

PLANNING AND DESIGNING URBAN PLACES IN RESPONSE TO CLIMATE AND LOCAL CULTURE: A CASE STUDY OF MUSSAFAH DISTRICT IN ABU DHABI

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This paper deals with how climate and local culture specifics contribute to urban diversity, and how they affect the way urban spaces are being conceived, planned and designed. The authors argue that regardless of the globally accepted principles of sustainability which emphasize smart responses, diversity and culture as the prime drives in urban development of, cities around the world are continually experiencing the all-alike solutions, which often compromise their identity and character. Having taken the genuine stands of the philosophy as a starting point for examining the subject, the authors explore and present how the climate specifics, along with the uniqueness of local culture, lead toward the solutions which make a difference to their cities. The discussion is illustrated by the case study the authors were engaged in, the Mussafah District project in Abu Dhabi, a redevelopment proposal recently initiated and developed by International Society of Urban and Regional Planners -ISOCARP and Urban Planning Council of Abu Dhabi.

Key words: urban places, sustainability, climate, culture, Mussafah District.

INTRODUCTION

Cities around the world are in constant search for spatial and design solutions that will sustain their development and make them visible and competitive on a regional or global scale. At the same time, they are engaged in a continuous search for proper solutions which will enable their functioning and provide high quality places to satisfy their citizens' needs. These two drives affect how urban places are planned, designed and maintained in every country, regardless of its geographical position or level of its development. Cities will continue to develop and grow across the globe, and all of them will be constantly challenged with the same task of doing what it takes to attract businesses, developers, investors, talents, visitors or new inhabitants.

On a global scale, this dynamics is accompanied by the ever increasing global exchange of ideas, concepts and solutions cities and regions explore and implement. While these interactions

improve our understanding of cities and contributes to making urban places work more effectively, it often leads to the sameness and uniformity of accepted spatial solutions, regardless of local circumstances and conditions, thus ending in the creation of the all-alike places which can be found virtually in any part of the world. This has also been attributed to the ongoing phenomenon of global culture, and is often explained as part of the ever developing globalization.

Over the last decade, these trends have been recurrently analyzed vis-à-vis the effects they create on urban liveability, quality of urban life and urban diversity. Thus, it is argued that cities are more and more often faced with the challenges of losing their spatial identity and character, producing uniform environments, and marginalizing their local culture and authentic developments by giving preference to the substitutes which are often found distant and alien to local citizens. The discussion often leads to the conclusion that these processes are potentially harmful and may create many negative effects on the overall urban diversity and richness of urban heritage globally.

For many, these trends continually compromise one of the basic principles of sustainability: keeping local uniqueness and local values as the prominent drives for making places happen. Having this genuine principle of sustainability as a starting point, that places should explore their uniqueness and build upon them, this paper goes on to examine this relationship more closely. It concentrates on the effects which local climate and local culture have on urban structure and form. These are the points cities rely upon in their constant search for becoming distinctive, different, attractive and competitive. The two of these are also believed to be the most relevant in making responsive solutions. They are also believed to be most often compromised in contemporary planning and building practice. There are many examples to illustrate this. For instance, open plazas and large open public

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spaces in tropical regions resembling those more appropriate for the areas with milder climate, or, the over-presence of glass structures in hot and year-round sunny places are often seen as typical expression of global uniformity. Local culture is another repeatedly debated issue. Indeed, one can hardly make a difference between the solutions conceived and developed in Shanghai from those created in Abu Dhabi or Lima. Their physical features are often alike and they often look the same, which makes their solutions continuously questioned vis-à-vis the credo of sustainability which refers to local uniqueness and local culture.

These are the two questions explored in this paper. Discussion is followed by a more detailed presentation of a case study developed for the Mussafah district in Abu Dhabi which provides an illustrative example of sustainable approach to developing liveable solutions which correspond to local uniqueness and specifics of the place.

SUSTAINABILITY, LOCAL CHARACTER AND LOCAL UNIQUENESS

Local character is a multifaceted phenomenon comprised of many different aspects interrelated and structured in a more or less coherent way. For some, it is an expression of social dynamics characterizing particular community, for others, it is more closely linked to the physical or eco-features of the regional and local surroundings, their natural habitats and environmental heritage. In urban areas, the character most often relates to the way people build and use places. Any of these, taken alone or combined with other aspects, can make a place different, in which case we talk about a distinguished character of the place. Although distinctive character does not necessarily lead to the uniqueness of a place, under certain circumstances it can make a place unique. The uniqueness evolves around a particular component of the character, which exceeds the others by being more exposed, and which, due to the specifics or significance it has, marks the place and makes it different. It is through the existence of these unique features that local uniqueness is identified and recognized. Both the character and the uniqueness contribute to the development of sustainable solutions, indeed, they are recognized as the prime manifestations of sustainability. Yet, it is only the uniqueness that makes a true difference for cities and towns. And indeed, all those places that got on the world map exercised their uniqueness as a principal guide in making them different and well-known.

These marks are easily detected in traditional settlements, or those with historic heritage. Thus, it is generally recognized that the

compactness of urban form typically derives from the climate constraints. In some situations though, it is a responsive solution to the scarcity of land. Internal courts, common in residential districts, present physical manifestations of social norms and relate to the privacy and public exposure of family life. In some regions they may also be attributed to the local climate. Public spaces diversify in accordance with types and intensity of social interactions communities practice. Thus, open plazas surrounded by public buildings are more common in communities where communal life is more intensively carried out in public. On the other hand, they sporadically appear where social detachment or weak social interactions are more common. In some cases, however, they are nothing else but the maintained responses to local climate conditions. Large squares were used for different purposes, religious, official or even recreational, but they also delivered messages of orientation related to major routes and links to other places, all of which being the expressions of cultural "codes", habits and norms.

At the present time, the complexity of any place has reached the stage at which single solution for conceiving places is no longer possible. On the contrary, cities and towns seek to embrace as many different solutions they can produce and consume. That shows their newly acquired strength which comes along with their quest for international recognition, and their need to satisfy their citizens' needs and aspirations.

In building their identity upon their uniqueness, contemporary urban planning and design recognize two parallel processes which may take place. They do not exclude each other, and often go together. The first goes along the recognized uniqueness places already have, which are readily available for planners and architects to work with. The second one is more concerned with a process of inventing the place. Opposite to the first one, where local uniqueness already exists and is available, in the second one it has to be conceived and created by urban planners and architects. In the first, the uniqueness is seen as a key factor in safeguarding their identity, while in second one it comes as a result of interventions that are set in the existing urban tissue, and is made by creation of new physical entities. There are various examples of developments which brought a new identity to their cities and towns. Many of them got on the world map. Their success contributes to better understanding of the meaning and the importance local uniqueness has in making places. It also advances our perception of the relationship between sustainability and local identity (Bajić Brković, 2009a).

Taking local character and uniqueness as part of planning and designing places, brings in the specific implications on planning methodology and the way design procedures are carried out (Nedučin *et al.*, 2009). The matter has been widely explored as it relates to conservation and preservation of historic districts and architectural heritage, resulting in development of the multilateral approach, as Cohen put it: "Urban culture is the result of human development and one of the peaks of its achievements. When this common goal is agreed upon and understood, conservation of the urban fabric can become a permanent part of architecture, design and planning. On the other hand, we often see that conservation not to be understood to be conservation of cultural content creates many avoidable pitfalls and planning mistakes. This mainly occurs because of the prevailing tendency to consider separate buildings as cultural "objects" and not as parts of the whole" (Cohen, 2001, pp.5). Similar observations refer to the relationship which planning and design approach focused on sustainability creates vis-à-vis local character and local uniqueness of urban places.

PUBLIC LIFE AND PUBLIC SPACES: PERSPECTIVE FROM THE LOCAL CULTURE

Over the last few decades many city initiatives are highlighting culture as a central element in advancing both their economic and social development strategies. Culture is being used as a means to attract capital, to improve the image of city, or to promote unity and cooperation.

The dynamics of the relationship between space and culture may take one of the following paths:

- Culture is taken as a drive in conceiving places;
- Culture is assumed to be a factor of social cohesion which consequently leads to the corresponding physical responses;
- Culture is among key factors generating economic recovery of cities or places;
- The meaning of cultural heritage can be extended to different intangible components, nevertheless resulting in physical form (Bajić Brković, 2009b).

In conventional urban planning and design, the issue of local culture is most often debated within the context of urban conservation and preservation. Consequently, the focus is on inherited structures and their value that are to be preserved for future generations. On the other side, local culture as debated in this paper is not

equated with the physical heritage only. It includes its intangible components as well. Local culture is thus a reflection of how people use their physical space and which values they attach to it. It refers to the relationship between the spatial and physical characteristics of a particular unit, on one hand, and social habits and norms, on the other. It also speaks about the features that people attach to places which they consider to be attractive enjoyable and an eye-pleasing environment. Therefore, if spaces with sustainable solutions are dependent on local culture, then the social interactions and their spatial performance constitutes the wholeness, and present their local uniqueness. Accordingly, it is culture conceived in this way that becomes the actual parameter in making places real and liveable (Bajić Brković, 2009c, 2010).

Every city and its culture evolve over time and new layers of experiences come as a result of continuous changes in social values, attitudes or life styles. Preserving and nourishing local culture strictly along the lines of inherited artifacts, buildings or urban complexes, nowadays are considered to lead to pseudo or faked reality. More thoughtful approaches, on the other hand, tend to look for the meaning that cities have and messages they communicate, in order to discover their "codes". These "codes" are subsequently being built into the new development solutions and new structures. Traditional ways or using spaces therefore need to be "de-coded" first, so that their rational can be understood, learnt and used again afterwards. The rediscovered "self" of spaces is the subject which is thereafter carried on, and around which new contemporary solutions are conceived and built. The same logic has been applied to developing and designing public spaces which are recognized as successful and sustainable. „The necessity of reinforcing the urban web by all possible cultural additions [...] is the way in which the mutual presence helps the creation of unique city sections, better understood and better used" (Cohen, 2001, pp. 202). These can be observed in many examples, the unsurpassed examples being the Abaindoibarra district in Bilbao, on a city scale, and Emscer Park and IBA, on a regional scale.

In making places to satisfy these multitude tasks, urban planners and designers use different approaches. Often, their language is nothing more than an expression of collective nostalgic memories that cities or regions share. Typical patterns and webs therefore emerge from repetitive design rules of dividing land, developing physical structures, similar height regulation, etc. "These marks of days past are influential in marking and forming the present scale of the town, bearing some notions of the

past into the future" (Cohen, 2001, pp.8). More and more often though, the traditional features are being re-interpreted to meet the needs of nowadays social communication. Architectural languages thus can vary, ranging from traditional urban forms like the one used in case of the Bazaar in Doha, to the newly conceived constructions explored in other cases. The example of Bazaar Abu Dhabi stands as a brilliant example of translation of "codes" of traditional social interaction into aesthetics of contemporary architectural language.

HOW CAN CLIMATE BECOME AN ENGINE OF CHANGE?

The issue of climate has been with planners and urban designers for a long time. Expressed in a more or less explicit form, it used to be among the major factors in planning, designing and developing spaces. There are numerous examples which illustrate how it worked all over the world, regardless of geography or culture. Typical physical expressions for hot regions include compact urban form, covered public spaces, or lavish greenery. Compactness and emphasis on indoor spaces are also responsive solutions to the problem of less friendly climate areas. Orienting streets, blocks or buildings according to the cardinal directions was for a long time a key point in making urban places comfortable and pleasing.

Much has been changed during the 20th century. While there were many factors contributing to it, it was the development of building technology which opened up the unparalleled potentials for making places in a different way. Options which technology offered fired builders' imagination, and the old wisdom of planning and building places, which was acquired through the experiences of many generations, was marginalized and gradually became almost forgotten. It was only occasionally studied and explored as part of the urban conservation and regeneration projects.

It is the newly accepted philosophy of sustainability, highlighted by a recent move in making urban places more climate and energy responsive that gave the rebirth of the old wisdom of building urban places more friendly to local conditions. Nowadays again, planners and urban designers are deeply involved in exploring prospective solutions that will respond to local climate as part of their sustainable solutions, together with making responses to the requests which refer to energy conservation, energy responsible planning and design, and designing and building the low carbon urban environments. A new trend is visible in almost every aspect of urban life, while special attention

is being paid to public spaces and development of codes which are to be implemented in local plans and design projects.

The relationship with local building culture is in that way being rediscovered, together with the connection it has to social behavior. In almost all studies and projects these connections are being supported by historical reviews of local tradition and knowledge gained by observation of their past experiences.

IMPLICATIONS ON PLANNING AND DESIGNING PRACTICE

Shifting the focus on these two factors and taking them as the prime drives in creating places consequently affects both the planning and urban design process. The impacts are seen in the way in which planning process is conceived and carried out, character and content of the stages within the planning process, selection of criteria for planning purposes, and selection of key factors which should be included. The same relates to the design process and making design solutions which will comply with local culture, or creatively respond to local climate. Searching for the right answer apparently leads to the emergence of a new planning paradigm-Cultural Planning, nowadays already a recognized and authentic planning model which is able to solve these complex socio-spatial phenomena (Bajic Brkovic, 2011).

Both planners and urban designers are engaged in transforming places and making places for people. While their concerns to make connections between people and places, movement and urban form, and nature and urban fabric, remain constant, the specifically and thematically centered approach transcends their routine and brings them to the more complex procedures laden with additional tasks. Thus, planners and urban designers are expected to reach (1) "full understanding of places and people, and how and why places are being used in a particular way; (2) they have to be able to develop visions and combine visions with reality; (3) their knowledge should be combined with imagination so that they could construct new concepts and projects by linking the analytic, synthetic and critical /evaluative thinking; and (4) they should remain aware of their responsibilities which are specific and far reaching, because they are changing the way resources are being used, distributed and allocated, while the implications of their proposals are serious and affect many concerned" (ETH, 2010).

The most visible are the changes at the earliest stages of their work, the community appraisal and appraisal of community character, together

with an assessment of the status quo of a project area. Taking culture as a major drive to lead the process inevitably converts it into the social science research where exploration of a delicate relationship between the social space and physical space, and interpretation or social values into physical structures become of critical importance. Consequently, planning and design procedures embrace additional, non-standard features, for instance, exploration of the local views, perceptions and aspirations, or mitigation of divergent views of different stakeholders. These changes consequently respond with land use changes, different zoning of land or blocks, growing land use densities, commercial zones replacing traditional residential areas, and many others behind which stand many different actors, visible and non-visible. Both planners and urban designers have to look closely at features of urban structure and urban grain which reflect culture and social values, including the "historical development, local community and heritage aspirations, local history, local and regional building, color and textures traditions and materials, local vernacular architecture, other local traditions, roofscape, streetscape and public activities, public realm analysis, layout and form of urban spaces, types of buildings, public and open spaces, relationship between built and non-built form, uses and activities, amenities and facilities, activity spines and nodes, leisure and recreation, public and open spaces, boundaries and barriers of the area, aesthetic quality of the area, legibility of the area, views, vistas and landmarks, and skylines" (English Partnerships and the Housing Corporation, 2000, pp. 21-24).

Another critical point refers to the evaluation procedure, as it is related to the relationship between the desired or planned objectives and values and aspirations of a community. This is again the stage at which the planning process needs to get very close to the social research procedures in order to produce good results. The specific challenges also arise at the stage of making a feasibility appraisal, especially as it relates to economic feasibility, and establishing a balance and compatible links between the social, cultural and economic feasibility.

Taking climate alone, especially local climate, as a guide takes planner into another direction, making the scope of its work intrinsically linked to the work of natural scientists and those skilled in engineering. An illustrative example comes from Abu Dhabi and its famous project of Masdar City which clearly demonstrates how the relationship between different fields, knowledge and skills must be complex when it comes to making sustainable and climate responsive urban solutions. However, in doing so, it is not always necessary to opt only for hi-tech options. Looking after traditional practice of local people which they used in making their spaces climate responsive, often yields to sustainable solutions acceptable by the nowadays standards as well. The Doha Bazaar in Qatar stands as a good example of employing traditional spatial organization and building techniques in creating contemporary urban solutions.

Developing responsive solutions involves complex procedures of playing with "what" and "why" in order to make them relevant, interpretative, suitable to purpose, general and

specialized. This also includes working with stakeholders and real-life people in general, interacting with clients, learning from practice, and acquiring knowledge through the planning process. Consequently, the design component can be used here both as an analytical tool and research method. The design process evolves into the "traveling through" procedure where the final result is an outcome of a complex intellectual procedure. The "traveling through" stands for exploring different options, checking different or potential outcome which may emerge from its implementation and evaluation of potential design solutions vis-à-vis the climate or cultural constraints, all of which using the design as an analytical tool (Bajić Brković, 2010).

THE MUSSAFAH DISTRICT PROJECT: MEETING THE CHALLENGE

One of the largest construction sites in the world today is Abu Dhabi. It is a very specific urban agglomeration which, on one hand, looks like every other rapidly growing city (skyscrapers, big projects designed or executed by star architects and world leading development companies, wide streets designed in such a way that road traffic can be managed without difficulty etc.), while on the other, is facing many challenges, ranging from developing an ambitious hi-tech model city of tomorrow - Masdar City, to the down-to-earth issues of providing decent housing and securing suitable living conditions for its less advantaged citizens (Fig. 1). To fulfill these requirements, many different policies and



Figure 1. Abu Dhabi in history and Abu Dhabi today
(photo: Milica Bajić Brković)

development plans have been designed and adopted over the last few years, including the Master plan Abu Dhabi 2030. All together they provide the groundwork for the sustainable development of Abu Dhabi, based on identity, uniqueness of the environment, local culture, liveability and connectivity.²

One of the areas designated for renewal and rebuilding is the existing industrial zone of Mussafah District, planned to be transformed into a mixed-used community with a substantial share of land allocated to housing, public facilities, recreation and open public spaces. The International Society of Urban and Regional Planners (ISOCARP) was invited to take part in developing this project through the cooperative initiative named Young Planning Professionals Intensive Training Program which was jointly organized by ISOCARP and Urban Planning Council of Abu Dhabi (UPC)³. ISOCARP delivered the program in two consecutive stages comprised of a Seminar Series followed by the Young Planners Workshop which was specifically focused on developing the conceptual plan for Mussafah District based on the Master plan of Abu Dhabi 2030. A number of ideas were raised over different issues taken from the Abu Dhabi 2030, which were not included in the final project. Although each thought received was taken into consideration by the team members, the final result shown here, represents a consensus among team members about what would be the most recognizable urban structure and form for the area developed along the principles and guidelines of the Abu Dhabi 2030.

Approaching Mussafah District

The first question the team was confronted with was "what" Mussafah district is today, and how it corresponds to the Abu Dhabi image of a growing and progressive urban agglomeration. Mussafah District is an industrial hub of Abu Dhabi, where heavy and light industries are mostly located, along with the headquarters of many industrial companies. The physical urban grid of the complex is rather unusual, with large plots occasionally going up to 1x1km. In addition to production plants and company buildings, there is a substantial number of housing units located in the area inhabited mostly by the low income groups. This is the place where the hand-laborers, coming mostly from India, Pakistan or Africa, live. Mussafah District hardly has any public space or land uses other than housing and basic services and facilities which are there to fulfill the everyday needs of local inhabitants. The area is separated from other parts of Abu Dhabi, and the living conditions are rather substandard compared to Abu Dhabi standards.

On the other hand, the development potentials of Mussafah District are significant. The area is conveniently located close to Abu Dhabi CBD and is integrated into the Emirate's road and traffic system. Its orientation is almost north-south, which makes it convenient for housing development, and its well-structured orthogonal urban grid with different plot sizes

can accommodate different uses without distracting the already established road network. On the North and the West, there is a natural sea channel. A visual link to the Abu Dhabi CBD and the Grand Mosque (Al Zayed Mosque) makes it a destination from which the scenic values of Abu Dhabi can be explored. In the East, it goes along the Emirate highway which connects Abu Dhabi with other parts of the country (Fig. 2). Due to its location, the Mussafah District stands as a gateway to Abu Dhabi, and therefore it has the symbolic importance to the city.

Having the Master plan Abu Dhabi 2030 as the starting point, the project had to fulfill the following tasks: (1) to preserve the existing and give impetus to new industry development, so that Mussafah District will transform into the industry park of Abu Dhabi, (2) to provide housing for the targeted groups of the habitants, predominantly those employed in the industry and a third sector.

Sustainability was taken as an overarching principle, while local Arab culture and climate were taken as critical points and guiding principles to be built upon. The first challenge the team came across was to define local culture. Although the first impression of Abu Dhabi is that traditional Arab culture is still dominant, a deeper insight reveals that the issue of culture is by far more complex. It

² The series of documents are: Plan Abu Dhabi 2030-Urban Structure Framework Plan, Estidama Pearls Rating Systems, Abu Dhabi Capital Development Code, Abu Dhabi Urban Street Design Manual, Public Realm Design Manual, Abu Dhabi Mosque Development Regulations Project, Interim Coastal Development Guidelines, Neighbourhood Planning. Some of them are available at www.upc.gov.ae.

³ ISOCARP (www.isocarp.org) and UPC (www.upc.gov.ae) international project team: (1) Lecturers: Fatma Unsal, Ric Stephens, Milica Bajic Brkovic, Liang Wang, Amer Moustafa and Francisco Paco Perez; (2) YPW Project Team leaders: Peter Jonquière, F. Brandão Alves, Zeynep Enlii; (3) International YP professionals: Thomas Buhler, Madalen Gonzalez Bereziartua, Zeynep Gunay, Niels Kropman, Mira Milakovic, Wai Ki Pang, Rolf Schuett, Peter Vanden Abeele; (4) Local coordinators: Dima A Srouri, Sonal Parikh, Olivia Duncan, Sura Abdelhadi, Swapnil Patil; (5) Local YP professionals: Ahmed Al Kuwaiti, Souad Al Thehli, Mariam Al Ameri, Hamdan Al Mulla, Sultan Ehtibi, Muna Al Shehhi, Mansour Al Harbi, Ahmed Al Hamed, Ahmed Al Zaabi, Mahmoud Al Mahmoud, Mohamed Al Hammadi, Omar Al Suwaidi, Jaber Al Dharif, Muath Al Mazrooei, Mohamed Al Ameri, Maha Al Rumaithi. (6) Logistics: Sally Biggins.



Figure 2: Satellite image of the location (source: <http://maps.google.com/>, accessed 5th February 2011) and images of existing situation in Mussafah district (authors: Mira Milaković, Wai Ki Pang, Madalen Gonzalez Bereziartua).

would be more accurate to say that Abu Dhabi is the society in transition, as it now stands between the cultural paradigm led by traditional values, and the global trends the countries with booming economies are experiencing at present. Abu Dhabi of today is a complex mixture of traditional values, variety of lifestyles commonly associated with the West, standing side by side with many other cultural paradigms brought in by migrant workers, mostly from Asia. Within such a context, the authentic Emirate culture and the legacy inherited from their Arab ancestors are being exposed to constant threat. This is particularly supported by the growing globalization which is affecting Abu Dhabi to a great extent, as well as the ongoing repositioning of Abu Dhabi on a global scale. Following the Abu Dhabi 2030 guidelines referring to social impacts and locally defined sustainability, the project was imagined to work on fulfilling the needs of each particular social and ethnic group, and consequently applies the norms and standards that would be acceptable to the local Emirate culture. This was especially emphasized as relevant in conceptualizing spatial allocation of housing units, types of neighborhood to be planned and the scale of development.

The other aspect taken as a guiding principle was local climate, which was considered in two ways: (1) exploring the specific impacts hot and dry climate has on urban and building strategies, and (2) integrating climate-sensitive solutions based on building heritage and local wisdom in making places.

Redevelopment Concept based on Estidama and Abu Dhabi 2030

The main objective of the project was to reinvent the place and develop it into a mixed use community which will integrate work, production, housing, recreation and urban amenities. These were to be achieved by

diversifying its economy, upgrading of the existing and the employment of the more sophisticated infrastructure, and through the thorough and socially sensitive land use planning. In physical terms, it was to be effectively connected to other parts of Abu Dhabi, while the area itself had to be served by efficient and affordable public transport.

The majority of responses were developed in accordance with the Estidama principles and guidelines. Estidama ('sustainability' in Arabic) was the initiative designed to transform Abu Dhabi into a model of sustainable urbanization. Estidama aims at creating more sustainable communities, cities and enterprises by establishing balance between environment, economy, culture and social development. The aspirations of Estidama were incorporated into the Abu Dhabi Plan 2030 and most of the policies for its implementation were developed by the Urban Planning Council (Estidama, 2010). Estidama is aimed at making Abu Dhabi a sustainable city, and will secure its further development into a healthy community. It provides different guidelines, referring to urban environment, land uses, culture-related architectural design, building materials, etc. The project followed these guidelines by developing certain responses, for instance, in case of recycling the existing structures, creating spaces closely corresponding to local authenticity, integrating tangible and non-tangible heritage components, etc.

The balance between different uses was planned for the whole area, while a particular attention was paid to the housing units which were to be supported by standard urban services. The social upgrading was supported by spatial solutions such as locating facilities and services attached to housing, creating multi-use areas for recreation, improving the relationship between housing design and local identity, and ensuring that a sufficient portion of land should be allocated to the quality

public spaces. This was estimated as locally acceptable, and is also supported by the contemporary industrial heritage renewal methodology, and refers to the „perceptive spatial elements, investigation of the shapes and motives reflecting local culture on a whole or in some of parts of it, influence of geography, location and time, etc.“ (Vukmirović and Milaković, 2009).

The specific input was provided by using or re-using vernacular architecture and evolutive structures typical for the region. Reusing old buildings instead of demolishing them was taken as an instrument for safeguarding the continuity, and keeping the sense of place already established there. Thus, many of the old warehouses were planned to be recycled in order to create „places within the places“ and establish a new relationship to the newly planned structures. Combining the old and the new, and using them as the means in creating urban environment was not only a design task. The effects were also estimated on development cost with savings in building material and construction cost.

A particular attention was paid to providing a substantial number of affordable housing. There were three types of housing planned for the area. The first one is a family accommodation with two options: (1) the detached or semidetached villas with the family enclosed space, and (2) the multi-story apartment buildings with family apartments of different sizes. The second type was intended for bachelors, the „bachelors housing“. These units were planned for skilled workers mostly. These two types would be spatially and functionally separated from each other, in accordance with the social habits and norms regarding the locally recognized differences in using space and kind of activities each one is usually engaged in. A third type was specifically planned for non-skilled labor, mostly foreigners (Fig. 3).

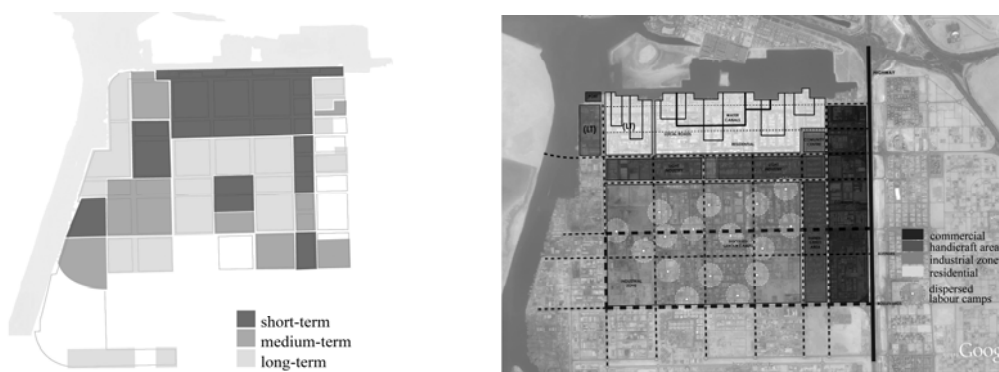


Figure 3: Phases of transformation and proposed intervention based on Abu Dhabi Masterplan 2030 (authors: Mira Milaković and Omar Al Suwaidi)

Towards the culture and climate friendly urban place

The proposed interventions were based on 5 spatial models: District, Dots, Strips, Edge and Patch. Each model has the corresponding physical morphology and is assigned to the strictly defined uses (Fig. 4). The models were based on the existing urban grid and its physical characteristics and reflected the conceptual points as they refer to local sustainability, identity and continuity.

Each model was built according to functional and spatial requirements, however each one was also tested against criteria related to local culture, climate specifics, and social characteristics, in order to make them locally acceptable and employable in developing the more detailed project for the area.

Model 1: District

This model defines industrial area as an integrated district. Generally, this model is used in large areas with clear boundaries and distinguished features, and most often combines different industry related uses.

Starting from the existing Mussafah street grid and its plots arrangement, it was estimated that there was an opportunity for the area to be further developed, without losing its functional and physical features already present there. The area was planned to be spatially defined by appropriate composition of streets, activity areas and land uses. A plot arrangement was proposed to be a mixture of different plot types, linking certain kind of activity to the size of each particular plot. Bigger plots were assigned only to heavy industry plants. Sizes of plots allocated to other industries were different depending on their technology and general industrial requirements as defined in other planning documents. The biggest plot size in the light industry area was 250m×250m, and the smallest 30×30m size (Fig. 5). Within the complex, the non-built land was left for later development of the supporting facilities and for parking lots, open storage areas, etc.

Model 2: Dots

In order to integrate foreign labors into the Abu Dhabi society as a whole, it was planned to develop their residences dispersed all over the area, instead of concentrating them in one location only. These units were planned to be within a walking distance from all urban amenities and are close to the places where the majority of their future tenants work. The 'dots' are positioned with a radius of 250m each (Milaković and Vukmirović, 2011). In addition to housing, each one has a community center, a mosque, recreational facilities and different public spaces.

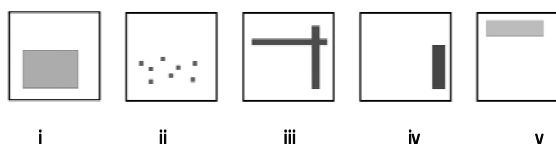


Figure 4: Five proposed models:
(i) District, (ii) Dots, (iii) Strips, (iv) Edge and (v) Patch
(design: Mira Milaković)

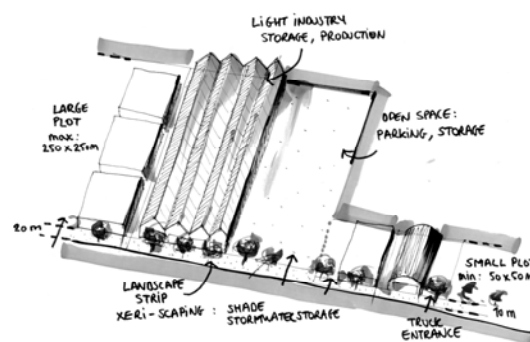


Figure 5: „District“ model
(authors: Peter Vanden Abeele and F. Brandão Alves)

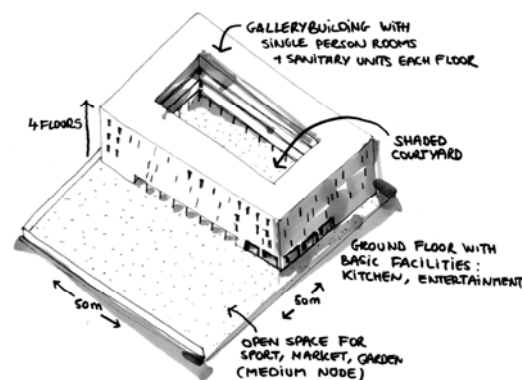


Figure 6: „Dot“ intervention
(authors: Peter Vanden Abeele and F. Brandão Alves)

This housing type is consistent with the traditional Emirate courtyard housing with enclosed private areas. The units differ in size, and consist of single rooms, shared kitchens, bathrooms and a large open space planned for recreational area (Fig. 6). Each „dot“ is attached to the external open space where different activities, like sports and recreation, social gathering, etc. will take place.

The „dots“ model will curb urban sprawl and suburban encroachment on land, encourage development which makes efficient and economical use of infrastructure and services, and minimizes the environmental, social and financial costs of new development.

Model 3: Edge

The „edge“ model was proposed for two areas: along the major thoroughfares within Mussafah, and along the sea frontage.

The first one, named 'highway wall', was designed to improve street frontage in terms of its functional and environmental qualities, and to upgrade the urban image of the area. This corridor, which will connect the activity nodes in Mussafah District, will operate as mixed use area offering a range of non-residential, retail, institutional and small and large scale commercial developments, such as car and furniture showrooms, small scale shopping malls, etc. These activities together with the appropriate design solutions planned for the

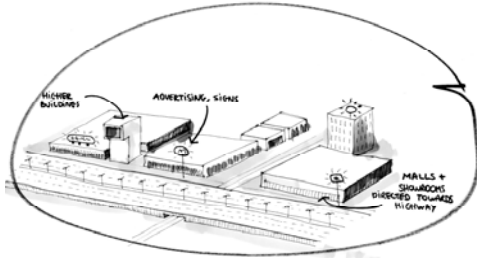


Figure 7: „Edge“ position, sketches of the proposed intervention and examples of improving the first image with the billboards (authors: Peter Vanden Abeele and F. Brandão Alves)

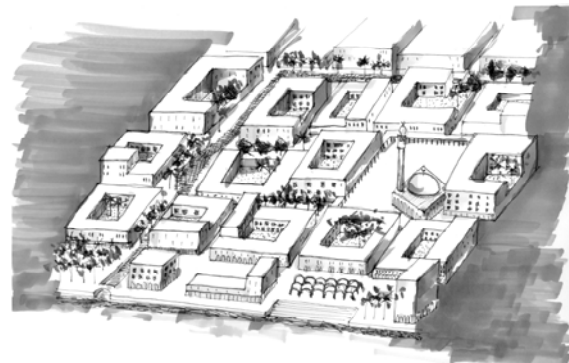


Figure 8: „Patch“ intervention in 'Arabic style' (authors: Peter Vanden Abeele and F. Brandão Alves)

area will give a more urban character to it, consistent with the ongoing progress of Abu Dhabi (Fig. 7). The „edge“ model will generate new employment opportunities in the area and will contribute to the functional transformation of Mussafah District turning it into a self contained community.

As for the waterfront area, the proposed interventions are mostly focusing on uses compatible with housing, offering large open spaces, community areas, and attractive urban amenities to secure urban liveability and soacial sustainability. Many climate-related responses were integrated into a design of complexes, blocks and individual buildings, like water channels as part of the passive cooling system, careful selection of greenery, landscape arrangements, a network of linked green corridors and spaces, etc.

The „edge“ model will minimize the environmental and social costs of new development in the area, it will preserve natural heritage in the waterfront area, and will encourage, promote and facilitate the use of public transport.

Model 4: Patch

The „patch“ model assigns particular uses to larger complexes of land, by precisely defining their boundaries, and their functional and physical character. Usually, the „patch“ model is used for the large scale residential neighborhoods with a variety of housing options, a range of community facilities, open and recreational areas, etc. Such units have to be close to the work areas in order to encourage and facilitate the everyday use of alternative modes of movement, and to preserve their predominantly pedestrian character. This model has many advantages comparing to the usual large scale developments. It minimizes the house-work commuting distances, number of the work related trips, and also encourages more frequent use of public transportation (Fig. 8).

The „patch“ model very much resembles the traditional structure of Arab communities, the 'fareej' and 'kasbah' city (Quassabah). A 'fareej' is a traditional neighbourhood scheme.

The courtyard-style homes are built to the edge of the plot in order to maximise the use of land and separate private space from public realm. Small paths, known as 'sikkak', strategically connect homes to each other within the neighborhood, as well as to community facilities and intimate public spaces known as 'barahaat', as well as to the larger gathering spaces known as 'meyadeen'. Together, these elements constitute and form the „fareej“. The key elements of a „fareej“, therefore, are a courtyard house, „sikka“ and „baraha“, while the overall design depends on the area in question.“ (Abu Dhabi UPC, 2011). This model was planned for Mussafah District with large plots (1x1km), with one central road which provides parking facilities and access to the complex. The pedestrian friendly design was provided with a system of shared streets and

'sikkak'. The „patch“ model was planned with a range of climate responsive solutions at different scales, for instance, local winds were carefully studied in order to decide on orientation of buildings so that the traditional cooling system could be built into the new design solutions (Fig. 9).

Model 5: Strips

The „strip“ model was planned for the transitional mixed-use zones combining industrial, housing and commercial development mostly of a small scale. The focal points in the „strips“ are the mosque and the public transport stations. All the „strips“ are well positioned with direct access to the main highway, and are conveniently connected to the city. The „strip“ model will enable the organic growth and development over time (Fig. 10).

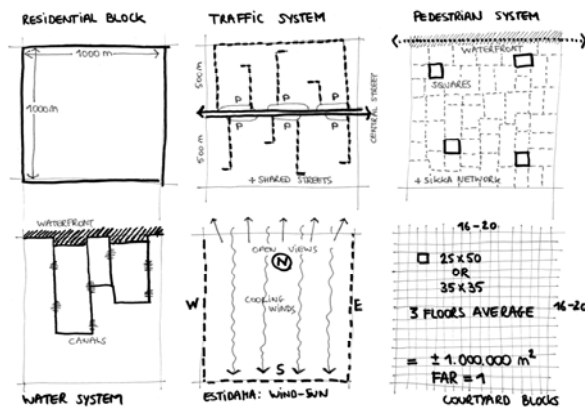


Figure 9: Scheme of plot remodeling (author: Peter Vanden Abeele)

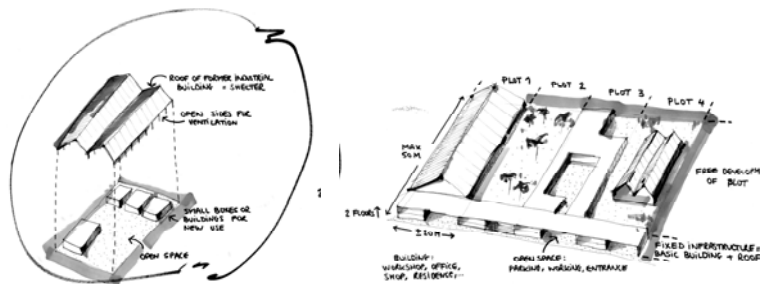


Figure 10: „Strip“ model for workshops and shelters (authors: Peter Vanden Abeele and F. Brandão Alves)

CONCLUSION

The doctrine of sustainability is based on a set of general principles whose task is to articulate and communicate messages about the values constituting the essence of its philosophy. It is the interpretation of these principles which should be applied to a concrete situation, vis-à-vis local views, aspirations and needs, and their conversion into the practical mechanisms and tools, that will enable planners and urban designers to successfully materialize the philosophy and create sustainable and liveable places. Throughout this process they are challenged with numerous questions of "how" and "what" to which they have to respond in order to make locally relevant and socially acceptable solutions. This paper explores the climate and culture related issues and offers some responses that may be useful for both planners and urban designers. The span of discussion is rather broad, ranging from conceptual issues to the very practical level of developing design proposals. Such an approach is underlined by credo that the closer we get to the built form the more we are involved in local specifics and consequently, are more likely to fulfill the task of making the surroundings sustainable.

In the paper, a particular attention is given to the planning methodology. And indeed, it is within this set of questions that planning profession needs the most in order to become more responsive to the specifics when working in different cultural and climatic environments. The recommendations outlined in the paper comprise the development of the site-relevant data base which exceeds a routine standard procedure and also includes data on local habits, collective memories, story tellin, etc., the integration of local stakeholders throughout the whole process, and the more sophisticated evaluation procedures. It is believed that in that way the planning apparatus will become more sensitive to the specifics of area in question, and consequently will be more likely to produce sustainable solutions.

The case study of Mussafah District serves as an example of working with community and for community. Only the culture and climate relevant findings and solutions which are focused on urban structure and morphology are presented in the paper. There are five urban models outlined here to be applied in Mussafah District: (i) District, (ii) Dots, (iii) Strips, (iv) Edges (v) Patch. These models represent the practical expressions of the value-laden approach to creating urban places as discussed in the first section of the paper, and show how this can work in practice. The

Mussafah District case study may be explored as a model for other locations as well, but should still be taken only as a good practice, and not as a set of instructions and guidelines to be applied regardless of geography and culture.

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