; *Badgirs* (wind towers adapted to contemporary ventilation needs); *Mashrabiyas* (Sun screens) and traditional buff brick and glazed faience panels inspired the overall design. The government had provided a brown field site that had been carefully surveyed by marine ecologists and determined that it had been partially filled and stripped of its intertidal marine micro-organisms prior to development; thus the reclaimed land for the project did not disturb the existing marine life. Celebrating Kuwait's heritage as a seafaring society, the development also included a 350-boat Pleasure Boat Marina and a Dhow Harbor for the traditional Kuwait fishing fleet and a major Fish Market and Auction Hall. In fact, the careful dredging of the old Dhow Harbor helped to improve the efficiency of the traditional fishing fleet while enhancing this traditional trade and preserving its historic ways. Thus the connection to the sea was again re-established.

Also on our itinerary was a visit to the American Mission Compound belonging to the Reformed Church of America. It wanted a presence in Kuwait, no doubt because it saw the city as a liaison (in much the same way that the city had linked points of trade in the olden days) to other areas of Arabia and the Persian Gulf. Evi told the story as follows:

> They tried several times to come here in the late 1880s, just to land their boats, meet with the sheikh, and so on, but they had no success. They were . . . repelled constantly. And in 1907, Sheikh Khazal, who was the [Arab] ruler of Khuzestan in Iran . . . under the Qajar Shah at the time, allowed the missionaries to build a station in Abadan. . . He was the very best friend of Sheikh Mubarak of Kuwait, the ruler at the time.
>
> Sheikh Mubarak used to go over all the time to visit him, and one day traveled over there on his yacht with a daughter who had a problem with her eyes. . . The Kuwaiti doctors weren't able to cure her. So Sheikh Khazal . . . decided to call in the American doctor to treat the little girl. And he treated her successfully, at which point the ruler of Kuwait invited the doctors over here. . . They were given land, the land where the hospital is built now, the first poured-in-cement building ever to be built in Kuwait, which was knocked down in the early 1950s to build this building that you see before you, a two-story building. The people who came to knock it down thought it was just one of those old mud brick buildings and in a few hours they'd get rid of it. It took them days and days and days (she laughs) because there was steel inside."

Evi continued with the building history of the American Mission's compound, pointing to, among other edifices, the first church built in 1930.

The fairytale-like story of the friendship between Sheikh Mubarak and Sheikh Khazal warmed us to the prospect of visiting the latter's residence, built by him while he was in Kuwait. The main building is a single, gigantic, two-story courtyard-house, with lesser structures for the kitchen, stables, and servants' quarters (long since torn down) as well as other features that were not part of the original design but added after its construction. It was purchased by the Government from a Kuwaiti family and is now being slowly and painstakingly restored as part of a university project that Evi runs. Apparently the Kuwaiti students are moved at the thought of being part of a team that is preserving their past and have become immensely dedicated to their task.

For a long time, the only expatriate presence in pre-oil Kuwait City were the Christian mission medical staff and their families as well as the family and staff of the British political agent, but this began to change rapidly in the early years of the oil boom. We went to the neighborhood that housed the expatriate professional working population of the 1950's and 1960s whose charming houses still stand, imperiled though they now are by a new highway cutting through the heart of the downtown. Modern construction materials were used but with buildings that are rarely taller than two stories, and oriented to the daily movement of the sun to maximize shade. What we have

called the extension of older building principles adapted to the particular climate of Kuwait was about to change, however, and beyond all recognition.

THE FIRST MASTER PLAN AND SUBSEQUENT ITERATIONS

Commencing in 1952 and continuing to the present, according to Mousa Al-Sarraf [former Director of the Kuwait Municipality], comprehensive planning was done to anticipate Kuwait's population growth, whose accommodation was envisioned by "cluster" or "satellite" towns on the periphery of the urban areas. The metropolitan area was planned for a population of around two million (at present, that population is around 3.2 million), with a projected growth of another million to be housed in the cluster cities, one to the north and one to the south of the metropolitan area (See the Kuwait Case Study for further details).

KUWAIT DEVELOPMENT FOCUS GROUP, FIRST PART

"The problem with Kuwait in terms of [planning] was that it followed the people rather than the people following the master plan." Mousa Al-Sarraf, Kuwait Municipality

From the original master plan one can see that Kuwait was to have east-west ring roads that paralleled the old city walls and radial axes that branched north-south, roughly following the routes from the five city gates leading to ancient caravan trails. Allusions to the past were thus incorporated in the plan, even though the downtown area was completely razed to make room for a modern city. The overall design of a brilliant center with roads streaming from it was supposed to bring to mind a shining sun and its rays. The intersections of ring and radial roads created neighborhoods that were supposed to be self-sufficient with their own shopping areas, schools and medical facilities.

What happened? For one thing, the car and the superhighways constructed to accommodate it. Every adult male Kuwaiti wanted to drive his own car. Add to this the burgeoning numbers of expatriates who also drove, traffic grew exponentially and traffic lanes had to be expanded accordingly. "There's something called infrastructure, which unfortunately had a very negative impact on Kuwait. The highways they built in Kuwait, I don't know, these engineers should be shot," said a participant of another focus group but who spoke eloquently to this point. "You [can] go from Iraq to Saudi Arabia just like that. You can go without coming across more than one or two traffic lights. But where do human beings and animals cross? There's no place for them to cross. . . So now, if you want to visit your neighbor across one of these highways. . . you've got to call a taxi to take you around because you cannot walk across." The effect on the neighborhoods was to isolate them physically from each other. "It's really fragmented Kuwait," he continued. "I saw it (I came in '74) and I saw the fragmentation going on. Who are these architects who are not building for the human being? Just for cars, cars, cars."

With the amassing of enormous wealth the idea that every family had to have its own home or villa became the norm. One of the Development Focus Group participants expressed this idea in talking, critically we might add, about his family's environmentally unsustainable life-style. "[Let me] tell you my experience of building a house. I built it in

1999. I was considering a solar panel . . . and I also wanted less space. . . [But] I ended up with a lot of space I don't use. I have a huge amount of space. Maybe a floor and a half I use once a month, maybe once every two months when I have a party or something. I don't need it really, but I built it. Because it is a social thing to do. If I don't do it, then I'll take a lot of pressure from the family, from the wife, the kids." Since extended families are common in Kuwaiti and many other Arab societies, compounds with several family homes inside them developed side-by-side, adding to the density of the built environment. In one way this can be seen as an extension of the older neighborhood pattern (*Fareej*) in which several houses were clustered in an alley alongside a mosque and a Diwaniya, but the new residential quarters are less like neighborhoods than gated communities, segregated from each other by massive traffic arteries. Some Kuwaitis spoke of a feeling of urban alienation that this exclusion or self-containment produced over time.

What made the idea that every family should have its own house and the extended family its own compound possible was, according to Mousa Al-Sarraf, "parcellation," or the division of individually owned lots, provided free by the government to each National, into two or more pieces, each of which requires its own infrastructure that in turn produces overcrowding and automobile congestion. It was not the government but rather private development that encouraged parcellation, and we heard two different explanations for it in the Development Focus Group.

One of these is what one person in the Development Focus Group described as the family social cycle and perceptively linked to "social sustainability." "In these neighborhoods, [parcellation] usually starts with a head of a family. . . and as the family with time grows in numbers, it becomes necessary for the family members to decide whether they want to be near the same home which they grew up in, or evolve in another locality. I'm talking here about the social aspect of sustainability in these neighborhood areas. . . Offspring of the family want to move out into another locality . . . where they have their own independence. They have their own house; they have their own living quarters. If they cannot [move out] because of financial reasons, then the head of the family finds a way to split that lot into two or three, if he can . . . and keeps the family close in the same environment in which they grew up."

Another, quite different explanation for parcellation, put forward by several individuals, hinged on real-estate speculation. This theory was seen as a substitute for the social one, based on the life-cycle of the family, but the two need not be exclusive of each other. Indeed, according to this theory socio-cultural desires or expectations are entangled with profit motives. The theory goes something like this. The head of a certain family buys land he thinks will be worth a lot of money, on the assumption that development is creeping towards that parcel of land and raising its value. Meanwhile, he builds a new home on that parcel of land for his son to raise his own independent family. Or, he may parcel his original plot of land and make money on it through rent and other investments, and move his whole family along with his sons and their dependents to the larger lot which he has purchased as an investment. He then builds a large house or even a compound for several kin-related families on it. He may decide to stay on this land, or continue to buy new parcels depending on the real estate market and his own desires.

As wealthy people began building on these new lots, many of them hired western architects to design their homes. They imported design principles that in many ways

were disastrous from an environmental standpoint: setbacks from the street and between the houses; windows and balconies facing the street instead of a garden or courtyard in the back; orientation to the street rather than the direction of the sun and wind. An incredibly eclectic mix of architectural styles is also to be seen – ranging from Mediterranean villa to American ranch – which was largely dictated by the individual tastes of the clients. To some, these hybrid concoctions appear like cultural monstrosities, though one important architecture scholar said that it is in the realm of domestic architecture that one can see some of the most interesting and perhaps innovative designs in Kuwait.

But parcellation, spurred by a combination of social and economic factors, had its own problems. The neighborhoods that sprang up were not of the mixed-use kind that the original plan had envisioned but were geared primarily for private or residential purposes, and to fulfill other basic needs, their inhabitants had to drive to shopping malls, places of work (usually in the city-center), schools, and medical facilities, thus exacerbating the separation or segregation of these neighborhoods from each other, not to mention also traffic congestion. The question now is what, if anything, can be done to alleviate some of the problems connected with these neighborhoods.

The downtown area, as the original master plan envisioned it, was to be a twentieth-century city, a deliberate "break" with the appearance and design principles of the buildings in the original port-city. A street grid pattern was put in place, along which buildings were constructed that are not necessarily oriented sustainably to the direction of the sun. If the buildings in the pre-oil area were rarely more than one-story high, vertical rather than horizontal construction was encouraged in order to maximize use and retail values, with, of course, steel, concrete and glass materials to allow for high-rise construction. Air-conditioning was twenty-four/seven. Energy for this massively built environment was provided mainly through electricity. As Kuwait exists in an arid environment with few underground sources of water and scant precipitation, water had to be provided by several desalinization plants.

The sense of the city we got from the focus groups was mainly dystopic, though minor instances were sighted of successful building designs in the sense that people felt comfortable in such spaces. The focus groups cited the following successful examples: Arab Organization Headquarters Building, Sheikh Nasser House by Hassan Fathy, Al Sharq Waterfront Market Place (already discussed), The Avenues Mall and the Khiran Development.

The negative reaction to the new Kuwait urbanism was prevalent among the focus group members. We did not do fieldwork to see which urban spaces get frequented and possibly even transformed into socially enjoyable spaces despite their lamentable environmental or esthetic features, work that would be worth pursuing for an anthropologist/urban designer. That is, instead of focusing on what didn't work or on what needs to be built in the future that will be more sustainable, an ethnography of the present would look at what is being remade or refashioned in order to be enjoyed as public urban places. That is also an important lesson about sustainability, that people can turn what decision-makers and other arbiters of architectural design and taste deem poorly conceived or constructed and make something positive out of them.

ROPME FOCUS GROUP: EFFECTS OF WAR AND DEVELOPMENT ON THE GULF ENVIRONMENT

Most of the architects who designed the contemporary buildings in Kuwait after the Liberation did so with little, if any, reference to the surrounding environmental or cultural context, opting instead for what might be called an international style that can be seen in any metropolitan area in the world. Prior to the invasion of Saddam and mainly in the late 70s and early 80s, the most consciously adapted buildings to the Kuwait conditions were realized. Perhaps in the haste to catch up with Dubai of the 21st C, they were not encouraged by their Kuwaiti clients to create such a vernacular modern architecture, but this proliferation of a universal modernist style was also pervasive in the urban design thinking of the 1960s and 1970s. That these high rises require air-conditioning twenty-four/seven, even in the cooler winter months when it is not needed, creates heat envelopes around the buildings and a stale atmosphere within them, presenting a health hazard to people with bronchial conditions. Universal dependence on the automobile has also caused massive air pollution.

As a result of war and urban development, the Gulf marine environment has become badly degraded, as we learned from a brilliant presentation by Dr. Hassan Mohammadi, Coordinator at ROPME. Gulf waters have two distinct environmental characteristics, depending on their proximity to the shore. Water closest to shore is quite shallow; beyond it are the open waters of the Seas of Oman and the Indian Ocean. The marine habitat closest to shore has taken the hardest environmental hit because of pollution from oil refinery spills, three recent wars much of whose detritus is still lies on the sea floor, and above all from coastal urban development – and nearly all urban development in the Gulf is coastal. As already noted, water is provided by electrically generated desalinization plants, which dump the salt extracted through osmosis back into the Gulf, raising the salinity and requiring the plants to work harder in a vicious cycle. This increased salination and rise in water temperature produced by the heat generated from desalination plants effect coral reef bleaching, rapid decline if not disappearance of many biological species, and shrinking of mangrove preserves. Due to the circulatory nature of water in a marine environment, contamination in one area cannot easily be prevented from spilling into a contiguous one (as the U.S. recently experienced with the British Petroleum spill in its southern gulf region), so the degradation of the marine environment is really a region-wide problem, requiring GCC cooperation on a massive scale.

ROPME is seeking solutions to the problems the Gulf marine environment faces as a result of the new built developments and other related causes, but primarily from a technical and regulatory sort, and though we were interested in these, we were also concerned with the socio-cultural and political dimensions of sustainability that have not been addressed as much in the technical literature.

A subtle lesson in the need to incorporate this socio-cultural dimension was imparted in the debate about a definition of sustainability that all could agree on. As a talking point for the ROPME focus group, we introduced the Brundtland Commission's definition of sustainability ('Sustainable development is development that meets the needs of the present without compromising the ability of future generations

to meet their own needs.' (WCED Report, Brundtland Commission, *Our Common Future*, 1987). Though it has wide acceptance in the technocratic community, it is not without its critics, who point to its narrow emphasis on economic development, the fact that the needs of contemporary society are not necessarily agreed upon by all (and may in fact be mostly needs of the powerful and the wealthy against those of the poor and dispossessed), and that it is difficult to gauge the needs of future generations that development is supposed to sustain. These kinds of criticisms for the most part did not come up in the focus groups, though one powerful Kuwaiti did assert that the definition was unworkable because it largely ignored the complex politics in the field of environmental sustainability, and he meant here not just governmental politics but also the politics of the global system that pushes for development at the expense of the environment. The larger point is that a purely "rational" and "technological" definition of sustainability will not be practical if divorced from political, social and cultural realities, and one of these has to do with local cultural concepts of sustainability that a purely technical definition has to complement.

As a case in point, the notion of "green architecture" was not necessarily seen as being the same thing in the Gulf as it is in western countries with radically different climates, yet people are only just beginning to ask what "green" might mean in their backyards. There were also deeper cultural reasons why western definitions of sustainability are likely to be insufficient. More than once it was pointed out that embedded in the thought and practices of Islam is a rich worldview about the environment, especially in regard to water, that sustainability experts in the Middle East should try to work with rather than ignore (and in some cases do work with, such as architects who have been searching for a modernized Islamic idiom for their plans and designs).

In line with the claim that sustainability is a cultural idea and not merely a technocratic one was the comment that "I think sustainability is a theory. And this theory is like a model adapted more to western countries rather than to the Third World or [developing] countries. I think sustainability comes to improve the quality of life, and we should have indicators [for that], like poverty indicators, education indicators, environmental indicators, and also [indicators] for health or social services."

This begs the question of what quality-of-life might mean in a local context like Kuwait or the Gulf. As one person put it, "We don't have a developed image for our Utopia in this part of the [world]." The answers to a locally sustainable definition of sustainability cannot be arrived at simply through technology or solely by decision makers such as state officials, international developers and architects, but via a civil society discussion among these and all the stake holders (older and younger generations, men and women, citizens and non-citizens).

One of the technical or rational ways to secure sustainability is through legislation (for example, World Green Building Council's LEED or Abu Dhabi's ESTIDAMA or green building codes), yet this solution seems problematic for Kuwait at this juncture in its history, for we heard about how conflicts between parliament and the government were impairing or slowing down legislation, not to mention national planning that would work with rather than against the environment. And even in the

case where there is sound legislation, implementation was noted as a constant problem – a complaint we heard in all of the Gulf countries we visited -- and is probably inherent to large-scale government bureaucracies where ministries and departments compete with each other for resources and authority. As one Kuwaiti put it, "There are conflicts of interest. Each ministry, each group thinks about its own interests without coordination with others." Though this may be somewhat of an exaggeration, the feeling of frustration and even exasperation the comment betrayed was not uncommon in the conversation of Kuwaiti decision makers.

More important than legislation or implementation, it was thought, was the need to increase awareness of environmental problems in the general population, especially among younger people (whom, after all, much of this development is supposed to be for). As was pointed out over and over again, one can have the best-laid plans in the world, including the most enlightened legislation, yet daily living will still negatively impact the environment. Only by altering people's thinking about their practices and how they affect the environment around them will there be any headway. As one leading Kuwaiti educator put it, "The major problem I face with Kuwaiti students is the fact that they don't see the need for [environmental] sustainability." Others were in agreement with this assessment. "I think . . . [what] is missing here is environmental awareness and education. And that has to start at the grassroots level, at the preschool level [as it does] in other countries." More research is needed to find out just what is being done (and what more could be done) in the educational system of Gulf countries like Kuwait to advance environmental awareness among young people; it is certainly one of the more urgent research agendas for Gulf social sciences. As another participant put it, "Education is not necessarily the solution, but it's the start." It was pointed out by the same speaker that education may not even be limited to the schools; environmentalism can be and is pushed throughout the world by popular culture, of which young people are avid consumers. Education might be one of the key sites in which sound environmental thinking and practices might be pushed.

KUWAIT DEVELOPMENT FOCUS GROUP, SECOND PART

Two ways to change deeply ingrained attitudes towards sustainability in Kuwaiti society would be to increase the cost of energy and water consumption and/or change the incentives for conservation. Right now, Kuwaiti citizens pay only a fraction of the cost of their electricity and water, the state and expatriate population bearing the overwhelming expense. "It costs the government 26 fils per kilowatt hour; they charge us two," one focus group member pointed out. If these same citizens had to pay what the actual cost of their energy and water consumption is, they would no doubt conserve a lot more. But that solution may not be politically feasible in a society where people have long expected the government to support their lavish life-styles. Someone else suggested targeted subsidies for the poor and regular prices for the well-to. ". . . You have a graded tariff. The high-consumption people pay 26 fils. You can increase that even further, because with the technology that you have now, you can direct your subsidy much more accurately [and you don't need to do it] across the board. You don't have to have a

blanket subsidy. You have a targeted subsidy. Make it affordable. Encourage conservation." Another approach that might not be as politically sensitive as cost increases would be government-paid incentives through subsidies for energy conservation. One gentleman observed that he would like to be environmentally conscientious, but that this is not economical in the present price system. "When I came to build my own house, I [wanted to install] extra insulation blocks . . . to reduce my electricity consumption. . . But compared to the two fils that I am paying to cool my house, it doesn't make economic sense. . . But if the government came and said, 'You know what? Your house, its electrical consumption, is 100 kilowatts. If you were to bring your house [energy consumption] down to 80 kilowatts, here is 10,000 KD on the table."

These are important ways to change people's conservation practices and should be the subject of vigorous debate within Kuwaiti society, and yet when one steps back from these many small but incremental steps towards an environmentally sounder society, there seemed to be a larger problem. Several times it was said that Kuwait lacks a "vision" plan for its future, in the way, for example, that Qatar or Abu Dhabi have one, which would explicitly link development with sustainability. Said one participant, "So this is I think the core problem. We don't have a proper vision. It's not given a priority." And another, "We don't have an image that we strive for."

That Kuwait does not have a "vision" plan for the future (in which it is determined whether it becomes a manufacturing hub, a tourist haven, an educational magnet or all three in some combination) was in part attributed to problems in governance. By the term governance we mean the broad range of "decision-makers" who were often invoked in the interviews which cut across several sectors of society, the state, business leaders, the parliament, and so forth.

The issue of governance seems to be a contested one in Kuwait at this historical moment. At times, it was described to us as a problem of Kuwaiti democracy, of which many Kuwaitis are justly proud. We were told that "Kuwait is really the only democratic society in the Peninsula." Nonetheless, its democracy is viewed as flawed and for different reasons. One person said the problem was due to a lack of political parties, on the platforms of which people could be elected to parliament to shape legislation and policy: candidates run more as individuals rather than standing on broad principles that have wider backing and appeal. Another problem was an ongoing tension or conflict between the government and the parliament, which prevents crucial legislative decisions from being taken. Others pointed to the 'bedouinization' or 'tribalization' that took place in Kuwait in the 1970s, when Bedouin from northern Saudi Arabia were invited by the government to settle in the country. Whatever the reasons for this re-tribalization, it is blamed for long-term governance problems in the country such as rampant autonomy that works against collective goals and action (though without studies of this phenomenon, it is hard to say anything very reliable or certain about it).

The government has also been blamed for over-bureaucratization, with too many departments responsible for different aspects of development and unable to coordinate their activities efficiently or sometimes even to cooperate with each other because of bureaucratic politics. And yet, defenders of the government point out that there is no dearth of development plans that have been produced, the latest, for example the recently announced 5 Year Plan (2009-14), containing many excellent suggestions, but the problem has been lack of implementation by developers in the private sector.

Corruption is blamed as is also the real-estate market, where profit wins out over sound development principles. To rein in both corruption and rampant real-estate speculation requires a strong arm willing to impose sanctions, but the political will for this seems to be lacking, and therefore the ad hoc implementation of the plans, driven by special interests, remains inevitable.

But there is a paradox in the way decision-making is perceived or expected to be carried out. On the one hand, it is expected that the decision-makers take action, according to a top-down model of governance; on the other, we are told that it cannot be top-down as in other Gulf countries because the Kuwaiti state (the government and parliament) is beholden to the Kuwaiti "people" (as one person put it, "The Kuwaiti government does not tax the people; it is the people who 'tax' the government"). To do this -- that is, to win the support of the people -- requires a presentation of goals and projects (in the various plans, for example) and to mobilize support for them through society-wide discussion and persuasion. Achieving that consensus of support requires a great deal more effort than the prevailing model of top-down decision-making envisages, and that may well be where one of the weaknesses of governance lies, in civil society. Do the media present the problems and the plans put forward to solve them clearly to the people? Are there venues in which they can be discussed and debated as well as defended by various decision-makers?

But there are other venues of governance besides the officially sanctioned institutions such as the government, parliament and civil society. One of the anthropologically more interesting of these are the Diwaniya-s as forums or venues of democratic discourse and consensus-building. The question was raised by one of the moderators whether the business community is (or could be) organized in such a way that it can discuss and be advocates for future development (rather than assume, passively, that this vision has to be handed to them from other decision-makers); but this does not seem to be in the offing.

KUWAIT SOCIO-CULTURAL FOCUS GROUP

Bearing in mind our strategy explained in the introduction of this report, to seek not a consensus in what is meant by cultural/national identity but the range of possibilities of such an identity, we turn now to the Kuwait socio-cultural focus-group discussion.

What is culture?

Let us consider, first, the range of concepts that we heard regarding the notion of culture. Here is one respondent: "Culture is a relative matter. . . As I see it, it is a social value system. And that social value system is a reflection or product of social and economic conditions." This is a fairly straightforward politico-economic understanding of culture, making it causally dependent upon socio-economic conditions. In this view, "Kuwait has gone through a historical process, which ended up in a different culture than what we had in the early 50's . . . Of course, the population increased. The influx of

people [who] came from different parts of the world also reflected itself on the cultural situation in Kuwait." In other words, as Kuwait's economy was transformed from inter-regional mercantile trade and pearl diving to oil production and the creation of a modern society primarily run by expatriates from all over the world, new ideas came into the country, including cultural ones, producing a mélange (or at worst, a cacophony) of identities. He went on to illustrate this point with reference to the built environment in Kuwait. "You find people building their houses with balconies: why should we need balconies in Kuwait? I mean we are not a Mediterranean country. . . This is, of course, part of the cultural influx, because architects who designed those places came from Syria or from Egypt. So they didn't have an idea of the old architecture in the country. The old housing building in Kuwait City, downtown."

Someone else came up with another definition of culture. ". . . The best definition of culture, in my opinion, [is] something you remember after you lose your memory. . . If I lose my memory, I will still be able to know to do certain things that [are] specific to Kuwait. For instance, eating a kind of fish. Nobody can eat it except Kuwaitis. . . That is what is culture, which is something that is very elusive." We may call this an embodied notion of culture, as something ingrained in our habitual acts that, when we reflect upon them seem cultural but do not depend on any such awareness when we perform them. (In anthropological theoretical parlance, this is sometimes referred to as a habitus. And as the respondent pointed out, this kind of culture is extremely subtle.

A university educator said he had taken anthropology courses in the U.S. to find out what culture meant, only end up more confused because the discipline does not have a single, agreed-upon definition. A value system seems as good as any other, though he confessed it was hard to pinpoint. He eventually decided that culture meant two different things, depending on whether one is talking about what is inside or outside the individual (batin vs. zahir). On the outside, he might espouse one set of beliefs and values, on the inside another. As he put it, "From the outside, you might see people who are dressed in modern style and they speak English. . . And then on the inside [they] are very conservative. . .You would be surprised if you came to the university, you'd find students who speak English all the time, they rarely speak Arabic. They are all dressed in modern styles. No *dishdashas* or *ghutras* or anything [like that]. But what they insist on, even in writing, is that they have Islamic values, that they have social values that they have to adhere to. . . So you have to go in-depth and understand . . . the complexity of the situation." And he went on to add that "culture is changing, dynamic. . . It relates to many different levels and many different aspects [of society] (for example, the role of man and woman in society, the family). So it is very complex system to talk about as a whole."

Someone complained that culture is often understood as what people had in the past (as in tradition) and what they presumably lack in the present (understood in terms of rationality and progress), and pointed out that "contemporary culture" is just as important, particularly for young people. Corollary to this point is that culture can also be forward-looking or future-oriented, in other words an image of what society wants to become rather than what is or was. It was thought that in the Gulf, which is trying to reinvent itself constantly, this is an important aspect of culture.

Is there a Common Culture in Kuwait?

It was impossible to answer this question definitively. As one of the respondents pointed out above, perhaps all or most Kuwaitis see themselves as Muslim, while acknowledging that there is a tension in the society over what a "Muslim" means and who can "properly" claim that identity. Perhaps all would agree that privacy, especially when it comes to the affairs of the family and of women, is still a cherished value in Kuwaiti society. Being able to speak Arabic may also be at the core, though many would readily admit that a Kuwaiti dialect is fast disappearing and competence in standard Arabic is often uneven or neglected.

It seemed that difference or diversity was more the expected state of affairs than any common culture. And the question arose as to whether this was a good or bad thing. Someone spoke of the importance of cosmopolitanism for the globally functioning individual such as one finds among Kuwaiti elite. "There's globalization. . . I don't know if we're giving up or losing some aspects of culture if you are replacing it with a new input that has to do with globalization and enabling an individual Kuwaiti to become a world citizen. He [or she] can survive and exist in Latin America and Australian and America, as well as right here." This plurality was attributed to more than an influx of foreign cultural ideas and practices, however. "Even Kuwaitis among themselves, they have . . . subcultures . . . I don't think we see a common culture in Kuwait." In other words, differences *within* an overall identity are important too.

Another person celebrated the fact of human universality, saying that on some fundamental level of humanity all people are the same, as a result of which peoples can learn from each other's cultural differences. "We are made of clay, and are baked under a global sun. . . This so important to realize, that we human beings are all made of one ingredient. We are made of one clay. So we are subjected to the global sun, informed by the Almighty, of course. So we can share things. We learn from you guys, and we also taught you." Difference is understood here not as imposition (of one more powerful culture on another) but as exchange.

Someone else, however, suggested that this diversity can become a problem where citizenship and loyalty to the nation are concerned. "Although there are similarities between the development of societies in the Gulf [and the history] of the [United] States, because most people came from different places and [then] settled in one location, still I think we have not developed the concept of national loyalty. What we are facing now, here in Kuwait, . . . are tribal allegiances [and] sectarian allegiances. . . After fifty years of modernization, we have not been able to develop a Kuwaiti national loyalty." Another person took exception to this characterization and said, "This is a bit harsh, that there is no national feeling towards the country. I think there is. [It is] only tested when we are in crisis. And we have had this moment in history, and it was a great moment, when all Kuwaitis stood up as one body against aggression and against occupation. Not one single Kuwaiti stood with the occupier. So in a way, in an affluent and relaxed society, you don't want to show your patriotism all the time. It's only in moments of crisis that this shows."

One might make the latter point also where identity is concerned. Kuwaitis who feel they have an identity do not necessarily feel the need to express or show it all the time, like a limb of the body one carries everywhere; rather, identity is something that

comes into question or view in certain kinds of encounters with people whom one feels are "different" from oneself.

Culture, Sustainability, and Youth

If one thinks of culture as tradition, there is sometimes a tendency to romanticize the environmental sustainability of past cultures. The tacit reasoning goes something like this: past societies in the region were adapted through thousands of years of evolution to a particularly harsh climate that does not naturally sustain high-density populations and which developed building and urban designs that worked with the directions of the sun and wind. This natural adaptation then became their "culture," which comes close to reducing the latter to evolutionary responses. In fact, it remains a matter of historical investigation whether past cultures were always in "harmony" with their natural surroundings, or whether the simplicity of their building materials and the modest scale on which they built were a function of their poverty or marginalization in the world system than their environmental adaptation. After all the nearly identical environment produced great civilizations in Iraq and Egypt, each distinctive from the other, and on a truly massive scale, so there was some impetus, some forward momentum that led to their flowering which cannot be accounted for in terms of adaptation alone. Yet having made that point it is also necessary to remind ourselves that many civilizations also foundered because they were no longer sustainable in their environment (think only of what happened to the people of Easter Island, for instance). The question is: can one create a society or a civilization in Kuwait and the Gulf that is part of the modern world and the global system but which is also sustainable from a cultural and environmental point of view? As one focus member put it, "After ten or fifteen years, after this huge building euphoria is over, who's going to stay in this area, to continue living in this area? At what cost to the natives of this area? . . . Would they be able to afford staying in this area?"

Another way to think about the problem of culture and sustainability has to do with the future, as in the Bruntdland definition that refers to meeting the needs of future generations, and this means society's youth. In Kuwait about 50% of the population is below the age of twenty, making the question of youth and the future of the society particularly acute. "We have a youthful population," said one member of the focus group, "and this is . . . good . . . but at the same time I . . . consider it a burden because you have to create jobs, you have to take care of their social costs, and at the same time, you have to prepare them to face the difficulties of the future." One of the limitations of our Kuwait research is that we did not have the time or opportunity to meet with enough youth to gauge their aspirations, their frustrations, their worries about the future, and their thoughts about sustainability. What we did get were the views on youth from among the country's top decision-makers, and they were less than sanguine about their prospects.

Confusion over identity, which it was asserted many Kuwaiti youth experience, begins, or so it was hypothesized in the focus group, with child rearing, which in the wealthy families tends to be handed over mainly to Asian care-givers, with the result that youngsters grow up not speaking Arabic well and have only a superficial acquaintance of their own culture and its values system. But there was a deeper criticism of this kind of care-giving, which is that it is based on an abrogation of parental

responsibility toward the care of children. This is how one person expressed it. "I think . . . [children] did not get enough care, neither from their parents, nor from their schools. . . I mean parents giving their children quality time, instead of giving them money and giving them cars. . . making [children] understand what life is all about [and] exposing them to problem-solving." He then gave an example of what he had in mind. "We started in '74 a science club. . . and it grew in ten years to 10,000 kids. Those kids who were in that science club are now engineers and pilots." Vocational colleges are now increasingly seen as part of the solution, where students are exposed to real-life problems and are asked to solve them.

Having grown up in one of the world's wealthiest societies has thus been a mixed blessing for Kuwaiti youth. They have had access to all kinds of life advantages and professional opportunities unheard of among most youth elsewhere in the world, but these have been cared for by the state for the most part. The flip-side of creating a "welfare society" that expects not to have to pay for its energy consumption and to rely on expatriates to do most of the work in the private sector (at present expatriates comprise about two-thirds of the work force and 99% of the private sector employment) is that you are not adequately preparing youth for a sustainable future, a future in which oil revenues are likely to decline and the work force will have to be increasingly nationalized. One person felt very strongly about the drawbacks of such "pampering." "This [older] generation which I belong to have taken a lot from the resources in Kuwait, our oil boom, but we are also the transitional generation that witnessed part of the hardship . . . before the affluence [provided by] oil. . . Consequently we pampered our children, feeling that we had been deprived. . And I personally hold myself responsible and I think my whole generation should be questioned about this attitude." Will they be prepared to take these jobs that require years of training and experience, not to mention long, exhausting hours in the work place? Besides vocational training and private schooling that have been increasing in the educational system, youth are also getting involved in volunteer work such as summer jobs in the tourist industry, and it is hoped that these efforts will help better prepare Kuwaiti youth to face their increasingly uncertain future.

Returning now to the built environment and the question of youth, memory becomes a crucial factor, the parental and grand-parental generation remembering a traditional, environmentally and culturally adaptive cityscape that no longer exists, the youth inheriting stories about them or visiting restorations and recreations of that past. Perhaps feeling guilty that they eradicated that past, the older generation now wants its children to experience it vicariously, anxious that without these narratives of their past their identities will be stunted or flawed. It really remains to be seen what youth think about these memory projects, as so little social scientific research has been done on them, and what the effects of these projects might be on their sense of themselves. But as we said, identity is also about an image that one has of one's future, and clearly, from what we heard in the focus group, that image for Kuwait's youth (and also the youth of the Gulf) cannot continue to be one of "unlimited good" or of "unlimited growth," as it was for the generation that preceded them. The challenge may be less about remembering a past (that cannot be reclaimed in fact) than imagining a sustainable future in which youth will take the leadership role.

NAUG

KUWAIT FOCUS GROUPS & SITE OBSERVATIONS IMAGES-1.23 TO 2.2.2010

1. Kuwait- Old & New
Behbehani Complex /New Towers

2. Former Palace of Sheikh Kazal
Rehabilitation Project just beginning-2010

3. Environmental Focus Group at ROPME

4. Al Nisf Diwaniya Interview

NAUG

KUWAIT FOCUS GROUPS & SITE OBSERVATIONS IMAGES-1.23 TO 2.2.2010

5. Socio-Cultural Focus Group at Australian University of Kuwait

6. Traditional Fish Kebab in the Old Souq

7. Restoration of Kuwait Souq

DOHA, QATAR

From Kuwait we flew to Doha, and it was early evening when we picked up an airport taxi to take us to our hotel. It was the anthropologist's first time to see the lit-up city skyline that towered over the crescent-shaped corniche, and he was immediately taken by its beauty. On a smaller and less dense scale it reminded him of Chicago at night from the lakeside. Over the next few days I would learn to see Doha in a more critical perspective. It was fascinating and thrilling to see a daring urban experiment (indeed, several such experiments) being carried out before one's eyes, with all the potential promise and problems they entailed.

The day after our arrival we took a brief architectural tour of the city, starting with the recently opened modernist Islamic Art Museum, the work of the architect I.M Pei. As Nader explained to me, both in its abstract, faintly ziggurat design that beautifully laces together planes of light and shadow, as well as Pei's signature poured-concrete construction, it is a marvel. Adding to its gravitas is its solid grounding on its man-made corniche site, fronted by a palm-studded oasis landscape with running water that is suggestive of a *saqqiyah* or cultivation channel. The approach by boat from the sea is no less arresting, the two modes of access echoing desert and sea that have been Doha's two great ecosystems (as they have been for other Gulf cities like Kuwait). From the outside, the building intriguingly does not look the same in all directions, and it is built to a scale that makes sense: grand for a word-class museum collection but not too overwhelming as to be inhuman or intimidating. In short, all the aspects that make up a fine building and they work together. Whether it will be regarded as one of the great architectural buildings, transforming one's sense of what built space can be like is doubtful, but there is no question of its iconic significance for the city of Doha.

From the museum, we wended our way to Souq al-Wāqif, looking for a bite to eat. Our route took us along the pedestrian walkway that girdles the corniche, and we were stopped by a couple of young men, guest workers from Sri Lanka if memory serves, who asked us to take their picture against the backdrop of the sea. Crossing the highway at a signal-light, we eventually got to our destination without feeling that we had endangered our lives trying to cross against traffic. In retrospect I now realize that I did more walking – and more pleasant walking -- in Doha than in any other Gulf city we visited, with the possible exception of al-ᶜAin, and the reason was the corniche and certain areas accessible from it on foot. All kinds of people strolled along it – nationals and expatriates, families and single people, men and women in all sorts of attire – and one felt it was one of those spaces in which people truly mingled. Should the corniche be developed, as it inevitably will be (leaving things well enough alone is not part of development philosophy), I dread lest its peripatetic pleasures be checked.

Upon entering Souq al-Wāqif, a reconstruction of a Souq of approximately sixty or more years ago, we realized that it was already quite late and most eating establishments were closed, but Nader has an unerring sense of direction when it comes to locating things Iranian, and sure enough he found a restaurant at which we spent a pleasant couple of hours sampling the Kebabs. When things picked up again in the Souq, we explored it on foot, enjoying some tea and a shisha in one of the several tourist establishments fronting the main street. It works well as a public space. Like the corniche its visitors are varied, with Qataris (both men and women) walking down the

street or eating in restaurants side-by-side expatriates in a relaxed manner. I was to go back to the Souq two more times, and each time I had the same impression of an easy-going cosmopolitanism grounded in what was imagined to be a past.

A Digression: What is the "past" and how does one build with it in mind?

The past is far from a simple concept, of course, and in many ways is quite paradoxical. It may help to interrogate what we mean by it in order to say something meaningful about an architecture that is meant to respond to people's need for continuity with the past.

It is a supremely relative concept – relative to the chronological age of the individual and relative to that person's generational position within a social community. As a person grows older, the past grows longer for them, though they might in fact perceive it to be the near present, as in the expression, "gosh, it's like it happened only yesterday." And in relating their sense of their past to, say, their children or grandchildren, they feel the latter do not have much of a past to speak of but are living continually in the present. In fact, however, as children grow older, passing from childhood into adulthood, they develop complex feelings of nostalgia or disavowal towards their own -- albeit much shallower -- past compared with that of their parents. Shallower in absolute terms though it may be, it could be argued that the child has a more intense *feeling* of the passage of time – hence a sense of the lived past – than the adult, which may have to do with developmental age; the sense of temporal difference is much greater between the ages of five and ten and between ten and fifteen and between fifteen and twenty than between twenty and twenty-five and between twenty-five and thirty, and so forth.) Furthermore, as the child grows older it may think of the past as the foundation for its future, and the present moment for it is one of looking forward in time more than looking back. But for the maturing adult that relation of prospection to retrospection may be reversed. In other words, each generation creates its own past (not to speak of a present and future), and these pasts co-exist or overlap in the present, as paradoxical as that may sound. The past is not owned by one generation, nor is it separate from the present (that it is gone or finished or over). As William Faulkner once said, "The past is not dead. It's not even past."

How might we use these insights to think about architecture in relation to people's desires for some continuity with the past? To a Qatari (and substitute here any Gulf person) eighty years old, the *lived* past goes back to the pre-1947 era, and he or she has memories of a reality that no longer exists. For that person the lived past is certainly not dead but continues on in their memories, which we might call the *remembered* past. Everything built after that point in time they might think of as the near-past or present. To a much younger Qatari, however, the lived past is a more recent period in chronological time, which might be associated with sixties or seventies architecture. In other words, what her father or grandfather might hold to be the present or near-past, she might think of as the lived past. That 1970s school that the grandfather thought of as the height of modernity when it was built and may now consider to be part of the present, the granddaughter went to as a child and as an adult now considers to be part of her lived past. For her, pre-1947 Doha is not a lived past or even, strictly speaking, a remembered past, but what we might call a *transmitted* past – memories that are passed

down from her grandfather to her. His memories might be kept alive in orally transmitted stories, in photographs, and in reconstructions of the built past like Souq al-Waqif, and it is this past that – to borrow once again a literary trope – is like a foreign country she visits because she was never at home there or alive then and it feels a bit strange or different. Like many foreign countries, however, this transmitted past is intriguing and heartwarming, and she wants the opportunity to visit it even though it is not something she lived through. Visiting that foreign country may also provide her with a quickened connection to her parents and grandparents or even the "ancestors" broadly speaking. The complexity of the past is that it entails both what is lived and remembered, what is transmitted and inter-subjectively experienced, what is individual as well as what is generational.

So let us not privilege one generation's past over the other as the supposedly really real past but try to keep them all in mind when we build (or raze) our environments. It is often convenient for developers to forget that the present will someday be another generation's past and say, "the real past is pre-1947, of which hardly any traces remain, so our responsibility lies with reconstructing that past (the old market or Souq al-Waqif) or re-inventing it (ancestral theme parks like "a typical pearl-diving scene, circa 1950)." Those are common sensical views, of course, but they omit a sense of the past that is emerging in the present moment, the sense of the past that the youth will have of their city which was recently built or is being built as one speaks. Development tends to see the past as something that its buildings echo rather than as something they *prefigure*.

For example, when we demolish a neighborhood to make room for a car park, let us not forget that some children grew up in that neighborhood and that it is their past we are razing. We ought not to obscure or forget that fact by saying the "real" past only begins with the generation before them (pre-1947), and therefore we need not worry about having destroyed a sense of continuity with the past by destroying that neighborhood. To paraphrase the Brundtland Commission, development has to sustain some present built environment (of the sixties, seventies, and eighties) if the Gulf is to sustain a continuity with the past for the present generation of young people who are, after all, the future. Of course, not everything can or necessarily should be preserved of the present, otherwise development could not move forward -- there are always trade-offs; but there has to be societal wide discussion of what stays and what doesn't, and as one is talking about the past for the generation of the future, youth have to participate in that discussion to avoid their feeling eventually "betrayed" by the older generation. Unfortunately, it is difficult to see any such inter-generational discussion going on, and we can include Europe and the U.S. in this blanket assessment. But given the tremendous youth "bulge" in the Gulf countries, this kind of discussion might be more urgent.

Doha Development Focus Group

Because our visit to Qatar was brief, we did not have a chance to see development happening in towns outside the capital such as Al-Wakrah and Al Khor, so we concentrated our attention on what was happening in the capital city. Surely this outlying development is important for the future of the nation and perhaps it can be explored in a future trip. (See Doha Case Study for more details)

Sustainability, Environmental and Cultural

There was universal agreement with the Brundtland Commission's definition of sustainability, though later in the discussion one of the participants elaborated his own take on it that bears repeating. "I do believe in the word balance. Life is a balance. Sustainability is about balancing lots of different things. And this particular issue [the built environment] is about balancing lots of different things." He then added, "It's a balance between involving new ways of doing things as long as they work in harmony with what people actually want. And that's where we've definitely lost our way [in] recent years." As for what people want or their "needs" he went on to explain, "The needs could be cultural, religious, social or whatever." It was up to the architect to balance those needs. "The minute you disconnect the architecture from . . . human requirements or needs, that's [when] you feel miserable or unhappy culturally, socially."

One of the needs of sustainability is felt continuity with the past. Creating a balance between the old ways of building and designing and the new is thought to be key to people's happiness. As one younger person poignantly observed, "It's a [sad] moment, to be honest, to see your house demolished . . . to be a parking lot. . . to see your older-style neighborhoods gone [where] the houses were connected to each other [and] the neighborhood was a community. Now your family is your only community." It should be pointed out that he was told his neighborhood was not pre-1947 and that it did not contain distinguished buildings, but it was still *his* neighborhood and knowing these rationales did not help him live any easier with its disappearance. Perhaps if he and others like him had been consulted, and development had been a negotiated process among all the stake-holders, he would have had a whole other outlook on the matter.

When questioned about the impacts of development on the environment, it is not surprising that water sustainability was one of the key concerns. And the problem had not just to do with providing water to an increasingly dense urban population; agriculture figured explicitly in the sustainability equation in ways it did not in our previous conversations in Kuwait. Perhaps this had to do with the fact that Qatar had undergone a recent food shortage (eggs from Saudi Arabia had to be taken off the market because of concerns over bird flu) that has prompted a national debate on food security. "With the exponential growth in population in recent years and the demand particularly for fresh dairy products, Qatar has been badly affected by competition, particularly from Saudi Arabia, which has . . . led to the whole dairy industry collapse," said one participant in the Development Focus Group. "Why should Qatar be dependent upon another nation for basic food staples?" was the question many Qataris asked. One response by Gulf countries has been to buy agricultural land in other countries like the Sudan that then produce those staples for them (though this may not be a beneficial solution for those countries whose basic resources like land and water are essentially being used to benefit another nation); an additional response, at least in Qatar, has been to expand agricultural production on certain lands outside the capital city (for example, in Al-Wakrah and Al-Khor), though because of the clayey soil this too is problematic. The solution put forward is hydroponics, a process through which crops can be grown in minimum water, with nitrogen and other essential minerals and chemicals added to provide the necessary nutrients for plant growth. But this solution – in spite of recycling

of the methane that the cows produce, the use of photovoltaic cells on the roof sheds, and state-of-the-art water conservation schemes -- is also not without its problems, for this water can only come from desalination, and as every technocrat in our focus groups noted, there are already far too many desalination plants in the Gulf (the deleterious effects of which have already been noted for Kuwait)

Given how expensive it is to grow such food, it was asked why basic staples were not bought from other agricultural producing GCC countries, and the answer basically came down to a lack of trust. Food security is a case in point where regional GCC cooperation could be mutually beneficial for everyone, yet it is not politically feasible at the present time. That said, it was thought that the Qatar project had innovative potential and was worth pursuing. "There is probably a potential [for] finding a way of combining . . . high technology and traditional farming to create a new kind of farming in a desert environment."

There was also universal agreement with the United Nations' IPCC 2007 assessment that "there is unequivocal evidence of a warming climate with human activity as the dominant cause." One of the participants expressed it in terms echoed by the rest of the group. "At a certain stage, I tried to convince myself [that] this is a normal cycle that our globe has been going through. But reading the articles [and] seeing the consequences . . . I'm beginning to be convinced that mankind is definitely playing a role in this global warming." Asked to be specific about the impacts of global warming, he answered, "As far as the sea is concerned, there are corals that I used to dive for that hardly exist now. Fortunately, with a little bit of environmental activities that have been happening, I can see them reviving. But it will take my whole lifetime before somebody will enjoy it the way I have." Another person drew our attention to rising sea levels. "I've only been here four years, but I feel the water looks higher some days. It's actually quite high on occasions. It's not going to take more than a meter when it [will] start lapping over the Corniche walkway at high tide." One need not go on detailing the deleterious effects, many of which ROPME has already identified for the Gulf region as a whole. It is only necessary to point out that the perception among top decision-makers in Qatar, as it is in Kuwait, is that global warming is having a massive impact on the environment, yet adequate public and private responses to mitigate it are sadly lacking.

Doha Development Trends and Concerns about Sustainability

When asked what kind of civilization was reflected in the architecture going up in Doha, the following answer was representative of the group. "You're portraying a western civilization because of the . . . influx of western architects imposing obviously their background [from] Europe, [or] wherever it may be." Lack of proper research on the stake-holders in these buildings was partially to blame. "Up until only very recently did designers, during the feasibility study . . . ever carry out the sort of extensive research [in] the country they were working, the materials that were available locally, and the people who [were to] actually occupy retail offices, residential developments, [and] particularly schools. . . "

Downtown Doha, in the West Bay, has been developed mainly according to one model: the single, multi-storied skyscraper made of steel, glass and concrete. It is the king of building one associates with the modern city, whether it is the Sheraton Hotel or

the main Post Office or the soon-to-be completed high-rise by French architect Jean Nouvel. Many of the newer West Bay constructions have lots of space around them that is essentially unusable by the general public, and seem to have been designed for motor cars. Again this has to do with the idea that car parks will bring the maximum return on construction. This was not, however, how the original master plan had envisioned these spaces, which were to have gardens and fountains in them (though these may not be an environmentally sound use of green space) where people could relax and get fresh air. Recall my delight at seeing the Doha skyline all lit up at night: that takes an enormous amount of energy, as does cooling the buildings twenty-four/seven. This energy is provided by massive electrical generation plants, fueled by oil and gas, and thus depends on non-renewable energy sources. As for the look or appearance of these buildings, the consensus was that few are outstanding examples of modern architecture and none really reflects anything very distinctive of the local culture or environment, although the early 1970s and 80s generation buildings, such as the Sheraton Hotel or the Post Office at least reflected the concern for sun control and shading in this intensely radiant land.

According to one of the focus group participants, "eighty percent of [developers in Doha] are new [to] the business. This is the first building they've done – or tower. So a lot of them are made to flip over . . . during construction" (meaning that they will be sold to another developer or businessman before they are completed). "In their feasibility study they never even calculated the maintenance and running costs. They get over their head and sell it to someone else to complete." The result is construction that is often sub-standard. The same person remarked, "The ghettos of the future are under construction now, as we speak." Constructing buildings according to LEED sustainability guidelines adds somewhat to the building cost, but it was thought to be minimal overall. Compliance, however, is voluntary and not all or even most developers are necessarily interested in LEED, if making a profit is their sole motivation. However, there is a growing consciousness about sustainable design promoted by HH Sheikha Mozah Bint Nasser Al-Missned.

Even less likely is it for a developer to include life cycle costs in the building's total capital costs, even though it would arguably enhance its value over time. It was pointed out by a member of an international construction consultancy that he routinely offers to make available to local developers life-cycle costing for their buildings, "but we've never been asked to do that to date." The reason is that developers want to sell the building as quickly as possible and get an immediate return on their investment. Another sustainability issue has to do with facilities management. The same person remarked, "I for one am keen to tell our clients to get facilities managers on board at concept designs, because they're specialists. They're the guys who will run the facility for you, once it's tested and commissioned. From the concept stage, they can tell you the types of air-conditioning sustainability approach best suited for the next twenty-five/fifty years of running that asset." Yet, developers tend not to want to figure in such costs because they narrow their profit margin and short term return on investments. Then there is the question of use. Buildings downtown are designed mainly for commercial office use rather than more mixed use, on the assumption that this maximizes the return on the investment, even though the market is now saturated with such retail space, and it is hard to sell or rent right now. Buildings remain vacant. Building primarily with single-use in mind also creates a situation where locals build

their homes outside the downtown area, having to use their car get to work, to buy groceries and do other kinds of shopping, and to get to the clinic. This kind of development is in line with the Dubai model of the single-use center (for example, Education City, Health Care City, Sports City, and so forth) which creates enclaves or small cities within the city that fracture or fragment the urban space into smaller, self-contained single use pieces, exacerbating traffic problems and air pollution along the way.

Also in accordance with the Dubai model has been the construction of huge malls, some of them in the heart of downtown, others more remote, to serve the general population's shopping needs. "Shopping malls are a bit of a barometer for me," said one participant, "and how they've developed over the last decade or two in the region. . . You could be anywhere in the world. It's like walking into a five-star hotel." However, this response was also nuanced by the following observation. "They're not shopping malls, are they? They're destination malls where during the hot months we go as a family and we spend most of the day there. So it's not just about going into a shop. It's about children going to play. It's about parents going to the cinema, or whatever it might be. They're destination malls these days." The general point could be made of any mall in the region, of course: these malls take on added and perhaps unanticipated functions related to the climate and the society, and thus are made over into public spaces not available before in the society. In our rush to condemn these spaces for one reason or another, this re-use or social adaptation is overlooked, a creative use by the society of modern architecture, and it would be something interesting and worthwhile to investigate ethnographically (cite Ghannam 2002). For example, we were told that certain malls (The Landmark) are hangouts for young people, the most sizeable demographic group in the general population. Mall coffee shops are now social gathering spaces for men who used to congregate for that purpose in their Majlis or the older Souqs, and hotel lobbies also serve the same function. In spite of the fact that these spaces are occupied and used by Arabs, however, they are still seen as "western" or "international." It's as if the space marks the people in them, rather than the other way around. "I don't see much Arab culture there. I see the food courts and you've got all the usual fast food outlets, in a very westernized orientation. . . I walk in and I think, well, it's all very nice. . . There's a canal in this one. It looks like I'm in Italy. [Laughter] There's a battery operated gondola. It doesn't reflect the cultural character of where we live and where we grow up." Someone added, "And when it does [reflect our own culture], I think it's very much a token . . . to acknowledge that maybe you are here. But actually [in] those malls, you could be anywhere. There's nothing relevant to the culture and geography of this region at all."

As for residential options, these are private villas, large gated compounds, and, more recently, apartment complexes.

With regard to the cultural design of modern villas, even when they include a typical Qatari space such as the men's Majlis or reception room (women tend to have their own Majlises in the interior courtyard, if there is one), they are not necessarily designed in a culturally appropriate way. As in western domiciles, in the new villas there is one main house entrance through which all are expected to pass, be they family members or strangers, males or females. What is supposed to serve as a Majlis is more like the western foyer or vestibule that greets one upon entering a house, followed by

living room and dining room areas, and it functions as a reception and greeting area for guests than a sitting room proper for males. Nor is the adjacent living room used as a male socializing space because it is contiguous to other spaces deemed familial and private. Lately, however, the Majlis is being constructed as a separate room attached to the main house but marked by a clear boundary between it and the family-female interior, along with a separate street entrance for visiting males, and another separate house entrance for women. This design solves two problems at once, a functional space that serves as the men's Majlis and the cultural need for familial privacy.

As an example of a newly developed residential compound, we visited The Pearl, for which see Qatar Case Study. The focus group had little to say about such construction per se.

In some ways, the more interesting new development is the construction of apartment complexes as a residential alternative to villas for young and largely middle-class urban professionals. As we shall see, this is becoming an attraction for young Qataris, newly married and seeking some independence from their families but without the financial means yet to afford their own home (if this latter is even an attractive option for them). Before the housing crunch hit Doha in 2007, no one was much interested in apartment living. That has shifted, and the trend is for younger people to seek apartments. "People start to evaluate: do I live with my family as an option? Option B: I will rent a very expensive townhouse. Option C: I go into an apartment and live with a small family." The one concern nationals have with residential arrangements is mixing with expatriates, something they would prefer to keep to work place or to the shopping malls – and primarily for privacy reasons.

Development Focus Group, Continued.

Given all he problems with development, some of them exemplified in The Pearl, there is now a fascinating effort to create an experimental community called "Heart of Doha" or *Musheireb* by Dohaland which is meant to represent the best of sustainable living the region has to offer. As its CEO, Dr. Issa Muhannadi, explained, "We wanted to create an example of what future cities in the region could look like." Heart of Doha has been called by its creators an urban "regeneration" project. It will be built in an area next to Souq al-Wāqif. However, the existing buildings there have been razed and their current occupants, mainly small merchants and the people who frequented their shops, displaced in order to make room for the new development. The fact that an older urban fabric has to be totally torn up has raised eyebrows in some sustainability circles, for even if new residences or shops are built to replace the old ones, they will neither have the same feel nor exactly the same socio-economic clientele. But as the project is to renew the downtown area and attract locals as well as expatriates, some population displacement was inevitable. It also speaks to what we mean by the past. We were told that every existing building on the site has been documented before it was demolished so that there will be a historical record of what used to be there. And the people who once lived at the site will be given priority among the locals invited to return and live in the new development.

Heart of Doha is not being developed as an investment per se (and therefore not driven purely by profit) but as a model for urban living. Its principle stakeholder is the

Qatar Foundation, chaired by HH Sheikha Mozah. It's not an economical development according to conventional notions, but it is hoped that people will see it as a long-term investment. In that way, perhaps, it will be immune to profit-driven development that has plagued the Gulf.

It is envisioned as a mix-use neighborhood in order to overcome the problems of single-use areas adumbrated above. The urban fabric will be fairly dense to maximize shade, with buildings oriented to the direction of the sun and wind to minimize heat and glare and maximize air circulation. Building heights will be kept to five or six stories, the few exceptions being on the northeastern periphery and away from the corniche (so as not to obstruct the view of the sea), thus keeping the scale relatively small and intimate. The approach was described as "medium development rather than mega-development." Many of the buildings will have interior courtyards for privacy. There will be a mix of apartments and luxury townhouses, the latter constructed with proper Majlis and separate men and women entrances from the street. Hopefully, reliance on the car will be reduced and people will use more public transport or even walk to their various destinations. This will presumably lower the development's carbon footprint. (See Heart of Doha Case Study for more details)

Dohaland Display

The day after our focus-group meeting we visited a very professional Dohaland exhibit set up on a barge moored next to the corniche, which is intended as a way of introducing the general public to this model community and what it stands for. We were fortunate to receive a guided tour from Dr. Issa al-Muhannadi, ably assisted by young local men and women who served as docents. Much of the text accompanying the display cases stressed sustainability and sound environmental principles and cultural identity.

Education City Focus Group and a Grand Experiment in the "Multiversity"

Heart of Doha is not the only urban development experiment in Qatar; the other is Education City.(See Education City Case Study for details) It is clear that Qatar has invested heavily in education (as well as media), and it wants to be seen as a global player in this field. Education City, an enormous area separated from the rest of Doha, is the brain child of the Qatar Foundation, itself the creation of HH Sheikha Mozah. "The whole thing is a grand experiment," said one architect who participated in the focus group, "which is why it's so fascinating and why I think we're all interested in participating in it. And certainly from an educator's point of view, it's a wonderful thing to be teaching in two cultures at the same time. And from a practitioner's point of view, I am fascinated by this, the ground shifts so quickly under your feet, not just in Education City, not just in Doha, but really in the region, that you have to be very nimble. I think that you have to rethink the way you think of design, that it can't be towards completing a single project or object, but designing for constant change. . . and be able to roll with it."

In one sense Education City is a product of thinking in terms of single-use areas that has been already criticized. The "city" so far consists of about a dozen, mostly American universities with their own "campuses," which has prompted one Qatar Foundation officer to dub Education City a "multiversity." This translates architecturally

into each university having its own large building, designed by a world-renowned architect.

As with previous groups, the Education City group largely agreed with the Brundtland definition of sustainability, but one person added an interesting coda, remarking that it was very much a "green" definition of sustainability that had to do with the environment and natural resources, which was fine as far as it went, while he would also like to consider a "blue" concept of sustainability that had to with human beings and their potential (what is sometimes called social capital). In that sense, the mission of the Qatar Foundation and of Education City more specifically, has to do with "blue" sustainability, of realizing the full potential people have through education.

On the campus grounds (on approximately 2000 square hectares site with 3.1million square meters of buildings ultimately under construction) one sees signs that read "Think! Create! Innovate" (ubiquitous exhortations in Doha), and the architecture is meant to reflect this attitude of bold originality. "You have to keep in mind," said one participant, "that these buildings were designed [by] international architects. . . These buildings are supposed to be iconic. I don't know if there is a contradiction, but there is a certain limit of density that is acceptable when you are trying to design an iconic campus. And iconic [is meant] not just the symbolism it has but the role model architecture can be." This is a fascinating comment and gets one to the heart of the matter, a tension between what we might call "green" and "blue" concepts of sustainability. If each building is supposed to be a master work by one of the world's leading architects, then the reasoning goes (according to a western theory of the artwork as a self-contained piece), it has to stand alone and apart from other such works in order to be properly appreciated. But the possible contradiction arises between this aesthetic experience and the equally compelling requirements of environmental sustainability that dictate a certain amount of density, best expressed by another participant who observed, "When you have a certain . . . density through buildings, you provide natural shade and you can have [optimal] climate conditions." The fact that many of the buildings contain interior courtyards he felt mitigated somewhat the lack of density, providing natural shade and giving what he called a nice "granularity" to the overall space. One focus group participant also observed that each college acts now as an independent "academic silo" with very little student mixing between the "silos". Another person quickly pointed out that what we were seeing was not the fully built campus – in addition to the iconic buildings housing the individual colleges and universities, there will be staff and nursing accommodations -- bringing the total number of campus student enrollment to about 11,000. Bearing all these constructions in mind, he ventured, would make the campus one of the more densely built spaces in Qatar.

Nevertheless, there is still a problem of what to do with the large amount of space around each iconic building, which in turn has to be woven into the encompassing grounds to form a campus. A landscape architect explained, "What we've developed together as a team is a unified landscape, also a kind of green network providing shade, [and] improving the microclimatic conditions so that people really want to go outside." To provide that draw, various "program spaces" are being designed, such as an outdoor education facility (where people can learn about the local habitat), an Oxygen Park

(where they can learn about oxygen and its importance to biological life and healthy living, and so forth.

How does matriculation into one of the campus universities work? A student's application to one of the U.S.-based universities with a Qatar branch is evaluated in the same way as it would at the States-side institution, and if admitted, takes the same four-year curriculum as if he or she were taking their classes back in the U.S. Students are for the most part the children of foreign nationals who have lived in Qatar for years (many of them considering the country "their" home), plus a few American students who have enrolled in part to get an experience of living in a Middle Eastern country, and a low number of Qatari nationals, mostly female. Enrollment figures vary for each university but in general they are quite small, usually between 200-500 hundred. Faculty from the American universities (as well as staff) come to the Qatar affiliate to teach the full undergraduate curriculum that is required in the States to obtain a degree from that university, which means that a very large number of faculty is teaching a relatively small number of students, with a ratio close to one to one. Clearly, this ratio raises questions about the long-term economic sustainability of this educational project, even when the total cost of it is borne by the Qatari state. If its energy reserves are seriously depleted in the next few decades or their demand significantly diminishes because of a world-wide shift to alternative fuels, it would appear as though Education City would no longer be financially viable. This also raises a serious question of whether U.S. educational institutions will sustain their Qatar-based programs over the long haul. It may be relevant to this discussion to observe that already two US Universities, Michigan State and George Mason University, have recently pulled up stakes in the UAE for economic reasons.

One way to overcome the separation and containment of each university on campus would be to allow cross-registration, and the administration is working on that, though progress is slow. For students not adequately prepared to start their college studies, there is a kind of swing program in which they can hone their skills.

From a local Qatari perspective, the value added by Education City is that it makes world-class education available to students who might otherwise not travel abroad for it. This may be particularly true of young women. As one Qatari woman put it, "Who would have thought that my two sisters would be studying in a U.S.-based university and taking [a] degree without going to the United States? They are graduating from engineering school." Another woman agreed, adding that "probably the biggest impact has been [on young women] because if you think about the way the culture is set up here, . . . it would be unusual for an unmarried young women to go abroad to study. . . There are exceptions to that, but it is difficult." The question remains of how many young Qatari women actually take the option of studying at Education City. And if they do attend, they will be going to classes with men, a mixed-gender educational environment that is highly unusual in the Gulf (for example, Qatar University is gender-segregated). This mixing has stirred controversy and some resistance in the general population to sending women to Education City. Beyond providing an opportunity for women to receive first-class education in Qatar, another impact was noted and appreciated, the fact that female graduates end up being important role models for other Qatari women seeking similar education.

Qatar Foundation and Education City are obviously young initiatives, and it stands to reason they would face problems in undertaking such bold, herculean challenges.

NAUG

DOHA, QATAR FOCUS GROUPS & SITE OBSERVATIONS IMAGES-2.2 TO 2.6.2010

1. The Three Research Musketeers

2. The Islamic Museum by I.M. PEI

3. View of West Bay from Museum Arcade

NAUG

DOHA, QATAR FOCUS GROUPS & SITE OBSERVATIONS IMAGES-2.2 TO 2.6.2010

4. Education City with Science & Technology Park 5. Qatar University Engineering Lab

6. DOHA MASTER PLAN 2030 - model of downtown core 7. Tour of Dohaland-“ Musheireb”

UNITED ARAB EMIRATES

DUBAI

We flew from Doha to Dubai. I had been to the city before, when it seemed to be on a trajectory of never-ending development, spurred on by huge real estate speculation and inspired by a vision of itself as a global city like Singapore or Shanghai. By February of 2010, that "boom" economy had vanished in the collapse of the real-estate market, and if development had not exactly ground to a complete halt, it was hardly proceeding at the red hot pace of earlier days. Many buildings remained empty shells (rumor had it that cranes were left on rooftops, in spite of what they cost to rent per day, and moved occasionally in order to give the impression that construction was still going forward). As a sign of how tough the times were, the city was more sparingly lit at night, casting many buildings into shadow that would have been unthinkable in the good old days. People put a brave face on these new austerities by noting that they were saving electricity and reducing their carbon footprint. Traffic had thinned, another unexpected boon of the recession, making Dubai for once pleasant to drive in.

We have to bear in mind how mind-bogglingly rapid this development was, roughly twenty years with the majority accomplished in the last five. Before the recession, I remember Dubaians quoting to me one of their favorite expressions that encapsulated the warp-speed at which they liked to get things done. "It should have been done tomorrow." But this feverish speed had its costs (other than financial), among them eradication of most traces of the pre-oil past and not enough time to learn from mistakes. As one developer lamented, "We bring it all in from the outside because we're doing it so fast. [Architects] build similar buildings to what they have in their own countries, saying 'Well I made my reputation on glass buildings.' Yes, you did, but you don't bring them to the Middle East. . . There was not enough time to learn from one building and incorporating [the lessons] into the next. It just kind of duplicates." One is reminded of a similar regret expressed by an architect who works on Education City projects in Doha: if only there were enough time to do a post-occupancy assessment of a building to find out what works and what doesn't and then incorporate these lessons in the next design. Perhaps with the economic slowdown, there is finally enough time to re-evaluate and do things differently. Perhaps? We did not see much of that introspection in evidence on our Gulf tour.

The downturn had a profound impact on more than the pace of development. Foreign investors who had lent huge sums of money to Dubai developers were now unable to get back their loans, because the developers could not sell their buildings, creating a liquidity crisis in the international banking sector. Abu Dhabi stepped in to guarantee some twenty billion dollars worth of outstanding debt, which eased the strain somewhat, but this was hardly a blanket bailout. Each claim, we were told, would be reviewed individually by the Abu Dhabi government before a decision was made as to its status, the implication being that much of Dubai's speculative development had been rash and unsustainable in the eyes of its more powerful and here-to-oire conservative neighbor. The bailout was seen as an opportunity to weed out the more untenable projects. Rumor had it that even Sheikh Muhammad al-Maktoum, who had spear-headed the feverish development of his beloved city, was keeping a low profile. Clearly, Dubai

had "fallen" and was in "disgrace" as far as its conservative neighbor was concerned. The effects on Dubai's power and tolerant ideology might be long-lasting, but only time will tell.

Yet, all was not doom and gloom. We arrived in Dubai at the same time that the Burj al-Khalifah, now the tallest building in the world, was opened to great ceremony and fanfare. One had to wonder, whether Dubai was in denial about the state of its real estate market by going through with what its critics decried as a real-estate boondoggle, a white elephant? Or was it important psychologically for the city to have this as a symbol of what it could still achieve even in hard economic times? Though the giant skyscraper will certainly have its detractors, I found it to be strangely beautiful one early evening, when I was sitting on a balcony and saw it shimmering on the horizon like a space craft about to be launched. Though on an immense scale, even close up it seems lighter, more air-borne than one might expect. The optimism reflected in the Burj al-Khalifah was also informally expressed about the city's economic recovery by some top-level people. When asked, for example, how soon Dubai might recover, one well-connected person told us, "It's already happening. Give it another eight months." The important caveat was added, "Of course, the speculative boom of the last two decades is over. Investors are never going to make that kind of money on real estate again." Given the glut of rental space on the market and what has turned out to be a longer recession than many analysts had anticipated, one has to think that this optimism is ill-founded. But again, only time will tell.

The appearance of some areas of Dubai as a ghost town made it hard to recall how important it's "branding" had been, and how widely it had been imitated, not only in the Gulf but in other regions of the world as well. The Dubai model of development came mainly in two forms: the single tower built on a concrete platform, preferably next to a lagoon or some body of water; and the mega-commercial complex with housing, shops and restaurants, often with artificial running water running through it as well.

An example of the former is, of course, the Burj al-Khalifa. The towering high-rise sits atop a plaza in the shape of a gigantic flower, supposedly native to the region, with an artificial lagoon in front of it. There a spectacular fountain is computer-timed to splutter forth with some regularity. (When we were there, it was temporarily out of order). Around the lagoon is a roughly crescent-shaped development with shops, some apartments, townhouses, and restaurants. A few nationals were milling about, but most were expatriates from all over the world. An example of the large mega-commercial/recreational development is Madinat al-Jumeirah, which we also saw, a sprawling complex that one enters through a fantastic gate straight off the set of "The Thief of Baghdad." One then makes one's way into what looks like Venice complete with motorized gondolas. We visited the "city" at night to get the dazzling effect of its dramatic lighting, had dinner at a pleasant Iranian restaurant, and then explored the various tourist emporia to be found in the Souq. Though expatriates once again predominated, there seemed to be more locals than at the Burj, though this impression was based purely on a casual visit and not a systematic survey.

Development Focus Group

Having visited some sites of recent development, it was instructive to then ask about development in Doha more generally in our focus group.

The First Master Plan for Dubai (1959, Sir John Harris) was highly praised by one participant as "ingenious." This is how he explained it, "While Kuwait in the 60s was completely demolished, the Dubai rulers, [took] a slightly different approach. . . [John Harris] took the little streets of Bastakiya and then drew them out, like roots growing out quite organically . . . like a plant in a desert landscape. For example, where we are right now, which is a grid of urban blocks, was really generated by the little streets of Bastakiya, which I think is fascinating." He refers to this kind of development as a "natural evolution" of cities. But development, as we have seen in other cities as well, veered away from the master plan. There were the setbacks (from the street and between the houses), plots got smaller, and few houses had interior courtyards. "Everything became grated, rectangular, in-between spaces were linear . . . the height of the buildings were [not] controlled, and so on. So all that fabric of the city that we all wish were still there . . . was completely lost, sacrificed to greed." Not just greed, however. A lot of modern development, as one person put it, was done to symbolize that Dubai had become modern and had arrived on the world stage, or as she put it, "stepping into the limelight and to show [off] a successful story."

The way another person phrased it was that development is working "against nature" in the Gulf. It has been building for real estate value, for some kind of image that will sell, and the result is often buildings that stand "against nature" – meaning that "they're working continuously against heat, and it's a pity that we haven't seen more interactive, adaptive, naturally-evolved elements that really work with rather than against [nature]." And, of course, the result has been a vicious cycle, with buildings emitting heat because of the mechanicals needed to cool them and creating what are called "heat islands." This was of major concern to an environmental activist who said, "Urban heat islands [are] a huge topic that we need to address. One of the solutions for that is the synergy of work between multi-disciplines."

Another obvious "man against nature development domain" can be found along the Dubai seafront in what has been called the "Palm Trilogy" and "The World". The developers, Nakheel, advertisement reads: "Many know Palm Jumeirah as an international icon, but few realize it was created to help solve Dubai's beach shortage. The Ruler of Dubai drew a sketch of a palm tree, realizing its fronds would provide more beach frontage than a traditional circular island. From this insight, the idea of Palm Jumeirah was born and the trilogy of islands envisioned." South of Palm Jumeirah can be found Palm Jebel Ali, now with reclamation complete and twice the size of the first palm while closer to Sharjah to the north lies the beginnings of Palm Deira. The latter remains incomplete due to the recession, but its master plan had anticipated a vast project bigger than Manhattan Island a populations of over a million. Completing the Nakheel seafront invasion is The World, whose leading ad reads: …"Today's greatest epic… a destination that allows investors to make the world their own… to be the sun in your own universe!" The World lies incomplete and lonely, with only one small man-made island inhabited, but the rest lying bare in the windblown sand. Although the developers advertise that their ecological policy is "to ensure that construction not only has smallest possible

negative impact on the environment, but actually enhances the environment above original, pre-development status", the marine processes that have been destroyed in the critical inter tidal zone and the disharmony created with natural tidal flows attest to a rather different reality- a picture of man out of harmony with nature.

Not just developers were faulted, however, which gets us back to problems of governance. In Kuwait, we heard that there was no overall "vision" for the future as put forward by the government. In Dubai, by contrast, there has been no dearth of vision by the rulers; now, what one person called "an overstated awe in the legendary status of the rulers" seems to be the problem. In the context of the economic collapse in Dubai, it was not hard to imagine which ruler was meant. Yet, this person gave specific examples of another UAE city where certain urban planning or architectural features, deemed sound from a sustainability standpoint, were vetoed by other rulers for reasons of distinction or personal taste. City thoroughfares, originally envisioned to be 20 meters wide, had to be widened to emulate the Champs Elysees Boulevard at 70 meters in order to symbolize the greatness of the capital; a preference for symmetry over asymmetry or for certain colors and trees over others dictated landscaping choices that were not necessarily environmentally sustainable.

With regard to reconstruction of Dubai's urban past, the old downtown area of Deira and parts, known as al-Bastakiya, came up in the discussion and generated a somewhat heated debate. [See Dubai Case Study]. Representing a more positive view was the following reaction, which acknowledged the criticism that the reconstruction was not really thorough in the end and that "the buildings are just aesthetically traditional buildings in terms of shape only; they have those wind towers but they're not functional." It was, in this person's view, an "imitation of a culture." Yet these drawbacks notwithstanding, the person affirmed that "I think it's a pleasant neighborhood. . . it's a first step and a good attempt." This person went on, "I like to think that Bastakiya represents what we are coming from. What are our roots? Who are our people? That there is more to this country than just the oil that was discovered in the 60s. That there was this country rich in culture, in heritage, in trading. Our fathers and forefathers went and traded and they were good business people, they were good traders [who plied] the Indian Ocean and went over to the subcontinent and east Africa. . . It is good for me to show it to my children, to tell them that 'yes, were there, our fathers were there, and they counted.'" Another person echoed these same sentiments. "There is nothing for me to show my children. I don't have anything tangible in my hand to show them. . . I did go into the old downtown. Maybe when you are walking, it brings you memories of how you lived."

But these views stood in sharp contrast to those of an urban planner, who quarreled with the new functions the reconstructed Bastakiya introduced in modern Dubai. "Bastakiya was an integrated, residential neighborhood. . . It had a minimal commercial side to it. . . None of that is the reality of Bastakiya now. . . It is a collection of new functions, art galleries, some restaurants. . . To point it out as a good example of urban renewal is misguided." The response to this damning criticism was, "That's okay. It's a symbol, . . . a bringing back of a memory of a culture somehow, because we [understand] its background and the experience of how it was." It is remarkable to me, an anthropologist, that a local person's identification with a place – and the memories of

the past it stirs – should be dismissed because it isn't enlightened from a professional town renewal perspective. Bastakiya works for certain people quite well, these objections not withstanding, and it would seem that one should try to learn from the valuable lessons that it has to offer from an environmental adaptation and local cultural life style perspective and not simply dismiss it.

To some people, especially young professionals, downtown Dubai is an exhilarating space, one that inspires optimism. In contrast to those who decry its eclectic and unsustainable architecture, others saw something positive in it. One successful local architect remarked that "when I walk or drive in Dubai, it's like I don't know, maybe driving through one of these surrealist paintings. Immediately around the corner I see a golden glass building and on another corner an Asian-Egyptian monument with slavery imagery but put in a new context of fashion [and consumerism]." He surmised that the internet had a lot to do with these images of the city; that clients see them online and then want to use them somehow in their own designs. He also connected this to fashion (not simply in the sense of taste but in the sense of how advertisements use kaleidoscopic images to create a certain look or appearance). We might call this the digital city. Times Square in New York City has the same feel or look, of building facades with their giant lighted signs and billboards constantly flashing images of "hip" people in hypermodern urban milieus next to major shopping emporia. When the young architect was asked whether downtown Dubai reflects his culture, he answered, "Yes, it definitely represents the way we live now. Our culture. It's not like our culture in terms of Islam but it definitely represents the way we are living now." When pressed by his colleagues that Dubai's cityscape may not be sustainable or that it has obliterated the traces of the past, he conceded that he wanted to learn from the past without being overly nostalgic about it. "But I would like to learn also from this. [I want to know] if there is a way to use this beautiful time that we are living in to come up with something that is interesting."

This culture as "the moment we are living in now" was connected by the same speaker to globalization and the concept of the "world citizen," something that also came up in one of the Kuwait focus groups. Whereas it is important to have the individual rooted in a particular locality, with all its historical and cultural specificities, it is just as important for him or her to feel connected in a positive sense to world systems. "It's very global, the way we are living," said one Dubai professional, "we are living as global citizens. I see similarities between me and any person living in downtown Manhattan. . . It's a huge and new thing that is appearing, and we are not experienced in how to handle it."

Consider in this regard Madinat Jumeirah: though it draws criticism (mainly that it is a Disneyland or Hollywood version of an "Arabian" tourist destination), it has its defenders. "Madinat Jumeirah is another representation of the old time [besides al-Bastakiya] that I like, while at the same time satisfying modernism or the contemporary," said an architect. What she likes is the very fact that it is a "hybrid" space of certain representations (or reinventions of) the past and modern life, and not that it tries to be either one (a reconstruction or preservation of the past) or the other (cutting-edge contemporary). "I would like to see more of that [kind of development] but used by local people in certain closed communities." In other words, the speaker, a Dubai citizen, was saying that such commercial spaces would draw more local visitors than if they

were built in communities where locals could mingle more with each other than with expatriates, a comment that betrays the de facto if not de jure segregation of locals versus expatriates in Emirati society. It's not clear whether this person was speaking for herself only or for Emiratis more generally when she added, "I may not feel comfortable going there [Madinat Jumeirah] because of my cultural background, because that place is overwhelmed with tourists. . . . I would like to have [it] but in an [Emirati] community context." Madinat al-Jumeirah was criticized for its over-the-top orientalism by one architect, even though he acknowledged it to be a popular entertainment spot for locals, "But I have a problem with [its] reenactment of culture and generalizations about the Arab world. It's orientalist in a way. It has nothing to do with the traditions here, or with Bastakiya." Yet, others had a different reaction, saying that orientalism was not a bad thing per se, it all depended on who was constructing the orientalism and for what purpose. Madinat al-Jumeirah's orientalism, for example, is not something foisted on locals by western developers; it is chosen by local developers and enjoyed by local visitors. In other words, Madinat al-Jumeirah is an example of where the Orient is producing its own generalized orientalism (a romantic notion of the Arab Other) and doing so in a very self-conscious, business-savvy way. This is the way one person in the group made the point. "I think Madinat Jumeirah is a relatively successful project because it adapts forms out of different traditional sources and puts them together into very much a new function, namely the function of hotel, beach front, cultural center and mall. That's a new function. And how do you – in order to meet that function – use different sources [so that] they work [together]? So, I feel relatively comfortable with some aspect of Madinat Jumeirah."

In reaction to this, the moderator observed that unfortunately there has now evolved only two "mono-cultures of design models" in the Gulf cities that all developers are following: The mega, "Avant Garde, super modern Tower" or the low/mid rise "Disneyland Gulf Kitsch". The former has no ecological or cultural relevance to the place, while the latter is burdened with fake wind catchers and fiberglass arches, neither model offering a suitably sustainable and contemporary paradigm for the region. There is a great need for an authentic contemporary architectural regionalism informed by critical thinking about sustainability, cultural relevance and valid opportunities for technological innovation.

In fact, of the two commercial models that Dubai has developed what was also regretted was the fact that they were duplicated all over the Gulf, and there were now too many of them. This building boom was in response to a vision of Dubai as a global city, to which people would go from all over the world for tourism, shopping, and health care. When it is often asked by the visitor to Dubai, "Whom is all this building for?" the answer is "the expatriates," not just the expatriates who live in Dubai to make its commercial system work (roughly 80% of the resident population) but a constant stream of visitors who, it is hoped, will fill its hotels, shopping malls, and other facilities. This vision of the city as a hub of various sorts in global flows of finance, commerce, tourism, and so forth is not entirely unwarranted, if one remembers that the Gulf has one of the densest intersections of air-traffic in the world and that most of the people are coming from Asia. Of course, it is the higher-end or more affluent tourist, the consumer of Gucci shoes not Wal-Mart flip-flops, whom Dubai is trying to attract -- the emerging

middle and upper middle classes of India, Southeast Asia, Korea, Japan and China. In the climate of the current recession, this vision would appear to be in doubt.

Visit to the Emirates Environmental Group

I was fortunate to have the opportunity of visiting a Dubai-based NGO, the Emirates Environmental Group, and to interview its co-founder and current director, Habiba al-Marashi (MBA). Its funding comes entirely from membership dues (it accepts no donations and no government money in order to maintain its neutrality). When I asked how it manages to keep financially afloat, Habiba told me, "We are good at barter arrangements." For example, the EEG's current headquarters is a villa, half of which it pays for; the other half is paid by the owner in exchange for certain kinds of business services performed by the EEG staff.

The EEG originated in 1990 and was based in Habiba's distress – and that of about a dozen other non-Emiratis at the time -- that there was no talk about the environment and the impact rapid development was having on it, and so she and her colleagues decided to create an action-group, arguably the first and still one of the few of its kind in the region (there are several in Kuwait and Bahrain). Given the speed of development and the scope of the problems, they realized they could not tackle everything at once, so they prioritized their efforts. The EEG had, as Habiba put it, a "preventative" rather than a "corrective" strategy, meaning that it wanted the government to prevent a lot of things from coming into the country that were not sustainable rather than undo the damage already done to the environment. They decided that the first priority was to prevent mounting waste, which could not be dealt with by laws and enforcement alone but had to be approached through public education and consciousness raising. The third and fourth priorities were water and energy conservation and the use of alternative fuels. To get things done, they would devise an "action program" (consisting of a number of different initiatives) and start it at the grass-roots or individual level. For example, with regard to waste management they provided conveniently located waste collection points for households which would otherwise have to haul their trash to the municipal dump; and they mounted informative or educational programs about waste management (workshops, environmental competitions, media publicity, public lectures, national "Clean Up Day" celebration, and so forth) at schools, corporations and government institutions. Gradually, public awareness grew and the waste problem diminished.

Historic Preservation and Restoration

While visiting the EEG and thanks to Habiba's kind intervention, I had the good fortune of interviewing Rashad M. Bukhash, Director of the General Projects Department of the Dubai Municipality and Chairman of the UAE Urban Conservation Society, which is involved in restoring Dubai's traditional architecture. In 2007 Dubai passed a new architectural conservation law mandating the study and preservation of the city's historic sites. It also allowed the UAE to apply some of its historic sites like al-Bastakiya to UNESCO for "world heritage" status (though none so far has been recognized as such). Bukhash explained that any building before 1960 is considered "historic," and there are

roughly five hundred buildings on the preservation list (which represent only about one percent of the buildings standing in Dubai – in other words, all the rest have been built in the last four decades). About fifteen to twenty buildings are added to the list each year. In what are deemed the "old" parts of Dubai, any new construction must conform to certain building codes, especially in regard to elevations.

Among restoration projects are private residences, though it is sometimes difficult to persuade locals to turn these into heritage sites. Some of the more distinguished residences (for example, the house of the first ruler of Dubai) in al-Shindigha have been turned into museums (eleven in all, with another ten being planned) and are filled with old family photos, furniture, and other memorabilia of the past for visitors to view. For all the efforts to preserve individual buildings, I was told that old "neighborhoods hardly exist at all," an important element of traditional Gulf society. The restoration of Bastakiya and al-Shindigha are geared towards preserving that element.

Noteworthy is the fact that about two hundred and seventy-five thousand people come to these heritage sites annually, and of that number roughly forty percent are Emiratis, the rest being foreign tourists from Germany, Korea, Japan and China. Younger Emiratis, especially university students, are quite interested in these heritage sites, and the historic society mounts all-day events at the different Dubai universities (lectures on traditional architecture, exhibitions, small courses to teach students about Dubai's history using original materials) to raise their awareness of Dubai's legacy and what they can do to preserve it.

There are some efforts at cooperation and collaboration with other heritage societies in the Gulf, and I was told that Abu Dhabi was very much at the center of cultural heritage preservation, including folkloric performances such as oral poetry and male dance.

AL-ᶜAIN

From Dubai we took a taxi to al-ᶜAin, the "oasis" city within the Abu Dhabi Emirate, and the birthplace of Sheikh Zayed bin Sultan al-Nahyan, the first president of the UAE. This is not the only reason that Al Ain is considered a cultural center of the UAE; archaeological remains have been found in al-Hilli that date back more than four thousand years, and because of its underground springs and strategic location along ancient trade routes, it may have been continuously inhabited for most of that time.

It is also home of UAE's national university, which is why we came to al-ᶜAin in the first place; to meet with the architects and planners of the new university campus and see how issues of sustainability figured in their designs. (See the UAE Case Study for further details about the new UAE University)

ABU-DHABI

Given what has happened to Dubai's building boom in the wake of the 2008 economic recession and the need for Abu Dhabi to bail it out, Abu Dhabi's much slower pace and more conservative approach to development through the years is seen, in

retrospect at least, as having been "wise" and even "prescient." Perhaps one might also say "fortunate," in that Abu Dhabi can learn from Dubai's mistakes.

In an interview with Dr. Al-Mutawa' the point was made this way. "I think Abu Dhabi is a bit different from Dubai. It's not the same model. And I think what helped them to refine their model is the last or current situation, the [financial] crisis. Abu Dhabi is not growing as fast as Dubai. [It] has stressed other issues . . . the environment . . . alternative {renewable] energies. . . human capital development through education . . . [health care] systems to maintain the health and safety of its population." He noted that these efforts are in their infancy, having been started in the last two or three years, and that it would take another five or six years to see them come to fruition. "That will have . . . a great impact on what type of real estate development will [emerge] in the region."

Aldar Development Focus Group

With regard to the Brundtland sustainability definition, there was wide agreement and yet some serious reservations were expressed as well: one person pointed out that its scope was a bit limited because it did not cover society and culture; another felt that it was too technical and that without taking into account the political-economic context in which development takes place, it was unworkable; and another person said that it was out of date because the issues had changed.

There was much wider agreement on the climate change question and that human activity was a contributing factor. Unfortunately, development did not seem to be focused on the climate change issue, meaning in what specific ways the Gulf region would be susceptible that other regions of the world would not. For example, it was pointed out that rising sea levels threaten coastal cities (though estimates of sea-level rise varied from one to three meters). Port facilities, on which the Gulf region is so dependent, would be threatened and have to be rebuilt. Someone mentioned potential damage to real estate development in the range of $400 million. As agricultural land could also be threatened by inundation or seepage of high-saline water, serious thought would have to be given to importing crops from other places, a move that would elevate food costs dramatically.

It was pointed out that, unfortunately, not enough was being done in the way of contingency plans for these possible impacts, partly because of a lack of reliable data. For example, how would rising sea levels affect the quality of Gulf water, which would in turn have an impact on water consumption? Would there be enough desalination plants? And would there be enough energy to power them economically in the long term? Risk assessment was also seen as an urgent need, in order to determine which aspects of a building might require reinforcement or even be entirely redone in the face of such extreme environmental changes. Lack of information and risk assessment were not the only problems, however; another was lack of inter-state Gulf cooperation. After all, an environmental change such as rising sea levels would be on a scale that no one country could address on its own.

As for sustainability guidelines such as ESTIDAMA developed by the Abu Dhabi Urban Planning Council in 2009 for Abu Dhabi explicitly, arguably the most advanced sustainability guidelines for builders and developers in the region, the questions were whether these guidelines were legally required or simply encouraged (and if the latter,

what incentives were offered to adopt them) and whether they could be applied to retrofitting existing buildings and not just new ones. It would appear that compliance with ESTIDAMA is currently voluntary, and in the opinion of one developer it should become more regulatory over time. Another developer, on the other hand, liked the idea of a mix or coordination of voluntary and regulatory aspects, allowing for more flexibility. Too much regulation could become a nightmare. Someone else insightfully pointed out that ESTIDAMA was not so much a rating system as a *way of thinking* about sustainability. In other words, it was not enough for architects and developers simply to check off on their to-do lists design and construction features that meet the criteria, but that they think creatively about how to meet sustainability goals contained more in the spirit of ESTIDAMA than in its specific guidelines because no such guidelines can ever be exhaustive in all the contingencies they are meant to cover. Or as someone else said, seconding this view, "the danger is in getting caught up with the numbers" and not thinking about intelligent options. The need to retrofit buildings was definitely felt, though the economic incentives to do so were not particularly compelling. There was a definite absence of capacity building to implement the rating system, and it was suggested that research centers and universities could do more to raise knowledge about the guidelines and to encourage their use.

ESTIDAMA aside, it was pointed out that sustainability cannot be tackled city by city but must be a regional concern, given that the problems are common to the entire area as are also their solutions. Sharing of knowledge and coordination in implementation are key ways in which the Gulf Cooperation Council could help improve the situation, especially as related to key issues of integrated regional transportation, agriculture, energy and water. Some of these regional issues we were told are now being seriously discussed, the regional rail network being on top of the list. Integrating urban planning across the region could be another. The current "vision" plans, with the exception of the Abu Dhabi Vision Plan 2030 which was thought to be "holistic" (taking into account economic, cultural and social aspects) and "integrative" in its thinking (that solutions have to coordinate efforts in various societal domains at once), are really about making one city or another distinctive and superior over the other, and not about how cities can become regionally linked and interdependent. That same person quickly pointed out, however, that more important than specific building guidelines or vision plans in changing the built environment's sustainability in the Gulf was the mind-set and behaviors of Gulf societies. A cultural life-style of "luxury through waste" and an obsession with building always on a grander scale are among the chief hindrances to sustainable architecture in the region. It was pointed out that although the third and fourth pillars of development in the 2030 Vision Plan pertain to culture and society, they are not given as much emphasis as they require given the fact that changing behavior and impact is seen as an urgent cultural and social issue.

As one economist noted, "notions of luxury in design rather than functionality still dominates." He noted that international companies are now introducing life-cycle and facility management costs into the thinking or consciousness of local developers, along with the realization that there are long-term economic gains in incorporating these into all kinds of facilities, ranging from schools to hotels and hospitals. Yet, most clients still draw the line at the initial building costs, not wanting to narrow their profit margin with inclusion of life-cycle costs. And even if they were to include these, there is a

lack of knowledgeable and experienced facilities management operators to maintain the building operations over time. (See Abu Dhabi Case Study for additional details)

Abu Dhabi Socio-Cultural Focus Group

The question of development and its relation to regional cultural identities was thought to be highly important but also a very sensitive topic. One person was quite scathing in his criticism. "Consumerism is what drives development here not cultural sensitivity, economic profit not cultural identity," though he conceded that there was now a wake-up call and decision makers were becoming more concerned about cultural issues, as per the Abu Dhabi 2030 Vision Plan and its third and fourth pillars. A person deeply involved in the planning of the new museums on Abu Dhabi's Sa^{c}diayat Island conceded that this was a delicate question for museum projects being planned for the region. They may be appropriate in scale and in their hyper-modern architecture for the leading edge, global institutions they aspire to become and yet be environmentally unsustainable and lack very meaningful references to regional culture. For example, a "signature" architect like Jean Nouvel might choose a sand dune or a desert rose for an image or form for one of his buildings in the Gulf, and while it at least is grounded in some local context, there is no guarantee it will have any resonance with the locals who live there and are supposed to identify with its design. As in other focus groups we conducted in the Gulf, part of the blame was placed on the selection of architects who may be brilliant and world-renowned practitioners but who know next to nothing about the local architectural tradition. What too often results is a "transplant," as someone eloquently put it, of a western tradition upon a local scene rather than a "transformation" of it as a result of its new context or location. It was said that transformation was not addressed by social policy makers in the UAE. Related to this observation was that of another person, who noted that an entire culture was being transformed through development of its specifically urban forms (meaning that the urban site bears so much of the weight or burden of this transformation) and while this is not unique to the Gulf it is not being looked at in any profound way in urban studies.

There was no agreement with this criticism of Abu Dhabi's contemporary architecture, however, just as there was no criticism of Dubai's uttered in the Dubai Development Focus Group. One person insisted on a minority point of view that the architecture strongly reflected the realities of present societies in the Gulf. He pointed out that they are "young" societies (meaning not only that they have developed rapidly but that their local citizen-populations have a majority of young people) and they are "multi-cultural" and cosmopolitan with peoples from all over the world (an identity they have always had because of their port economies and trading pasts, though not on the same scale as now). Their brash, contemporary architecture that we bemoan as "transplants" have everything to do with these realities. We should rather question our own esthetics as elitist, our own notions of traditional culture as stereotypical and what we deem worthy or not of a cultural heritage as somewhat arbitrary (based on artificial cut-off dates and hegemonic points of view). Why say that anything before 1960 should be preserved, when a young person who sees his school that was built after that date razed to make room for some development might lament this as a loss of <u>his</u> cultural legacy? None of the complexities of the questions of cultural relevance and preservation

were being discussed by the policy makers. Not exactly the same as these observations but related to them was the comment that perhaps Abu Dhabi like other cities in the Gulf would develop its identity over time, as part of an evolving process than a prescriptive set of rules. That would suggest that realities on the ground and architectural forms emerging in their midst would find a "natural" fit, and it may already be happening though we can't perceive or understand it yet.

The urban neighborhood or *Fareej* is a unit of the built environment that was important in the past and, not surprisingly, is a focus of contemporary development as well. The question, though, is whether Emiratis should have their own residential neighborhoods or, as the 2030 Urban Plan suggests, neighborhoods should be mixed. That some neighborhoods should be reserved for locals was, apparently, the expressed desire of the late Sheikh Zayed, who was concerned that Abu Dhabi citizens, who are in the minority, would be overwhelmed by the influx of expatriates. In spite of urban planners warning against socially segregated neighborhoods, "there is a very focused drive from the government here," said one expert, "to provide Emirati neighborhoods." Surveys conducted among Emiratis who said they would live in such neighborhoods indicated that people, especially women, would prefer to live in apartments rather than villas, primarily because they would require less work to maintain when the wife is in the work force.

According to this vision, then, there would be neighborhoods for locals and neighborhoods for foreigners (in which locals could live if they wanted to) and downtown areas or public spaces in which the two populations, local and expatriate, would mix. As the latter is conceived of as a utilitarian work space that is also "cosmopolitan" and "global," it is non-threatening – in fact, it is a space in which locals welcome the chance to learn from "foreigners." This "fear" of the Other as someone who threatens one's culture, an anxiety expressed several times by decision makers all through the Gulf, is evident in this vision of urban segregation. But what exactly is it that Emiratis fear they will lose by being dispersed residentially among expatriates? This is how one woman expressed the concern. "In the past, we could walk over to our neighbor and visit with them. Visiting was part of our culture. Now that rarely happens. Visiting a non-Emirati, even if she is a good friend, is not the same thing because she is not family." In other words, to sustain the family face-to-face communication is thought to be essential, and urban planning should take that into account. In fact, in the view of one participant, it is this density of local peoples in the same city that makes that city "local," and not necessarily the specific appearance of its architecture. "When we look at Tunis or Damascus . . . you immediately envision an identity. What is it that comes to mind? . . . For me at least, [it is] the old communities, the dense fabric. It's not the new buildings, it's not the stand-alone villas on the cliffs."

Interview with Dr. Al-Mutawa'

Dr. Al-Mutawa' was highly critical of the educational quality of Dubai's universities, with the sole exception of Sheikh Zayed University. Nor was he favorably disposed towards the Qatar model of higher education as represented in Education City, if for other reasons. He felt it was not financially viable in the long run for U.S. institutions to open their own campuses in the Gulf. A better alternative, in his view, was

to provide locals students with part of their education at a good regional university and another part in the U.S. He was a powerful advocate for study-abroad. "If you ask me, would I leave my son here or ask him to go abroad; I would . . . want him to go abroad. . . I think the issue of learning how to depend on yourself; how to mix with another culture and feel you are part of it – you're not an outsider – it opens your mind to other cultures. It teaches you how to adapt yourself to changing circumstances around you." He added that getting exposed to foreign ways of thinking and living among expatriates residing in the Gulf was not the same thing. This contact did not teach self-reliance. And if Gulf citizens only live in their own countries, no matter how cosmopolitan they might be, they will remain parochial in their outlook. "If you only grow up here and you've studied here, you're taught here, then your limitations remain local." It was more than a matter of personal development for Dr. Al-Mutawa'. "The only way this country can move forward is by interacting with other countries."

When it was pointed out to him that Qatari women welcomed the chance to study in Education City because they did not want to leave their country and their families to pursue higher education and would not get it otherwise, he responded by saying, "I think the problem with women in this part of the world [is that] they are still using culture and religion to restrict their ability to participate in society. And when we make it easier for them to have that restriction, we contribute to preventing them from being more active in society. Don't you think that if a woman, who wants badly to be a doctor, will do her best to travel abroad and have some Qatari women live with her while she studies medicine?"

When asked whether Americans have become less welcoming of Arab students since 9/11 which might impede their travel to the U.S. for their studies, he agreed that "There are more impediments, there are more obstacles" and he thought this was unfortunate for it would drive students away to seek their education elsewhere, perhaps in Asia.

Education Focus Groups: Students

Having had a chance to talk to some students in Doha's Education City, it was important to do the same in the UAE, which we did twice, once with a group of female university students and once with a group of male university students at the Women's and Men's Colleges, respectively, of the Higher Colleges of Technology (HCT), Abu Dhabi campuses. These are vocational schools, not liberals arts or technical universities.

Women's College Group

The newly built college campus which was not yet fully occupied or utilized when we visited it was built according to ESTIDAMA guidelines and upon cursory examination, it seemed to have many of the criteria of environmental sustainability we had been searching for in our visit to the Gulf (though built away from town and requiring access by car): buildings oriented in such a way as to minimize sun-glare and heat and maximize air circulation; structures that were rarely more than two stories tall, with windows that could be opened for fresh air during the winter months; courtyards; and enough density to create shaded exteriors. Overall, it was also built on a scale that made

sense for the place in which it was located. Freshly painted walls and highly polished corridors were filled with colorful artwork, some of it student projects based on some social theme or other; for example, a poster of a young man with a troubled expression on his face and a caption that warned about the dangers of depression and how to read its symptoms; or another installation of a crime scene with yellow tape around it and the outline of a body on the floor, representing the death of Arabic. Other artwork problematized identity questions in ways we would explore in our focus groups.

We were quite impressed with the young women we met at HCT. Their English was good, they were full of enthusiasm and hope about their futures, and in retrospect – that is in comparison with the young men we met and interviewed – they were more confident than their male counterparts. What struck us was their eagerness, as they put it, to both prove and improve themselves; that is, to take up the challenges they faced as workers, wives and mothers in a modern society and in the process to improve both themselves as persons and the society at large. The sense of patriotism was very strong. Many expressed gratitude for their country in "giving us everything" so that "we can better our lives"; but the ultimate goal of self-improvement was not self-gratification but nation-building. They wanted, as we might say, to give back to their country. For example, these students are subjected in their schooling to "citizenship campaigns" (such as awareness about littering as a national problem and the need to combat it) which inculcate in them devotion to their country. Thus, it might be objected that they said these patriotic things because college officials were present at the focus group, but the sentiments these young women expressed seemed genuine, not formulaic or canned.

Still, the answers have an ideological ring to them, that is, as a way to legitimate their entry into the workforce while facing possible resistance from their families. As one woman put it, "I have to finish, I have to do it. It's not a choice. . . . When I had high marks on my English course or my IT, I would show them to my brothers and they were really happy about them. Now, when I show them to my husband, he's telling me, 'You have high marks because you are not taking care of your kids.' [Laughter]. It's really a challenge for us, but we like to challenge ourselves." The respondent quickly clarified that her husband was very supportive at home, helping her take care of the kids and adding that "He gave me everything, like the transportation, the time for studying." In fact, her situation turned out to be more complicated yet, for her husband was also studying, and the couple has to juggle schoolwork with joint family responsibilities. In her view, and possibly also her teasing husband (whom we did not have a chance to interview), her education did not come at the expense of her family, for she pointed out that she is a role model to her daughter who also wants to do well in school and make something of herself in life. She is even teaching her French. Still, not all the young women said that they had entirely supportive male siblings, parents or husbands, and so this young woman's experience might be more the exception than the norm. The UAE has one of the highest divorce rates in the world, and tension over what the role of women should be as wives and parents as well as members in the work force might be a contributing factor.

Besides wanting to improve themselves and in the process also build up the nation, these women made it clear that they had to work to help support the family financially; that is, because of the high cost of living in Abu Dhabi and a correspondingly high standard of living, it is difficult to raise a family on a single income, unless the

husband comes from a wealthy family. The ambivalences that males feel towards working women do not necessarily go away for that reason, especially if they have to compete with women for jobs in the labor market. Yet, this is all speculation, because no in depth study has been done.

HCT has a more vocational curriculum that will enable young women to enter the workforce upon graduation. For many women, study abroad is not an option, either because they have families whom they can't transport with them or because they don't want to live separated from them, and so colleges like these are seen as an opportunity for women to get a quality education without leaving the country. The young women we met at HCT were studying business administration, public health, electrical engineering, statistics and mathematics, and other more technical/applied fields. All of them were looking forward to working. As the dean, a national, explained to us, "Our graduates are usually rated first choice for most of the government and private sectors, because they are well prepared. They're ready to jump in and work." Not all graduates directly enter the work force, however; some expressed a desire to continue with their education and pursue an advanced degree.

When asked how they would describe themselves in terms of some identity categories or other, the most frequent response was, as one woman put it, "We are a mixture between tradition and the modern. We are looking for a modern lifestyle." When pressed to be more specific, she said, "I'm a student in a modern university or college. At the same time, I wear my *shela* [head covering] and *abaya* [black cloak], which are traditional clothes." Another person said that besides traditional clothes, she also thinks of herself as an Arabic speaker, while quickly adding that she also likes to study other languages like English or Italian. But it was clear that, like clothing, speaking foreign languages touched a nerve, for the sentiment in the room was that learning the latter came at the expense of mastering their native tongue Arabic – not the dialect but the classical register. As one women expressed this ambivalence, "Talking in English doesn't mean everything; we have to talk also in our mother language, Arabic."

Asked what sorts of living arrangements they were seeking once they were married, quite a few said they were ready to move into apartments, especially if they were occupied by Emiratis as opposed to foreigners, because of their affordability. Apartment-living was not necessarily their preference, if living in a self-contained villa was an option, due mainly to reasons of privacy, but short of that, they were willing to try it. A few said they would prefer apartment-living over other accommodations, as long as they were designed in such a way as to preserve their privacy and protect them from undue exposure to the opposite sex. This preference for apartment-living is, of course, important for our consideration of the built environment, and we return to it later in the report.

Men's College

In some ways, the men had similar aspirations to the women at HCT. "I just want to get this bachelor's degree and then get an MBA, or something. Then I will start to develop this country." Yet, this did not necessarily translate into greater passion for their studies or optimism about their future, a trait so much in evidence in what the young women were saying to us.

One of the men's worries was job security in the wake of the recent economic downturn and that their expectations regarding their standard of living might not be met in the current employment market. "My brother told me, maybe two weeks ago, he told me companies now are not taking people from HCT, from the colleges, from the university. They are looking for students from [high] school. Because, as you know, when I go out to find a job for myself, I won't take a 3,000 salary just because they tell me, 'We will hire you.' I want something more. I want something I can live on."

Another qualm expressed in the male focus group had to do with the kinds of work Emirati men would or would not do, given their cultural notions of labor and human dignity. For instance, most menial work or low-status jobs would be out of the question. At the same time, however, the nationalization of the work force was deemed to be a desirable thing. "I would like to see more Emiratis in the workforce instead of all the foreigners," said one young man. "We consider it embarrassing to work like that [a repairman]. I would like to see people saying, 'It's no problem, it's just a job. I'm working and [making] my country better." Oman came up in the conversation as an example of a Gulf country that was transitioning into a nationalized workforce, partly because of diminishing oil supplies. "They [Omanis] want to work. They want their country to be theirs, not anyone else's." Nationalization of the workforce was not only a patriotic issue; it was also an economic one. If locals were given the proper vocational training and experience, it was thought they could do a better job at things like auto repair than current South Asian workers who are, or so it was assumed, largely self-taught.

When asked what kinds of expenses he was worried about, the student said, "To begin with, gas for my car. Gas costs. It doesn't cost as much as in the UK and US, but for us it costs a lot. . . When I am 25 years old, I need to get married. . . and it is expensive. I need to pay the dowry. I need to buy some gold for my future wife. I need to reserve the hall for men and women. I need to buy food for the guests. It will cost around 500,000 Dirhams." Because of the cost of gas, as well as car maintenance, these young men seemed willing to consider other modes of transport. "My plan is to come here [to study], have a bicycle, go to the college every day, in the early morning. Until it gets hot. When I travel from Sharjah, I can travel every week by bus. It costs 30 Dirhams. Why am I paying 50 Dirhams for fuel and the maintenance for the car which will cost me more? . . . That's why I am trying to change my lifestyle. . . in a sense teaching myself." Another worry was paying back debts fueled by consumerism in the recent speculative economy. One young man who worked part-time in a Mercedes Benz company observed, "The amount of locals who buy cars through loans is huge, it's really huge. . . And they are getting into loans for lots of stupid reasons like wanting a new house, lots of expensive furniture, and stuff like that."

When asked about the changes happening to women in society, especially their burgeoning desire for education and work, their answers were conflicted and often confused. On the one hand, they saw education for women as a good thing, but when these same women wanted to work, many began to question their motives. They were accused of being influenced by negative values from western culture (greed or rampant individualism) and thus of betraying their own culture. One young man pointed to the changes that had happened in veiling within his own lifetime. It used to be, he asserted, that the woman was entirely covered in black just ten years ago; now it is okay for her to show her hands, to reveal her jeans and blouse underneath, and even some hair under

her head covering. He concluded, "They're not sticking to their culture." Yet, in the same breath that young man pointed to strong working women in the public sector, who are positive role models for women in society.

Like the women, the men expressed unease about their Arabic. They felt they had spent so much time learning English that they had not devoted enough time to mastering classical Arabic. Their college instruction is in English, not Arabic, and they wished they could learn some of their subjects in their own language the way the Japanese or Koreans do. "Why do we have to study everything in English?" one student lamented. The extent to which their identity is wrapped up with Arabic is communicated in the remark, "It's as if we've forgotten [classical] Arabic. If we forget Arabic, we forget that we are Arab. We forget the religion itself."

Finally, when asked if there were anything in the built environment that they might point to with pride as a symbol of their culture, several suggested the Emirates Palace Hotel. This is how one young man explained the appeal of its visual imagery. "The [entrance] of the Emirates Palace Hotel is like a dome in the mosques, you see it in the mosques. . . They recognize it as the same thing, the same idea." This association brought to mind Sheikh Zayed's Mosque as another recent construction they could be proud of.

MASDAR: the city of the future?

> "Everything you do in MASDAR has to have behind it a very clear, understandable, simple story that you can tell to anybody." Participant in the MASDAR Focus Group

There is now in the Gulf perhaps no other development more eagerly anticipated, and more widely heralded from a sustainability point of view, than MASDAR City. We had heard about it all through our trip, and it was fitting that we should end our journey with a site visit and focus group session with some of the leading planners at work on this grand experiment. (For details about the scale and infrastructural details of the city, which is still under construction as this report is being written, please see the accompanying case study.) Masdar is intended to be the first "carbon neutral" city in the world which, ironically, lies within the perimeter of one of the most polluted cities of the world, Abu Dhabi. It is conceived of as a research-and-industrial city (complete with residential areas for its workers) devoted to the development of renewable energies and their attendant technologies; but it is also intended to be a model of how people might live in a city using energy and water sparingly and dependent on transportation that would not add to the carbon footprint. To put it differently, it not only preaches about energy conservation and environmental sustainability, it is supposed to put it into everyday practice.

The research arm of MASDAR is MIST, a graduate research institute created in collaboration with MIT, which is supposed to teach students from all over the world about the science and technology of renewable energy (solar power, off-shore wind generation, bio-based fuels, etc.) and environmental sustainability (such as water conservation). Together with their faculty mentors, they are supposed to innovate new technologies in collaboration with energy renewable and energy efficient companies that have offices in MASDAR City. These companies would be attracted to locating their

arms in the City not only because of a world-class research institute but also because it is a "free zone" within Abu Dhabi (operating according to rules that international businesses find accommodating to their own thinking and practices). The technologies created jointly by MIST and these companies would either be manufactured on site, elsewhere in Abu Dhabi or at Abu-Dhabi-owned factories elsewhere in the world. The overall aim is to make Abu Dhabi an international knowledge and manufacturing hub for renewable energy, which is part of the Emirate's larger aim of making itself economically and socially sustainable after it is no longer primarily a producer of fossil fuels.

The people behind the making of MASDAR are convinced that there is nothing quite like it, at least in the Gulf. It is worth quoting at length the words of one focus-group participant that captured this sentiment. '[It] is very different from any other development in the region, and I'll tell you why. The site here is not a coastal site. It's not a beautiful place. It's hemmed in by developments on all sides. And the quest is to build this clean tank cluster around the university. . . The difference with this place is that what has been produced are green buildings in a sustainable plan. And that's very different to any other commercial development, because it's not just a group of office buildings. It's not just a group of residential buildings, with the university placed in it and a couple of conference and hotel facilities. It is actually a green building community. The analogy I would use is, if you like, something like Stanford, and you look at how Stanford influenced the growth of Silicon Valley. [Or] if you look at MIT, you look at how MIT influenced the growth of a community around it."

Our research team arrived at MASDAR at a critical juncture in its history, just after MIST's project manager had resigned, for reasons that were not altogether clear to us, though we supposed it had to do with the recent turn MASDAR was taking under the directives of the Abu Dhabi government. At this writing, the original Provost and Senior Technical Directors have also departed. It has to be remembered that MASDAR is part of the Abu Dhabi Future Energy Company which is itself a subsidiary of Mubadala Development Company, owned and directed by the Crown Prince, Muhammad al-Nahyan. As an investment arm of the Abu Dhabi Government, which at this point in time is trying to deal with Dubai's debt at the same time that it is keeping to its own timetable for development, Mubadala is driven to realize as high a return on its investments as possible. If MASDAR is to be a model of sustainable development, however, it has to go slowly, which means a much lower return or profit than Mubadala may have properly understood at the time of its initial investment or than it can afford in the present world economic crisis. Other possible concerns may have been the fact that the project implementation was behind schedule and they were realizing higher than expected construction cost of this grand design. This tension – one we had seen before -- between an ideal of development and profit-driven expectations was frankly expressed. "This whole project," said one participant, "let's not forget has been started by Mubadala, which is an investment company. So they are looking for a return. . . We have to come to terms with that fact." The people we were looking at in the room in which we conducted our discussion were doing just that, trying to come to terms with how they would have to scale back their plans to fit new realities.

In point of fact, however, this is not the first time that Mubadala intervened in MASDAR's plans to create a sustainable city, as became apparent in the rest of the focus-

group discussion. When pressed as to why MASDAR has a commuter population at all (ideally, it would house everybody who works within its precincts in order to reduce the carbon footprint), we were told that "there was a push-back on where the income comes from, because income comes from office buildings." So a compromise was struck, where part of the population would be commuter (about 40%), part residential (about 60%). It is also important to know that there were two "squares," as it was put to us, that were set aside for development within MASDAR City, the first of these being the master plan of the city itself, the smaller one being for an energy plant that was to be built one day with which to power the construction and "reduce the amount of PV that you then have to integrate on the buildings." The difficulty of the second square from a real estate point of view is that its land is not being developed in the short term; its properties could be leased or sold for short-term income. "The difficulty with that was at the time, political difficulties, people were saying, 'Hang on a minute. Masdar's not using this entire site? You're wasting all this land? What you should be doing is planning a second phase of development." There was a fear that the land committed to MASDAR City would be taken away for short-term development and not returned to it, so the thinking changed to incorporating the second square more tightly into the advances MIST would presumably be making in sustainable energy technologies by housing or mounting these new developments. Such a strategy, of course, would put tremendous pressure on the research and technology arm to speed up its work so that the second square could be put to use for sustainable purposes, and it may well be that it had run out of time and Mubadala was now taking it back for its own real estate development purposes. This is pure speculation on our part, of course, pieced together from bits of information divulged in the focus group; even if the details are wrong in our scenario, the basic point is the same, however: vision and innovation driven by scientific goals has run up against the pragmatics of the market place. As Crown Prince of Abu Dhabi, Sheikh Muhammad is in a unique position to bring MASDAR back into alignment with its original plan and green goals, but as the biggest real-estate developer he is also a business competitor in the public sector and may be averse to doing so for market reasons. Is this the best kind of government or the worst?

Another criticism of MASDAR is that it is unclear to what extent questions of culture's relationship to the built environment have figured into the building design. Not that these questions have been neglected, for we were told that, "We ask ourselves repeatedly who will be living in MASDAR City?" A social scientist has been hired, Yasmine Abbas, with Sheikh Zayed University's Sociology Department as a research partner, to understand the cultural context in which the building is to occur, but this initiative has only just begun, for it seems that urban planning and building design are well underway without the possible benefit of its input.

It is understood that the population of MADAR City will be heterogeneous and roughly mirroring the population of the emirates as a whole; that is, about 20% Emirate, the other 80% of people from all over the world. Flexibility seems to be the operative principle in the building design, with the "flexibility of the London townhouse" seeming to be the ideal model. This would translate into a variety of designs to fit the cultural predispositions of any number of groups, a kind of mix-and-match to accommodate a range of possible residential preferences. Do you want total segregation from the public eye (that supposedly translates into the privacy concerns of locals)? Then here is a

design for you. Do you want private quarters in back but have the house front open to the public? Then check out this design. Do you want an international, open-plan design? Here's the house for you. A residential building typology is produced in which "you can create something that's tailored for different uses," as one person put it. The typology is also sensitive to scale, ranging from villas to residential town-houses and apartments, but all low-rise. There will also be a range of affordability to reflect the income diversity within the City.

This modular approach or "design flexibility" helps to address the social diversity likely to make up the population of MASDAR City, but it is not exactly the same thing as being culturally sensitive to the built environment's particular place and the social identities of its possible inhabitants. Some participants in the focus group were upfront about this possible shortcoming in MASDAR's planning. "To be honest, this question [of cultural relevance] rarely comes up. It is the question of environmental relevance that drives the discussions."

Cultural prescriptions for privacy and familial intimacy which are both subtle and profound get turned into generalizable design principles that can be punched out into ready-made formulae, without much further reflection or need for research. It was striking how town designs from other parts of the world – London, Venice – were readily adapted to the needs of the local population in the Gulf, as though models had to be transferred and then adapted to work, rather than be developed organically from the specifics of a local situation. (What someone in another focus group called a transplant rather than a transformation.)The same sort of presumption is at work in the thinking that buildings work culturally if they are environmentally sound (as one person put it, "I actually think that if you environmentally design buildings in the right way, actually culturally they will be right") which suggests a questionable hypothesis that culture is more or less a reflection of natural adaptation (and leaves little difference for culture as something apart from nature). Nor is the problem of cultural sensitivity adequately addressed by paying attention merely to traditional building designs as is so often the case in development discourse. Perhaps an even more urgent question for the different Gulf societies is how they might create a present and future identity for themselves that is not a mere adaptation or transferal of what comes out of foreign-based models but is organic to its own place and time.

No doubt the speed with which development is taking place – even in Abu Dhabi which claims to slow things down in order to do things differently and presumably better – is dictating these superficial ways of thinking about cultural relevance, but even if there is now an attempt to include a more thoughtful cultural approach through the intervention of social scientists and their research, the input might come too late for it to matter much in the building outcomes that have already been determined.

As one of the planners said of it, "I think that MASDAR is a process, in terms of the design of the city, it is a process that will be repeated. What I mean is, if you were building this city in China or you were building it in Africa, the process that you go through in terms of the thinking process – looking at the environment, going back to history, going back to the culture – that would be something you would do. That would not mean that you would end up with the same result. . . What MASDAR generates in terms of the production of the city is a checklist of principles you have to go through to build a sustainable city. . . But the process is the important thing." In a sense, what our

brief field trip to MASDAR afforded us was a glimpse, murky at best, into that process, and what we came away with was a process far messier and politically contentious than the idea of a "checklist of principles" suggests. We still know little about history and culture that go beyond facile prescriptions or reductive thinking (could one get away with this sort of thinking anywhere else but in the Middle East?). And one can always count on the politics of real-estate to be the spoiler of even the best-laid process. Taking MASDAR as a sociological case study of this messier kind of process which all building of sustainable cities will go through will be more rewarding in the long run than a checklist. Nevertheless, Masdar is an important urban experiment from which much can be learned.

NAUG

UAE- DUBAI, AL AIN & ABU DHABI FOCUS GROUPS & SITE OBSERVATIONS IMAGES- 2.7 TO 2.17.2010

1. Dubai Sustainability Focus Group

2. Cartoon- Dubai current dilemma

3. Rashad Bukhash- Conserver

NAUG

UAE- DUBAI, AL AIN & ABU DHABI FOCUS GROUPS & SITE OBSERVATIONS IMAGES- 2.7 TO 2.17.2010

4. Al Ain, Hili Tomb,3000 bc – reconstruction of tomb

5. New UAE University- IT College

6. Abu Dhabi- Sustainability Focus Group – Aldar Headquarters

PART TWO – CASE STUDIES

CASE STUDY- KUWAIT

INTRODUCTION

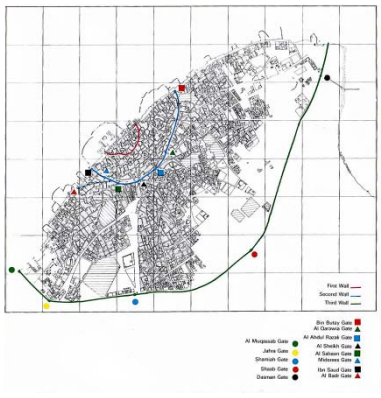
"When Sheikh Ahmad al-Jaber turned the silver valve to start the flow of oil from Kuwait to the British tanker *Fusilier* in 1946, few people realized the tremendous impact that oil would have on the lives of the Kuwaiti people and the future of their country. Once a small country of daring mariners and enterprising merchants, Kuwait today is a welfare state that depends on oil rather than the ocean for its growth and development"

OLD KUWAIT- Memories in Photographs
By Yacoub Y. Al-Hijji
Center for Research & Studies on Kuwait, 2001

The Architect asked, "To what extent are the new built environments in the Gulf region ecologically sustainable?" The answers revolve around that "silver valve" that Sheikh Ahmad turned in 1946. This case study of selected episodes in the young history of Kuwait shall weave together several key factors, as mainly discerned during our research from Focus Groups, interviews and site inspections. Both prior to 1946 and continuing till today, they provide clues to the particular built environments of Kuwait and the ripple effect that they have had on urbanism all along the oil rich eastern coastline of the Arabian Peninsula.

OLD KUWAIT – Exemplary environmental and cultural adaptation

But let us commence this story in the early 18th Century on the northeastern shoreline of the Arabian Peninsula, at the northern tip of the Gulf waters adjacent to the Tigris/Euphrates Valley, around a small bay on a promontory of low/lying, loose soft sand where the first settlement of Kuwait was founded. Here a Bedouin group named the "Bani Atub", a sect of the "Amarat" tribe of the "Anizah", had migrated from inner Najd of Saudi Arabia in the face of a series of terrible droughts to find a less difficult place to survive. Eventually they found this promontory, with its sloping shelf on the south of Kuwait Bay, with plenty of sweet water under the earth's surface, adequate pastures in the surroundings and a sheltered Bay with good anchorage. With the permission of the Turkish Pasha in Basra, who ruled this region, they settled the land.



Map of Kuwait published 1868, Berlin 1950 Kuwait with three historic walls Kuwait 1951

The name Kuwait, a diminutive of "Kut" or small fort, was igiven by the early settlers for the stronghold built in the center of the original tented encampment. In 1760 the first wall was built to protect the inhabitants from marauding, fanatical tribes of central Arabia. Its boundaries were known to be from "Naqaat Bin Nissif" in the east to "Naqaat Saud' in the west and measured about 750 linear meters, enclosing a town of approximately 12 Hectares, with a population of around 10,000.

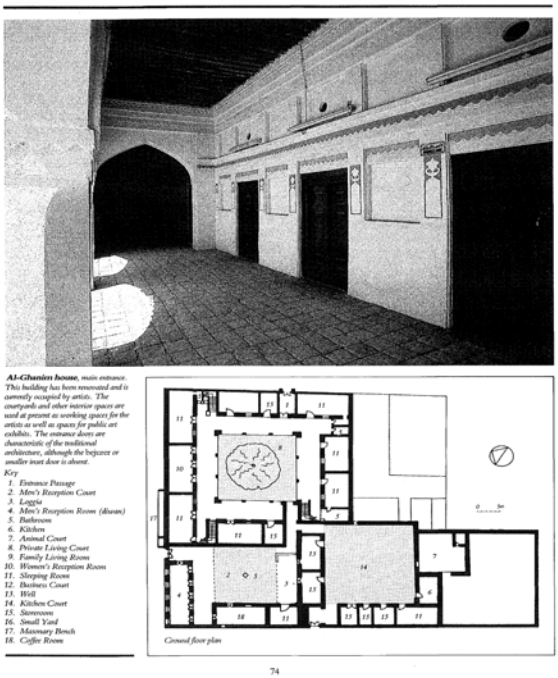
Gradually over time, as the town grew a second wall was built in 1811 encompassing an area of 72 Hectares. In the meantime the influence of the Ottoman Empire had waned and had been replaced by the British. In 1921, the third wall was built with a length of 6400 meters surrounding an area of 750 hectares and contained five gates. Before these walls were torn down, the town population in 1950 had reached 75,000 inhabitants, attesting to a compact and high density of 100 persons per hectare as related to gross town area. For nearly two hundred years the physical and cultural life of Kuwait remained as a traditional Arab port town. The merchants developed their sea commerce, using the indigenous boat building skills to craft sailing dhows, such as the, *"Bum","Baghala* and *"Batil*" to reach far-off places in India and Zanzibar; while the Gulf waters offered regional trade with Iran and Iraq and to bring fresh drinking water, with the gifts of the sea through pearling and fishing providing their daily livelihood.

In that momentous year of 1946 the main features of the traditional town were the dhow harbor, the Amir's Seif Palace, the customs house, and the entrance to the main souk with its open market place known as *"Safat*" that led to town gate and the Caravan sites and tents of traders and temporary settlers. Around the perimeter of other sections of the walls were the town cemeteries and the empty desert.

Inside the town, continuing along the "*Seif*" or seafront toward the northeast, past the British Political Agency (Dickson House), onto the British Residence and large courtyard homes of merchant families, in front of which "*dataches*"or long mud benches were placed for guests to view the port and make deals, was the fishing harbor, and at the nose of the promontory was the quarter called *"Dasman*" and the Palace of Sheikh Jabir Al Mubarak, which was used as the Amir's *Majlis* and European guest house. Along the sea front to the west was the American Mission Hospital and Ahmadiyah School. The town was organized into compact residential quarters or *"Fareej*", structured along tribal and ethnic affinities each containing local mosques, small retail areas and accessed

through narrow shaded lanes. Perhaps the most obvious characteristic of the town was its fine grain of one and two story buildings and the noticeable absence of open public space, especially no public green space. The locus of space was to be found in the inner courtyards of private dwellings.

Kuwait 1955



Traditional Courtyard House- Al Ghanim House

Traditional Kuwait Urban Quarter-Fareej

Architectural typology, language and materiality of the traditional town followed classic Gulf region courtyard forms. "Kuwaiti traditional architecture lay in its simple, functional and rational approach to vernacular design. (Can you say what rational means

in this context?) A comfortable living environment that responded to human, social, cultural and environmental needs was the dominant concept."The more wealthy homes had two courtyards, known as *Alhoush,* an outer court with *Diwaniya,* meeting room for male guests, and rooms for occupants, while an inner family court related to the female inhabitants and had its own separate entrance. A deep need for privacy, security and environmental adaptation characterized the house form. Orientation of courtyards to optimum solar and air movement generated a microclimatic adaptation to the harsh, arid environment. Coral stone or adobe wall construction covered in plaster with narrow rooms around courtyards covered by *Chandal* wood beam ceilings imported from Africa and palm fronds from local farms was the norm. The *Mashrabiya* or wood grilled windows were a distinctive feature that opened to the pedestrian pathways and allowed natural ventilation, reduced glare and provided privacy. *Mashrabiyas* and other fenestrations in walls demonstrated the inhabitant's love of geometric designs that provided a welcomed delicacy while at the same time omplementing the massive load-bearing adobe architecture. Great carved entrance doors of teak were imported from India and were one means of demonstrating the wealth of merchant families. Wind catchers ingeniously built into the walls, rather than protruding above the roof, became one adaptive technique for cooling interior spaces. Roof top night-time sleeping, with high, geometrically pierced parapets to provide privacy and ventilation, became another adaptive pattern.

Only the Seif Palace on the harbor, built by Sheikh Mubarak in 1907 over his stables, was a complete "import". Built of imported yellow brick with arched openings and large "*Orosi"* glazed windows looking out to the sea, the architectural style was characteristic of Basra and southern port architecture of Iran. A later text in Arabic over the front door to the palace reminded the ruler of the need for humility and his transient position in life. It read: "If others were able to hold it forever, it wouldn't have reached you."

FOCUS GROUP COMMENTS-OLD KUWAIT

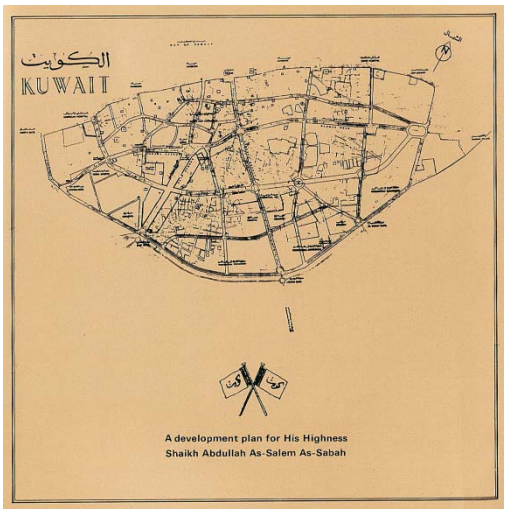
The Focus Groups almost unanimously agreed that the traditional Kuwaiti built forms were sustainable and adapted to the hot/arid environment and the cultural values of the inhabitants. There were problems, however, in times of heavy rains – mud-brick could become brittle and break, causing walls or rooves to collapse. They also commented that they may not fit the broader needs of today's people.

NEW KUWAIT – The Beginning of Environmental Forgetfulness

The Master Plans- 1952 to 2003

Oil was discovered by the British in Kuwait in the 1930s, but it was not until 1946 that the first oil tanker was loaded and the modernization process began in earnest. As a result of rapid urban growth, the Municipal Council of Kuwait in 1952 commissioned the English firms of Minoporio & Spencely with P.W. MacFarlane to prepare the first Master Plan of Kuwait. The Seven Goals of this plan belie betray the emphasis of attitude of the planners and the client: modern road System; zoning of land use inside and outside the

third wall; sites for parks & sports; creation of a dignified town center-focus on Safat Square; tree planting; and the provision of improved roads linking Kuwait to adjoining towns and villages.



First Kuwait Master Plan 1952

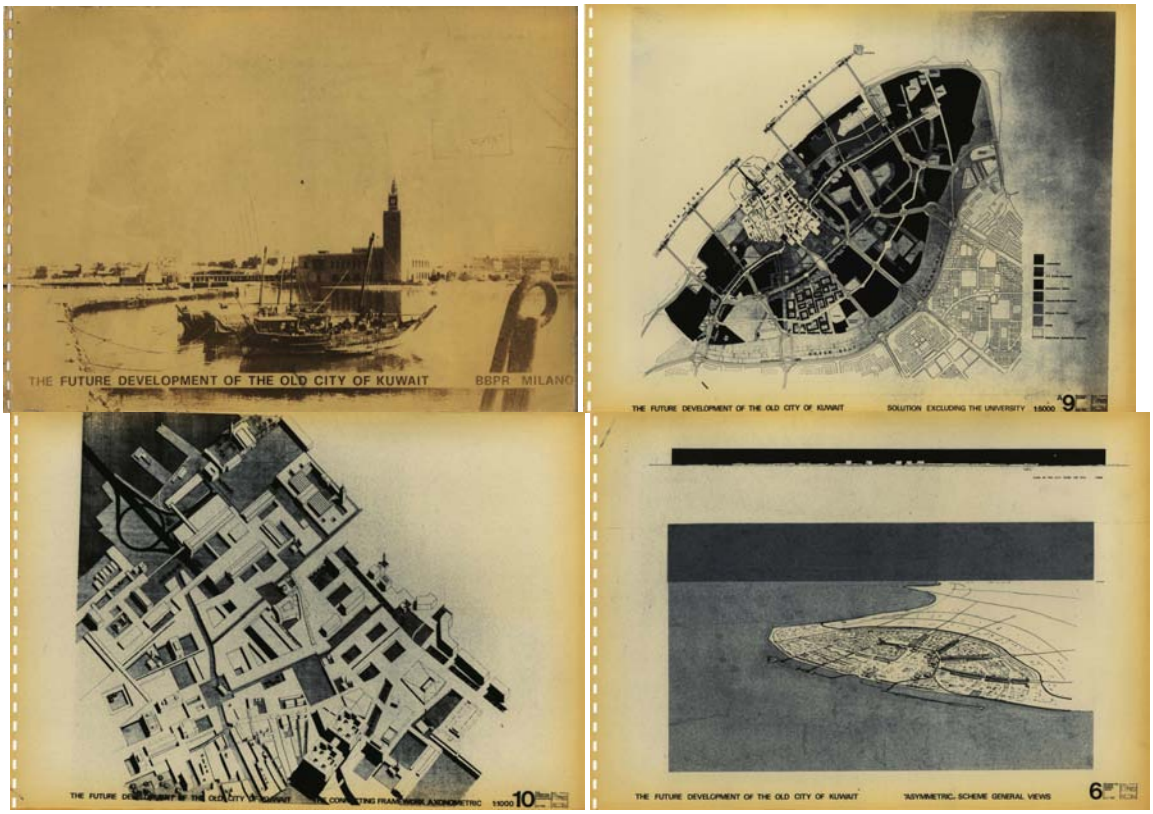
Kuwait City Center-Aerial Photograph-1967

Kuwait- 1980

The plans were based upon English Garden City models of Ebenezer Howard." The main result of this plan was that the old town inside the walls was slowly abandoned by the wealthy that moved out to the large plots in new quarters provided outside the wall along the newly planned First to Third Ring Roads. In 1961, Kuwait became an independent nation. By 1967 the population of Kuwait, due to increased investments of the oil industry in the country, grew to 467,000. The Kuwait City Planner, Saba George Shiber in 1964 observed: "Kuwait literally exploded from a small village to a fast-urbanizing regional metropolis in just over twelve years."

In 1969, a most thoughtful and sensitive study for the regeneration of Old Town Kuwait was proposed by the Italian team of BBPR, headed by Professor Ludovico Belgiojose. Based upon a survey of historic Arab cities from Morocco, Egypt, Damascus, Yemen and examples of western old town regenerations, the urban design

recommendation was to create a new *Kasbah* or urban core connecting the Seif Palace to the rehabilitated Old Souk and in between relegated to the place of government, mosque, commerce and an urban university, much like Al Azhar University in Cairo or Edinburgh University in Scotland. Upgraded courtyard residential quarters would surround this renewed "Heart of Kuwait". The proposal also structured an option for new roads and sub-grade utility lines along the historic pathways of the town with high density, mixed use linear development that would border the *Kasbah* and reach out into the Gulf creating new harbors, offering the public direct contact with the water and allowing traffic to make "U-turns". In this manner the character and life of the Old Town would be maintained and enhanced, while the New Town would be built outside the walls.



BBPR Proposal for the Future Development of the Old City of Kuwait, 1969

Regrettably, these sustainable proposals were never realized. The Municipality, instead, modified the master plan to accommodate the continuing growth and extended the city to the 6th radial road and in a linear form along the eastern coastline. The Old town continued to be emptied and neglected.

The Second Master Plan of 1970 by Colin Buchanan & Partners, with three advisors including Sir Lesley Martin, Dr. Omar Azzam and Prof. Franco Albini, expanded the area of the city to 25,000 hectares with a projected population of a fast growth of 2 million by 1985 or a slow growth by 1997. The Plan had three parts: A National Physical Plan for the whole country; Short Term Plan for the urban areas and a Plan for Kuwait City. By this time the Old Town of Kuwait and its traditional pattern had been demolished, except for the Seif Palace, a few mosques, some *Diwaniyas* and the American

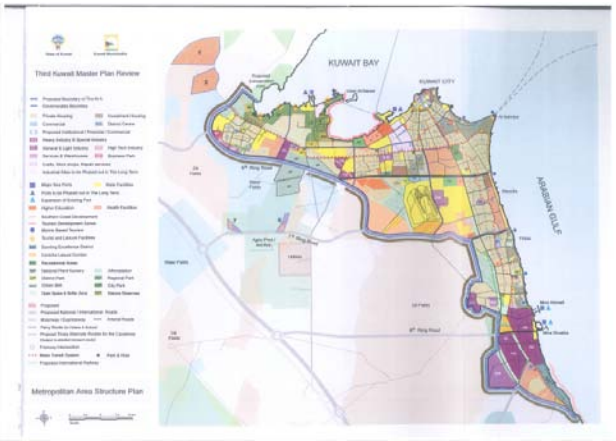
Mission Hospital. Fahd Al Salem Street became the fashionable avenue with modern Bauhaus style buildings and Safat Square became the focus of public institutions.

When the British withdrew from the Gulf in 1971, a greater American influence in Kuwait and the Gulf commenced. The Master Plan was once again revised, this time by Shankland Cox Partners in 1977 for an ultimate year 2000 population of 2.76 million and the idea of three urban centers was proposed- Kuwait City at 1.7 million, Subiya in the North and Khiran in the South, each with half million population. As a part of this plan for the areas inside the First Ring Road, all obsolete (traditional) dwellings were to be demolished to make way for higher density housing inside the old city. The pattern, however, had already been set- the wealthy and middle class were located outside the old town, while some lower income moved to the old town, which by and large became a place for daytime government and commercial offices, retail and vast open plots of sand held for future development. The new old town was a shell that had minimum life at night when the commuters left for the suburbs. The vibrant traditional old town was no more.

The Master Plan of 1983 (Second Review) by Colin Buchanan continued the three part study and projected a 2005 population of 2.5 million with 2 million in Kuwait; 250,000 in Subiya and 115,00 in Khiran. These two towns never came into being. A 55% Kuwait and 45% Expat mix was projected. Needless to observe, that this demographic mix never came to be as wealthy Kuwait imported labor from the sub-continent and the Philippines and began to be ever so dependent upon the Palestinian population for its second tier government staff. A car dependent transportation network, commenced in earlier plans was reinforced, while an International railway network to Iraq and Saudi Arabia and hovercraft service to Failaka Island were proposed. Other well intentioned proposals, but far too late, included the conservation of any remaining historic buildings; the requirement that all major developments should submit an environmental impact assessment; a solid waste reclamation system; and coastal management zoning control. Few of these initiatives were realized.

During this period, several international architects were commissioned to design key landmarks of the city that suddenly put Kuwait on the world spotlight, but dramatically changed the architectural character of Kuwait and over time the entire region. Kenzo Tange designed the International Airport in the form of a 747 airplane, Jorn Utzon conceived the National Assembly as a great series of concrete Arabian tents, Reima Pietila was inspired by the silhouette of the camel in his post-modern design of the Ministry of Foreign Affairs, while the Kuwait Water Towers by Lindstorm, Egnell and Bjorn from Denmark, which won the Aga Khan Award for Architecture in 1980, seemed to be sculptural forms imitating traditional perfume bottles. Since Kuwait at that time was the leading, progressive state of the GCC, it became a source of emulation; the ripple effect upon the other fossil-fuel-rich Gulf States was only a matter of time and circumstance.

Third Master Plan Review, 2003- National Plan



Third Master Plan Review, 2003- Metropolitan Kuwait Plan

Kuwait City Center-Aerial Photograph 2002

Third Master Plan Review, 2003- City Center Plan

To conclude the review of urban planning in Kuwait, in 1990 Kuwait Municipality commissioned SSH of Kuwait to develop a Third Master Plan, which was only completed in 1997, due to the Iraqi invasion of 1991. This plan projected a population of Kuwait by 2015 of 3.8 million and the urgent need for the creation of the two towns of Khiran and Subiya to accommodate 1.5 million people. In 2003, during a period of major regional geo-political events, Kuwait Engineering Group (KEG) in association with Colin Buchanan & Partners were commissioned to review and update the SSH plan. The Third Master Plan Review (KMP3R1) projected a population of 5.4 million by 2030 (with 35% Kuwaiti/65% Expatriates) and observed that 99% of the population that had already reached 2.6 million in 2004 resides in only 8% of the total area of the country. The need to develop Khiran and Subiya had become critical, yet still little effective action on these initiatives was taken.

A number of unforeseen circumstances, meanwhile, severely impacted Kuwait. These included the *Azmat Souq Al Manakh* financial fiasco in 1983 and the Iraq/Iran war (1981-1988), which delayed many of the planning policies from being implemented. The final blow came in 1990 with the Iraqi invasion of Kuwait and the subsequent disastrous burning of 700 oil wells by the retreating Iraqi Army followed by the US

liberation in 1991. However, with the Iraqi situation insecure and in tension until 2003 and even more so till today, the repercussions on Kuwait have perpetuated a sense of insecurity that has precipitated a standstill in its political, business, cultural and academic institutions and have compromised the city's growth in a coherent manner. Vast tracks of empty sand-filled spaces dot the urban core, their private or government related owners flipping development schemes and waiting for land prices to increase, but hesitant to build. As a result, the country has never been able to regain its regional leadership in intellectual, educational and commercial terms and the first shoots of democracy and openness that it had enjoyed in the 1970s and early 80s have become embroiled in tribalism. In the late 1990s the Bedouin tribes of Kuwait gained through public elections the majority vote in the National Assembly. Characterized by strong conservative Islamic tendencies, they have also pushed for a more pervasive welfare state for their constituents, checkmating the government representing the Amir and the old establishment of the urban elite. The so-called regional beneficiaries of this stagnation were the other GCC countries, with Dubai at the forefront. The environmental and cultural forgetfulness in the new built environments that Kuwait had sparked under the rubric of globalization, with the importation of contemporary architectural Icons and life patterns from other civilizations, soon spread as a "contagious allergy" or a "blessing", depending upon one's point of view, and was heightened by the vast new income from oil, gas, land speculation and entrepreneurship that has become evident in the recent urban development's of the UAE, Qatar, Bahrain and Saudi Arabia.

Kuwait oil fires after Iraqi Invasion-1991 Periodic Dust Storms Rolling over Kuwait

FOCUS GROUP COMMENTS- NEW KUWAIT

- One Focus Group participant observed that: "It was just a physical plan, without a holistic study of environmental/social/cultural/economic concerns"

- The Focus Group on Development observed that, "It should not be forgotten that 94% of all the land of Kuwait, especially in the urban core, is owned by the

government. Therefore, there was and still is little room for new initiatives to be taken by the private sector"

- In the Focus Group sessions in Kuwait, a most telling observation was made by a senior government official with regard to all the history of master plans in Kuwait: "(Thus far), the master plans have followed people, instead of people following the master plans." But if 94% of the land was owned by the Government, then it must have been government related people to whom this reference has been made.

- One Focus Group member said: "We have to understand that 60 years ago, this was a fishing village and we lived in mud buildings… So, we are talking about only one or two generations, including myself that now live in a **virtual world**."

The Focus Group sessions and interviews, to the extent that these provided insights, sought to identify institutions and new initiatives that could provide effective sustainable strategies that could be utilized in Kuwait today and in the future. There are currently no internationally recognized sustainable criteria, such as the Green Building Council LEED, BREAM or other similar systems required by government agencies for new development projects in Kuwait. Perhaps one or two building projects through their own initiative are using LEED standards. The consensus among focus group respondents indicated that due to highly government subsidized electrical and water rates, there is little incentive among Kuwaitis to consider sustainability in most of their design and life activity patterns. The only institutions or recent activities that were active in the sustainability field that we were made cognizant of included:

ROPME- the Regional Organization for Protection of the Marine Environment was founded in 1979 by the 8 countries surrounding the Gulf waters and uses the designation of ROPME SEA AREA (RSA) for this body of water and has been headquartered in Kuwait. It is a part of the United Nations Environmental Program (UNEP). ROPME is one of the important organizations to mitigate the harms on the marine environment. Its responsibilities include the environmental monitoring and assessment of the marine life and establishing protocols and conventions for its safeguard. The main source of data on the RSA is from NOAA/AVHRR sensors, Landsat-EROS, SIR-C/NASA, and Radar SAT. Ropme reported that the RSA is one of the most polluted bodies of water in the world mainly due to seven factors:

- Oil seepage- more than 1.2 million barrels of oil are spilled into the Gulf annually by the combined oil industries of the oil producing countries, mainly from their offshore wells and the oil tanker traffic, discharge of tanker ballast water has introduced alien micro algae that has caused vast algae blooms harmful to marine and human life;

- Recent urban development and industrialization along the coastline- dredging and reclamation to extend coastal frontage has damaged coral, sea grass, mangroves and the inter-tidal zone where most of the micro-organisms of marine life are hatched. Desalination plants, largest capacity in the world, have discharged harmful brine into the Gulf, while outlet pipes with high temperature discharges have killed entire marine zones;
- Three wars- the leftover environmental destructiveness caused by 700 burning oil wells from 1991 Iraqi invasion of Kuwait, more than 500 hundred sunken ship wrecks, land mines and depleted uranium ammunition, the destruction of the marshlands of southern Iraq(largest in Middle East) which had served as a giant "kidney" to filter all the pollutants of the Tigris/Euphrates before they reached the Gulf
- Fragile ecological nature of the RSA-High temperatures, high saline, low oxygen rates and slow flushing of the Gulf results in a particle of water entering from the Straight of Hormoz to take an average of 3 years to circulate out, with bottom flushing in certain areas of Bahrain requiring 6 to 7 years, thus causing high build up of sediment pollutants. The predicted IPCC sea rise due to Global warming in the next 20 years in the RSA will average about 1 meter, whose impact is estimated to destroy 30% of the Gulf wetlands and major coastal urban areas will be lost.

KISR- Kuwait Institute of Scientific Research publishes research reports on adaptive plants, vegetation and low water irrigation systems for more suitable for use in Kuwaiti environment. Additionally, it has made studies regarding energy management systems for buildings and is working with MIT to do a pricing strategy for electrical consumption.

EPA-Environment Public Authority is the primary environmental regulatory agency of the government. It has a sustainable development committee, but due to fragmentation of responsibilities between other government entities, it is mainly effective in marine related projects that require an Environmental Impact Statement.

MEW- Ministry of Electricity and Water- Since 1983 the first Energy Code in the region has existed regulating eight watts of electricity per square meter of useable space. All projects must meet these regulations before a building permit is issued. However, in theory once the building is built, the occupant can leave the A/C on 24/7 and open his windows as well, so there is no control on actual consumption of energy.

DASMAN CENTER- A recently instituted public entity dedicated to research and education about healthy living-primarily looking to the future of the country, with a

focus on diabetes, obesity, hypertension and general life pattern improvements for sustainable living.

Kuwait Engineers Society- In 2008, a successful summer campaign to raise awareness and reduce electricity use in Kuwait was undertaken by KES and MEW. The idea was simple: Ads, newspaper articles and telephone calls by volunteers with a basic message: "Turn off your electricity when you go off for summer vacation." They proved that within eight weeks the initiative managed to save an equivalent of 20 million KD worth of electrical consumption in Kuwait. This NGO action may serve as a reference for other social activism to encourage greater sustainability awareness.

VISIONARY PLAN

In January, 2010, the Kuwait government announced plans to spend up to 40 billion dinars ($139.9 billion) on its proposed five-year development plan. The plan, if implemented, would be the governments first since 1986. The budget of the government plan which runs from 2009 to 2014 still needs to be finalized.

The plan aims at diversifying the world's fourth-largest oil exporter away from oil, attract more investments into the Gulf Arab state, and boost the participation of the private sector in government projects. The five-year plan sets out a spending program under which the government will inject $125bn into the economy through a series of projects and the creation of new construction and engineering companies, which will be 60 per cent owned by the public. Amongst the plans awaiting funding are Silk City, a new town whose blueprint includes the world's tallest tower; a new container harbor and 25km causeway; a railway and metro system; and Project Kuwait, a complete overhaul of oil production infrastructure.

Kuwait desperately needs to diversify its economy and create jobs for its people. The five-year plan is a step towards making this happen and, for once, it seems the government and parliament are in accord – a majority of lawmakers voted for a draft version of the bill in early January, 2010.

Proposed concept for Silk City-Subiya, Kuwait

FOCUS GROUP COMMENTS- on Environmental Sustainability

The four Focus Groups participants were asked to comment on several questions related to sustainability:

- There was a wide diversity of opinions on the definition of sustainable development as presented in the Bruntdland Commission Report which stated: "Sustainable development is development that meets the needs of the present without compromising the ability of future generations to meet their own needs." Comments were made that 'flexibility', 'culture and economic dimensions' and 'strategies for implementation' should be added to this definition; it was observed that most third world countries are not politically and economically stable, therefore not able to achieve sustainable development- case in point is Kuwait; while a minority objected that the basic thesis is flawed because humanity is a scavenger and not a good Samaritan by nature- to quote one participant: "The capitalist mentality is always to make most of what they can do. They don't look at the future to the extent that the welfare of the people should be considered."

- To the question: "How do you react to the 2007 IPCC Assessment Report that states: "There is unequivocal evidence of a warming climate with human activity as the dominant cause", there was almost unanimous agreement by the participants, but environmental education and awareness campaigns are necessary to spread the word.

- "How much awareness of sustainability is there in Kuwait now and to what extent is anything being done about it?" The respondents overwhelmingly observed that since we live in a welfare state where no taxes exist and electricity and water are heavily subsidized (actual electrical cost is 26 Fils/KW/Hour while the government charged rate is 2 Fils/KW/Hour) and few nationals even pay their bills, there is little incentive to be sustainable. Furthermore, there is no political will by either the government or the National Assembly to confront and control the issue of sustainability. However, it was observed that, "Kuwaitis are very creative, if you give them the right "Driver"- economic and social incentives to be sustainable could be those drivers."
  On the issue of awareness, one Kuwait University Professor said: 'Some young Kuwaiti students have started a magazine called *Envy* and some of the students write about environmental issues."

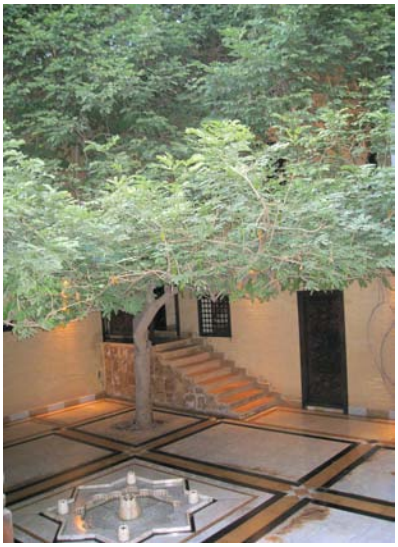
- To the question: "What policies and actions is your country taking to support environmental sustainability?", the observation made was, " Kuwait has divided the tasks under different ministries and agencies, therefore there is no single body responsible for holistic, coordinated action. This has caused jurisdictional disputes between agencies and little progress is ever made."

- In response to the question: "Is the "Green Impulse" popularly supported? Is it a direct expression of deeper ethical beliefs within the society?" One member said:

"I'd like to know what might be a deeper base to moderate sustainability from a cultural point of view... Are there such operative things? Can it be touched? It's like a well. Is there any water in this well? Can we draw from this well?" Another member responded: "In this region we have the Islamic culture and it can really have an influence if it is done properly, but we are always at extremes…
So, I think there is, like a foundation, there are principles that can be used to approach the issue of sustainability and how to do so properly."

In terms of urban sustainability, the Focus Groups agreed that Old Kuwait manifested compact, high density, mixed-use urbanism that was well adapted to the environment and culture of the people. They were sympathetic to the observations that the New Kuwait with its low density suburban development since the 1960s with its coincident traffic generation of massive private car movement; its single use new communities and isolated land use pattern of developments; its architectural typology change to imitate western building styles that are less-adaptive to the desert environment with the consequent dependence on 24/7 air conditioning leading to Kuwait being one of the highest energy users per capita; its growing landfills of waste; its desire for green public and private open spaces in lands of scarce water and harsh sun; its nurturing of a somewhat complacent citizenry due to the welfare social situation of the country; that all these tendencies are leading to a situation that may theoretically be at the tipping point of sustainability by some standards, but that so far economic prosperity has enabled Kuwaitis to not be confronted in real terms with the actual dangers of climate change and the environmental crisis.

NOTABLE ENVIRONMENTALLY AND CULTURALLY SUSTAINABLE CONTEMPORARY PROJECTS
(Observations made by various Focus Group members)



Sheikh Nasser House by Hassan Fathy

Arab Organizations Headquarters Building
by Pan Arab Consulting Engineers-Kuwait, 1995

Sharq Souk Waterfront-KEO, 1996 **Khiran Development- Buro Happold, 2005** **The Avenues Mall- Noor Consultants, 2007**

Nevertheless, with regard to the environment, a recent article in the Kuwait Times stated that: "Kuwait is one of the most polluted countries in the Gulf region, with its marine life, atmosphere and soil degrading to alarming levels", said Dr. Hamad Al-Mutar, Head of Kuwait's Green Peace Organization and a Chemistry professor at the Kuwait University. Among other reasons, he cited that the aftermath of the burning of more than 700 oil wells during the 1991 Iraqi invasion had left thick, black clouds that contained several hydrocarbon substances which harmed all aspects of the environment for at least five months and Kuwait's soil has consequently been almost completely polluted (ninety million square meters contaminated), adding that this has a detrimental effect on local agriculture, making produce unfit for consumption. Umm Al-Haiman area is considered the most-polluted area in the country, noting that the Environment Public Authority (EPA) had previously informed the Cabinet about the area's unsuitability for inhabitation due to it close proximity to oil refineries in Al-Shuaiba. The pollution due to the Mishref sewage plant spill into Kuwait's shorefront and marine life has produced a

major hazard. The 'Umm Al-Qawatti' area, located in the northern part of the country, has been used by the Kuwaiti Army as a 'dumpster' for unloading waste. It is also contaminated with depleted Uranium, which has been responsible for the rising cancer rates in the country, as reported Al-Qabas newspaper. Dr. Al-Mutar concluded by saying that: "Although the situation in the country has not reached the red zone yet, it has crossed the 50 percentage mark." He called on activists and the Kuwaiti public to continue placing pressure on the government to save Kuwait's environment.

In a summary of one Focus Group, the moderator observed that the respondents had hit upon a paradox:

"We have nostalgia for the desert and yet we go there and mechanize it and ruin it"
"We have an environmental policy that has much of the legislation that is needed and the energy saving code, yet it's hardly applied."
"We live in a desert, yet we dream of a green mountainous paradise"

PLACE OF EDUCATION- AL SHADADIYAH CAMPUS

Background Definition

Kuwait University is a public university supported by the state of Kuwait and was established in 1966, five years after Kuwait became an independent state. Expanding from a small institution comprised of College of Science, Arts and Education and a Women's college with 480 students and 31 faculties, it has since grown to 7 scattered campuses and more than 20,000 students with 1200 faculty. These campuses were all converted from existing high school buildings.

In 2003 Kuwait University acquired a 3.5 H site along the 6th ring road in south Kuwait, to which an additional 1.5 H plot was added for the Medical campus. In 2004 the National Assembly approved the establishment of the New University City to accommodate 30,000 students by 2025 and the transfer of all university facilities to this new campus within 10 years, with the proviso that the new Government mandated law of Separation of Student Sexes (SOSS) be implemented in the new campus. Thus the University City had to be designed composed of two separate campuses, one for males and one for females. A Canadian Consortium was selected to master plan the new campus.

Kuwait University, Shadadiyah Site Location

FACT SHEET

CLIENT: Kuwait University
SITE AREA: 520 HECTARE SITE.
STUDENT ENROLEMENT: 30,000 STUDENTS BY 2025.
GROSS FLOOR AREA; 1,440,000 gsm
BUDGET: $3.5 BILLION
PLANNERS: WZMH/CCA & SSH, CANADA/KUWAIT 2006
ARCHITECTS: NBBJ/Gulf Consult: College of Engineering & College of Science
CAMBRIDGE SEVEN/ GULF CONSULT: College of Business Administration
SOM/Gulf Consult: Sports Center
SSH/Perkins & Will:
PROJECT MANAGERS: Projacs/Turner

Master Plan for the New University City

From 2004-2006 the Canadian Consortium Architects (CCA), working with Educational Consulting Services Corp as educational programmers, was selected to participate in the development of a Master Plan for the consolidation and relocation of Kuwait University to a new location. The new 520 hectare Al Shedadiyah campus site was designed to support 30,000 students and serve the needs of the university and community to 2025 and beyond.

ECS, in association with institutional partner, the University of Ottawa, was the Educational Consultant on the project team responsible for conducting a review of Kuwait University's strategic vision and goals, academic plans, research, and instructional delivery methodologies in the context of the international university standards and practices. ECS also prepared detailed functional space programs and space requirements for each of the 13 academic colleges, and University level administration and support spaces totaling 1,440,000 gsm. The space plans were based on the institution's strategic vision, enrolment projections, program offerings, research

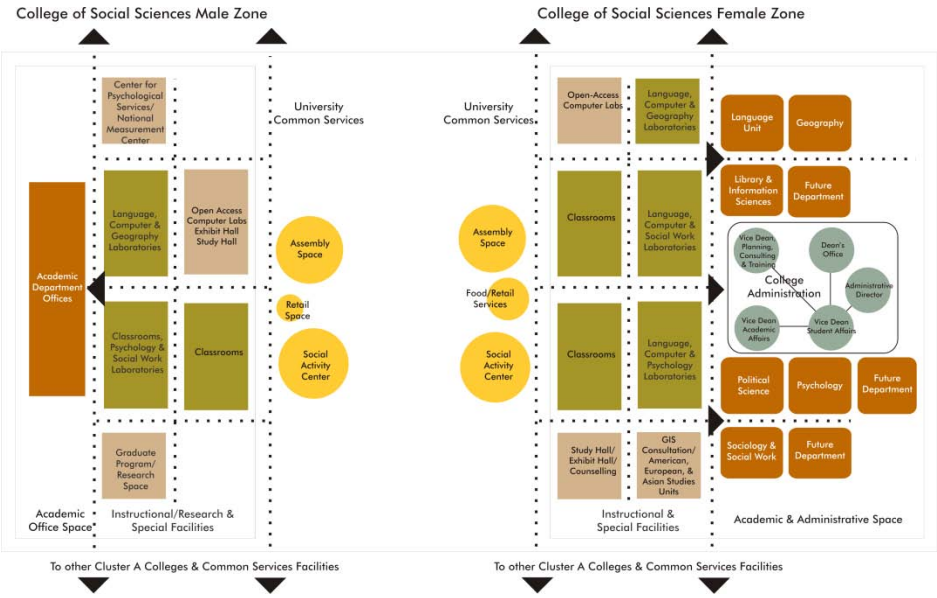
activities and an assessment of ancillary functions. The results of ECS' work guided the development of the Campus Master Plan prepared by the project architects.

The Master Plan was conceived as a" city on the banks of a river" – the "river" metaphor being realized as a landscaped palm oasis. Two linear campuses on each side of a wide oasis over one kilometer long formed the basis of the design. The ends of the main campus became anchored on one side by the medical campus with a 600 bed teaching hospital and the other by the outdoor sports center. The main student social, fitness, recreational, dining, and retail facilities are centered along the main spine. Each linear campus is organized along a covered, A/C Galleria that provides access to each academic facility and creates the "High street' of identity for the students and faculty. A linear underground service tunnel provides for an independent route for infrastructure, utility and service access.

A major element of the design focuses upon the fact that the entire student body will commute to the new campus, thus necessitating significant car parking with 33,400 car spaces, covering approximately 1/3 of the entire site. It has been projected that nearly 90% of students and faculty will commute unaccompanied, while 10% may be chauffeured or share rides.

Kuwait University Colleges in Shedadiyah Campus:

- College of Arts
- College of Education
- College of Law
- College of Shari'a and Islamic Studies
- College of Social Sciences
- College of Business Administration
- College of Engineering
- College of Science
- College of Women
- College of Applied Health Sciences
- College of Dentistry
- College of Medicine
- College of Pharmacy
- Sports Center



MASTER PLAN/PHOTOS OF PROPOSED DESIGNS

Master Plan of Kuwait University in Shahdadiyah, Kuwait

Concept Sketches of new Kuwait University-Shadadiyah Campus

Concept Sketches of new Kuwait University-Shadadiyah Campus

FOCUS GROUP COMMENTS- SUCCESSES & SHORTCOMINGS OF NEW KUWAIT UNIVERSITY

Some members of the Focus Groups observed that several key decisions regarding the new university master plan render the sustainability of this place of education as being far less than desirable:

1. Location of isolated, gated campus far from center of city population

   Isolation verses integration of the university campus, especially as a single use entity, within Kuwait City is an issue that works against sustainability principles. The items of concern are that dependency upon a car dominated commuter college model, lack of mixed use potential; lack of integrated potential for multi-use of educational facilities by other town residents. Granted that the history of the scattered campuses of Kuwait University in existing urban pockets of Kuwait had certain difficulties of traffic congestion and overcrowding, the sustainable benefits of urban integrated place of education vs. isolated campus setting seems to not have been adequately considered in the decision to completely isolated the new campus on the 6th /7th ring road.

2. Decision to make a commuter based campus

   The master plan anticipates that nearly all students and faculty/staff will travel to and from the new campus by car. If current patterns prevail, nearly 90% will travel unaccompanied and the remaining 10% by chauffer or accompanied by another passenger. The predicted traffic volumes will significantly result in carbon emissions that will exacerbate climate change concerns, while creating vast hard paved parking lots that will occupy over 1/3 of the campus or nearly 150 hectares of paved asphalt, generating large heat radiating surfaces and thus increasing microclimate temperatures. Alternative public transit policies and behavior patterns might be investigated to overcome this issue.

3. Decision to have a segregated male/female master plan

   This strategy resulted in a dramatic increase in the required built area for teaching facilities and staff offices. Undergraduate teaching laboratories and instructional facilities had to be duplicated. 30% extra staff offices were allocated in the men's campus to facilitate temporary accommodations of staff during office hours. According to the Bulletin of Committee to Defend Women's Rights in the Middle East (2002), "the cost of segregating classes is estimated at more than $180 million".

4. Is the built form the most appropriate in terms of sustainable passive design?

   The optimum physical form would be circle, square or fat rectangular volume of compact, dense courtyard typologies with a solar orientation slightly tilted to the

NW/SE. The proposed master plan for the two male and female campuses is based upon exactly the opposite design with a linear, thin elongated order of compact, courtyard buildings oriented to the NE/SW. This means increased solar exposure of buildings, more heat gain and greater need for solar shading of openings, thus increasing energy, a/c and architectural cost.

While the central linear Oasis is aligned with the prevailing NW wind direction that may provide micro-climate cooling to the oasis, the predominant place where most student/faculty occupation will be opens its courts to the NE and SW where least cooling breezes occur and surrounded by vast paved parking lots. Therefore in terms of a master plan level, the evaluation of sustainability suitability is poorly addressed.

5. With regard to how do the individual architecture of the classrooms, laboratories, dormitories and administration buildings, let alone whole campuses, adapt to this ecologically arid hot and water-stressed environments, there seems to be a lack of specific standards such as LEED or WWF One Planet Living Principles and requirements stated by the University. It is important to observe that environmental consciousness and sustainable technologies are not only changing the way educational buildings are being planned and built internationally, but can be used themselves as the means to teach and research sustainable design and the protection of environmental resources and raise awareness in the student body and to use the campus as a model of sustainability for others to emulate.

6. Cultural identity-Apparently, one of the requirements of the University to the architects was to provide an architectural image that reflects Muslim and Kuwaiti identity. As the final Architectural designs have not been fully released to our inspection, it would be premature to comment on this topic at this time. The very early images shown in this report indicate an attempt at environmental adaptation through shaded pathways, but lack adequate detail to evaluate building sustainability. The issue of cultural relevance and esthetic identity seems to have had less attention paid to it at this stage.

CASE STUDY- Doha, Qatar

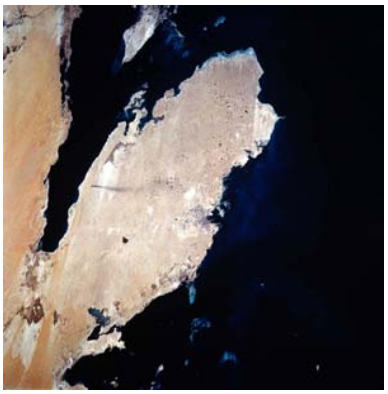
THE VISION OF DOHA

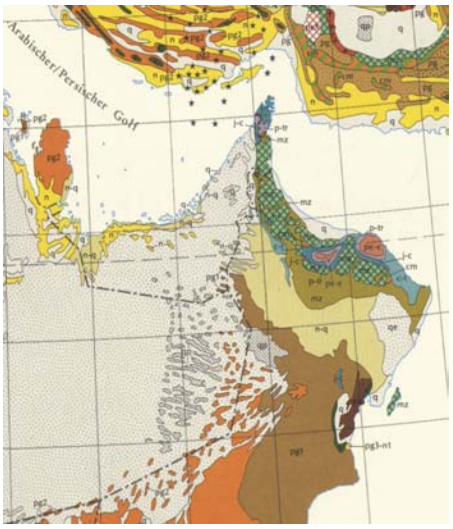
"A meeting, not a melting of cultures-
A Modern state in the context of Arab culture, tradition and religious beliefs-
As the mother is the centre of the family, the family is the centre of the community and the state-
Islam has always guaranteed the full rights of women, and women have always occupied a central role in Islamic civilizations-
A culture of quality firmly rooted in the infrastructure of our country.
An environment of freedom, creativity, innovation, communication, meeting and interacting-"

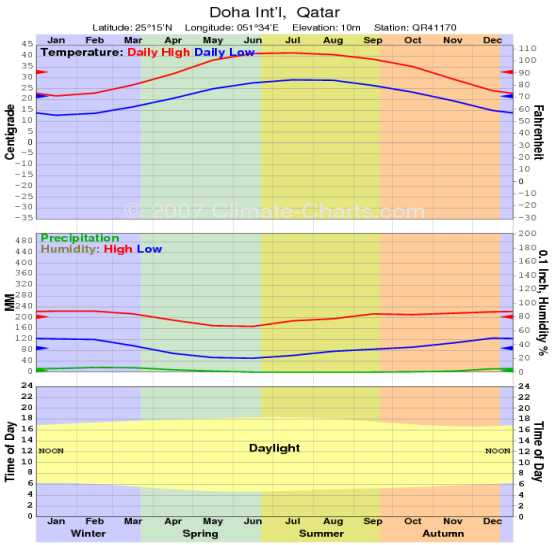
HH Sheikha Mozah Bint Nasser Al-Missned

CONTEXT

Qatar is situated as a "hand" extending out from the eastern Arabian Peninsula into the Persian/Arabian Gulf, and as such its climate is very hot and semi- humid. Temperatures average over 38 °C (100 °F) from May to September, and humidity is variable. Dew points can reach above 25 °C (77 °F) in the summer. During the summer months, the city averages almost no precipitation, and less than 20 mm (0.79 in) during other months. Rainfall is scarce, at an average of 75 mm (2.95 in) per annum, falling on isolated days mostly between October to March. Winters are mild, and the temperature rarely drops below 7 °C (45 °F).







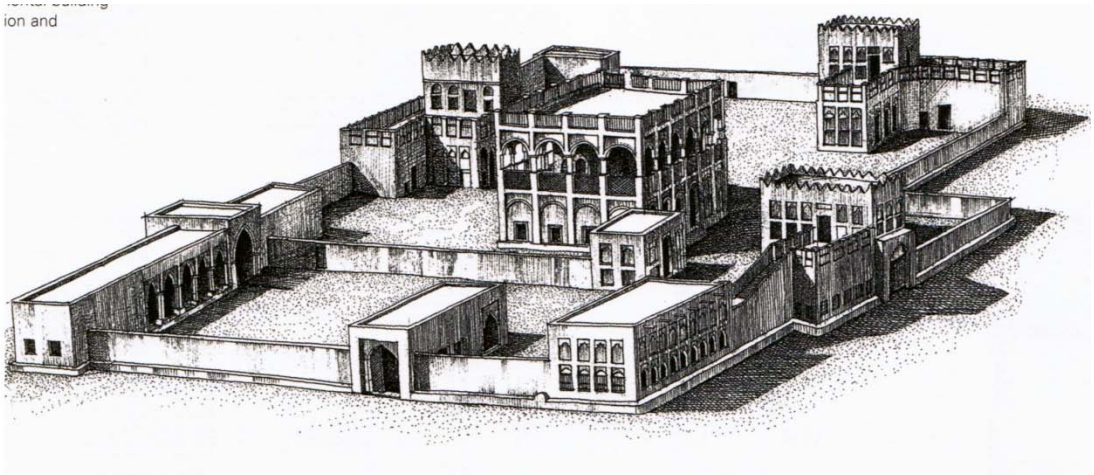
OLD DOHA- EXEMPLARY SUSTAINABLE URBAN FORM

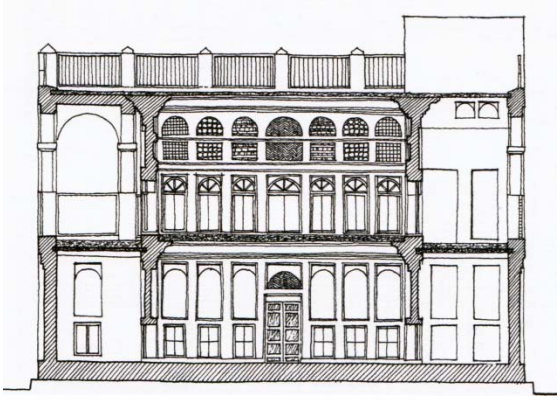
In 1825, the city of Doha was founded under the name **Al-Bida**. The name "Doha", may have come later, possibly derivative of the Arabic *ad-dawha*, "the big tree." The reference is said to have been to a prominent tree that once stood at the site where the original fishing village arose, on the eastern coast of the Qatar peninsula. It might have been derived from "dohat" — Arabic for bay or gulf — referring to the Doha bay area surrounding a Corniche. Fishing and pearling constituted the primary economic activities of the settlements of Qatar. The town of Doha, with Al Khor to the north and Wakrah to its south, developed along the eastern coast, with their backs to the central desert and the NW *Shamal* winds, they faced the Gulf waters to the east. Doha grew in a linear, compact form along the coast and was structured with typical components of a traditional Gulf port town, consisting of a dhow harbor, fort, ruler's palace, souk, mosque and residential quarters known as *Fareej* or *Furqan.*

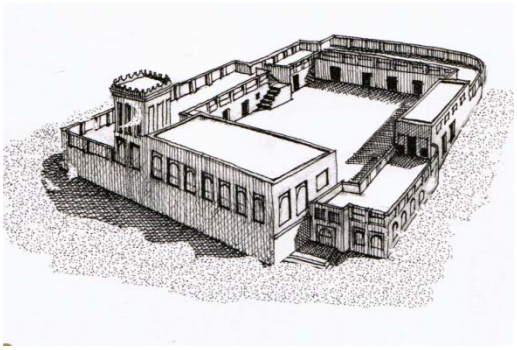
Qatari traditional architecture suggests their builders came from Persia or were influenced by its port architecture- the main difference being the to amount of finance and building material available. Therefore, the architecture was simple, orthogonal cube-like structures based upon a central courtyard and the inward oriented life of the home. Privacy, security and environmental adaptation to the harsh climate motivated the form typology. Completing the pattern were load-bearing walls of stone from central Qatar rendered in adobe with minimum openings to the exterior, palm trunks and frowns for the roofs, porches or *Talars* facing north or east provided a transitional outdoor sitting space while shading the narrow rooms, gypsum highlights and geometric decoration. Occasionally, *Badgirs* or wind towers were used by the wealthier homes, while wind catchers in walls were more common.

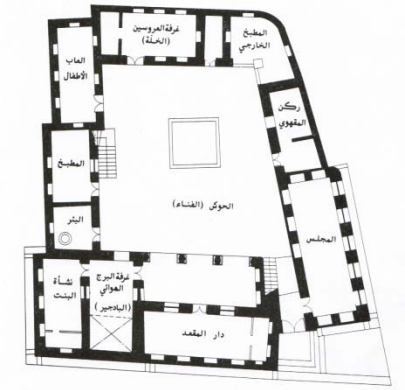
In 1882, Al Rayyan built the Al Wajbah fortress, in southwestern Doha. The following year, Sheikh Qassim led a Qatari army to victory against the Ottomans. At the end of the 19th Century Sheikh Abdullah bin Qassim Al Thani began to build the Old Emiri Palace, which went through a number of modifications, additions and recent restorations. It remains today an

outstanding monument of Qatari Architecture and serves today as the National Museum. It received the Aga Khan Award for Architecture in 1980.

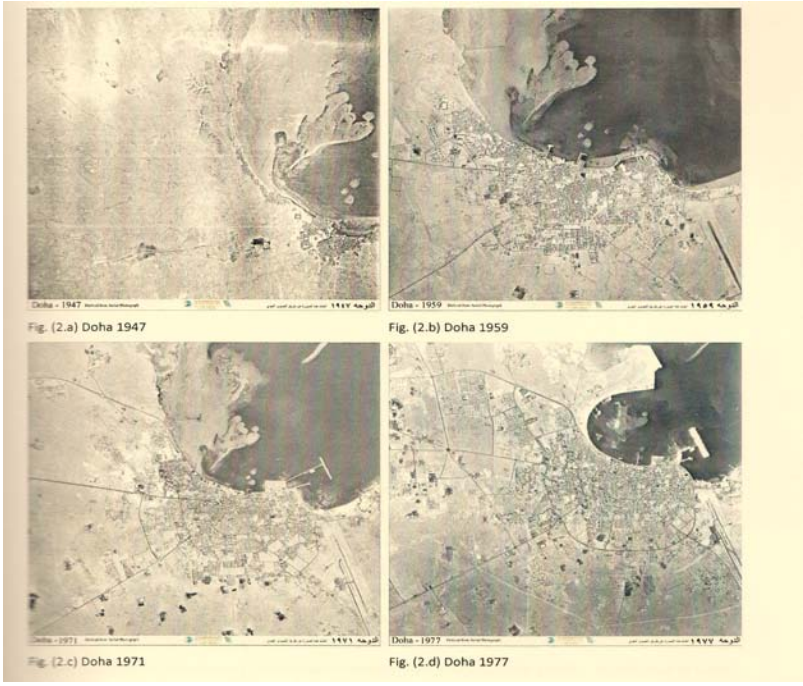




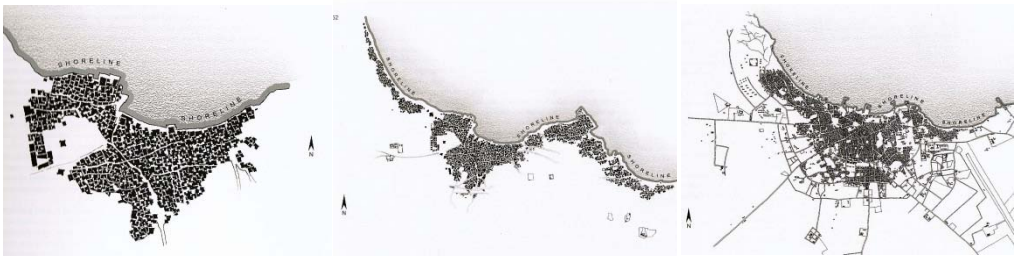




With the end of Ottoman influence in 1915, the town was made the capital of the British protectorate of Qatar in 1916, which lasted until the nation gained independence in 1971. Until the early 20th century, much of Qatar's economy depended on fishing and pearling, and Doha had about 350 pearling boats. However, after the introduction of Japanese cultured pearls in the 1930s, the whole region, including the town of Doha, suffered a major depression and Qatar was plunged into poverty. This lasted until in the late 1930s, when oil was discovered. However, the exploration and exportation was halted due to the Second World War, and it was not until 1949 that Qatari oil was first shipped.



Old Doha 1952



1937 **1952** **1959**

NEW DOHA- Sustainability suspended

Subsequent to independence in 1972 and new income from oil, Qatar commissioned the UK firm of Llewellyn Davis to prepare a master plan for Doha to the year 1990. One of the main recommendations of the planners was for the government to buy much of the traditional residential quarters (Fareej) in central Doha and clear them for higher density commercial and government buildings along with a modern infrastructure of roads and utilities to accommodate them. This single act brought about the migration of large segments of Qatari Nationals from the city to the suburbs and with it the death of Old Doha and the birth of unsustainable development.

The government's policy to purchase lands at inflated prices was a means to distribute the new oil wealth among Qataris. Among the obvious consequences of the urban renewal policy was the change in demographic mix in the city center. During the 1970s, the influx of expatriate Asian construction workers was at its zenith. During the 1970s they began to move into the emptied central district. The houses that had survived the bulldozing clearance were usually divided internally and rented to low income, particularly Asian workers and their families, who lived in overcrowded conditions. Under these circumstances, most nationals fled to the outskirts and the city center lost its prestige.

Faced with this dilemma, a new district to the north of the center- West Bay- was conceived to be reclaimed and developed as a modern western development. The Los Angeles firm of William Periera Associates was hired to develop a concept plan for this district. One of the immediate effects of the reclamation project design, which began in 1974, was the shaping of the Doha Bay and the emergence of the long crescent-shaped Corniche. It proved a great instrument functionally and symbolically for the future of Doha. On one hand, the Corniche opened new areas for development and was used by many residents during their leisure time, on the other, it became a symbol of the new city.

The Sheraton Hotel designed by Periera which was placed at the northern tip of the crescent remains until today a successful new architectural paradigm- the great interior atrium hotel that was first popularized by John Portman in the San Francisco Intercontinental. Built in precast white concrete, with massive shaded terraces in the

form of a *Mustaba* or Ziggurat, it had that Hollywood, Orientalist image of the mysterious East.

But what followed and has most recently exploded into 50 new high rise towers in West Bay, some reaching one hundred floors and mostly in low quality, mirror glass curtain walls, is a sad testament to speculative development that lacks any sustainability consciousness or urbanity. The towers stand as isolated single-use silos separated by vast hot asphalt roads lacking human scale or ground-level activity. The buildings are high energy demand buildings with no sense of correct solar orientation, un-adapted to their desert environment and totally lacking in cultural identity with the architectural history of the region or the social customs of the inhabitants.

In contrast to the high density of West Bay, the rest of Doha is a sprawl of low-rise, single-family suburbs or isolated pockets of new developments such as the *Pearl* or *Lusail*, following the *Dubai Model,* and which are located further north of Doha and connected by a network of traffic congested roads. Does this sound like what happened to Kuwait?

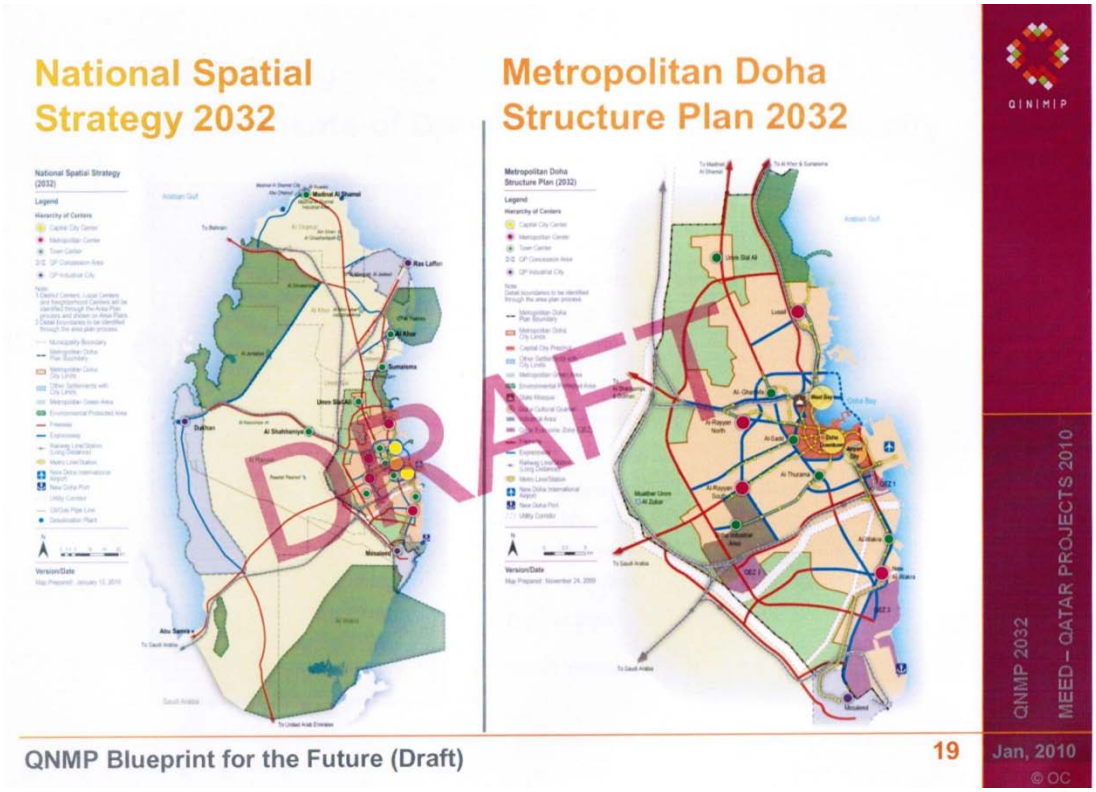
PROPOSED NEW URBAN FORM/ARCHITECTURE- NEW SUSTAINABLE PARADIGMS

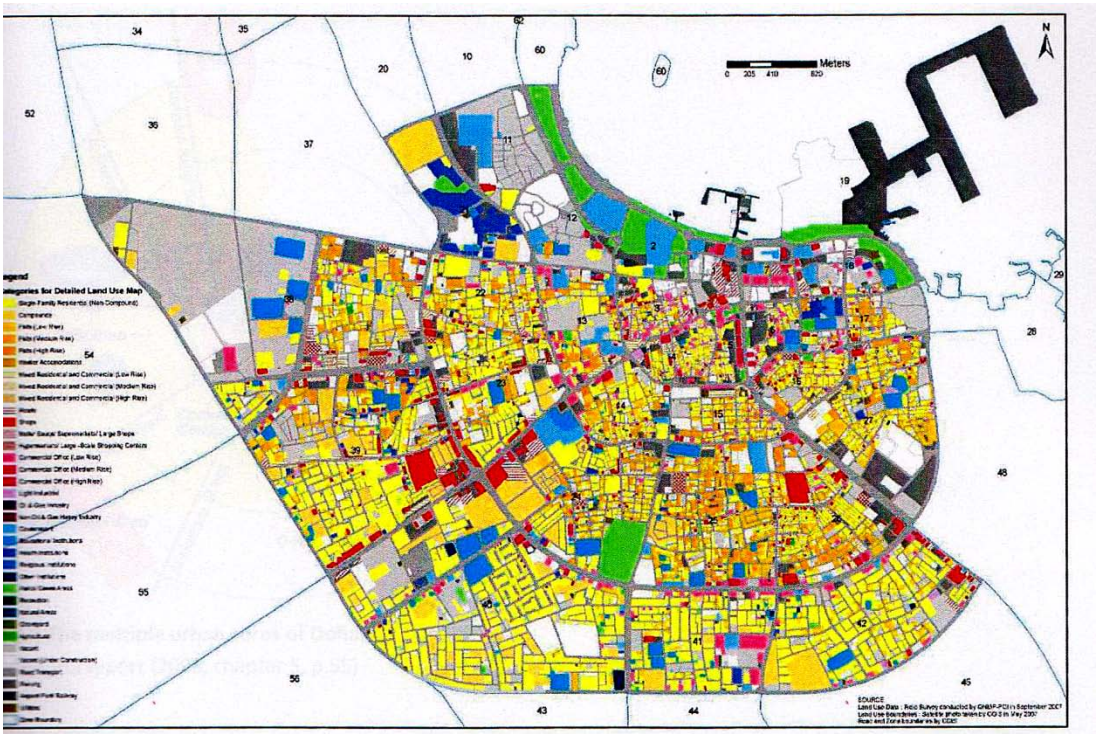
QATAR NATIONAL VISION 2030

QNV 2030 Four Pillars: Human Development; Social Development; Economic Development and Environmental Development

Beyond Carbon- a diversified, knowledge based economy providing a high quality of life, opportunity and sustainability future for all-currently 95% hydrocarbon economy. Targets are Food Security-currently 95% of food consumed comes from abroad-Saudi Arabia, Syria/Lebanon and Brazil (Chickens)-creation of solar farms in desert to produce energy for desalination water to irrigate agriculture based upon hydroponics.

QATAR NATIONAL MASTER PLAN

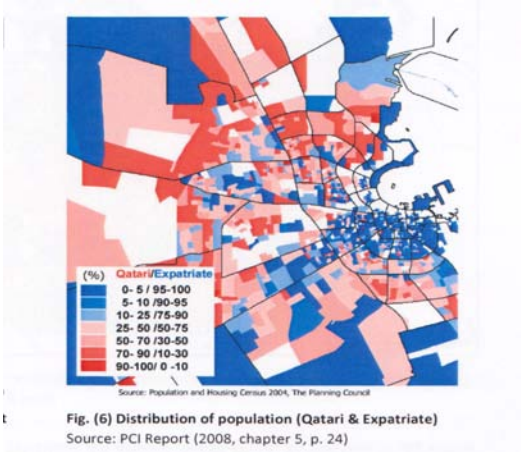




(7) **Land-use map** (red: commercial, yellow: residential/ mixed residential and commercial, blue: governmental/

Doha Master Plan 2030-Land Use Map

Doha Master Plan Model



Doha –Distribution of Population-2008

CLIENT: Ministry of Municipalities & Urban Planning- Sheikh Abdul Rahman Al Thani, Minister Ali Abdullah, Director General

MASTER PLAN CONSULTANTS: Oriental Consultants (formerly Pacific Consultants)- Japanese (2007 to Dec 2010) Target is to receive Emiri Decree approval by end of 2010.

QNMP 2030 transforms the QNV four pillars into 7 spatial and physical planning principles:

Quality of Life for all; sustainability; environmental values; connectivity of people and places; economic growth and diversification; ownership in planning and implementation; identity

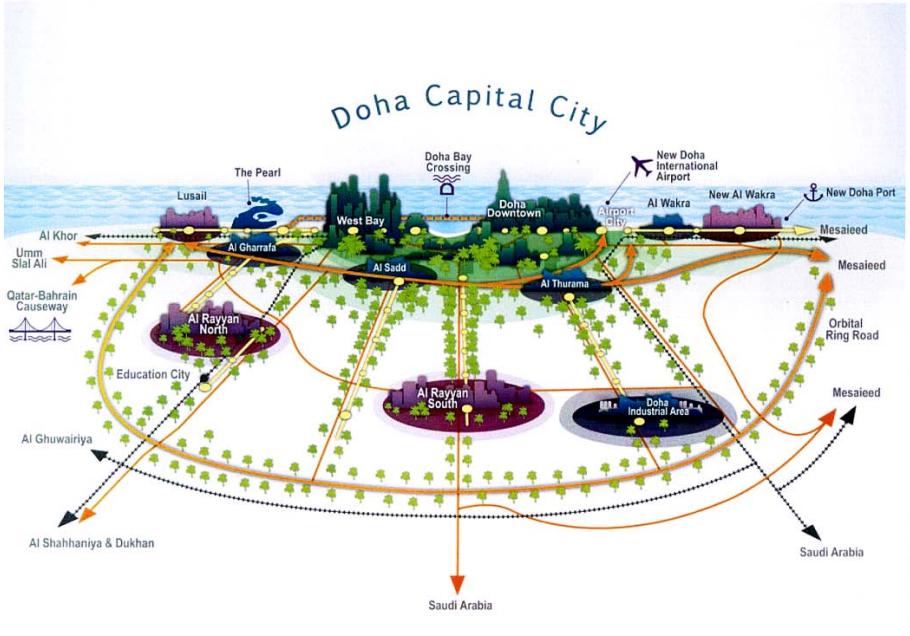
Population Growth; Year 2000= 617,000; 2009= 1,639,000; projected 2030=2.3 million

Future Demographic mix= 22% Qatari; 10% western; 70% Indian sub continent & Arab

Assumes population Greater Doha = 80% & outside Doha = 20%

Currently there are 700,000 foreign workers building the new facilities, most will leave

Nationals relocation to suburbs has led to Urban Sprawl and overcrowding & traffic congestion in Doha city, with resultant unsustainable urban form



Doha Capital City 2032-Conceptual Development Diagram

QNMP comprises 3 parts:

Qatar National Development Framework

National Spatial Strategy 2032 (Whole country)

Metropolitan Doha Structure Plan 2032

(projected population =1.7 million on 126,500 H land area= 13.4p/H)

Rail Networks Strategy proposed within Greater Doha:

Coast line (priority); historical line; education line; city line

Greatest density along coastal line & Capital core + dispersed centers

Planning strategy is based upon the existing road system, which is radial from Corniche outward and circular ring roads-where they intersect mixed use nodes of higher density will be planned

Strategic Environmental Assessment Process- QNMP will be assessed for its sustainability- Barwa Foundation and Qatar Green Building Council have developed a Sustainability Matrix which will be tested against GNMP

Coastal Zone Management Plan- QNDF will cover for 3 miles out from the coast

Area Plans: Zoning, Coding & Regulations to guide local area planning in concert with QNDF and allow developers/agencies to master plan specific sites, including:

3 metropolitan centers: Doha downtown; West Bay; Airport City; **plus** the Pearl; Lusail; Al Gharrafa; Al Sadd; Al thurama; Al Wakra/new Wakra; Al Rayyan North; Al Rayyan South; Doha Industrial Area

Development Guidelines:

The Vision: Density is key driver for sustainable development, existing regulations produce an unsustainable built environment, therefore strategy to change current building regulations to allow traditional building typologies to be built, such as courtyard housing, no side setbacks. Also strategies to encourage walk-ability and streetscapes that provide shade and ground level retail and community facilities. Problem and challenge comes from land owners and developers who have high rise isolated building typology in mind and resist QNMP guidelines. Target is downtown to achieve average of 100 to 150P/H density.

Land use Typologies:

Commercial mixed use: Shaded open space; GF retail; offices above,G+9
FAR=7.2; Density= 613 p/H Net

Retail Mixed Use: shaded open space; GF retail souk; housing above,G+5
FAR=3.9; density= 260p/H(net); 129 DU/H(net)

Community mixed use: shaded open space; GF mixed retail; apt above,
FAR= 4.45; Density= 204p/H (net); 102 DU/H (net)

High density residential: shaded open space; GF retail/com fac; apt above,G+5
FAR= 2.45; Density= 548p/H; 182 DU/H (net)

Med density residential: shaded open space; GF retail/com fac; town houses above
G+2; FAR= 1.7; 326p/H (net); 82DU/H (net)

Low density residential: open space; detached villas & local retail/mosque/com fac.
G+1; FAR= 0.5; Density= 60p/H (net); 12Du/H;

Retrofitting existing environments: retain buildings of merit; car park podium; retail wrapped around edge; colonnade around retail edge; communal open space over podium; residential townscape of visual and microclimate value above; G+4 max G+7; density= 144 DU/H (net); 433p/H(net)

VISIONARY PROJECT-MUSHEIREB- HEART OF DOHA PROJECT

VISION: Dohaland will test the boundaries of architecture and urban planning in Qatar to balance the best of today with the best of the past, creating a beautiful legacy for the future and a vibrant new community at the heart of our capital city.

CLIENT: Dohaland, a subsidiary of QF,
HH Sheikha Mozah Bint Nasser Al-Missned, chairperson
QF & Capital Projects Director: Saad Al Muhanadi, VP
Issa Al Mohannadi, CEO Dohaland

CONSULTANTS: Master Plan: AECOM, ARUP, Allies and Morrison
Architecture: Mangera Yvars; Dar Al Omran; Sauerbruch Hutton; Hashim Sarkis; David Adjaye; Massimo Carmassi; John Mcaslan & Partners; Mossessian & Ptnrs.

PERIOD OF REALIZATION: 2008 -2017

THE PLACE: One of the oldest urban locations of Doha with 35 Hectare site immediately adjacent to the Emiri Diwan. The site borders the Souk Waqif, the Al Koot Fort and the old Wadi Musheireb that leads to the Corniche of Doha.
PROJECT COMPONENTS: 226 of buildings with mainly mixed use residential townhouses and apartments ranging in heights from 3 to 6 stories with edge office buildings ranging from 15 to 30 stories over 2-5 basement levels accommodating 13700 car parking spaces and following projects: National Archives*;* Theater & Museum; three types of Hotels with approx. 700 rooms; primary school; heritage quarter ; and infrastructure conceived as: dedicated below grade servicing road; centralized district cooling; proposed domestic gas network; vacuum waste disposal system; dedicated cycle ways; centralized security; dedicated tramway on grade connected to future light rail and heavy rail links.

PROJECT POPULATION: 27,637 (20% Nationals/80% Expats)

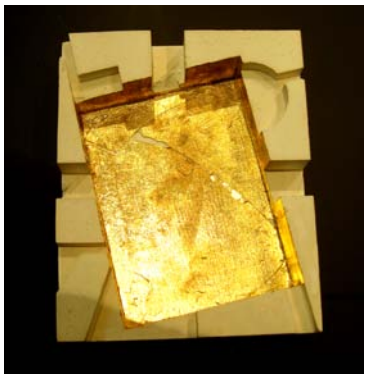
TOTAL PROJECT GFA: 760,000 SM

LEED RATING TARGETS: Phase 1A =Platinum; Phases 1B -4 = Gold

Musheireb Location Plan

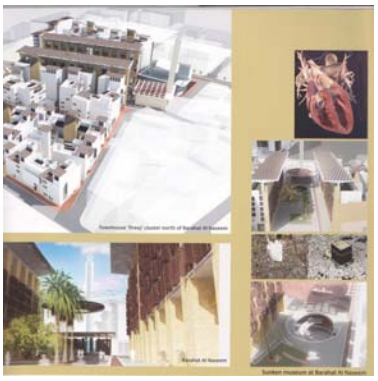
Illustrative Master Plan

I.Al Mohannadi, Dohaland CEO



Basic Concept ofPositive Space- Courtyard

Application of Courtyard Concept



Project Area Design Concept

Musheireb Model- Massing Concept

PROJECT DESIGN HIGHLIGHTS

- Urban Regeneration Project

- Learning from Doha Heritage
    - Tradition of Privacy & security
    - Organic Courtyard Typology
    - The "Fireej" Spirit at Cluster/neighborhood level
    - The re-creation of intimate public open spaces, "Sikkats"

- Urban Design Principles
    - Correct Solar/air, Microclimate Orientation
    - Compact, mid to high rise buildings, medium-high density
    - Narrow, shaded pedestrian only pathways
    - Integrated Mixed –Use Design
    - Below grade parking & services

- Architectural Principles
    - Harmonious balance between the individual & the collective
    - A carved, informal and protective urban grain
    - Homes clustered in intimate groups around garden "sahans" and shared or private Majlis spaces
    - Arcaded streets and shading canopies
    - Energy Efficient Building Designs
    - Language of Architecture inspired by rediscovered authenticity of traditional Doha
    - "State of Art" Technology adapted by traditional, timeless principles

FOCUS GROUP- PROJECT OBSERVATIONS

The project cleared the entire existing site; it did not attempt to rehabilitate any existing structures.

The existing population were scattered and few will return, as project will be gentrified and not affordable to former residents.

Issue remains if any upper income Qataris will move into new project, or it will become a place for upper income expats.

The level of design quality and technology incorporated in the design may become financially not feasible for the developer.

While good passive design principles are being considered, the project is only considering renewable energy options in a minor way, if at all.

EDUCATION CITY

"Education City is a community of institutions designed to serve the educational needs of the whole citizen: from early childhood education to post-graduate study. Education City provides an environment that unites leading researchers with cutting-edge facilities and qualified graduates. This dynamic atmosphere allows the opportunity for collaboration and the development of pioneering ideas into real world applications… Through Education City, **Qatar Foundation** has been the driving force behind the country's commitment to education- and to becoming one of the most developed knowledge-based societies around the world."

Fact Sheet

CLIENT: Qatar Foundation –General Policy Direction,
Chairperson: HH Sheikha Mozah Bint Nasser Al Missned
Qatar Petroleum- Project Programs, Scope of Work/TOR, Consultant & Contractor Contracts, some Const. Management
QF through QP pays for all consultant services for all buildings, faculty of all universities, all staff and all national students receive full scholarship tuition room board.

TIMELINE: Est. 1995-Qatar Foundation for Education, Science and Community Development is created by Decree of HH Sheikh Hamad Bin Khalifa Al Thani, Emir of Qatar.
Projected project completion 2015

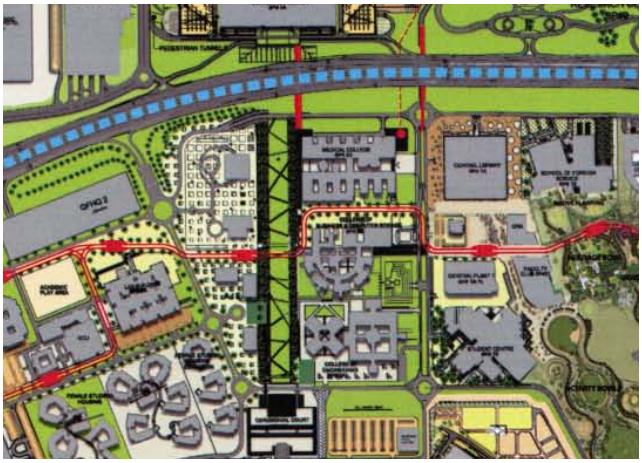
ESTIMATED BUDGET COST: $14.9Billion

CONSULTANTS (partial list):
Master Planners, Phase 1- Arata Isozaki-2001
Landscape Planners Phase 2- AECOM
Consultants (Partial List): Arab Engineering Bureau, Arata Isozaki, Legorreta & Legorreta, Koolhaas, Woods-Bagot, Arup
Project & Construction Managers /Infrastructure Engineers: KEO International Consultants

MASTER PLAN & FACILITIES DESCRIPTION (Master Plan version 15 now under design)
Over 2000 hectares site
Over 3.1 million SM of built up area
Ultimate Student Enrollment Target: 11,000
Resident Student Population 2011= 1200; 2015 projection= 2400
(20% Nationals/80% Expat?- Nationals from all economic levels)
Faculty & Administration 2011= 1000
(2000 resident with family- 20% National/80% Expat)
Student Faculty ratio 2010= 1 to 1
Qatar Academy & Learning Center-1996

Qatar Leadership Academy (QF & Qatar Armed Forces)-2005
15 major branch colleges from the world (1998 – present), inc.:
Weill Cornell Medical College & Teaching Hospital; Carnegie Mellon; Texas A&M; Georgetown University Foreign Service; Virginia Commonwealth ; Northwestern Media & Communication College; Rand –Qatar policy Inst;
Science & Technology Park, with tenets such as Shell, Microsoft, GE, HP (2005)
Major Convention/Exhibition Center
Central Library, Student Center & Qatar Foundation HQ
Community Facilities (religious, cultural, health, recreational)
Sports Complex
Al Shaqab Equestrian Academy, stables/veterinary care facilities
Housing for faculty, staff & students
Commercial & hotel development
18 hole golf course

Master Plan of Education City & associated projects 2010



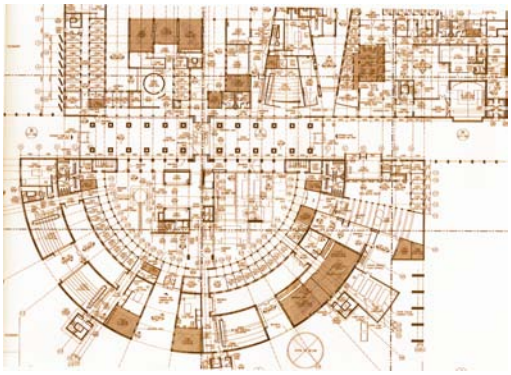
Education City-The Mall & Future Development

Education City 2010

The Mall

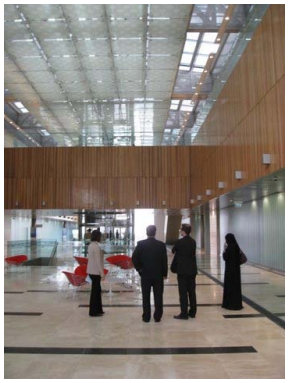
College of Arts & Sciences

Carnegie Mellon University



Carneie Mellon University Building Plan

Texas A & M Building Plan



Science & Technology Park

DISCUSSION OF PROPOSED SUSTAINABLE PLANNING /ARCHITECTURAL GOALS & PRINCIPLES

Sustainability Goals: Agree on Bruntdland Report definition of Sustainability
"Green & Blue"; target new buildings to be LEED Gold rated
Water-recycling program for effluent to be used for landscape irrigation, cooling tower and toilet flushing.
Transportation- Planned parking garages on perimeter with future mass transit spine, shuttle buses, bicycle, pedestrian shaded walkways and micro climate change through new landscape master plan by AECOM.
Architecture- Key Guideline Principles: Environmental Adaptation; Quality Iconic Design that are contemporary interpretations of Qatari/regional heritage; Ed City is an Expo of various architectural styles that seek to meet the basic design criteria.

FOCUS GROUP CRITICAL OBSERVATIONS

Greatest shortcoming is that the Master Plan was never based upon a comprehensive sustainability strategy, so buildings stand as isolated icons with great distances between them for students to traverse, but as each college acts very independently as "Silos", problem is less acute. There is currently an assessment and post occupancy study of how QF buildings and master plan are performing in terms of meeting pedagogic vision, sustainability and operations/maintenance performance. Education City from QNMP viewpoint is a single-use isolated community that needs to become a mixed-use and more sustainable community.

Master Plan landscape planners observe that current site usage is far too much land for population and buildings on it, so from a sustainability strategy it needs to become denser to work.

While in the first scene, the sea was the source of life for Qataris through fishing and pearling and in the second scene, through extracting oil and gas, in the third scene it is as if suddenly the people of Qatar have discovered yet another value: real estate. In the urban dynamics of contemporary capitalism, for Doha to become a global city it must reinvent and rediscover itself, but in this round through real estate and spectacular , iconic mega-projects. But is this a feasible dream?

CASE STUDY ABU DHABI, UAE

"A Nation without a past has neither a present nor a future."
- HH Sheikh Zayed bin Sultan Al Nahyan

Wilfred Thesiger described the traditional life of the Arabian Peninsula as "a disappearing world'.

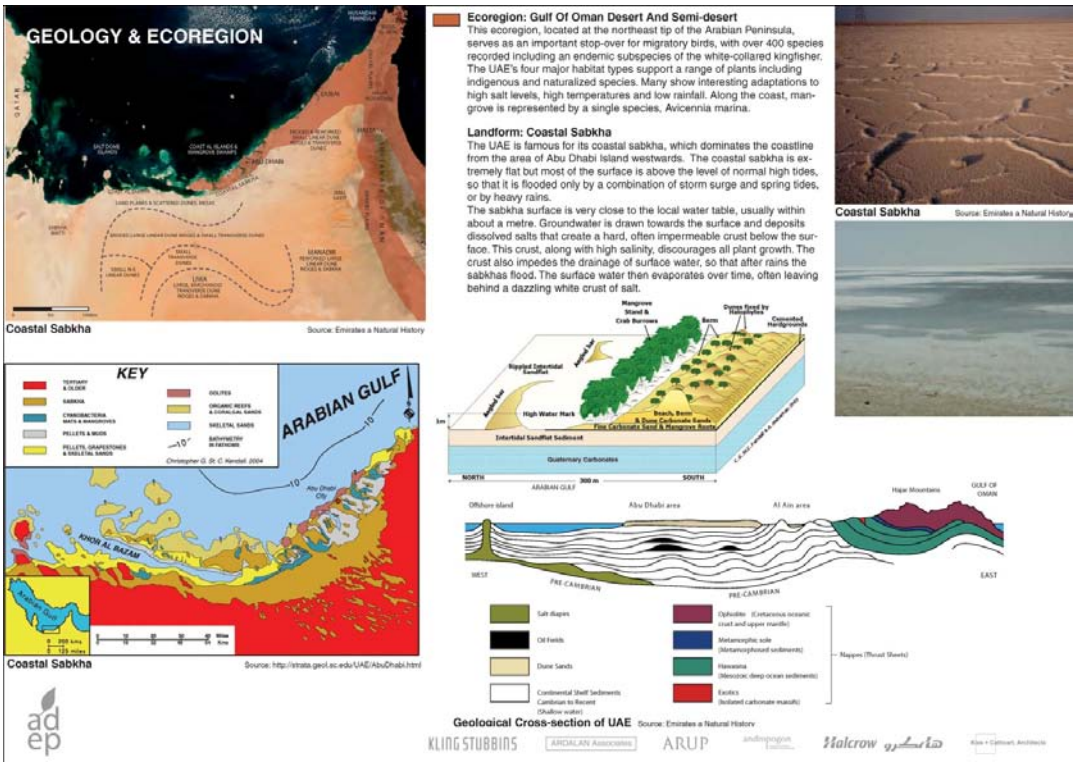
"You became for me a riddle and my riddles always complex
Astonished me, oh knight, I live not without you
If I promise to solve it, I fear disappointment
If I promise to forget it, how can one leave a chance presented?"
- HH Sheikh Mohammed bin Rashid Al Maktoum

CONTEXT

The UAE and its capital city, Abu Dhabi (Arabic: literally Father of gazelle), are characterized by their location at the intersection of desert and sea. The Gulf sits on the Arabian platform, an extension of the continental crust, and is not a true ocean inlet. It is very shallow; offshore of Abu Dhabi, the water is no more than 10 meters deep for up to fifty kilometers. About 85% of the Emirate is sandy desert replete with spectacular dunes. Winds have generated the dunes, which form patterns across a wide variety of scales, from the giant ridges in the Empty Quarter, that run for tens of kilometers, to smaller formations tens of meters in length, to textured surface ripples no more than a finger deep, varying in sand colors from black to white through grays, yellows to russet red. Another 7% of Abu Dhabi's land mass found predominantly along the coast is *sabkha*, an Arabic term adopted by geologists to describe low-lying salt flats subject to periodic inundation. In effect, 92% of the Emirates land mass is prohibitively difficult to inhabit.

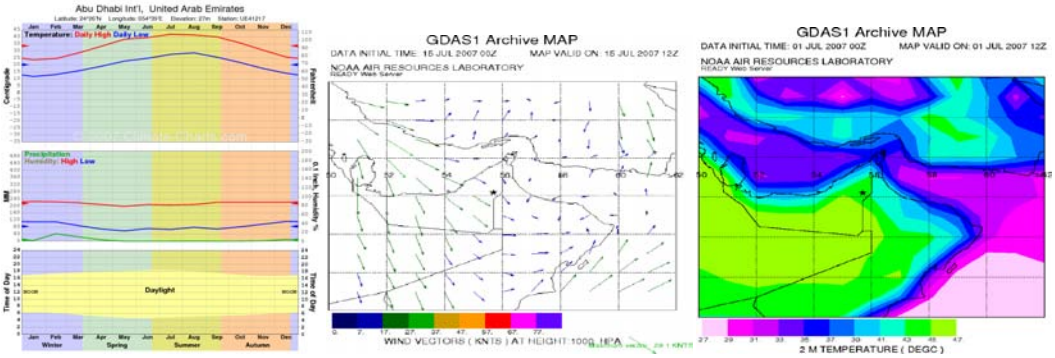
The coast has more than 200 natural islands, some of them formed by spectacular protruding salt domes that have never been inhabited due to the lack of fresh water.

Mangroves along the coast account for a large portion of the biodiversity and provide excellent habitats for migratory birds that transit between Central Asia and Africa. There are also some off shore coral reefs, but marginal in extent due to the hyper salinity of the Gulf and extremely high temperature of the region.



CLIMATE

Abu Dhabi has a hot-semi arid climate. Sunny/blue skies can be expected throughout the year. The months of June through September are generally hot and humid with maximum temperatures averaging 35 °C to 45. The *Shamal*- the prevailing northwesterly wind- blows across the Gulf and the land mass. During this time, sandstorms also occur intermittently; in some cases reducing visibility down to a few meters. The weather is cooler from November to March, with average temperatures ranging around 20 C. This period also sees dense fog on some days. The oasis city of Al-Ain, about 150 km (93 mi) away, bordering Oman, regularly records the highest summer temperatures in the country; however, the dry desert air and cooler evenings make it a traditional retreat from the intense summer heat and year round humidity of the capital city.



OLD ABU DHABI-SUSTAINABLE URBAN FORM & BUILDING TYPOLOGIES

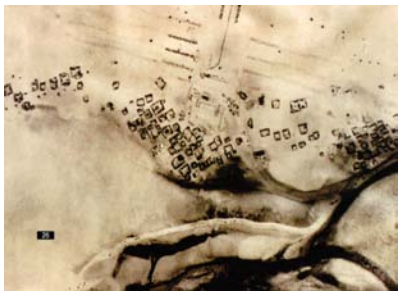
Until the 20th Century nothing was known of the ancient history of this region. A key document of King Sargon of Akkad in Mesopotamia tells how, in 2400 BC, he "made the ships from Meluhha, the ships from Magan, the ships from Dilmun tie up alongside the quay of Agade". Dilmun has been shown to refer to Bahrain, and Meluhha is most probably the Indus Valley. Clues to the whereabouts of Magan came from a Sumerian document that mentioned "Magan-kur", the mountains of Magan; other clay tablets in Dilmun spoke of the copper trade from Magan. It has been theorized that these references had been to the Hajar Mountains, a known source of copper and other precious materials imported to Mesopotamia. The 1958 discoveries of Danish Archeologists at Umm Al Nar Island soon led to others inland to the oasis of Al Ain and other Hajar mountain locations that revealed the larger "Umm Al Nar Culture" of the region dating from 2500BC to 2000BC and the proposition that ancient Magan indeed referred to this geographic location.

Therefore, parts of Abu Dhabi Emirate were settled in the 3rd millennium BC and its early history fits the nomadic herding and fishing pattern typical of the broader region. Modern Abu Dhabi traces its origins to the rise of an important tribal confederation, the Bani Yas, in the late 18th century, which also subsequently assumed control of the town of Dubai. In the 19th century the Dubai and Abu Dhabi branches parted ways. Into the mid-20th century, the economy of Abu Dhabi continued to be sustained mainly by camel herding and the growing of dates and vegetables at the inland oases of Al-Ain and Liwa, and hunting, fishing and pearl diving off the coast of Abu Dhabi town, which was occupied mainly during the summer months. At that time most dwellings in Abu Dhabi town were constructed from palm fronds (*barasti*), with the wealthier families occupied mud huts. The growth of the cultured pearl industry in Japan during the first half of the 20th century created hardship for residents of Abu Dhabi as pearls represented the largest export and main source of cash earnings.

DILMUN SEAL REFERRING TO "MAGAN"

HILI TOMB-3RD MILLENNIUM BC

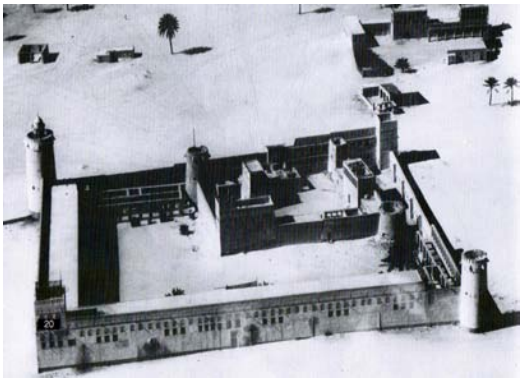
ABU DHABI 1968



ABU DHABI 1940s

MAGDA FORT CROSSING 1945

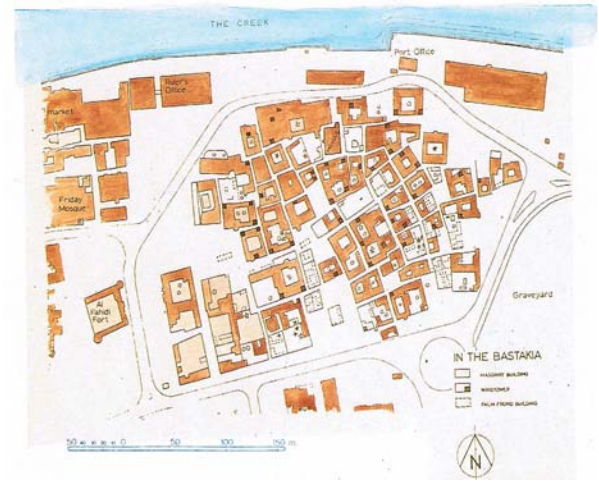
ABU DHABI SETTLEMENT 1960s



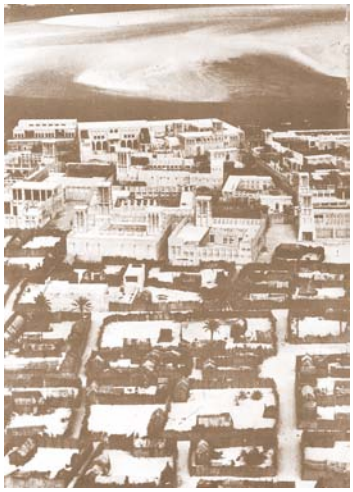
HUSN FORT 1940s

ABU DHABI HOUSING 1960S

SEAFRONT 1948



DUBAI-BASTAKYA QUARTER

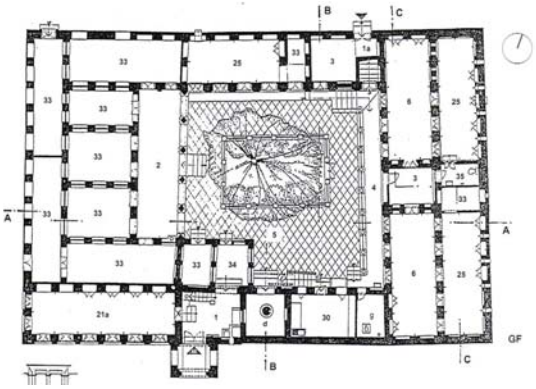


DUBAI TRADITIONAL COURTYARD HOUSES & BARASTI

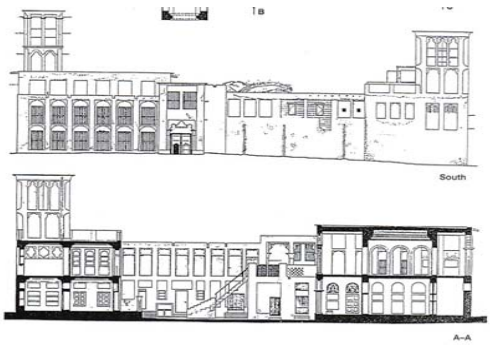
BASTAKIYA WIND TOWER HOUSE

TYPICAL BARASTI HOUSE

PALM FROND BARASTI



DUBAI-BUKHASH HOUSE –GROUND PLAN



BUKHASH HOUSE ELEVATION/SECTION

NEW ABU DHABI- THE LOSS OF SUSTAINANILITY: 1970 TO THE PRESENT

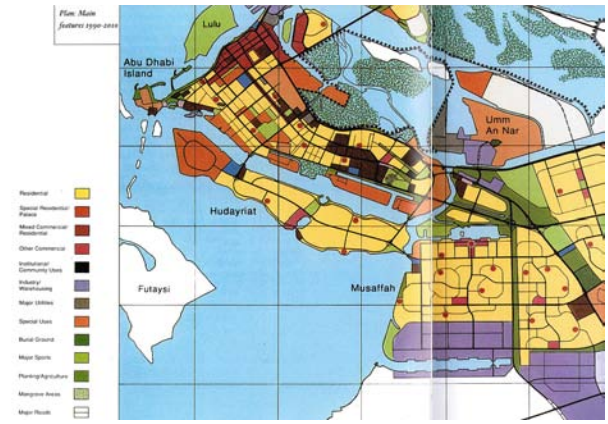
The population in 1960 was 25,000, which grew rapidly after the discovery of oil and the British departure from the Gulf in 1971. The city was planned in the 1970s for an estimated maximum population of 600,000 in 1990. In accordance with what was considered to be ideal urban planning at the time, the city had wide grid-pattern roads, and high-density tower blocks. It grew to 127,763 in 1975, then 283,200 in 1985 and reached nearly 400,000 by 1990.

In 1991 WS Atkins & Partners were commissioned to prepare the Master Directive Plan for Abu Dhabi for the period 1990-2010 with a projected population of 712,000 by 2010. According to the Abu Dhabi Department of Planning and Economy, in 2006 the population of the entire emirate was 1,463,491. As of 2001, 25.6% of the population of the emirate was made up of UAE nationals. Approximately 74.4% of the population was expatriates. The median age in the emirate was about 30.1 years. The majority of the inhabitants of Abu Dhabi are expatriate workers from India, Pakistan, Eritrea, Ethiopia, Somalia, Bangladesh, Sri Lanka, Philippines, the United Kingdom and various countries from across the Arab world. Consequently, English, Hindi, Urdu, Tamil, Tigrinya, Amharic and Bengali are widely spoken. Apart from Urdu and Hindi spoken by Indians and Pakistanis, many South Asian expatriates also contribute other South Asian languages to the cultural milieu, including Malayalam, the main language spoken in the state of Kerala. Abu Dhabi has a diverse and multicultural society. The city's cultural imprint as a small, ethnically homogenous pearling community was changed with the arrival of other ethnic groups and nationals — first by the Iranians in the early 1900s, and later by Indians and Pakistanis in the 1960s.

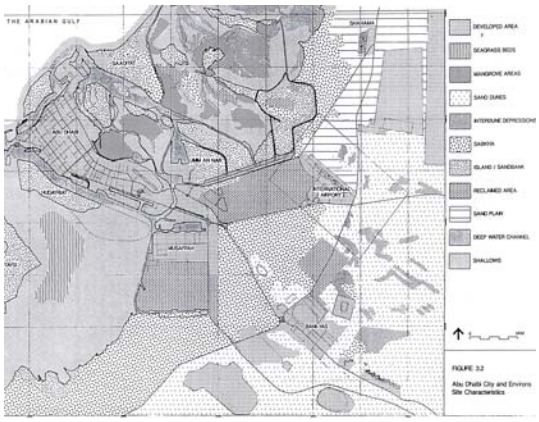
ABU DHABI 1978

ABU DHABI 1998

NATURAL MANGROVE ENVIRONMENT



ABU DHABI MASTER DIRECTIVE PLAN 1990-2010



ABU DHABI SITE CHARACTERISTICS- WS ATKINS- 1991

FOCUS GROUP NOTED SUSTAINABLE ARCHITECTURE IN PRESENT ABU DHABI

THE CULTURAL CENTER BY TAC

ADMA_OPCO HEADQUARTERS BY JUNG/BRANNEN- 1996

FOCUS GROUP NOTED LESS SUSTAINABLE URBAN FORM AND ARCHITECTURE IN PRESENT ABU DHABI

THE CORNICHE 1990S

STREET PATTERN/URBAN FORM

FUTURE ABU DHABI

In 2007 the Abu Dhabi Urban Planning Council (UPC) was established, which is the agency responsible for the future of Abu Dhabi's urban environments and the expert authority behind the visionary Plan Abu Dhabi 2030 Urban Structure Framework Plan that was published in September 2007. The UPC is also working on similar plans for the regions of Al-Ain and Al-Gharbia. It is forecast that the city's population may grow to three million or it may exceed five million by 2030. The plan's policies are grounded by three basic elements of sustainability: the natural environment, economic development and cultural heritage. In particular, the key directions of the plan include: **sustainability** (epitomized by the ESTIDAMA process), **conservation** of the unique environment, balancing human scale within an **evolving culture**, **identity** as an Arab city with 21st C. opportunities, **excellence** in quality development and livability, **connectivity** through a multi-layered transportation network.

PLAN ABU DHABI 2030

ENVIRONMENTAL CONTEXT

URBAN IMAGE VISION-PLAN 2030-REEM ISLAND

CAPITAL DISTRICT

KHALIFA B RESIDENTIAL QUARTER

VISIONARY PROJECT: "MASDAR"FUTURE ENERGY COMPANY

The primary goal of the recently formed Abu Dhabi Future Energy Company (ADFEC) is to turn Abu Dhabi into an international hub for renewable energy. ADFEC is Abu Dhabi's vision and investment in the future of energy and environmental

sustainability- a private joint stock company established and wholly owned by Mubadala Development Company. ADFEC drives the Masdar Initiative, a multi-billion dollar, multi-faceted response to the need for a global focus on the development of advanced energies and sustainability related technologies.

Masdar has partnered with the world's most prominent companies, educational institutions and investment firms to change the way in which the world understands energy and to create a historic, global shift to new energy sources and sustainable resource utilization.

The Organization Chart for ADEF is structured upon the following four main components:

MUBADALA DEVELOPMENT COMPANY
ADFEC

MIST – MASDAR CITY - MASDAR POWER - MASDAR CARBON

MIT . ZAYED UNIVERSITY TORRESOL . LONDON ARRAY . SHAMS I

MASDAR POWER

- Clean Tech Fund has initial funding of $250 million plus additional $250M.
- Abu Dhabi Target: 7% renewable energy capacity by 2020 (mainly through concentrated solar)
- A major problem of solar collection systems located near Gulf coast is humidity & air born sand/dust that reduces efficiency of collectors up to 30-40%.
-

MASDAR CARBON

- Q2 Protocol has allowed Monetizing Carbon-most of this business is outside Masdar city
- Masdar city will buy carbon credits at the beginning- carbon capture & storage
-

MIST- MASDAR INSTITUTE OF SCIENCE AND TECHNOLOGY

- Mist goals: to become a world class graduate institution for research and teaching in renewable energy systems
- MIT is assisting the faculty and administration in recruitment. John Perkins had been the Provost until his recent resignation. Professor Fred Moavenzadeh, formerly of MIT is the new President MIST faculty on 4 year renewable contract
- Masters program- 2 year with diploma from MIST, plus certificate from MIT
- 7 programs: Mech. Engineering; Material Science; IT; Energy Systems Mgmt; water Environment; electric power systems; sustainable cities
- PhD Program- starts in 2011

  MIST Strategic Research Areas (funding from ADFEC):
- Solar Energy with MIT Energy Initiative (catalyst for photochemical reaction & nanotech); algae for fuel-joint MIT&MIST research-issue of invention copyrights being worked out

- Carbon Capture & storage
- Sustainable Cities: transport; urban climatic cooling; night time cooling; water & environment; smart grids; logistics of material transport

  MIST Student Composition:

  Emirati: 15%, Gulf Region=30/40%, US=5%, world=30/40%

  Socio-Cultural Research
- ZAYED UNIV has MOU with MIST to provide socio-cultural research on UAE
- Social awareness of sustainability is being studied with help of Zayed U., even theology

  "It took 2/3 generations for Emiratis Bedouins culture to become SUV Culture. It may take another 2/3 generations top reach a more mature balance relationship to their context." Outreach to schools for social awareness of sustainability
- Student sensitivity to various environmental situations and ways they use energy

MASDAR CITY
PROJECT TEAM

Client: Mubadala Investment Co. – Masdar City-Implementation Division
Project Managers: CH2MHill
Master Planning Team: Foster & Partners
Sub-consultants:
WSP- Infrastructure, UK- Peter Sharratt, Div. Mgr
TransSolar- Mathias Schuller, Harvard, Germany
Systematica- Transportation-Fredrico Parolotto, Milan
Atkins
Adrian Smith & Gill- Masdar Headquarters
Booz & Co. Ernst & Young
Maxmakers
Walbridge
Hip Hing Construction –Subsidiary of NWS Holdings
Solar Energy needs- 10MW -$50 million contract
First Solar (USA /GERMANY), thin film 5MW (Environmena Co.) = 9% efficiency @ $1/watt.
Sun Systems (China) Crystalline Silicon, 5MW= 15 to 20% efficiency

Population & Density
Original Master Plan concept was based upon 70,000 populations (40,000 resident+30,000 commuters)
Current population design base is for 90,000:
Resident population = 50,000
Commuter population= 40,000
Large Square Town Area = 1500 X 1500M = 2,250,000 gsm = 225 hectares
Small Square Town Area = 750 x 750 M = 562,500 gsm = 56 hectares
Total land Area both towns = 2,812,500 gsm = 281 hectares
Overall resident Town Density= 50,000/281 = 177 p/ hectare
Demographic mix of ultimate residents anticipated:

Emirati = 20%
Regional = 50% (mainly Arab/Muslim)
International = 30%

MASDAR CITY-MIXED-USE PROGRAM OF BUILT SPACE-

Residential= 48% (incl. student housing & 4 income groups from luxury to workers)
Three residential types: Courtyard Villas, Townhouses & Apartments (4 floors)
Offices = 30% (15% special economic zone)
Industry= 12% (light industry & labs located on edges of city)
MIST = 5%
Social Facilities= 5%
Total 100% (Areas of open space, circulation & parks separate)
Total GFA in large square = 3.9 million SM
Total GFA in small square = 2 Million SM
Grand Total GFA = 5.9 Million SM
Announced development Budget: $ 22 Billion over 7 years, in 7 phases first phase to be completed by 2010 (target not achieved-MIST may be ready by Sept 2011).

<u>Masdar City Goals:</u>

- Masdar Goal shift in 2010: from "zero carbon" to "Carbon neutral" targets
- Reduce energy demand of its buildings & infrastructure by average of about 50% compared to business as usual in the region - 70 to 80% in office & residential use of electricity
- Integrate world corporations in sustainability strategies: Bayer in materials; IBM in systems
- Free Zone to provide economic incentives for outside investors to set up office/home in the city
- Project to be based upon WWF One Planet Living 10 Principles
- MASDAR seeks to import a new work/research culture into Abu Dhabi and the goal is to have this import change the culture of the place
- Masdar City is pursuing goals established in Abu Dhabi 2030 Plan, including sustainability criteria, but different than Estidama standards and other National Development Goals
- The sustainability strategies and process of design exploration used for Masdar can be replicated in other locations, but the response to environmental & cultural context would be different
- Renewal Energy strategies being actually explored: Geothermal well drilled 3 kilometers deep; pilot beam down solar system
- Model of residential urban pattern was based upon London (Chelsea) townhouses in which mixed incomes live
- Dependence on "Iceberg" effect- by raising entire town 7 m above grade on a concrete podium. Podium serves all PRT system, utilities infrastructure and allows flexibility for future systems and usage (as designed in Beijing Airport, but analogy seems farfetched)

- Material Selection and design of facades & walls:
  Residential: facades of GRC external panels color of local sand with good insulation and light drywall interior panel.

Master Plan- planning considerations

Traditional Principles used in the Master Plan include:

- High Density, low rise
- Courtyard design
- Linear garden
- Natural Ventilation and Wind Towers
- Pedestrian circulation focus
- Metaphor of "Buildings as sail boats- how long can you sail with sails up before they need to turn on the engine?" The idea is based upon good passive design, natural ventilation and mixed mode a/c systems
- Wind Rose of Abu Dhabi shows prevailing warm winds during the day from NW, but cooler night winds from East. Therefore, the Orientation setting out of Masdar square shaped plan is rotated 45 degrees from north toward NW to channel day time breezes through main streets (located NW/SE direction)
- Two linear green spines are placed in the plan commencing from the NW passing through the plan and bending east to catch night time winds
- The Public Open Space is planned to be about 30% of the site, with large portions covered by solar shading panels. Courtyard architecture, four stories, high density low rise has been basis of design. Gross town Original Density Target was 135 persons/hectare (exceeded to 177p/H), 30 DU/hectare with average 5 persons/DU (These numbers may have changed). All pedestrian Streets are average 7 m. wide with a side building section the steps in so top of fourth floors are only 4 meters apart. Walking distance is limited to 140m diameter
- Overall land allocation larger than needed for program, therefore arbitrary occupation of land by town forms to maintain given plot, such as large square & small square
- Different shapes were investigated: first option- one large circle; selected option large and small square tilted to NW based upon survey of regional traditional town forms and sustainability; Foster Planning Partner agreed that fat rectangle facing approx. NW would have been more optimum form to allow greater number of buildings to face north/south and be exposed to microclimate of NW wind pattern
- Micro scale plan based upon sub-neighborhoods (Fareej) measuring 70M in diameter with corner shop/child care at axis within2.5 minute walk of perimeter. Four sub-neighborhoods create one neighborhood140 M in diameter and center with social facilities. Neighborhoods to be fully mixed-use and multi-income integrated and traversed by PRT system connecting to perimeter of town parking garages to allow commuters or residents to park cars outside of the pedestrian based town
- The concept is based upon a district of London, such as Chelsea

- A light rail transit passes diagonally through the square connecting town to city of Abu Dhabi and Airport
- Space Syntax of University College London provided social research on way-finding and social patterns to Foster. Their studies favored an "organic grid pattern" for the town, as the grid helped with orientation of residents in way-finding
- All the financial savings are in the energy savings obtained because of emphasis on correct passive design based mainly on optimum solar/air orientation and energy efficient building design
- The active solar systems are not economical at this time, thus less integrated solar panels on buildings and more simple energy farms of focused solar collectors is the effective way to go
- Large square city form surrounded by open green as buffer to adjacent plots and as green filter and open lung to dense compact town plan
- Bldg. materials & construction methodology, the most sustainable routes are: Pre-fabrication; factory-made components, pre-assembled units, modularization
- Correct solar orientation to the North and to wind from NW; solar shading; angled facades away from direct solar radiation; recyclability (the use of relatively cheap copper today for institutions that should last 100 years, make that material very valuable in the future
- Renewal Energy strategies being actually explored: Geothermal well; pilot beam down solar system
- Model of residential urban pattern was based upon London (Chelsea) townhouses in which mixed incomes live
- Dependence on "Iceberg" effect- by raising entire town 7 m above grade on a concrete podium. Podium serves all PRT system, utilities infrastructure and allows flexibility for future systems and usage (as designed in Beijing Airport, but analogy seems farfetched)
- Material Selection and design of facades & walls:
  Residential: facades of GRC external panels color of local sand with good insulation and light drywall interior panel.

ENERGY SYSTEMS

a. Energy demand reduction from BaU by 40%
b. Energy Efficiency in systems selection reduction from BaU by 20%
c. Original Targets: Renewable Energy Production for remaining 40% energy needs = 136 mw.

Wind (for water pumps)	= 1%
Concentrated Solar Collectors	= 35%
P.V Solar	= 40%
Geothermal (3 kilometers deep)	= 24%
Total	= 100%

(These % have changed since project start)
d. 18mgW export to grid daytime
e. 40mgW import from grid at night

f. Carbon offset trading potential (of about 1 million tons of CO2 compared to BaU for similar town size) due to Zero Carbon Footprint of Masdar. Current Carbon trading selling at 20 euro per ton = 20 million Euro potential (these goals have been significantly reduced as unachievable).

TRANSPORTATION

Four integrated systems:
1) Connection to future Metro adjacent to Masdar site
2) Light Rail passing through Masdar Site
3) Below Grade PRT-approx. 1500 vehicles
4) Back-up PRT on Grade Option Criteria:
   Walking distance to PRT Stop 140m
   Waste & Freight Service by PRT off Hours
   Total of 1500 4 passenger vehicles required by design
   Phase 1 PRT for 20% of total system recently awarded to 2GetThere $60million contract


MASDAR MASTER PLAN VISION


URBAN STREET VIEW


VIEW OF MIST


PROPOSED MASDAR & IRENA HEADQUARTERS


LAVA TOWN CENTER AERIAL VIEW

FOCUS GROUP OBSERVATIONS OF MASDAR MASTER PLAN

- Criticism of SC was that the research performed seemed to be based on a sort of general universal design approach studied in London and might not be applicable to the Abu Dhabi context and Culture, as inadequate local ethnographic research performed
- SC: "How do you really know what is the relevant design for living for the future residents, as no user surveys or input has been performed-it is all top down"
- Problem of suitable residential typology patterns to fit multi-cultural residents
- SC: "Environmental Determinism" -that environment sets cultural pattern is a debatable 19th c. theory, but one that Master Planners and residential planners are following in Masdar
- Isolating Emirati residential quarters from others will only generate cultural ghettos
- Foster & Partners Comments: "Masdar City is going to cost more than initially estimated and longer to implement. This is cause for concern by Mubadala which is an Investment Company they look for short term returns. Thus certain changes in goals and strategy are now taking place that will significantly impact Masdar City
- The idea that 40,000 commuters (mainly labor & service providers) will travel back & forth to Masdar City daily is against basic sustainability principles. This was justified not on sustainability, but on financial considerations that to provide cheap housing for that many persons would be uneconomical and better to focus on higher income residential ,but more so on office rental incomes
- PRT system originally envisioned was far too expensive-better route would have been to invest in dependable guidance systems that could be installed in commercially produced vehicles. Therefore, Masdar is switching to simply electric carts to serve PRT function at much lower costs, but with less effectiveness
- Perception problems of Masdar by the public: Westerners think it may be too expensive for people to live in; Emiratis think it is not exclusive/private enough; Asians worry will they be allowed to live there; experimental nature of residential /town design is concern; isolation of Masdar from city center
- Sustainability has been the driving factor in Masdar Design and priority given to key performance indicators, such as energy, carbon emission, water, waste or short & long term economics has required that protocols of interaction on decision making should come into place. However, as these protocols have been slow to come into force, the priority has been set on who was dominant decision maker in the room and his ideas have prevailed at that particular time. This has lead to indecision and delays in moving project forward
- Four decision making factors have had to be balanced: Cost, quality, schedule and sustainability.

EDUCATIONAL CASE STUDY- UAE UNIVERSITY, AL AIN

The Emirate of Abu Dhabi is home to several international and local private schools and universities, including government-sponsored United Arab Emirates University in Al-Ain, New York Film Academy, and Abu Dhabi University in Abu Dhabi. These boast several languages that make up the population of the city. INSEAD, the prestigious international business school, has established a campus in February 2010, offering an Executive MBA and executive education courses. New York University is opening a campus in Abu Dhabi in fall 2010.

AL AIN CONTEXT

Al Ain, which means in Arabic "water source" is one of the greatest cultural assets of the Emirate of Abu Dhabi: the roots of indigenous nomadic people and their culture lie in this oasis. The Al Ain Valley, situated in the foothills of the Hajar Mountain range, slopes gently toward the west, traversing rich areas of archaeological and diverse environmental landscapes, ranging from the vast red-hued sand dunes and plains to the emerald-green agricultural farms with their animal husbandry. This has been an ancient city with over 5000 years of recorded history - a cool refuge from the heat of the desert surroundings. It is a lush city-oasis fed by the ancient irrigation system known as "Falaj." It is also the ancestral homeland of the Al-Nahyan ruling family of the Emirate of Abu Dhabi.

Structure Framework Plan for Al Ain

In 2007, the Board of the Urban Planning Council began to develop Plan Abu Dhabi 2030: Urban Structure Framework Plan. In 2009 the Urban Structure Plan of Al Ain was launched to help the city in assessing and responding to the challenges of current and future development and to support the development of this city into an exemplary desert community.

Within this framework, the Master Plan for the city is being prepared by Shanklin Cox of UK. It proposes a linear east/west extension of the town from the original Al Ain Oasis and the Hajar Mountain range in the east toward Abu Dhabi, along the existing Abu Dhabi Road. A major north/south cross artery leading to the Al Ain Airport to the north and the alluvial plains to the south cuts across the Abu Dhabi Road. This new junction is planned to be the locus of the new City Center. The New UAE University Campus at the Magam district falls directly into the proposed new town center.

STREET PLAN OF AL AIN WITH ARROW POINTING TO UAE UNIVERSITY MAGAM CAMPUS

HILI TOMB DETAIL

AL AIN OASIS" FALAJ"

UAE UNIVERSITY MASTER PLAN

The UAE University is for nationals from the seven Emirates and was first started in 1977. However, the majority of students come from Abu Dhabi and Al Ain, with the largest percentage being females. By 2005, the university had grown and was housed in 12 separate campuses around Al Ain. The scattered units caused great academic inefficiencies and transportation problems for students and faculty. The decision was made to unite all the campuses into one central campus.

The Master Plan was created as a compact cluster of buildings with a central focal point being the Information Technology College that had been built previously to accommodate 3000 students, the crescent-shaped Administration Building/Library and a time-shared set of laboratory buildings. To either side of the center were placed the male and female academic and residential facilities, each approached separately and with their own covered parking lots. The building typology used has been based upon a courtyard motif with volumes ranging from two to four floors. The building materials and finishes appear rather insubstantial, as they are primarily steel framed with metal lath and drywall exteriors of varying earth tones and aluminum doors and windows, some with sun screens

A grand central ceremonial approach road brings guests to the crescent admin building. Shaded walkways connect all the buildings and together with a tree planting landscape design, it is planned that pedestrian communication between buildings will be eased.

PROJECT TEAM:
Client: Mubadala Development Company
Campus Development Department, UAE University
Consultants:
Conceptual Master Plan: Woods/Bagot-Australia
Master Plan & some building Design: Cox Partnership, Australia

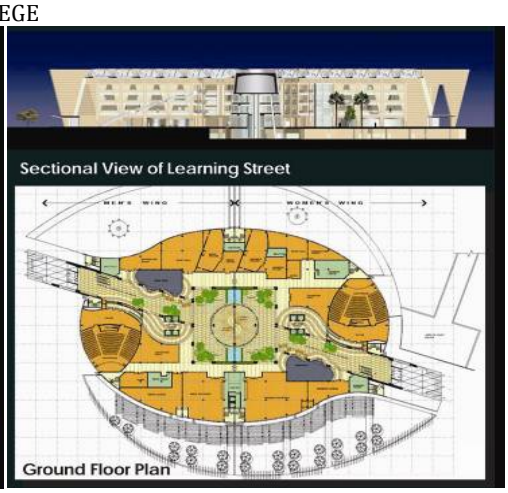
I T College, School of Architecture/Student Union/Female dorms: KEO International Consultants
Student Capacity: 15,000
Site Area: 700 Hectares
Built up Area: 300,000 GSM,

Academic: 107,900 GSM (Male/Female segregation with time-shared labs)
Female residences: Phase I=2500 students; Final Phase= 7,000
Administration/Main Library
Sports Facilities

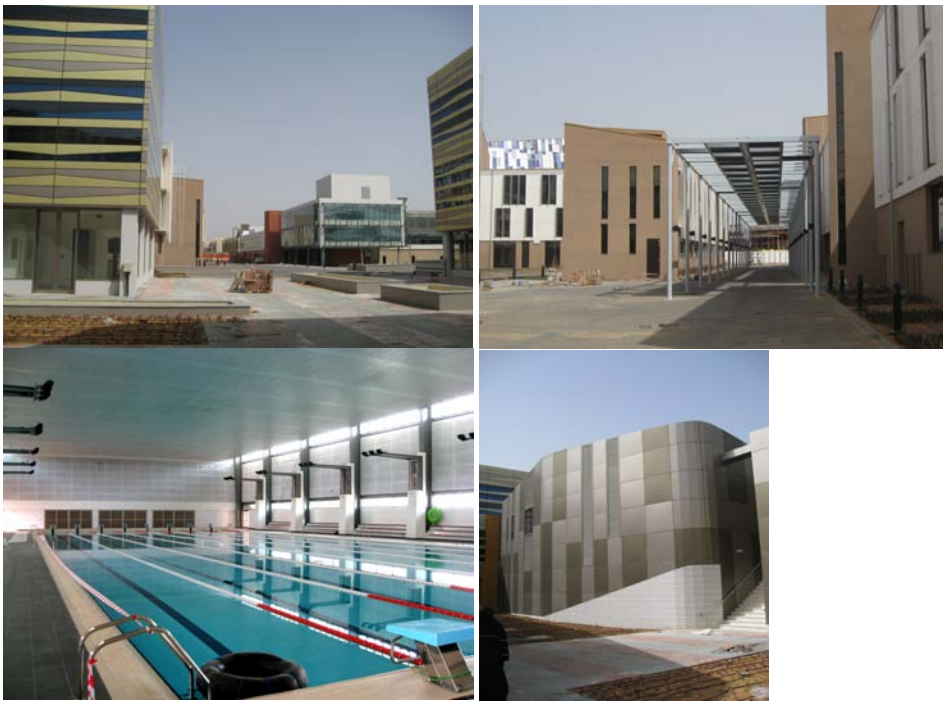
Project Schedule: 2007 to 2012



MASTER PLAN AERIAL RENDERING IT COLLEGE

INFORMATION TECHNOLOGY COLLEGE- KEO INTERNATION CONSULTANTS



NEW CAMPUS BUILDINGS- COX PARTNERSHIP

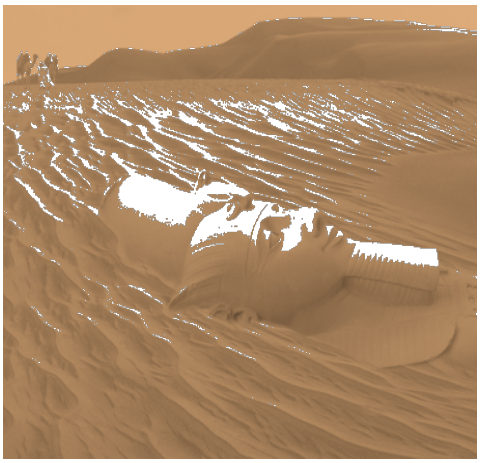
FOCUS GROUP OBSERVATIONS

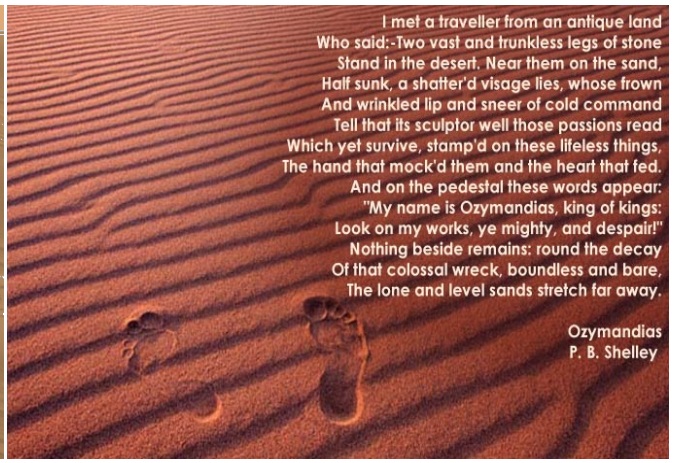
With regard to sustainability of the design, the mandate did not require the project to meet any internationally recognized sustainability criteria, such as the Green Building Council's LEED Guidelines. As such the primary issue of optimum correct orientation of building facades to the Solar Path to reduce heat gain has not affected the layout of the buildings, which face and open to all four cardinal directions. This has in some cases been resolved with additional sun shading. Similarly, as the new buildings are mainly sealed, with non-operable windows, little advantage of natural ventilation in the buildings can be utilized.

In contrast with the concrete frame, stone clad and durable curtain wall construction of the earlier IT College, the impression of the new work is one of light flimsiness. Therefore, thermal lag opportunities will have less impact on the buildings, indicating that afternoon heat gain in buildings may be inordinately high, thus requiring greater air conditioning.

In view of the fact that the building designs are not highly effective in terms of good passive design, there is the other concern that the architecture has not incorporated any alternative energy production strategies. For example, roof top solar energy systems, either over the vast parking shade structures or the even greater building surfaces, might have been explored, but no mention of these strategies were made in any presentations. This point is of particular concern since Al Ain , which is less humid than the coastal cities has much less problems of "caking"-when air born sand and humidity form a crust over solar panels that reduce their efficiency by 30 to 40 %. In terms of cultural identity of the new buildings and the architectural heritage of Al Ain or the region, one is left wondering what the design intent had been. The architecture lacks

any relevance to the place and shows some jarring facades, especially in the central crescent building housing the administration, which is the first and most prominent image seen upon approaching the university.

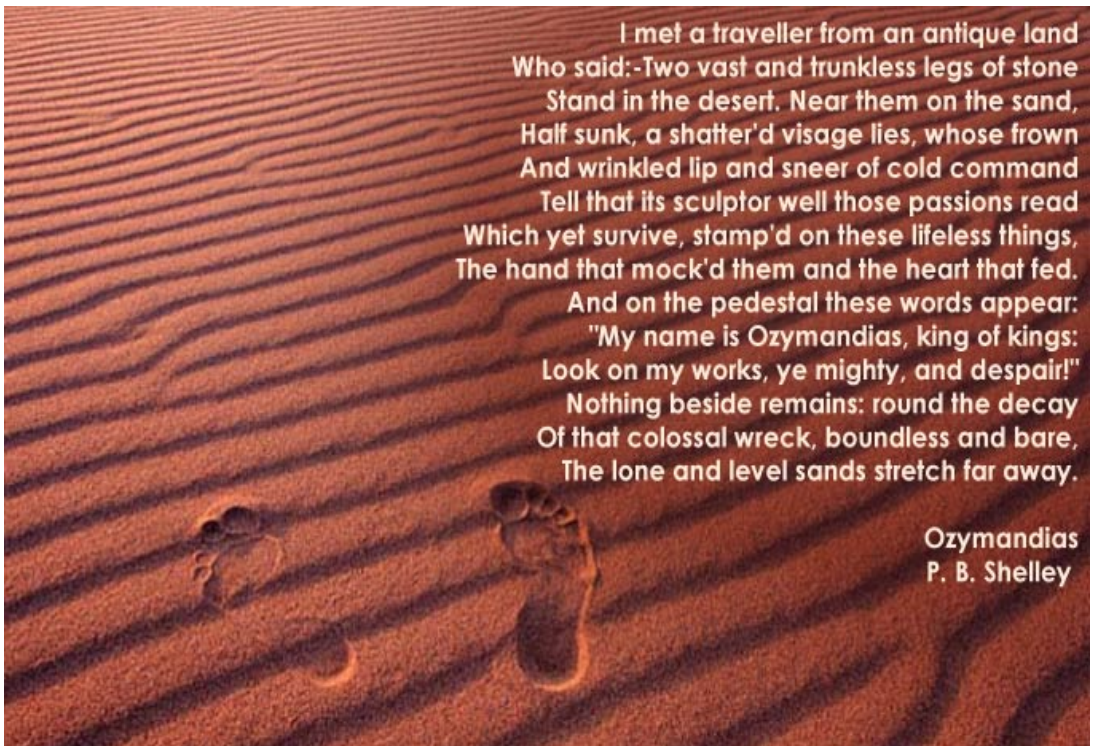




EPILOGUE

THE ARCHITECT'S EPILOGUE

Ozymandias or Sustainability



The New Arab Urbanism research project focused upon the holistic sustainability of the phenomenal, recent developments in Kuwait, Qatar and the UAE. Upon reflection on the lessons learned from that intense, penetrating series of interviews and site observations, the overriding sense that I have is these countries are facing a significant crisis of direction- will it lead to a cataclysmic "Ozymandias Legacy" or a brilliant sustainable future?

Leading thinkers and decision makers, both nationals and expats representing government authorities, academia and professionals, all residing and working in the region, constituted the participants of the Focus Groups. The sessions were convened to review and discuss the environmental sustainability and cultural relevance of the recent urban developments and architectural projects to the residents of these three Gulf countries today. The methodology of the research was to record their impressions and responses to specific questions about the two core issues, to observe selected urban sites and projects through field inspections and through this lens to assess in preliminary ways the holistic sustainability of the new built environments and how the Focus Group participants were recommending to improve and enhance them through innovative design guidelines and strategies. The preceding narrative essays and case studies have documented in greater detail the observations of the interlocutors, while

this epilogue highlights the main lessons learned and comments obtained from a Peer Review of the research.

Much has been written and documented recently about the “Dubai Model” as a smart, mixed use development formula based upon a full service –single source solution that is now being branded and replicated in the region and other parts of the world. It can be paraphrased that the participants used the term “Dubai Model Metaphor”, not as it particularly related to that city, but more generically as a phenomena of the prototype developments now characteristic of the region.

While many agreed on the model’s initial, vast financial success, it was still considered a "work in progress", especially as impacted by the recent financial meltdown globally, and most dramatically represented by the boom/bust of Dubai. The sense of the research was that the fiduciary and social responsibility of those who are responsible for the vast new developments, be they in government or in the private sector, would benefit from a careful SWOT evaluation of this model, now that adequate examples of them have been built and can be tested against a more broad set of criteria, in addition to their economic and political aspects.

On the whole, the Focus Group participants understood the need and encouraged the integration of practical, sustainable design and environmentally conscious strategies into the fast paced implementation of the economic and physical developments of the Gulf region. This was especially recognized as two of the biggest ecological footprint per person countries in the world are the United Arab Emirates and Qatar.

They were in almost unanimous agreement on the definition of sustainability as defined in the WCED Report, Brundtland Commission, *Our Common Future,* and 1987 that stated: ‘Sustainable development is development that meets the needs of the present without compromising the ability of future generations to meet their own needs.’ Not surprisingly, however, there were diverse opinions expressed by the regional participants on the implementation of this sustainability standards - some viewed the important short term need to clearly establish an urban base within the previous sparsely settled, inhospitable desert region - a habitable place from which to then to grow into maturity, regardless of context or sustainability. Others were concerned that without a long term view for suitable environmental and culturally adaptive urbanism that the new settlement patterns would be doomed to an unsustainable future. Further, there were different opinions expressed about the definition of sustainability as it should be applied to the new habitats of the Gulf and the relevance of the subject to its inhabitants as most GCC countries heavily subsidize energy and water in their welfare states that are also free of taxes or apparent fiscal or regulatory limitations. Based on this latter view, the observation was made by many that sustainability is therefore that a priority as long as it did not affect their personal and household pocket books. Of course, this perception avoided the facts that the Gulf States have the highest energy and water usage per capita in the world, coincident with the highest carbon footprint. But, the consensus was that most of the three countries while paying lip service to sustainability are actually doing very little about. Perhaps, Abu Dhabi with its Estidama Program and the much publicized Masdar new town might be a pace ahead of the others with respect to this issue, followed by Qatar and lagging most behind would be Kuwait.

Not unlike the appreciation of "Motherhood", they recognized that ultimately sustainable solutions had to be found and demonstrated in economically viable ways, but that rapid growth and applying the measures of sustainable design would be difficult to reconcile in the short term. It was further stated that there is an inseparable link between Sustainability and Politics. Therefore, sympathetic public policy and legislation needs to be nourished to support sustainable strategies that should encompass the whole spectrum of social participants, from the individual, the community and the State.

A SWOT Analysis of Current Gulf Urbanism

The following SWOT observations on the "Dubai Model Metaphor" summarize in a conceptual manner some of the salient discussion and thinking of the participants, representing the diverse disciplines of governance, development economics, environmental design, marine engineering, planning and architecture.

Strengths

The Model is characterized by strong physically identifiable global building styles and types clustered into isolated, single-use development packages targeting an economically stratified medium to high-end user and well branded that are rapidly designed and built with some cities allowing transparent, legally binding ownership procedures and bankable financial arrangements.

Weaknesses

Environmental Considerations

Within the issues of the global environmental crisis, it has already been observed that replicating the high energy use, car dependent transportation model of the US would require "3 Earths" to support such an energy inefficient approach, if the rest of the world followed suit. Since the physical development characteristics of the current built "Dubai Models" in all the Gulf countries follow closely US energy guzzling, full A/C, non-Green, highly polluting Building Types with predominating car based transport. Such a physical model, with its associated negative public health impacts, for the Gulf and the hot Middle East Climates, leaves much to be desired and would not be a sustainable model to promote as it is.

Similarly, the subject of the negative impacts upon the Gulf Aquatic Environment of much new waterfront developments is another important weakness that deserves serious re-consideration and repair before further deteriorization occurs in the marine life of the Gulf. Contingent to these issues is the urgent need for Tidal Rights legislation that can anticipate shoreline ownership within the context of shoreline location changes that are bound to global warming and the resulting sea level rise.

Socio-Cultural Considerations

The term "Refugee Rich" has been used by some to describe some of the recent luxury, gated communities and developments in the Gulf. This symbolically addresses one of the social engineering issues of gentrification, exclusion and unsustainable social stratification that the "Dubai Model Metaphor" represents. Others considerations such as lack of community identity, human scale, pedestrian walking comfort, lack of satisfactory public realm urban spaces, etc. are other attenuating concerns.

Culturally, there is the important issue of whose culture is this place anyway? With only a minority of nationals representing 10 to 20% of the population and those percentages rapidly are declining in most of the GCC countries and very large resident populations from many diverse world cultures how are the demographic and cultural needs of these residents going to be met both physically and spiritually? What are the ethnographic and iconographic common ground signs and symbols being created in the new built environments to harmoniously integrate the diverse peoples and how does the lack of such thinking further or hinder the population's respective need for a Sense of Identity? How will a feeling of belonging and loyalty to the Place be nurtured after the big building boom is over?

Opportunities

Today we are encouraged by the Abu Dhabi Plan 2030, the Estidama Program, the incorporation of the UAE Green Building Council and the Masdar 'Carbon Neutral' New Town with their emphasis on energy efficiency and environmental consciousness that offer hopeful signs and may be pivotal to the beginning of overcoming some of the key weaknesses of the "Dubai Model Metaphor". However, we are also reminded of the relative inaction of Dubai with respect to active implementation of H.E. Sheikh Mohammed bin Rashid Al Maktoum mandate of October, 2007, that all buildings in Dubai must become "Green" as of 2008.

An encouraging sign can be found in Qatar with the recent *Strategic Environmental Assessment Process* of the Qatar National Master Plan 2030 that will be assess the sustainability of QNMP through monitoring by the Barwa Foundation and Qatar Green Building Council, who have developed a Sustainability Matrix. The Heart of Doha Development Project, with the local name *Musheireb,* promises to be an important case study regarding an experiment in sustainable and culturally sensitive urban regeneration.

Regrettably, Kuwait yet lacks such visionary sustainable development programs or a major sustainable demonstration project. With one of the most polluted air, land and sea environments and vast wealth, it seems frozen in time and inaction, although most recently a Five Year Kuwait Vision has been announced. However, upon inspection of the objectives of this plan, the emphasis seems to be based on the old "Dubai Model", with its show piece development being "Silk City" in Subiya featuring another so-called iconic tower and connected to the city by a causeway that traverses long stretches of intertidal mud flats where biodiversity impacts of its construction will raise environmental concerns and cause significant carbon emissions based on the vehicular traffic that it will engender.

However, time will tell how conscious these societies will become of sustainability concerns and how much affective action they will really take, but in the interim we need to be mindful of the following shortcomings and considerations:

- What new sustainable strategies, both technological and cultural, are needed to be conceived to help overcome inherent weaknesses in the "Dubai Model Metaphor" that will help propel the existing environmentally unsustainable development model to transform into a new and successful Paradigm of Sustainable Development- One that is good for the region and for others to emulate?
- The idea of sustainability fits well into the Islamic ecological view of the proper relationship of Man and Nature. How can this aspect inspire new design thinking?
- How can the idea of sustainability be made more related to the person and his individual commitment to become more conscious, not only of ecology, but of his whole context of existence?
- How can the Gulf Countries learn from innovative new Zero-Energy Cities being designed and built in Dong Eco-City, Shanghai, China, the Walled City in Abu Dhabi by MASDAR or the culturally related Heart of Doha project?
- What is to be done to retrofit the existing, newly built buildings and urban communities to overcome their lack of sustainability?
- How will the issue of citizenship and democratic participation in the governance of this society come about to create and sustain a harmonious community?
- When and how will the current counterproductive policies of "Socio-Economic Exclusions" practiced in most Gulf cities be addressed and resolutions found to avoid near future social antagonisms?
- How can the current employment pattern that is focused primarily upon low paying jobs in infrastructure and building construction be transformed into higher income, higher knowledge based employment that can attract and nurture a true middle class to help sustain these societies?
- What are the new, innovations in governance procedures and public policy that are required to encourage through incentives and flexible legislation to establish more sustainable procedures and practices in the Gulf Region?
- How are the academic institutions of the region from elementary to higher education levels, particularly in the schools of architecture and engineering, transforming their curricula and training their students to become the future leaders of sustainable design in the region?

Threats

If the "Dubai Model Metaphor" is left unchecked and simply continued, the environmental problems already in evidence of urban air and water pollution, excessive urban heat build-up, traffic congestion, lack of human scale and adequate, harmonious socio-cultural community building could well reduce the financial success and jeopardize the boom that has been recently gained.

Additionally, since the main infrastructure of power generation, water desalination and transportation to support the building developments fall in major part upon the government, the enormous operating and maintenance costs of a non-sustainable city in a desert will economically burden the governments of the Gulf and divert their resources from growth to simple maintenance.

In short, unless the model is significantly repaired and enhanced to be more environmentally and culturally sustainable, the "Dubai Model Metaphor" will be superseded in a short while by others with new, hybrid energy efficient, human scaled, culturally and aesthetically more desirable models. Already, aspects of this trend toward a less "wasteful luxury" theme of development can be seen in the development programs of the large development companies in Abu Dhabi where a greater emphasis on medium to medium low income residential projects are on their drawing boards. This tendency more truly reflects the demographic need of the region, rather than the speculative programs that now lie partly empty in Dubai.

RESEARCH FINDINGS AND RECOMMENDATIONS

There are timeless sustainable habitat paradigms that have been time tested in this region, with minor variations as pertaining to bio-climatic and cultural variations. If the basic, scientific principles of these paradigms are extracted and defined, there is a strong potential for the emergence of a significantly suitable model for sustainable urbanism that can respond holistically to the challenges and opportunities of the Gulf region, with more specific reference to the GCC countries.

The research and practice of the last thirty years has provided considerable evidence that the use of conventional energy in buildings can be greatly reduced, -or eliminated altogether in some cases-, and occupant thermal and visual comfort can be improved. Some recent schemes are aimed at near zero conventional energy for space heating and cooling and some buildings have been designed to become net producers of energy. In the Gulf Region the overriding issue is the blind acceptance of and total dependence on mechanical cooling. Given the rapid urbanization taking place at present, this dependence creates a vicious circle that threatens the sustainability of these developing urban centers.

The quest for cultural relevance would also be to search for what the late Joseph Campbell called the "Monomythic" and primordial common ground narratives, forms, signs and symbols from the Middle East and around the world to be realized in a unified New Creation.

Preliminary research findings from our Focus Group discussions; reviews of innovative sustainable projects in the region; and reviews of other current research carried out by academic and professional groups that are concerned with the

development of a "Critical Regionalism" approach suggest the following five major design criteria can foster this much needed new "Paradigm of Sustainable Habitats":

1. CLIMATE & SOLAR/WIND ADAPTIVE, COMPACT, MID-HIGH DENSITY, MIXED-USE, SOCIALLY INTEGRATED URBANISM

Building form, orientation and spatial organization have a bearing on solar and wind exposure; on heat loss and gain by transmission through the building envelope; on day lighting and ventilation; on the potential for passive cooling and solar heating; and on the need for solar control.

Compact, mid-high density urban forms expose less building surfaces to heat gain and engender narrow, shaded pathway networks and greater opportunity for more comfortable, pedestrian movement. Mixed use developments incorporating residential neighborhoods with relevant commercial, educational, recreational and places of employment require less reliance on the automobile and traffic generation. Thus they require less energy demand, less infrastructure investment and are more economical to build, operate and maintain.

2. CULTURALLY RELEVANT, PRIVACY & IDENTITY GENERATING, COURTYARD DESIGN TYPOLOGIES

The courtyard form has a long tradition in the architecture of this region. A deep need for privacy, security and environmental adaptation characterized this house form, which still are relevant criteria for contemporary residential places.

We are reminded that in the traditional, metaphysical worldview of this region, reality has two structural dimensions, the "inner" (batin), understood by our enlightened thought and the "outer" (zahir) perceived by our sense receptors. Architecturally, the Walled Paradise Garden and the Courtyard, with their inward spatial orientation, have come to symbolize this duality in archetypal space making. From this view the very unique regional conception of "Positive Space" comes into play where Spiritualized Space, not exterior shape or object, is the dominant focus of this planning and design approach.

Study of some of the historic complexes surviving in the region has provided insights on how the courtyard and the shaded porticoes that surrounded them helped modulate indoor environmental conditions under the very intense summer conditions experienced in these countries. The use of intermediate or transitional spaces, such as porticoes and arcades, mediating between indoors and outdoors are valuable spatial devices that should be promoted to achieve greater comfort conditions.

Landscaping and other microclimatic interventions can also help improve conditions in the vicinity of buildings.

3. CONTEXT BASED & ECO-BALANCED DESIGN & PLANNING

Understanding the Genus Loci of the place; developing with the natural qualities of the environmental context and thus creating a "Sense of Place" with regional identity realized. This is one of the special characteristics of memorial cities of the world. The

Gulf Region is the meeting place of the desert and the sea. This unique place- the shallow, aquatic intertidal zone that is also the breeding ground of the marine life of not only the Gulf, but contributes to that of the Indian Ocean- is a precious ecological zone that needs to be conserved for the sustainability of future generations of man and marine life.

The destructive manner in which the coastal edge has so far been damaged in just the last few decades by insensitive, speculative development needs to end and a new cycle of eco-balanced development of the meeting place of land and water commenced.

Coastal Zone Management legislation that is enforced is the critical need of governments and a new paradigm of context friendly urbanism positively promoted.

4. CONNECTIVITY, HIERARCHY OF SCALE, PEDESTRIAN FOCUSED, MULTIPLE TRANSPORTATION ORIENTED PUBLIC REALM DESIGN

In Planning/Design terms the scale of the Individual family and the smallest building unit-the Dwelling- must be recognized at an urban dimension. Moving outward to the social Cluster of dwelling units, to the Pedestrian Neighborhood (Fareej) and on to the Urban Community and finally encompassing the Regional Domain, this hierarchy of spatial design needs to be re-instated by new, innovative building codes.

As cities in the region become more densified, there will be more pressure put upon the "Ground Plane". Public Space and the public realm will require far greater urban design consideration than hereto has been accorded to it. Instead of looking at it as the left over space between private development parcels, the sustainable city of the future will have to create viable, climatically comfortable and pleasant spatial nodes where there is connectivity between various modes of transportation, places of relaxation, social integration and interaction between the diverse demographic populations of these global cities.

5. ENERGY & WATER EFFICIENT, RECYCLABILE, MIXED-MODE TECHNOLOGY & AFFORADABLE, REGIONALLY SOURCED DESIGN

Natural, controlled Daylighting should be encouraged into rooms through external windows, clerestories, and roof lights. Size, geometry, and location of openings and the reflectance of room surfaces are the main controllable design parameters. Artificial lighting has a high penalty in electricity consumption, adds to cooling loads and has overall negative environmental impact.

In the Gulf Region night-time ventilation should be sufficient to maintain buildings within the neutrality comfort zone throughout the mild and warm periods and for part of the hot period. This is the case assuming effective solar control as discussed in the previous section.

The issue of solar control requires designers to pay close attention to the spatial and temporal distribution of incident solar radiation. Given the high sky luminance throughout the year excellent day lighting conditions can be achieved by fairly small openings. In contradiction to climatic Region is toward use of reflective and absorptive types of glazing in conjunction with oversized, non-operable glazing that carries little or no other form of solar protection. This is both expensive and insufficient in controlling cooling loads and thermal and visual discomfort due to direct radiation and glare.

THE CONTINUING QUESTIONS

At this writing, the jury is still out regarding if the future portends "Ozymandias" or a "Brilliant Sustainability" for the new urban centers of these three countries. The first impression is that there is insufficient consciousness today, as previously documented in this report, in both the public and private sectors about the real threats and potential harmful impacts of Climate Change on water availability, actual energy costs, transportation, agriculture, ecosystems, public health and social harmony.

With such a wealth of resources and concentration of talent in these countries, both national and expatriate, the keys to success lie in the immediacy of viable answers and operational actions related to some of these pivotal questions:

1. Have Senior Decision Makers been made fully aware and have they a commitment to the value and need of Ecologically-balanced and Sustainable, Energy-Efficient Design for the Gulf Region? Are there adequate Government and NGO institutions that have begun to take any effective actions, such as holding technical forums specifically related to this topic; issued corporate mandates on Sustainable Design; created specific governance on the subject? Or provided adequate incentives to developers and professionals to design and build sustainable habitats? How much of it is hype and how much essence?

2. Has the beginning "seed" of a working, continuing international network of academic institutions, governmental agencies, corporations and concerned professionals focusing on integrating sustainable design strategies for the region been instituted? If not, is there a need and a will to do so? How could such a crucial vision be organizationally implemented and financially funded over the long term effectively?

3. Has there been adequately raised consciousness to scientific and ethical issues related to Climate Change and Environmental Design in Architectural Students and Faculty and has it motivated the Schools of Architecture to offer pedagogic curriculum that can adequately and holistically educate students in Applied Sustainable Design? What more remains to be accomplished?

4. How can the message and activities on Environmental Awareness and Sustainable Design that the academic, professional, and governmental agencies taken so far or propose to be taken in the region be meaningfully conveyed to the general public so they can "assume ownership" of this process and participate actively in changing their lifestyles to be more energy efficient?

ANTHROPOLOGIST'S EPILOGUE

Because relatively little social or anthropological research has been done in he Gulf by comparison with the fields of architecture and urban planning, the anthropologist feels it would be premature, if not foolish, to offer any policy recommendations. Instead I share my impressions of how policy makers, an elide cadre in the Gulf, are thinking about the relationship between the built environment and socio-historical context as well as cultural value and meaning.

The anthropologist was in search of what our interlocutors in the Gulf mean by "culture" and "identity" and was pleased to see that there exits a variety of opinions on these fraught subjects (tradition/modernity, national/global, mixture or hybrid). Pleased, because I am not sure that consensus is a good thing, if the ideas we get behind turn out to be less than sound or desirable. And sound to whom? Desirable to whom? We have to be open to the very real possibility that such important ideas will be contested or challenged by different groups in the population. It is far more helpful at this stage to have a free-wheeling, open-ended discussion across different groups in the public about what is meant by "culture" and "identity" than for top decision makers to assume they already know what these mean and then tfoist them on the rest of the population. True, there was some evidence that research was being done by developers on potential consumers of the newly built environment (Dohaland comes to mind as does Masdar City) but the methods are limited to small-scale focus-groups and surveys and not longer-term ethnographic analysis that will require a deeper, more intimate connection with peoples' lived experience in, or habitation of, their environments.

There are, of course, immediate challenges with such a call for social scientific research. The first has to do with the fact that quantitative not qualitative research is emphasized in Gulf social science research, and while quantitative methods are clearly important, they need to be balanced with qualitative methods as well. The second has to do with time frames. In spite of the fact that development has slowed down in the Gulf because of the recent economic recession, it is still moving at a pace that would be unfriendly towards longer-term methods.

These challenges not withstanding, I would encourage social scientists working in the Gulf with a combined expertise in quantitative and qualitative methods to collaborate on what might be called the ethnography of the built environment in the Gulf. These would be an examination of the kind of building that is currently going up and of the diverse populations it is meant to serve.

For example, one might examine ethnographically what different segments of the population (men vs. women, older vs. younger generations, nationals or locals vs. expatriates) mean by the urban past (not only in terms of periodization but also of the lived experience of urban space). For an older generation, the past is likely to mean the pre-oil era, of which, in terms of building, little remains; their relation to the past may be based largely on memory and nostalgia. For a younger generation, that past is learned, if at all, in schools and fieldtrips, and it is the early part of the post-oil city that constitutes their past. We know next to nothing about how that younger generation experiences the existing city as part of their lived past; and yet, if we are building a city for the young, we risk destroying much of that built past in the rush towards development. For women, urban space may have to do with privacy and family visitations that a past neighborhood

configuration sustained (this was expressed any number of times in the focus groups); for men, it may have had to do with visitations, as well, but in more public spaces and for purposes other than kinship per se. For expatriates there may be some emotional connection with the city's pre-oil past (as, for example, is the case with our guide to old Kuwait, Evi Simos Ali) having to do with salvaging a "world" heritage but, one presumes, not as something that they identify with as part of their own history. One of the results of this kind of research may be a more nuanced understanding of what a "past" built environment means in the area to the diverse citizens of the city and how best to respond to it in new development. Legacy or heritage sites may be one but not the only means to do so.

Another interesting research project would be to see how people (men and women, families and single people, locals and expatriates) frequent and use the urban environment as it now exists, with all of its blemishes and good points. We came across enough evidence to show how spaces like giant malls or commercial/residential developments, which architects or historians may find deplorable, are nevertheless enjoyed by urban peoples, yet we know next to nothing about why they do and how these spaces or similar ones might be retrofitted to better accommodate these tastes and predilections. Again, surveys coupled with on-site observation, detailed interviews of the users/consumers of such spaces, and discussions with developers might prove extremely productive here.

Still other research projects are possible, perhaps focused on youth, such as came to mind during the course of the fieldwork and were mentioned earlier in the report. We know next to nothing about how culture, sustainability and the built environment are discussed in civil society or the classroom, on television programming or other public venues of communication such as internet sites, such that we can say how youth understand the challenges they face or what they might do about them. Education obviously has a big role to play in fostering awareness about these problems; one can have the best research go to waste because its findings are not communicated well or translated into best-practices.

Finally, let me say that with new-found awareness among policy makers of the importance of culture in their assessment of sustainability, anthropology may have a very important role to play in urban planning, but it has to be understood that anthropology's theoretical object of study, culture, has itself undergone criticism in recent years, especially within the discipline itself. In our efforts to become more aware of a cultural dimension in Gulf development, let us not end up reifying and creating a bounded, homogeneous and somehow "authentic" entity that in reality doesn't exist except in the analyst's own head. It is more difficult to work with something porous and fractured but it may be truer to realoity. I will be curious to see whether the collaboration with anthropology takes off and even more curious about its outcomes.

In any case, the anthropology of the Gulf where the built environment is concerned is in its infancy. Much has yet to be done.

PEER REVIEW COMMENTS

On October 27, 2010 the penultimate version of this report was subjected to a peer review by six colleagues who gave generously of their time and wisdom in a three-hour session to discuss our findings and analysis. These six people were: Professor James Wescoat, Agha Khan Professor of Architecture (MIT), Professor Martha Schwartz, Professor in the Practice of Landscape Architecture (Graduate School of Design, Harvard University), Richa Shukla (graduate student, Graduate School of Design, Harvard University), Mohamed Chakaki (graduate student, MIT) and Justin Stern (Graduate School of Design, Harvard). Dr. Gareth Doherty (Lecturer, Graduate School of Design, Harvard University) also joined the peer review even though he was on our original research team, but it was thought that he could comment on things he knew transpited that were left out of the report (which, in fact, he picked up in the session). We want to thank all these individuals for their very helpful comments. We asked them to consider not only the contents of the report but also its format and organization as well as the methods employed in our research. What follows is a capsule summary of their observations..

Theory. We were encouraged to think more about our conceptions of urbanism, especially ones that might integrate our perspectives as architect and anthropologist. While this was certainly an excellent point, we felt that to do so would require a lot more theoretical work (and especially an engagement with existing literatures on these topics) than this field report warranted. If we wanted to take this report to the next academic level, we would then certainly do so and revisit this suggestion.

Comparison. Since we claim to be comparing different cities in the Gulf, it was suggested that we need to think more about our methods of comparison, the categories or criteria we used to compare the built environment in these cities. Fair enough, but the answer to this is quite different for the architect and the anthropologist. The architect can and did invoke certain categories such as a particular definition of sustainability that might or might not be shared across the different focus groups we interviewed in the Gulf. There were other commonalities as well in terms of sustainability criteria such as LEEDS or ESTIDAMA. For the anthropologist the basis of comparison was more the stories or narratives that experts tell about development, the past, culture, and so forth, and the fact that these stories are often contested.

Policy. We were asked how our activities or findings might inform what architects do. The architect has responded to this question by making some specific policy recommendations in his share of the epilogue. The anthropologist prefers to answer this question in the following way. We know very little about the socio-cultural dimensions of the built environment's sustainability, and so we need to encourage social science research on this question before we can even begin to make sound policy recommendations.

Cultural Identity. One person, rightfully, felt that too much of the burden, as it were, for the formation of a cultural identity fell upon the youth (and students, in particular, though of course this was an artifact of our focus on educational institutions), but what about other segments of society such as the poor? This is a very fair criticism, though it is important to remind ourselves of the disproportionately large percentage of the Gulf population that is under twenty years of age. And as for the urban poor

(constructions workers, for example, or street cleaners), we agree that they certainly also have to figure in any story about Gulf development, one which we did not pick up in our ethnography of policy elites. In our defense we would say that our top-down approach is also necessary to understand the poor and the disadvantaged, for they are affected by elite policy decisions. Perhaps by making those policy makers more aware of the poor and how they occupy cityscapes, we might bring a more bottom-up perspective into our study. In the future, we would also like to shift to a more bottom-up perspective as well.

Critical Urban Arabism. We were asked to encourage a more critical perspective in Arab urban policy makers, and we certainly hope that this report will do just that. Indeed, we were struck by how many times were told things such as the following in our focus groups: "this is the first time I have ever heard my colleagues talk frankly about the common problems we face, and it is quite refreshing." Or, "things are built so fast, I wish we had time to slow down and reflect on what worked and didn't work." Or, "it is difficult to offer criticisms when so many projects are the brainchild of powerful rulers." Clearly, the people we spoke to craved this more critical perspective though the conditions in which they worked did not necessarily encourage it.

Constitution of the Subject by the Built Environment. One of the questions raised by our study for one participant was how the subject (the person) is formed by the built environment they inhabit, and whether one can approach this historically. Clearly this question requires long-term and detailed ethnographic fieldwork, of a sort we could not do. But we can point to some beginnings in the work of Nadia Fuccaro and Ahmed Kanna cited in the bibliography.

Voices of Architect and Anthropologist in the Text. Gareth Doherty commented that he thought the voice of the architect was most interesting when he was talking about socio-cultural issues and the voice of the anthropologist most interesting when he talked about the architecture of the built environment, and he thought that this was indicative of a deep dialogue between us. He went on to observe that the architect and anthropologist had many conversations about these themes, especially when visiting specific sites, and he wished that we had included some of these conversations in the interpretive essays which would have shown how our ideas informed each other.

Identifying Names and Audiences in Focus Groups. We were asked to consider identifying a bit more clearly who was saying what in the focus groups. We understand the reasoning behind the suggestion (one can assess what is said in the perspective of that person's office or role) , but we resisted it because of our strong desire to protect the identity of focus group participants who were often very frank in their discussions.

The Use of Public Space. It was noted that most of our attention was on the ground plan of the urban space and not on how people actually use public spaces in the city. This is a very fair criticism. Had we done more ethnography of the city, this shortcoming might have been overcome.

The above were valuable comments and criticisms of our approach, and we learned a great deal from them. If we left out any, we apologize for the omission. Some of what we learned informed our writing of this Epilogue, the rest we hope will be a spur to future research, whether our own or someonelse's.

APPENDICES

Appendix A

SUSTAINABLE DESIGN FOR THE BUILT ENVIRONMENT OF THE GULF REGION

Preliminary Design Guidelines and Assessment Criteria

By SIMOS YANNAS,

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INTRODUCTION

In view of the absence in the Gulf Region of any environmentally appropriate, contemporary built precedents, a major research effort will be required to underpin the formation of guidelines and regulations to help redirect building design and the retrofitting of existing buildings toward climatically adaptive and environmentally sustainable models. The AA E+E Environment & Energy Studies Programme of the AA undertook a series of preliminary studies that combined with reviews of historic precedents led to the formation of some early guidelines and assessment criteria that may form a framework for developing a sustainable design approach for the region.

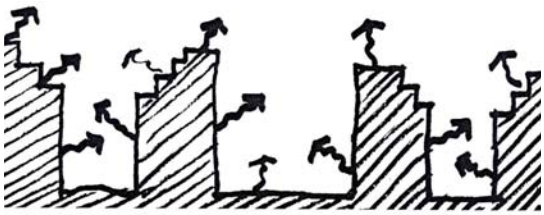
The research and practice of the last thirty years has provided considerable evidence that the use of conventional energy in buildings can be greatly reduced, -or eliminated altogether in some cases-, and occupant thermal and visual comfort can be improved. Many recent schemes are aimed at near zero conventional energy for space heating and cooling and some buildings have been designed to become net producers of energy. In the Gulf Region the overriding issue is the blind acceptance of and total dependence on mechanical cooling. Given the rapid urbanization taking place at present, this dependence creates a vicious circle that threatens the sustainability of these developing urban centers.

Increasing dependence on mechanical **air conditioning**

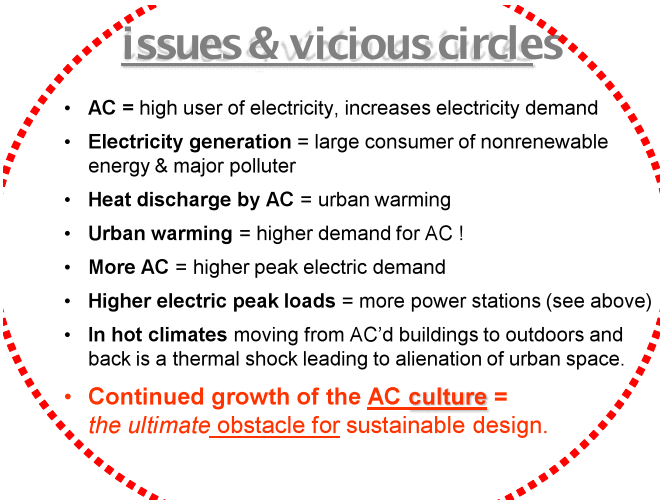
AC

is now the single most important environmental **issue** (in all climates)

... it turns buildings into all-year heaters for the city, ...



... thus working against the climate...

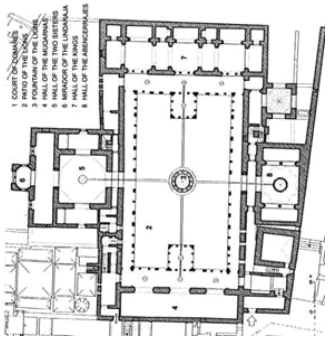


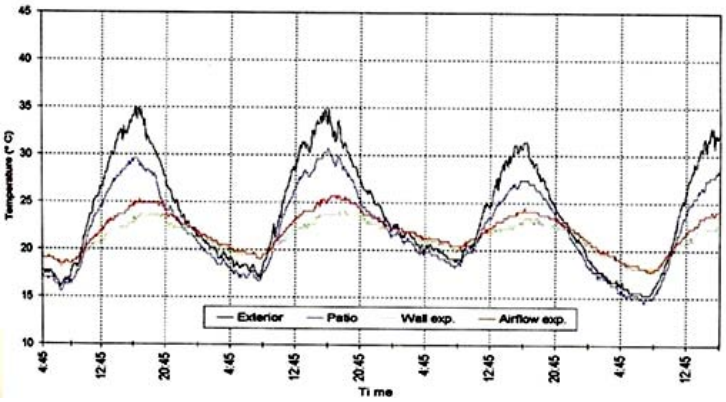
Energy use, indoor air quality and occupant thermal and visual comfort in buildings are largely influenced by decisions taken in the early stages of design, often by choices made even before design commences. Understanding of the principles of sustainable environmental design, in conjunction with use of specialized analytic tools, can inform design decisions, helping to assess the likely environmental implications of different design options as these are being considered, and providing the means for setting performance targets for new buildings and refurbishment schemes.

PRECEDENTS-Courtyard Tradition in Islamic Architecture

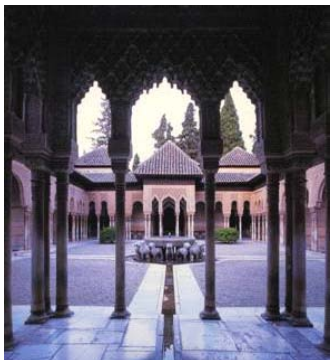
The courtyard form has a long tradition in Islamic architecture. Study of some of the palace complexes surviving in Spain has provided insights on how the courtyard and the shaded porticoes that surrounded them helped modulate indoor environmental conditions under the very intense summer conditions experienced in the south of that country. Measurements taken recently in the 14th century Palace of the Lions, a residential complex of the Alhambra in Granada show the role of the courtyard and its porticoes as transitional spaces mitigating the effects of the outdoor temperature and intense summer sunshine. The graph shows outdoor, courtyard and indoor temperatures measured over four consecutive days. With outdoor air reaching peaks of 31-35C, those in the courtyard are lower than 27-30C and are further reduced indoors by the thermal inertia of the building.

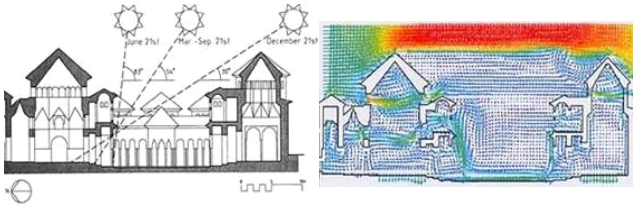
The daily range of 18-25C and average of 22C achieved indoors is quite remarkable and is achieved despite the fact that the courtyard is now operating without the lavish vegetation that used to populate it and which has been recently removed to protect the building's foundations from moisture (Jimenez Alcala 2002).





Court of Lions, Alhambra, Granada





We may consider application of environmental information and design support tools at different stages, before, during and following design as described below:

a) Before design: to set environmental design targets, study likely effects of ambient and site parameters, determine the environmental conditions to be provided in the different spaces being considered (temperatures, humidity, luminance levels, fresh air supply).
b) During design: evaluation and comparison of alternative design options, comparison with precedents and targets of energy use, pollutant emission limits, indoor thermal and visual comfort range and air quality; fine tuning and optimizing building performance.
c) Post-design evaluation establishing operational targets and guidelines, advising occupants with information on how to use building; assessing effects of different occupancy scenarios, thermostat settings, use of blinds, etc.; adaptation of building to daily / seasonal changes.

Few of the available tools deal with all of the tasks and operations encompassed by environmental design and some were designed to deal specifically with only one or some of these processes. The most widely used from among the tools that deal with thermal analysis have become increasingly more designer-oriented aiming to address both three dimensional visualization (and thus also studies of solar access and shading design) and the processes of natural ventilation and solar gain that are of critical importance in contemporary building design. With increasing computer power there has been a continuous trend of integration and greater capability. Calculations that needed to be run overnight a few years ago are now performed in a few minutes. Even so, there is still

considerable discrepancy between designers' conception and expectation of realism and accuracy, and what is feasible by the application of even the most sophisticated of the current tools. Nevertheless, practically useful and reasonably accurate results can be produced even with the simplest tools provided users understand the processes involved and the capabilities and limitations of the tool. It is especially important to be clear about what processes are ignored and the likely effects on results.

The following are key design tasks and aspects of design specification that require specialist information and the use of analytic tools:

- Weather data and climate analysis
- Environmental design criteria for thermal comfort
- Solar control
- The role of thermal inertia and night-time ventilation
- Heat sinks & application of passive cooling techniques
- Material properties, environmental impact and building element design
- Assessment of space heating, cooling and lighting energy use and occupant comfort

The following sections are structured to cover all of these aspects and are sequenced in the order in which they would be commonly of use in the design process.

WEATHER DATA AND CLIMATE ANALYSIS

Design weather data for Kuwait and the UAE are available from several meteorological stations located in cities and airports in the Region. The Meteonorm global climatological database (version 5.1.2, Meteotest 2004) holds weather data from the following weather stations in the vicinity of this year's GRP sites:

- Kuwait City Centre (Latitude 29.20N Longitude 48.00E)
- Hawalli (29.21N 47.57E)
- Salmiya (29.20N 48.04E)
- Kuwait International Airport (29.13N 47.59E)
- Sharjah City Centre (25.20N 55.26E)
- Sharjah International Airport (25.20N 55.31E)
- Dubai City Centre (25.15N 55.20E)
- Dubai International Airport (25.14N 55.17E)
- Abu Dhabi City Centre (24.28N 54.25E)
- Abu Dhabi / Bateen (24.26N 54.28E)
- Abu Dhabi International Airport (24.26N 54.39E)

Using the Meteonorm software, monthly and hourly data files were generated for Abu Dhabi City and Kuwait City typical weather years. The data files include whole year hourly dry-bulb, wet-bulb and dew point temperatures, relative and absolute humidity data, direct and diffuse solar radiation values on horizontal and tilted surfaces, wind speed and direction, cloudiness, global and diffuse sky luminance, and incoming and outgoing long wave radiation. Hourly sky temperature, sky temperature depression and wet-bulb depression were calculated separately using the RSPT software (Yannas et al 2006).
Some of the data for Abu Dhabi are summarized and illustrated here.

• The tabulated data of monthly dry-bulb temperatures, Table 1, show that the annual cycle can be subdivided into three distinct periods: a four-month period of *mild*

weather (December to March inclusive) characterized by daily average outdoor air temperatures of 20-23oC, a *warm* period (November and April) with mean temperatures of 25-26oC and a *hot* period (May-October inclusive) with daily average outdoor air temperatures of 30-35oC.

• Sunshine is strong throughout the year with an annual average of 8 hours of bright sunshine per day, rising to 10 hours/day in the hot period. These are accompanied by fairly clear skies (mean cloudiness of 3 octas on most months).

• Incident solar radiation is high throughout the year varying in the range of 3.7-7.0 kWh/m2 on unobstructed horizontal planes. Table 1 gives the monthly breakdown between direct and diffuse radiation showing that the latter represents 40-50% of the global (total) incident radiation. This has important implications in designing for solar control as it suggests that even when all the direct radiation is removed by shading as much as half of the incident radiation may still affect the surfaces requiring solar protection. South and North-facing vertical surfaces are seen by the Sun at low angles of incidence and thus benefit from considerable reductions in the amount of direct radiation affecting them. The monthly values for global radiation on unobstructed south vertical surfaces ranges between 1.5 and 5.0 kWh/m2 with the lower values occurring in the hot period. At this geographic latitude North-facing surfaces are not seen at all by the Sun between October and March, hence the radiation they receive in this period is solely the diffuse radiation from the sky vault which is in the range 0.9-1.4 kWh/m2. In the hot period the values of the incident radiation on this orientation increase owing to inputs from direct radiation in the morning and afternoon. In the height of the hot period North-facing surfaces receive more solar radiation than south-facing ones and are more difficult to shade. East and West facing vertical surfaces are highly exposed to solar radiation in the morning and afternoon respectively and receive values of incident radiation that are twice as high as those on south and north surfaces in the hot period. For energy generation from solar radiation a Sun-tracking surface would be ideal. The amount of solar radiation that can be collected by such a surface is consistently high throughout the year at 6.5-8.5 kWh/m2.

• Winds average above 4.0m/s throughout the year with the strongest coming from the direction of the Gulf on most months with the exception of the three hottest months (July-September inclusive) when the predominant direction is recorded as South.

• The diurnal temperature range of 10-12K results in sufficiently low night-time temperatures to provide s quite sufficient leaves temperatures quite high at night for most of the hot period.
• Relative humidity mean daily values of 50-65% conceal fairly high levels of absolute humidity in the range of 15-25 g/kg during the hot period. The calculated hourly wet bulb depression in this period varies between 5 and 15K. However, at the peak of the hot period the mean wet-bulb temperature is in the region of 24-25oC which is a limiting value for evaporative cooling. The prospects for evaporative cooling are better in the warm period and toward the beginning (early May) and end of the hot period. The wet-bulb depression is similar to that of the hot period but the mean daily values of the wet-bulb are considerably lower at around 20oC which can provide a useful cooling potential.
• Calculated hourly sky temperature depressions are in the range of 10-12K in the

hot period which could provide a useful potential for radiative cooling.

• Ground temperatures have not been calculated, but can be assumed to be in the vicinity of 27oC (average annual outdoor air temperature) at depths over 10 meters below grade. This is not low enough to provide a powerful heat sink for cooling.

• The mean sky luminance has an annual average of about 25,000 lx, rising above 100,000 lx in the summer period of which about half is *diffuse luminance* from the sky vault. Under these conditions 1-2% of the outdoor luminance can be sufficient to provide illumination levels in the range 300-500 lx that are required for typical indoor activities.

TABLE 1. Monthly Weather Data for Abu Dhabi City
Source: Meteonorm v5.1

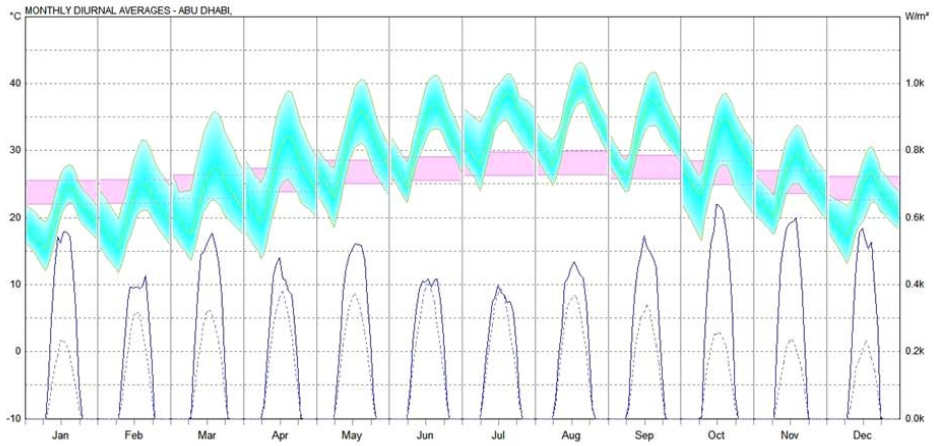
TABLE 1. Monthly Weather Data for Abu Dhabi City

Month	T_a	T_{admin}	T_{admax}	T_p	RH	SDd	G_Gh	G_Bh	G_Dh	G_Gvs	G_Gn	FF	DD	RD
[redacted]														
Year	27.2			20.2	59	8.9	5.3	0.0	2.4	3.1	7.4	4.3	317	6

Source: Meteonorm v5.1

Nomenclature

T_a Mean daily air temperature (dry-bulb), °C
$T_{a\,dmin}$ Mean daily minimum temperature, °C
$T_{a\,dmax}$ Mean daily maximum temperature, °C
T_p Mean daily wet-bulb temperature, °C
SD Sunshine duration, hours/day
RD Number of days with precipitation
FF Wind speed, m/s
DD Predominant wind direction (North=0)
G_Gh Global (direct & diffuse) solar radiation on the horizontal, kWh/m² mean daily total
G_Bh Direct radiation on the horizontal,kWh/m² mean daily total
G-Dh Diffuse radiation on horizontal, kWh/m² mean daily total
G-Gvs Global solar radiation on vertical South, kWh/m² mean daily total
G_Gn Global solar radiation on a plane tracking Sun (normal to direct beam), kWh/m² mean daily total



The graph shows the hourly patterns of the dry-bulb (green line), wet-bulb (blue line) and sky (cyan line) temperatures on a typical day in the middle of the hot period in Abu Dhabi City. The sky temperature depression (dry-bulb minus sky temperature) is an almost constant 15K. The cooling potential by long wave radiation is significant and can be exploited at night-time. During daytime the outgoing long wave radiation is overtaken by incoming long wave and shortwave radiation. The potential for evaporative cooling may be limited in this period by the high value of the wet-bulb temperature. The surface
temperature (broken orange line) is the estimated temperature of a horizontal surface with an albedo (reflectance) typical of urban surfaces and unobstructed view of the Sun and sky. This illustrates the temperature increment resulting from the absorption of solar radiation on outdoor urban surfaces. The temperature elevation would be much higher on darker surfaces such as asphalt. The value of the surface temperature falls below that of the air temperature after sunset. This is the result of heat dissipation by long wave (thermal) radiation from an unobstructed horizontal surface to the sky. It highlights the potential for radiative cooling which in this case can be seen to be of the order of 2K relative to the air temperature.

The data for Kuwait City show even higher maximum dry-bulb temperatures are even higher, but the diurnal range is wider providing more scope for night-time cooling by ventilation and long wave radiation, and the very low relative humidity suggests substantial potential for evaporative cooling throughout the hot period.

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Givoni, B. (1994). Passive and Low Energy Cooling of Buildings. Van Nostrand Reinhold.

Yannas, S., E. Erell, J.L. Molina (2006). Roof Cooling Techniques. A Design Handbook. Earthscan / James & James.

Meteonorm (2004). Global meteorological database for applied climatology. Version 5.1. Meteotest, Bern.

BUILDING PROGRAMME & ENVIRONMENTAL CRITERIA FOR DESIGN

The following aspects of a design brief have a direct bearing on environmental design objectives (i.e. on the range of temperatures and luminance levels to be adopted for different spaces and on other criteria such as whether direct solar penetration can be allowed in a space or not).

• Building location provides indications on climatic, microclimatic and topographic constraints or opportunities (slope and its orientation, surrounding hills, profiles of adjacent buildings, prevailing wind directions, presence of large masses of water or vegetation, etc.)

• Occupancy density and occupant activities determine the requirements for fresh air supply and the appropriate range of thermal and visual comfort conditions. These vary considerably between different spaces and building types. For example, higher levels of natural and artificial lighting are needed in an office building than in a house. On the other hand, higher indoor temperatures can be accepted in a residential building where occupants have more choice on clothing and behavior than in an office or other public space. Occupancy also provides the basis for the estimation of internal heat gains; these have a very substantial effect on space heating and cooling loads.

• The types and sizes of spaces have a bearing on building form and internal layout, and thus influence exposure and thermal transmission rates, illumination, ventilation, passive solar heating and solar control options.

• Occupancy patterns, which in conjunction with building location, suggest the temporal profiles of heating, cooling and lighting loads relative to outdoor conditions.

THERMAL COMFORT

The range of values of the environmental design variables (air temperature, mean radiant temperature, relative humidity, air movement) appropriate for human thermal comfort has been the subject of national and international standards for many years. Such values can vary substantially as a function of clothing, activity, climatic adaptation and other subjective parameters.

Fanger's (Fanger 1970) PMV (Predicted Mean Vote) and PPD (Percentage of People Dissatisfied) indices are used widely. The International Standards Organization ISO 7730 defines thermal comfort conditions as being represented by a PMV between +0.5 and -0.5, corresponding to PPD of 10 percent or lower. The American Society of Heating Refrigerating and Air-conditioning Engineers' ASHRAE 55-92 Standard defined an acceptable thermal environment as one which would satisfy at least 80% of its occupants. This is equivalent to a PPD of 20% or lower, and PMV of +/- 0.85. Over the annual cycle PMV values can be kept within the range stipulated by the ISO 7730 with air and mean radiant temperatures of between 19oC and 30oC when the other variables (including air movement) are suitably adjusted to reflect common human adaptive behavior. Thus the common belief that a building will require mechanical air conditioning so that the indoor air temperature does not exceed 22-24oC does not follow from comfort theory.

The following example has been calculated using a Thermal Comfort software (Environmental Analytics 1997): With both the air and the mean radiant temperatures equal to 30oC, the relative humidity at 60% and air velocity of 1.5-2.0m/s, the PMV and PPD values can be maintained within the ASHRAE 55-92 and ISO 7730 limits at typical metabolic rates of 1.0 met and clothing levels of 0.4-0.5 clo.

The adaptive model of thermal comfort postulated by Humphreys (Humphreys 1978) and Auliciems (Auliciems and Szokolay 1997) based on empirical data from different climates, shows the sensation of neutrality to vary as a function of the outdoor conditions. People resident in a location take adaptive measures that relate to seasonal and daily changes in environmental conditions and personal characteristics. In this model the nature of the adaptive measures adopted by people does not need to be known, as different individual will respond differently. Thus the model simply describes the outcome in terms of the notion of thermal neutrality. Auliciems derived the following expression for free-running buildings:

$Tn = 17.6 + 0.31\ To$

where,

Tn, neutral temperature oC

To, mean monthly outdoor air temperature oC

A comfort zone can be then defined with the value of Tn at its centre extended by 2K on either side thus giving a lower limit equal of Tn-2 and upper limit of Tn+2. For the same air temperature as used for the example above, the neutral comfort zone given by Auliciems' equation is 26-30oC, which suggests that adaptive measures that will be taken by people will make this range of temperatures acceptable. Applied to data fro Abu Dhabi City, Auliciems' expression gives the monthly neutral temperatures and adaptive comfort zone limits listed in the Table 1.

For the whole year these results can be encompassed by a single comfort zone can be assumed with a range between 20 and 30oC.

For values of air and mean radiant temperatures up to 30oC the results obtained from the adaptive models and the PMV/PPD model are very similar. The linear expressions of the adaptive model are not meant to be used for outdoor air temperatures above 30oC. On the other hand, PMV/PPD values rise quite steeply at temperatures above 30oC. This is to be expected since temperatures above 30oC will be very close to skin temperature thus rapidly closing the temperature difference that is necessary to ensure heat dissipation from the human body. At ambient temperatures close to skin temperature all temperature-dependent mechanisms become inhibited and only increased evaporation can provide a heat loss path for the metabolic processes. However, the CIBSE Guide also comments that "people are found to be more tolerant to diversity in ordinary circumstances than would be predicted by PMV/PPD". Air movement eases the physiological processes and can be taken into account as an extension of the upper limit of the comfort zone. This has been estimated as equivalent to 1.4K for 0.5 m/s, 3.9K at 1.0m/s, 5.9K at 1.5m/s and 7.4K at 2.0m/s (Auliciems and Szokolay 1997). Clearly, as the air being moved is at a high air temperatures the comfort cooling provided to occupants is at the detriment of the air temperature in the building. It is therefore not desirable to couple the indoor spaces to outdoor air when the air temperatures are above 32oC. Ceiling fans can be used instead.

The following guidelines can be drawn for the requirements of Abu Dhabi:

- PPD values in the range of 10-20% are acceptable (the higher value applies for the hot period)
- A single comfort zone extending between 20 and 30C can be assumed as acceptable for the whole year. In outdoor spaces this can be extended by incremental amounts of air movement up to a limit of 2.0m/s. The same applies

to indoor spaces where the incoming air does not seriously affect building cooling loads.

References:

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CIBSE (2006). CIBSE Guide A. Environmental Design. Chapter 1 : Environmental Criteria for Design. Chartered Institution of Building Services Engineers, London.
Fanger, O. (1970/1982). *Thermal Comfort*. Danish Technical Press.
Humphreys, M. (1978). *Outdoor Temperatures and Comfort Indoors*. BRE Current Paper 53/78, Building Research Establishment, Watford.
Huisenga, C. and M. Fountain (1997). Comfort Software. Environmental Analytics, University of California, Berkeley.

SITE PLANNING

Topography and other site factors can have a considerable effect on sunshine, wind, humidity, air and mean radiant temperatures, and radiant exchanges near the ground and should be taken into account in site selection and site layout design. Landscaping and other microclimatic interventions can help improve conditions in the vicinity of the building.

The main environmental attributes, opportunities and constraints presented by the site arise from the following parameters:

- geographic location and topography
- built density and profile of adjacent buildings (if any)
- orientation of streets (if any; if street orientation can be chosen, adopt an east west direction so that buildings can face north-south unless there are other reasons for doing differently)
- nature of open spaces (vegetation, water, materials and finishes and their properties)
- traffic, noise, pollution.

The good wind velocities in Abu Dhabi can help ventilate and cool the urban tissue. Good air permeability can be provided by ensuring good air flow conditions through streets. Air permeability can be also improved for the urban blocks via openings between Landscaping Materials and external building finishes: Most cities are now “black”, that is they absorb almost all of the solar radiation that falls on them. This contributes to the heat island effect and thermal discomfort outdoors and increases building cooling loads. Highly reflective finishes can lead to glare on the other hand. Unlike dark colored masonry materials, water has unique quality of absorbing heat and producing cooling rather than heating its surroundings, which is why it is irreplaceable as a landscaping feature. Vegetation provides complementary microclimatic effects including shading. A street or square that is surrounded solely by manmade materials and finishes should be studied very carefully in terms of proportions, building elements such as overhangs, balconies or arcades and color finishes.

BUILDING FORM & SPATIAL PLANNING

Building form and spatial organization have a bearing on wind exposure and heat loss

and gain by transmission through the building envelope; on day lighting and ventilation; on the potential for passive cooling and solar heating; and on the need for solar control.

The main environmental attributes, opportunities and constraints presented by building form and spatial layout arise from the following parameters:
• building shape; different shapes have different environmental attributes in relation to orientation, exposure, self-shading.
• exposure (attachment, height); the proportion of the building elements surrounding indoor spaces exposed to outdoor conditions
• orientation of elevations with respect to sun, wind, view.
• layering of spaces and extension of the plan into semi-outdoor transitional spaces.
• plan depth is a critical parameter for the day lighting and natural ventilation of individual rooms.

Different forms and spatial layouts highlight particular building elements which will acquire an important role in the environmental performance of the building.

• Linear building forms with relatively shallow plans can provide good conditions for day lighting, natural ventilation, solar control and passive cooling if orientation is also favorable. Walls and windows are critical elements. Extension of the roof or overhang elements along the two longer elevations can contribute to the shading of the elevations as well as provide the transition with outdoor spaces.
• Deep plan forms provide a compact envelope with less exposure that other forms but can suffer badly from poor ventilation and day lighting at the centre of the plan.
• Courtyard forms resolve the problem of the deep plan at the cost of increasing exposure and requiring additional footprint.
• Composite forms combining linear and deep plan features are characterized by an "internal street" which can be part of a transitional area.

TRANSITIONS & TRANSITIONAL SPACES
Air conditioned buildings in the Region are kept at temperatures of 22-24oC. In the hot period of the year the resulting temperature differences between inside and outside for such buildings is in the range of 15-20K. This is higher than the temperature difference experienced in other climates in mid-winter (for example, in London the temperature difference between inside and outside rarely exceeds 15K in winter and in Southern European cities such as Seville or Athens it is no more than 10K). Moreover, in winter conditions people will wear additional clothing to go outdoors and the insulation value of such clothing can be chosen to suit individuals' assessment of the severity of outdoor weather.

In the Gulf Region's hot weather conditions such adaptive behavior is not available when moving from inside a building to the outside. One is hardly expected to take off clothes to go outside. On the contrary, some people may have to wear heavier clothing when on their way to attending formal functions or business meetings. Thus whereas people exiting from a heated building to a cold outdoors can prepare themselves fully for a smooth transition, exiting from an air-conditioned building to the hot urban environment outdoors is a thermal shock. A similar effect, albeit somewhat less unpleasant, follows the transition from outside to the air-conditioned inside.

Clearly, it is absurd to invest a large proportion of a building's capital cost in mechanical

cooling equipment that will use large amounts of electricity, generated at high environmental cost, to provide excessive cooling while also exaggerating the thermal discomfort experienced outdoors. The heat discharged by the AC equipment then contributes to the urban heat island effect and thus to increasing cooling loads and new demands for extra electricity generation capacity, etc. Continuation of such trends will clearly put in question the sustainability of the rapidly growing cities in the Region despite the low cost fuels and financial resources available.

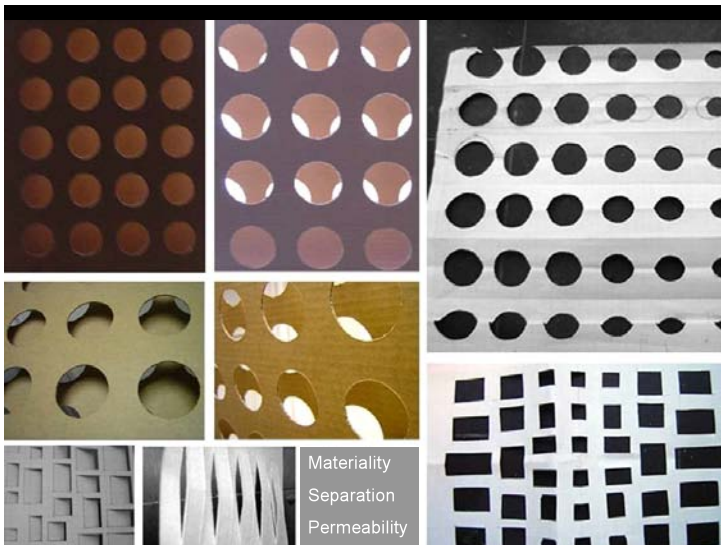
It is now widely accepted that the very low indoor temperatures currently demanded of the AC equipment are not conducive to indoor thermal comfort and can be problematic for many people. It was shown in earlier sections that thermal comfort can be achieved at higher temperatures in conditions that will also ease the transition with the outdoor environments. Adoption of the recommended PPD and adaptive neutral temperatures can result in energy savings on air-conditioning, reduction of the heating load and air pollution imposed by the use of air-conditioning appliances, lessening of the increase in peak electric loads that leads to commissioning of new electric generating capacity which in itself is a major source of waste heat generation and air pollution. In these climates outdoor spaces can be very pleasant for over six months of the year and can be made more tolerable in the hot period. This will encourage outdoor activities as well as help reduce the cooling loads of buildings. A major conceptual tool to this aim is the creation of stepped transitions which can be expressed physically through the development of intermediate or transitional spaces mediating between indoors and outdoors.

SOLAR CONTROL

Principles
In tropical regions solar control is essential on openings of any orientation. Solar control comprises three distinct, but complementary strategies:
- control of aperture geometry (orientation, tilt, surface area of opening)
- obstruction of sun path (shading)
- solar-optical properties of transparent and opaque surfaces.

The issue of solar control requires designers to pay close attention to the spatial and temporal distribution of incident solar radiation. Given the high sky luminance (see Section on weather data) throughout the year excellent day lighting conditions can be achieved by fairly small openings. In contradiction to climatic considerations and good design practice the trend in recent buildings in the Region is toward use of reflective and absorptive types of glazing in conjunction with oversized, non-operable glazing that

carries little or no other form of solar protection. This is both expensive and insufficient in controlling cooling loads and thermal and visual discomfort due to direct radiation and glare.



Application

Solar radiation absorbed by outdoor and indoor surfaces will raise mean radiant temperatures above the air temperature; there is scope to minimize this effect. At any time of the year when the average outdoor air temperature is above the neutral temperature no direct radiation should reach occupied spaces indoors or outdoors

Aperture Geometry

• Where choice of *orientation* is available North and South should be preferred to East or West.

• Where there is choice between North and South orientations, the former should be preferred for offices, school classrooms and commercial spaces and the latter for residential spaces.

• Horizontal *roof lights* must be avoided. Where openings are needed at roof level these should be provided in the form of *vertical clerestories* facing North or South.

• Window sizes should be based on the criterion of providing adequate day lighting; day lighting requirements can be satisfied with fairly small windows (total room glazing area to room floor area ratios of 1:10 or lower).

Shading

• Studies have underlined the importance of shading for openings on all orientations.

• Given the high outdoor air temperatures and strong solar radiation values experienced in the Region throughout the year, it should be assumed that effective shading will be required at all hours of the day all year round. This greatly simplifies the question of when to apply shading leaving designers to concentrate on how to provide it.

• There is scope for both fixed and movable devices.

• Green roofs and other uses of vegetation on and around buildings may be appropriate.

Solar-optical Properties

• Reflective glazing is particularly problematic as it returns large proportions of the

incident solar radiation to neighboring buildings, thus increasing their cooling loads, and to streets and pavements increasing surface temperatures and affecting pedestrian comfort and the safety of pedestrians and drivers.
• In tropical regions the high solar altitude angles make building roofs and other horizontal surfaces most vulnerable to solar radiation. These surfaces can be treated to increase their albedo or provided with other means of solar control.

Data, Design Support & Assessment Tools
Solar Radiation Data: study of seasonal and daily profiles of incident solar radiation on surfaces of different orientation and tilt; breakdown of the global radiation between direct and diffuse components; reduction of incident solar radiation by obstruction from neighboring buildings, trees and purpose-made shading devices.
Sun path: pre-design assessment and early design assessment of solar angles and shading requirements.
Heliodon: early design assessment of shading resulting from building masses and purpose-made shading devices.
Ecotect Software (v5.5 Square One 2006): quantification of solar radiation on unobstructed and shaded surfaces and visual appraisal of shading; scripting for optimizing design of shading devices.
TAS software (EDSL 2006): dynamic thermal simulation software for detailed calculation of heating and cooling loads and resulting internal conditions and energy requirements.
References
Szokolay, S. (1996). Solar Geometry. PLEA Note 1. PLEA International / University of Queensland.
CIBSE (2006). Design for improved solar shading control. TM37. Chartered Institution of Building Services Engineers, London.

THERMAL INERTIA & NIGHT-TIME VENTILATION

Principles
The daily variations in outdoor air temperature, incident solar radiation and internal heat gains from occupancy represent considerable fluctuations in mean and peak cooling loads. The extent of such fluctuations depends on the thermal inertia exerted by buildings' interior spaces. This can be judged from the combined thermal capacities of internal surfaces of the building elements surrounding the spaces in a building. A room surrounded by surfaces of low thermal capacity (low density materials, soft furnishings, walls and floors covered by lightweight finishing) has very little thermal inertia. At the other extreme an unfurnished room surrounded by exposed masonry materials will exert a much stronger thermal inertia. The effects of thermal inertia are easy to visualize by considering two *free-running* (i.e. not heated or cooled by mechanical means) spaces that differ solely in terms of their heat storage capacity. All else being equal, the internal temperature in the space with a weak thermal inertia will closely follow the fluctuations of the external and internal environmental parameters. In the absence of heat inputs from solar radiation and occupancy (for example, at night in an unoccupied space) the resultant temperature will follow closely both the profile and the actual values of the outdoor air temperature. During daytime, when the space is occupied and is also influenced by solar radiation the internal temperature will tend to rise above the outdoor air temperature by increments related to the values of the heat gains from occupancy and from the solar radiation absorbed indoors. At the other extreme, a space with a very

strong thermal inertia will absorb the heat inputs into its storage capacity showing little fluctuation in its internal temperature; the higher the thermal capacity the closer the indoor temperature will tend toward a constant temperature close to the daily mean outdoor temperature.

Application
The modulating influence of thermal inertia can be desirable for both free-running and mechanically-controlled buildings. In both cases, thermal inertia acts as interim heat sink at a time when the outdoor air temperature or other permanent heat sinks are not available to take the excess heat. Such interim heat sink then needs to transfer the excess to a permanent sink at a later time. Coupling of a building's thermal mass with the cooler outdoor air at night provides such a mechanism provided suitable temperature differences can be achieved. In the Gulf Region night-time ventilation should be sufficient to maintain buildings within the neutrality comfort zone throughout the mild and warm periods and for part of the hot period. This is the case assuming effective solar control as discussed in the previous section.

Potential
Givoni (1994) has reported that night-time ventilation can allow the peak indoor temperature to be held 7-10K below the daily outdoor temperature peak. In the Gulf region this will be more than sufficient for comfort in the mild and warm period, as well as being adequate for much of the hot period. It may not be always sufficient in the peak of the hot period.

Applicability Limits
Clearly, when the mean daily outdoor air temperature is close to the upper limit of the comfort zone, a high thermal inertia will not suffice unless combined with further means of heat dissipation than just ventilation. It can be seen from the weather data for Abu Dhabi City that this limitation will apply to the hot period here, as well as in other parts of the Gulf Region. For these periods the potential application of radiative cooling techniques can be explored as an alternative to mechanical cooling (see section on Cooling Techniques).

Data, Design Support & Assessment Tools
Weather Data: diurnal dry-bulb temperature range
Material Properties: specific heat of materials on the internal surfaces of building elements; thermal capacity of building elements surrounding rooms.
Thermal Simulation: The processes of heat storage and release for storage are time dependent. Assessment of the effect of a building's thermal capacity on indoor temperatures and cooling loads requires the use of dynamic thermal simulation (see following sections for operations and software).
Air Flow: Increasing the ventilation rate of a building at night can provide a mechanism for dissipating excess heat accumulated within the building structure during daytime.

In the Gulf Region this option is of particular interest in the mild and warm periods. The cooling potential from night-time ventilation depends on the air exchange rates that can be achieved and the temperature difference between inside and outside. Air exchange rates under different design conditions can be calculated using network modeling techniques. Where the air exchange rate is known, or where likely values of air exchange rate can be assumed, the effect ventilative

cooling may have on indoor temperatures can be assessed using dynamic thermal simulation models (of the kind listed above). Air flow patterns inside and around a building are influenced by topography and site conditions, by wind direction and velocity, by temperature difference, and by building and opening geometry. The physical processes involved are complex. Predictions of air flow may be obtained with a wind tunnel, or other techniques involving physical models, or using computer models based on network techniques or on computational fluid dynamics (CFD).

Software
AMBIENS (2005). Environmental Design Solutions Limited. Two-dimensional computational fluid dynamics (CFD) modeler calculates air flow and temperatures and gives comfort assessment.
STAR-Design (v4.04 2006). CD-Adapco. 3-D CFD Modeler for airflow simulation in and around buildings.
TAS software (EDSL 2006): dynamic thermal simulation software for detailed calculation of heating and cooling loads and resulting internal conditions and energy requirements.

Publications
Allard, F. (Ed. 1998). Natural Ventilation in Buildings. James & James (Science) Publishers Ltd. London.
CIBSE (1997). Natural Ventilation in Non-Domestic Buildings. Applications Manual AM10. Chartered Institution of Building Services Engineers, London.

DAYLIGHTING

Principles
Daylight is admitted into rooms through external windows, clerestories, and roof lights. It is often also "borrowed" from adjacent spaces through openings in separating partitions. The amount of light reaching a point in a room through any opening reduces the further away the point is from the opening. Depending on room heights, room depths of 6-9 meters represent the limits for daylight penetration. The addition of roof lights, and borrowed daylight from adjacent spaces, are common ways for supplementing incoming day lighting from windows in areas furthest from the external perimeter of a building. Failing to provide adequate day lighting results in heavy reliance on artificial lighting, as well as in daylight deprivation.

Artificial lighting has a high penalty in electricity consumption and overall environmental impact owing to the high CO2 emission of electricity generation (nearly four times higher rate of CO2 emission than other fuels).
Moreover, use of artificial lighting adds to cooling loads and thus its abuse is a potential source of thermal discomfort in free-running buildings, and additional air conditioning use in buildings that are mechanically cooled. At the other extreme, there is a penalty from over sizing windows. Substantial over sizing leads to higher cooling (as well as heating loads), as well as increased risk of glare in addition to incidence of uncontrollable solar heat gain. This was the case, for example, when a 2% daylight factor was assumed as a *minimum* for school classrooms in Britain in the recent past, which led to very high levels of glazing on elevations. In turn these led to high levels of heat loss in winter and thermal discomfort from solar heat gains, as well as glare, on sunny days. Clearly over sizing windows on buildings in the Gulf Region can lead to very poor results all year round.

Application
Predictions of the likely availability of daylight in a room can be made at the design stage with a computer model, or using a scaled physical model with an artificial sky or under real sky conditions. Size, geometry, and location of openings and the reflectance of room surfaces are the main controllable design parameters. Simple calculation procedures ignore the direct sun considering day lighting only under an overcast sky.

For a Standard Overcast Sky (sky luminance of between 5,000 and 20,000 lux), a daylight factor of 2-5% corresponds to average illumination values of 100-1000 lux on the working plane (at a height of some 0.80m from the floor). This range encompasses
lighting requirements for most common uses in buildings. For offices and school classrooms, illumination levels of 300-500 lux on the working plane are adequate for typical tasks. In northern Europe where overcast sky conditions may occur at any time of the year, a space achieving an average daylight factor of 5% is generally expected to provide satisfactory day lighting for office and classroom use.

In the Gulf Region mean daily global sky luminance reaches average values of 20,000-30,000 lx. The desirable indoor levels can be achieved with average daylight factors of 1-2%.

Data, Design Support & Assessment Tools
Sky Luminance Data: availability and temporal distribution of daylight
Daylight Factors: ratio of indoor luminance to that on unobstructed horizontal plane outdoors
Real Sky Studies: assessment of day lighting on scaled physical models outdoors
Artificial Sky: assessment of day lighting on scaled physical models in purpose-made laboratory space
Day lighting Simulation software: predictions based on overcast or sunny outdoor conditions.

Software
ECOTECT (version 5.5 Square One 2006). Daylight factors and luminance analysis based on CIE overcast and uniform skies. Interfaces with RADIANCE (see below).
RADIANCE imaging system for visualization of indoor lighting conditions developed at the Lawrence Berkeley National Laboratory currently the most detailed and accurate visualization tool available.

References
Baker, N. et al (Eds. 1993). Day lighting in Architecture. A European Reference Book. James & James (Science Publishers) Ltd for the Commission of the European Communities.
De Herde, A. and S. Reiter (2001) L'Eclairage naturel des batiments. Architecture et Climat, Universite Catholique de Louvain.
Fontoynont, M. (Ed 1999). Daylight Performance of Buildings. James & James (Science) Publishers, London.

MATERIAL PROPERTIES & ELEMENT DESIGN

Principles
The surface area, position, exposure, construction, detailing and finishing of external

building elements have a very considerable effect on environmental performance. Judicious specification of the space-time properties of individual building elements also allows to compensate for possible environmental weaknesses in siting, building form or internal planning. Even more important are the properties of materials used on the internal surfaces of both external and internal building elements which are critical *for the thermal and visual performance of buildings as they affect the absorption and reflectance of incoming solar radiation and have a decisive effect on indoor air and surface temperatures.*

The following are important design parameters:
• geometry (surface area, orientation, tilt)
• internal and external thermal properties (thermal conductivity, thermal resistance, emissivity, thermal capacity)
• internal and external solar-optical properties
• daily and seasonal variations on above
• constructional continuity and detailing at joints.

The need for thermal insulation increases as a function of indoor-outdoor temperature difference and the relative exposure to the outside of individual building element. In the Gulf Region the direction of heat flow is mostly from the outside to the inside during daytime. The temperature differences can be extremely high for heavily air-conditioned buildings throughout the 6-month hot period.
Windows and other glazed elements are the most climate-sensitive elements. Balancing the positive and negative aspects of glazing requires considerable attention to the following :
• window area and orientation are critical parameters.
• solar protection is essential
• the thermal inertia of the building envelope is a key mechanism for controlling temperature fluctuations and thus an essential complement of window controls.
Roofs are often a critical building element on low rise buildings. There are many different possibilities for engaging roofs into additional environmental functions which may suit particular climatic conditions, or space occupancy criteria.

Application
Modest glazing areas are recommended on all orientations. Sizing should be primarily on the criterion of providing adequate day lighting. In these climates this should be achievable with glazing to floor ratios of no more than 1:10. Use of clear glazing is preferable. Double glazing is essential.

Lightweight finishes should be avoided in rooms to safeguard the thermal inertia.
Rather than absorb solar radiation in unplanned ways that contribute to a worsening of the urban heat island, there are four choices for building roofs:
- making roofs ”green”, using vegetation, provides a microclimatic improvement at roof level which contributes to the city and a roof garden for the building;
- making roofs “white” (i.e. with a reflective finish) is a cheap way to reduce cooling loads through the roof (especially important for low rise buildings) and the urban heat island for the city;
- making use of evaporative and radiative cooling potential using roof surfaces where applicable; water consumption can be avoided by containing the water and giving emphasis to the radiative cooling mechanism

- turning part of the roof into an energy producing system; the strong sunshine provides a source of energy that can be used in a variety of ways at both individual building and urban levels.

Data, Design Support & Assessment Tools
The thermal and solar-optical properties of building elements are fundamental to most calculations and indices of thermal performance. Choices can be made on the basis of properties such as the *thermal transmittance* (U-value) and internal thermal capacity of individual building elements. The mean thermal transmittance of the building envelope, and a building's overall *heat transfer coefficient* are useful indicators of the rate of heat transfer through the building envelope. The *thermal capacity* of building elements and that of the building structure as a whole provide indication of a building's thermal inertia and capacity for heat storage. For standard constructional specifications most of these properties are given in tables published by national and international organizations. Computer software dealing with thermal calculations will normally provide databases of material properties as well as the means for calculating composite properties such as the thermal transmittance and admittance. Since the mid-1970's there has been also a great deal of information on the *embodied energy* and the environmental impact of building materials and construction processes.

Software
ECOTECT (v5.5 Square One 2006). Database and graphical calculator of thermal transmittance and thermal admittance.
Envest (Building Research Establishment, UK 2006). Environmental impact assessment and life cycle cost analysis of building construction.
THERM (Lawrence Berkeley Laboratory, USA). Finite element simulator of temperatures across section of building elements allowing study of thermal bridges.
WINDOW v.5.0 (Lawrence Berkeley Laboratory, USA) Thermal and solar-optical properties of windows.

Publications
Arink, D., C. Boonstra, J. Mak (1996). Handbook of Sustainable Building: an environmental preference method for choosing materials in construction and renovation. James & James Science Publishers.
CIBSE Guide A3. Chartered Institution of Building Services Engineers, London.
Anderson, J., D. Shiers, M. Sinclair (2002). The Green Guide to Specification. An environmental profiling system for building materials and components. Building Research Establishment, Watford, UK.
Zold, A. and S. Szokolay (1997). Thermal Insulation. PLEA Note 2. PLEA International / University of Queensland.

COOLING TECHNIQUES
Principles & Applicability
Guidance on the climatic applicability and potential of passive cooling techniques is given by Givoni (Givoni 1994) based on his longstanding empirical studies. Applied to the climatic conditions of Abu Dhabi and the Gulf Region this leads to the following points.
Cooling by Night-time Ventilation can allow the peak indoor temperature to be held 7-10K below the daily outdoor temperature peak. This will be more than sufficient in the mild and warm period, and adequate for much of the hot period but may not be always

sufficient in the peak of the hot period.
Radiative Cooling: Givoni (1994:12) stipulates that under clear sky conditions a temperature reduction of 2 to 5K can be achieved on the outdoor air temperature regardless of air humidity. This could help alleviate the fairly high night-time temperatures of the hottest months (July-August).
Evaporative Cooling: Direct evaporative cooling can provide a temperature drop of 3-4 K relative to the outdoor dry-bulb (Givoni 1994:14). Limiting values for applicability are wet-bulb temperatures above 24-25 o C and dry-bulb exceeding 44oC. In indirect evaporative systems such as roof ponds the water temperature can be held close to the average ambient wet-bulb. For the period in Abu Dhabi this varies in the range 20-25oC in this case. Givoni gives the limits for applicability at wet-bulb of 25oC and dry-bulb of 46oC.

Application
The roof area can be used for the application of radiative and evaporative cooling systems as described in Yannas et al (2006). Roof ponds with water contained in plastic bags can operate effectively in this climate as they rely on radiative exchanges and not on evaporation. Evaporative processes may be added if or when the potential is available. Air and water radiators may be also applicable but have lesser cooling capabilities than roof ponds.

Data, Design Support & Assessment Tools
Given sufficient information on the geometric and constructional characteristics of a proposed building and appropriate weather data for its surrounding external environment, it is possible to predict the likely space heating and cooling energy requirements and the internal temperatures in different zones of a proposed building under different operational conditions of occupancy. Such predictions provide a means of comparing, assessing and fine-tuning designs.

A first indication of the potential for natural or passive cooling of buildings and outdoor spaces can be obtained from the temperatures of the environmental heat sinks (dry-bulb, wet-bulb, sky and ground; see Visual Atlas software below). These respectively identify the natural cooling potentials available by ventilation, evaporation, night-time radiation, and contact with ground. More detailed analysis of this potential is not yet fully integrated in the major computer models.

Software
RSPT (AICIA 2004). Simulates performance of roof ponds and radiators based on systems described in Yannas et al (2006) Roof Cooling Techniques. Expresses results as savings on air-conditioning or comfort improvement for free-running buildings.

Publications
Givoni, B. (1994). Passive and Low Energy Cooling of Buildings. Van Nostrand Reinhold.
Yannas, S., E. Erell, J.L. Molina (2006). Roof Cooling Techniques. A Design Handbook. Earthscan / James & James.

LIFE CYCLE ANALYSIS AND ENVIRONMENTAL IMPACT

In accounting for energy use we distinguish between primary energy, delivered energy (or fuel) and useful energy (heat, light, and other forms required at end-use). Primary energy is the energy source in the ground which is then processed to produce and distribute the fuels we use (petrol, electricity, etc.) that power the machines that provide the heating, cooling, lighting etc. required by end-uses. Thus primary energy encompasses the calorific value of the fuels used as well as the energy spent in the production and distribution of the fuels and their raw materials. It thus also gives a measure of total carbon emission.

Through their operational energy requirements buildings have a very significant impact on the depletion rate of non-renewable fuels, and through their share of fossil fuel energy use, on the emission of greenhouse gases and other pollutants. The processes of production, transport from manufacture to point of use and application of materials in building construction, entail a number of further environmental implications. These include the energy that was used in the processes of production and transport of materials (embodied energy), the depletion of scarce sources from which materials are extracted, harmful emissions in the course of manufacture and use, the disruption of ecosystems, risks to human health etc.
There have been several attempts at integrating these issues into comprehensive methods for assessing the environmental impact of buildings. None of these is entirely satisfactory but they are part of continuing developments that are currently being implemented in several European Union countries and in the US.

The Environmental Preference Method
Developed since 1991 in the Netherlands by Woon / Energie, the Environmental Preference Method (EPM) was first published in English in 1996 (Anink, D. et al) and is currently in use in several countries of the European Union. The EPM ranks materials and products according to their environmental impact. It covers all the main building elements and components. The environmental impact is considered over the whole life cycle from extraction of the materials to the final disposal of the product.
The aims of EPM are:
• prevention of unnecessary use and efficient use of materials
• use of renewable and recycled sources
• selection of materials with least environmental impact.
Rankings are given to both new construction and refurbishment.
The issues that form part of the assessment are:
• shortage of raw materials;
• ecological damage caused by extraction of raw materials
• energy consumption at all stages including transport
• water consumption
• noise and odor pollution
• harmful emissions such as those contributing to ozone depletion
• global warming and acid rain
• health aspects
• risks of disasters
• repair ability
• reusability
• waste

Example: Under “External wall construction” EPM lists its Preference 1 as sustainable durable wood, loam construction. Preference 2 is a masonry construction, and

preference 3 a construction of fiber cement resin-bonded plywood. Use of tropical wood and preserved softwood are listed as not recommended. For internal skin, concrete is listed as not recommended. For thermal insulation, cork and cellulose are high preferences whereas extruded polystyrene is not recommended.

BREEAM, EcoHomes & Green Guides

The Building Research Establishment Environmental Assessment Method (BREEAM) which has been in development at the Building Research Establishment (BRE) in the UK since 1990. Several versions and revisions of BREEAM have been published so far addressing different building types.

The most recent version for residential buildings,
EcoHomes provides ratings that combine credits under the following environmental categories:

• operational energy use and CO2 emission
• access to public transport issues
• pollution of air and water
• environmental implications of the selection and recyclability of materials
• water consumption
• land use and ecology (Greenfield and Brownfield issues)
• health and well-being
• management

The aims of EcoHomes are to:

- maximize the operational energy efficiency of residential buildings
- reduce the energy used in construction
- minimize emissions of CO2 arising from operation of homes and their services
- minimize need for travel, encourage greater use of public transport, reduce transport energy for commuting and for leisure travel.

A proposed development scheme is rated based on the credits awarded under each of these categories followed by weighting factors applied to obtain a single score. The ratings are awarded by assessors trained and licensed by the BRE, and responsibility for quality assurance and certification rests with the latter. The assessment results in the award of a certificate.

Green Guides

In the UK the "Green Guide to Housing Specification, an environmental profiling system for building materials and components used in housing" was published in 2000 based on research at the BRE. This follows an earlier "Green Guide to Specification", an environmental profiling system for building materials and components published by BRE in 1998.

The Green Guides deal with the following issues:

• toxicity in manufacturing / in combustion
• primary energy
• emissions of CO2, NOx, etc
• resources (mineral , water, oil feedstock)
• reserves
• waste generated
• recycling (% contained, % capable of being, % currently recycled, energy required for recycling)

• summary rating

Ratings are given on each of these issues for all the main building elements and construction categories and for a wide range of different constructions. The ratings (given as A, B, C scores) were determined for a functional unit of element of 1 square meter of surface area that satisfies the UK building regulations. The assessment was over a 60-year building life and took account of maintenance, refurbishment and demolition. For each element specification the ratings were derived for each issue and a summary rating determined by assigning relative weighting factors to each issue. The weightings were determined through consultation with professionals representing different interest groups. The BRE data show that for a typical UK house the elements with the most environmental impact over 60 years are the external walls and the roof. The ratings are given in tabulated form by building element and construction categories. The Green Guide to Housing Specification aims to deal with the following issues:
a) Climate Change (greenhouse gases including carbon dioxide, methane, CFC, HCFC, HFC (36.0% weighting)
b) fossil fuel depletion (measured in terms of primary fossil fuel energy needed) (11.4% weighting)
c) ozone depletion (7.7% weighting)
d) freight transport (issues of congestion, noise, and discomfort caused) 7.4% weighting)
e) pollutants toxic to humans /toxicity (risks to human health from emission of various substances) (6.7% weighting)
f) waste disposal (depletion of landfill capacity , noise, dust, odor , gaseous emissions etc) (5.8% weighting)
g) water extraction/consumption (depletion, disruption , pollution) (5.1% weighting)
h) acid deposition leading to acid rain which impairs ecosystems; ammonia, nitrous and sulphur oxides and other chemicals) (4.8% weighting)
i) ecotoxicity owing to release of substances such as heavy metals (4.1% weighting)
j) eutrophication high concentration of water pollutants (4.1% weighting)
k) summer smog (implications on human health and crop damage) (3.6% weighting)
l) minerals extraction as disruption to environment (3.3% weighting)

Example: A typical external wall construction of brickwork outer leaf, insulation, dense block work inner leaf, with plaster and paint is given an overall summary rating of B whereas the same specification with an aerated block work inner leaf instead of the dense block work is given a summary rating of A, claiming better waste disposal of the latter. Under windows, PVC-U and aluminum frame windows are given C ratings. PVC-U windows have high intensity of material manufacture and no recycled input. Aluminum has high recycling but also very high embodied energy intensity. Softwood windows are given the best ratings. Sustainably grown softwood timber has low energy of manufacture. Locally grown hardwoods are also given a good rating whereas imported hardwood gets a worse rating because of the extra transport. Under insulation materials the use of HCFC (hydro chlorofluorocarbons), which have replaced CFC (chlorofluorocarbons) as blowing agents, still contributes to ozone depletion and to greenhouse gases. Even HCFC-free extruded polystyrene gets a C rating. Expanded polystyrene, glass wool, mineral wool, recycled cellulose achieve A ratings.

LEED
LEED (Leadership in Energy and Environmental Design) a green building rating system

developed in the US in the late 1990's and first introduced publicly in 2000. Subsequent updates and versions for existing buildings and specific application guides introduced since or being planned.
www.usgbc.org

ESTIDAMA

READING LISTS

This is extracted from the AA E+E Masters Programme Guide 2006-07 and is subdivided into key topics. Some of the books and papers listed contain material that is relevant to more than one topic category.

Built examples, Case Studies
Baird, G. (2001). The Architectural Expression of Environmental Control Systems. Spon Press, London.
Hawkes, D. and W. Forster (2002). Architecture, Engineering and Environment. Laurence King Publishing, London.
Wigginton, M (2002). Intelligent Skins. Architectural Press.
Yannas, S. (2004). *Adaptive Skins & Microclimates*. In Proc. PLEA 2004 Conference, Eindhoven, Vol.1 pp217-222.
Yannas, S. (ed. 2000) Designing for Summer Comfort. AA E+E, London.
Yeang K. (1994). The Skyscraper Bioclimatically Considered. Academy Editions, London.
Climatology, Urban Climatology, Microclimatic Design
Akbari,H. M. Pomerantz and H.Taha (2001). *Cool surfaces and shade trees to reduce energy use and improve air quality in urban areas.* Solar Energy Vol. 70 No. 3 pp 295-310, Elsevier Science Ltd., Oxford.
Givoni, B. (1998). Climate Considerations in Building and Urban Design. Van Nostrand Reinhold.
Littlefair, P. et al (2000). Environmental site Layout Planning : solar access, microclimate and passive cooling in urban areas. Building Research Establishment, BR 380.
Oke, T.R. (1987). Boundary Layer Climates. Chapters 7 & 8. Methuen & Co., London.
Thomas, R. (Ed. 2003). Sustainable Urban Design. An environmental approach. Spon Press.
Yannas, S. with O.D. Corbella and V.N. Corner (2001). *Outdoor Spaces and Urban Design: case studies of two plazas in Rio de Janeiro*. Proc. PLEA 2001, Florianopolis.
Comfort Thermal & Visual, Adaptive Response
ASHRAE. Handbook of Fundamentals. American Society of Heating Refrigerating and Air Conditioning Engineers.
Auliciems, A. and S. Szokolay (1997). Thermal Comfort. PLEA Note 3. PLEA International / University of Queensland.
CIBSE (2006). CIBSE Guide A. Chapter 1: Environmental criteria for design. CIBSE, London.
Fanger, O. (1970). Thermal Comfort. Danish Technical Press.
Humphreys, M. (1978). *Outdoor Temperatures and Comfort Indoors*. BRE Current Paper 53/78, Building Research Establishment, Watford.
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Environmental Sustainability Issues & Theories
Girardet, H. (1992) The Gaia Atlas of Cities: new directions for sustainable urban living.

Gaia Books.
Jenks, M. and N. Dempsey (2005). Future Forms and Design for Sustainable Cities. Architectural Press.
Rogers, R. (1997). Cities for a Small Planet. Faber & Faber, London.
Smith, P.F. (2006). Architecture in a Climate of Change. Architectural Press.
Viljoen, A. (Ed. 2005). Continuous Productive Urban Landscapes. Architectural Press.
Yannas, S. (2003). *Towards Environmentally Responsive Architecture*. In Proc. PLEA 2003, Santiago.
Environmental Design Principles
Allard, F. (Ed. 1998). Natural Ventilation in Buildings. James & James (Science) Publishers Ltd. London.
Berge, B. (2001). The Ecology of Building Materials. Architectural Press.
Burton, S. (ed. 2001). Energy Efficient Office Refurbishment. James & James (Science) Publishers Ltd. London.
CIBSE (2006). Sustainable Low Energy Cooling. Knowledge Series KS3. Chartered Institution of Building Services Engineers, London.
CIBSE (2006). Design for improved solar shading control. TM37. Chartered Institution of Building Services Engineers, London.
CIBSE (1997). Natural Ventilation in Non-Domestic Buildings. Applications Manual AM10. Chartered Institution of Building Services Engineers, London.
CIBSE (1990). Design Notes for the Middle East. TM4. Chartered Institution of Building Services Engineers, London.
Energy Research Group et al (Eds. 1999) A Green Vitruvius. Principles and Practice of Sustainable Architectural Design. James & James (Science) Publishers Ltd. London.
Fernandez, J. (2006). Material Architecture. Emergent technologies for innovative buildings and ecological construction. Architectural Press.
Givoni, B. (1994). Passive and Low Energy Cooling of Buildings. Van Nostrand Reinhold.
Krishan, A. et al (Eds 2001). Climate Responsive Architecture: a design Handbook for Energy Efficient Buildings. Tata McGraw Hill, New Delhi.
Littlefair, P. (1999). Solar Shading of Buildings. Building Research Establishment.
Szokolay, S. (2003). Introduction to Architectural Science. Architectural Press.
Szokolay, S. (1996). Solar Geometry. PLEA Note 1. PLEA International / University of Queensland.
Yannas, S. (1995). Design of Educational Buildings. *Book 1: Design Primer.* Environment & Energy Studies Programme, AA Graduate School, London.
Yannas, S. and O.D. Corbella (2001). *Learning from Built Examples in Rio de Janeiro.* Proc. PLEA 2001, Florianopolis.
Yannas, S. (Ed. 2000). Designing for Summer Comfort. EC Altener Programme. Environment & Energy Studies Programme, AA Graduate School, London.
Yannas, S., E. Erell and J.-L. Molina (2006) Roof Cooling Techniques. A Design Handbook. Earthscan.
Yannas, S. (1994). Solar Energy and Housing Design. *Volume 1: Principles, Objectives, Guidelines.* Architectural Association Publications.
Zold, A. and S. Szokolay (1997). Thermal Insulation. PLEA Note 2. PLEA / University of Queensland.
Lighting, Daylighting
Baker, N. and K. Steemers (2002). Daylight Design of Buildings. James & James

Science Publishers.
Fontoynont, M. (Ed. 1998). Daylight Performance of Buildings. James & James (Science) Publishers Ltd. London.
Littlefair, P. (1996). Designing with Innovative Daylighting. Building Research Establishment Report.
Engineering
Battle McCarthy (1999). Wind Towers. Detail in Building. Academy Editions.
Boyle, G. (Ed. 1996). Renewable Energy Power for a Sustainable Future. Open University / Oxford University Press.
Campbell, N.S. & S. Stankovic (2001). Wind Energy for the Built Environment. Project WEB, BDSP Partnership Ltd. London.
CIBSE (2005). CIBSE GUide B. Heating, ventilating, air conditioning and refrigeration. Chartered Institution of Building Services Engineers, London.
Santamouris, M. (Ed. 2003). Solar Thermal Technologies for Buildings. James & James (Science) Publishers.
Thomas, R. (ed. 1996 and later). Environmental Design. E&FN Spon London.
Environmental Assessment, Life Cycle Costing, Codes of Practice
Anderson, J. and N. Howard (2000). The Green Guide to Housing Specification. Building Research Establishment, CRC Ltd.
Arink, D., C. Boonstra, J. Mak (1996). Handbook of Sustainable Building: an environmental preference method for choosing materials in construction and renovation. James & James Science Publishers.
BRE (1998 and later). BREEAM for Offices. An environmental assessment for office buildings. Building Research Establishment Report.
BRE (2006). The Building Regulations Part L Explained. Building Research Establishment.
BRE (2006). EcoHomes 2006-the environmental rating for homes. Building Research Establishment.
Department for Communities & Local Government (2006). Code for Sustainable Homes. UK Government Publication.
Howard, N. and D. Shiers (1998). The Green Guide to Specification. An environmental profiling system for building materials and components. Building Research Establishment.
Howard, N. and D. Shiers (1998). The Green Guide to Specification. An environmental profiling system for building materials and components. Building Research Establishment.

ENVIRONMENTAL DESIGN SOFTWARE

This is a list of the specialist environmental design software used on Masters and Doctorate projects undertaken within the AA E+E programme. The software is listed below under the main categories of tasks undertaken as part of sustainable environmental design. Software designed to perform more than one of these tasks may appear several times. Brief explanations are given about the nature of the analysis offered by each software tool.

Multipurpose Multimedia

IDEA (2003) Universities of Geneva, Siegen, Louvain-la-Neuve and AA E+E. Building case studies, encyclopaedia, software review, simple analytic tools.

Weather Data, Climate and Microclimate Analysis

METEONORM (v. 5.1 2005). Meteotest. Global Meteorological Database for Solar Energy and Applied Climatology that generate monthly or hourly weather data for

any location in the world.
WEATHER TOOL (2004). Square One, Welsh School of Architecture. Useful graphic representations of weather data produced with data imported from Meteonorm. Creates weather files for Ecotect (see thermal analysis sections below).
Clim Pro (v1 2001). D. Robinson, EPFL. Climate data processing tool.
ENVI-met (v3.0 2004). Michael Bruse, University of Bochum. Prediction of air and surface temperatures, airflow and solar radiation climate in urban areas taking account of existing buildings, surface finishes, water bodies and vegetation.
Thermal Analysis and Energy Predictions
ECOTECT (v. 5.5 2006) Square One. Monthly and hourly thermal calculations based on the Admittance procedure.
ENERGY INDEX (1994-00). S. Yannas, Environment & Energy Studies Programme, AA Graduate School. Annual space heating requirements for residential and educational buildings.
LT EUROPE (2002). University of Cambridge et al. Annual space heating, cooling and lighting energy requirements for different building types in European climate zones.
TAS (v9.0.9 2006). Environmental Design Solutions Limited. Multizone dynamic building thermal analysis program.
IDEA (2003) Universities of Geneva, Siegen, Louvain-la-Neuve and AA EE. Energy balances.
RSPT (2004). AICIA, Univ. of Seville. Design of roof cooling systems.
Daylight and Artificial Lighting
ECOTECT (v. 5.5 2006) Square One. Daylight factors and illuminance predictions in and around building models for overcast and uniform skies based on 3-D models input by user; interface with RADIANCE (Lawrence Berkeley Laboratory).
DIAL (v.1.2 1999). LESO Ecole Polytechnique Federale de Lausanne. Simple daylight analysis and interactive illustrated lexicon of lighting concepts.
RADIANCE (2000). Environmental Energy Technologies Division, Lawrence Berkeley National Laboratory. Detailed daylighting analysis.
Solar Geometry and Shadow Simulation
ECOTECT (v. 5.5 2006) Square One. Good 3-D shadow and sun penetration visualisation capabilities; also produces sunpath diagrams, overlays sunpath on perspectives, can optimise shading devices and calculate solar radiation on shaded and unshaded surfaces.
IDEA (2003) Universities of Geneva, Siegen, Louvain-la-Neuve and AA EE. Sunpath diagrams, shading design.
Solar and Thermal Properties of Materials
ECOTECT (v. 5.5 2006) Square One. U-value and admittance calculations for multilayered elements.
WINDOW 6 (2006). Windows & Daylighting Group, Lawrence Berkeley Laboratory, University of California. Thermal properties of windows (glazing and frames).
THERM 6.0 (2006). Finite Element Simulator. Study of thermal bridges, calculation of U-values at junctions of materials. Lawrence Berkeley Laboratory.
IDEA (2003) Universities of Geneva, Siegen, Louvain-la-Neuve and AA EE. U-value and condensation risk prediction; materials database.
WUFI (ver 4.0 2005) Fraunhofer Institut Bauphysik. Calculation of coupled heat and moisture transfer through building elements.
Airflow Simulation

AMBIENS (2005). Environmental Design Solutions Limited. Two-dimensional computational fluid dynamics (CFD) modeller calculates air flow and temperatures and gives comfort assessment.
STAR-Design (v4.04 2006). CD-Adapco. 3-D CFD Modeller for airflow simulation in and around buildings.
Thermal Comfort Assessment
COMFORT (Environmental Analytics, Univ, Berkeley 2000). PMV, PPD, ASHRAE 55-92 and ISO 7730 criteria; also adaptive comfort and neutral temperatures based on Humphreys and Auliciems.
ARCHIPAK (S. Szokolay 2000). Neutral Temperatures, psychrometric analysis, Mahoney tables.
COMFORT (V2.1, 1995). Politecnico di Milano. Calculates PMV and PPD values and incorporates multimedia material on thermal comfort.
AMBIENS (2005). Environmental Design Solutions Limited. Two-dimensional computational fluid dynamics (CFD) modeller calculates air flow and temperatures and gives comfort assessment.
Environmental Impact Assessment & Whole Life Cost
ENVEST 2 (2004). Building Research Establishment.
Other Functions and Processes
RETScreen International (2005). Ministry of Natural Resources, Canada. See Wind, Photovoltaics and Active Solar modules.

Appendix B

NEW ARAB URBANISM IN THE GULF
FOCUS GROUP PARTICIPANTS

KUWAIT

ENVIRONMENT GROUP
VENUE: REGIONAL ORGANIZATION FOR PROTECTION OF MARINE ENVIRONMENT (ROPME)

FACILITATOR: DR. HASSAN MOHAMMADI
1. DR. ABDUL RAHMAN AL AWADHI, ROPME EX. DIRECTOR
2. DR. NAJI AL- MUTAIRI, KISR DG
3. DR. ALI KHURAIBET, ECO-CONSULTANTS
4. AMAR SHARMA, LANDSCAPE ARCH
5. DR. KAZEM BEHBEHANI, DASMAN CENTER
6. PROF. ABDULLA AL-AWADI, KUWAIT UNIVERSITY

DEVELOPMENT GROUP
VENUE: QABAZARD OFFICE

FACILITATOR: JASSIM QABAZARD, QABAZARD ENGINEERING CONSULTANTS
1. MOUSA HUSAIN AL- SARRAF, KUWAIT MUNICIPALITY
2. MOHAMMED AL ALI, AL AMAN INVESTMENT CO.
3. SULAIMAN AL QAMLIS
4. ZAHOOR ALI KHAN, GULF INVESTMENT CORP.
5. GERARD SNABIAN, AL SHALL CONSULTING
6. ABDULATIF AL MISRAI, ARCHITECT

EDUCATION GROUP
VENUE: KUWAIT UNIVVERSITY

FACILITATOR: DR. MALEK HUSSAIN, KUWAIT UNIVERSITY
1. DR. HASAN AL-SANAD, KUWAIT UNIVERSITY
2. DR. ADAM AL-MULLA, KUWAIT UNIVERSITY
3. DR. TAHER AL-SAHHAF, KUWAIT UNIVERSITY
4. HASSAN HELMY, PROJACS INTERNATIONAL
5. DR. FARID ABDAL, KUWAIT UNIVERSITY

SOCIO-CULTURAL GROUP
VENUE: AUSTRALIAN COLLEGE KUWAIT (ACK)

FACILITATOR: DR. USAMEH EL-JAMALI, OAPEC
1. SHEIKHA HUSSAH AL SABAH, DAR AL ATHAR AL-ISLAMIYYAH
2. DR. ABDULLAH AL-SHARHAN, AUSTRALIAN COLLEGE OF KUWAIT
3. ABDULMUHSIN TAQI MUZAFFAR, KUWAIT SOCIETY FOR HUMAN RIGHTS
4. AMER Al TAMEEMI, KUWAIT SOCIETY FOR HUMAN RIGHTS
5. DR. YASSER MAGHOUB, KUWAIT UNIVERSITY

INDIVIDUAL INTERVIEWS

1. YOUSIF BIN M. AL-NISF, AL NISF DIWANIYA
2. DR. EVELINE SIMOS ALI , KUWAIT MUNICIPALITY -TOUR OF OLD KUWAIT
3. DR. MOHAMMAD AL RUMAIHI, AWAN DAILY NEWSPAPER
4. HASSAN ALHASAWI, ALHASAWI INDUSTRIAL GROUP
5. DR. FATEN AL KHURAIBET, ECO-CONSULTANTS
6. BABJI RAO, KEO INTERNATIONAL CONSULTANTS

NEW ARAB URBANISM IN THE GULF
FOCUS GROUP PARTICIPANTS

DOHA, QATAR

DEVELOPMENT/ENVIRONMENT GROUP

VENUE: "W" HOTEL

FACILITATOR: IBRAHIM JAIDAH, ARAB ENGINEERING BUREAU
1. ISSA AL MOHANNADI, DOHA LAND
2. NEIL NOBLE, ARUP
3. KOVANI, MINISTRY OF MUNICIPALITIES &URBAN PLANNING
4. NIGEL COUPER, NORTHCROFT
5. ERIC BARONS, AECOM

EDUCATION GROUP

VENUE: EDUCATION CITY

FACILITATOR: AMEENA AHMADI, QATAR FOUNDATION
1. JASSIM M. TELEFAT, QATAR FOUNDATION
2. RASHA K. AL SULATI, QATAR FOUNDATION
3. RAMI EL SAMAHY, CARNEGIE MELLON UNIVERSITY, QATAR CAMPUS
4. KEVIN UNDERWOOD, AECOM
5. JOHN GRAHAM WORSNOP, QATAR PETROLEUM

EDUCATION/SOCIO-CULTURAL GROUP

VENUE: EDUCATION CITY

1. PETER CHOMOWITCZ, VIRGINIA COMMONWEALTH UNIVERSITY, QATAR
2. CHRISTOPHER SILVA, QATAR FOUNDATION
3. CYNDY HOWMAN, TEXAS A&M UNIVERSITY AT QATAR
4. SAMER EL-KARANSHAWY, CENTER FOR ISLAMIC STUDIES, QATAR FOUNDATION
5. ABOUT 10 STUDENTS FROM VARIOUS US COLLEGES AT EDUCATION CITY

PERSONAL INTERVIEWS & TOURS

1. ABDUL RAHMAN JASSIM SOROUR, MINISTRY OF MUNICIPALITIES & URBAN PLANNING
2. STAN WYPYCH- MINISTRY OF MUNICIPALITIES & URBAN PLANNING
3. TOUR OF ALJEERA TELEVISON NETWORK- IHTISHAM HIBATULLAH
4. DR. FARID BENYAHIA, QATAR UNIVERSITY

NEW ARAB URBANISM IN THE GULF
FOCUS GROUP PARTICIPANTS

UNITED ARAB EMIRATES

HOLISTIC SUSTAINABILITY GROUP
VENUE: ARUP, DUBAI

FACILITATOR: JEFF WILLIS, ARUP
1. HABIBA AL MARASHI, EMIRATES ENVIRONMENTAL GROUP
2. RASHAD BUKASH, DUBAI MUNICIPALITY
3. DR. MARTIN GIESSEN, AMERICAN UNIVERSITY OF SHARJAH
4. GEORGE KATODRYTIS, AMARICAN UNIVERSITY OF SHARJAH
5. AL JANAHI, BRITISH UNIVERSITY OF DUBAI
6. AHMED EBRAHIM, X ARCHITECTS
7. AHMAD ZOHADI, 2A MAGAZINE

EDUCATION –PERSONAL INTERVIEWS

1. DR.TARIK YOUSEF, DUBAI SCHOOL OF GOVERNMENT
2. PETER DI SABATINO, AMERICAN UNIVERSITY OF SHARJAH
3. DR. AMER MOUSTAFA, AMERICAN UNIVERSITY OF SHARJAH
4. DR.JOHN SMITH, AMERICAN UNIVERSITY OF DUBAI
5. AL JANAHI/V.CHANCELOR INTERVIEW, BRITISH UNIVERSITY OF DUBAI
4. DR. MOHAMMED RAOUF, GULF RESEARCH CENTER
5. AHMED BIN SHABIB,THE SHELTER & BROWNBOOK

EDUCATION GROUP
VENUE: AL AIN

FACILITATOR: MOHAMMED AL OWAIN, UAE UNIVERSITY
PARTICIPANTS
1. DR. RAMY EL DIASY, UAE UNIVERSITY
2. TALAL ABDULLAH AL SALMANI, DEPARTMENT OF MUNICIPAL AFFAIRS, AL AIN MUNICIPALITY
3. COX, MASTER PLAN ARCHITECTS

PERSONAL INTERVIEW
DR. YASSER EL SHESHTAWY, UAE UNIVERSITY

HOLISTIC SUSTAINABILITY GROUP
VENUE: ALDAR, ABU DHABI

FACILITATOR: DR. ASHRAF HEGAZY, ALDAR
1. GREGORY ACKER, ABU DHABI URBAN PLANNING COUNCIL
3. WAFA AL HAMADI, ALDAR
4. DR. GORDON BROWN, HIGHER COLLEGES OF TECHNOLOGY
5. DR. SADEK OWAINETI, EDAMA CONSULTING
6. STEPHEN OHEME, HYDER CONSULTANTS
7. ERLAND RENDALL, DAVIS LANGDON
8. WAEL ABU ADAS, KEO INTERNATIONAL CONSULTANTS
9. SAMIR SADDI, AECOM

DEVELOPMENT PLANNING GROUP
VENUE: ABU DHABI URBAN PLANNING COUNCIL

FACILITATOR: JOHN MADDEN, SENIOR PLANNER, UPC
1. DR. ALAN PARKINS, SR. PLANNING MGR
2. GREGORY ACKER, ESTIDAMA DIRECTOR
3. LIA GUDAITIS, PLANNER
4. SALMAN SHAKIR KHAN, RESEARCH & URBAN ECONOMICS
5. DR. ASHRAF HEGAZY, ALDAR

EDUCATION & SUSTAINABILITY GROUP
VENUE: MASDAR, ABU DHABI

FACILITATOR: AFSHIN AFSHAR, MASDAR, ENERGY MANAGEMENT
1. CHRIS WAN, PROJECT MANAGER-ARCHITECTURE
2. DR. MAHIEDDINE EMZIANE, MIST
3. GERARD EVENDEN, FOSTER + PARTNERS
4. DR. RICHARD PERRY, CH2MH, SUSTAINABILITY MANAGER
5. DR. YASMINE ABBAS, ENVIRONMENTAL SOCIOLOGIST
6. DANIEL RENDER, CH2MHILL, LEAD ARCHITECT
7. KIM AAD HAYEK, MASDAR, SR. INTERIOR DESIGNER
8. MAHA MATRAJI, MASDAR DESIGN COORDINATION
9. BERNARD GRAY, MASDAR, SENIOR ARCHITECT
10. IBAN VENDRELL, MOTT MACDONALD, RENEWABLE ENGINEER

PERSONAL INTERVIEW
1. DR. AHMED KHALIL AL MUTAWA, CEO- KHALIFA FUND
2. SHAHSWAR AL-BALUSHI, EX.DIRECTOR, URBAN LAND INSTITUTE

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