

Urban Biophilic Theories upon Reconstructions process for Basrah City in Iraq

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ABSTRACT

Basrah is the most beautiful part of Iraq. In terms of size, it is the second largest city after Baghdad. For more than 25 years, Basrah has almost constantly been at war or been in an Aggressive situation. Three major conflicts have dominated, from 1980 to 2003. The wars have brought great suffering to the Basrah population and city. The bombing caused great material damage. Today with reconstruction process the city require to take a stabile process of reconstruction by using environmental cods in urban planning and design which offer an exciting opportunity to achieve environmental, social and economic benefits. The concept of biophilia deserves a deeper explanation. The hypothesis is that this affiliation leads to positive responses in terms of human performance and health even emotional states. The new movement aims to create environmentally friendly, energy-efficient buildings and developments by effectively managing natural resources. This path will discover a far deeper integration of nature with the built environment and the potential synergies in exchanging energy and nutrients across the human-nature interface. The research will take in reading different experiences from 1980 until now, in which we will try to put all practical consideration necessary to be able to select competent urban and architectural elements adequate to Basrah condition.

INTRODUCTION

An urban settlement, town or city, is one of the primordial and predominant expressions of human sociability on a territorial basis. The outward, visually perceptible manifestation of the complex, multiform social structure that constitutes a town is the three-dimensional plastic townscape [Acta Tongressus madviciani 1958]. A sustainable city is organized so as to enable all its citizens to meet their own needs and to enhance their well-being without damaging the natural world or endangering the living conditions of other people, now or in the future [Herbert Girardet 1999]. Arid zones are characterized by various conditions that can be affected by different combinations of physical determinants. Planners must decide which conditions are desirable and adopt criteria designed to maximize them in selecting the best site for a new settlement [Gideon Golany 1977]. The region of Basrah, the city of Sinbad, is, some would say, the most beautiful part of Iraq. It is Iraq's second largest city and principal port. Its commercially advantageous location, localize near oil field. In 1948 many oil refineries have been built in the city. It is an area of countless birds and a variety of animals, full of trees and gardens and canoes

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gliding on the mirror-surfaces of calm lagoons [Amjad Almusaed 2004:14]. The human being entered the third millennium without the hope of achieving permanent peace on our beautiful earth, sustainable development and equality for all. We must seek what we have in common, namely, codes of understanding [Amjad Almusaed 2004:11]. A biophilic city is a healthy city, a city with abundant nature and natural systems that are visible and accessible to urbanities. It is certainly about the physical conditions and urban design parks, green features, urban wildlife, walkable environments, but it is also about the spirit of a place, its emotional commitment and concern about nature and other forms of life, its interest in and curiosity about nature, which can be expressed in the budget priorities of a local government as well as in the lifestyles and life patterns of its citizens. [Timothy Beatley 2011:13]. Natural and biophilic elements require being significant in everything and anything we design and build, from habitations, schools and hospitals to neighborhoods and urban configuration, to street and road structures and larger urban- and regional-scale design and planning. One of the classics of town and country planning is a garden city movement which it founded and inspired, has had a profound influence on town planning throughout the world, though its essential proposals are only now beginning to be properly understood and applied. Garden City history is that it carried further than Letchworth the technique of civic design and architectural harmony, and in the organization of its shopping center and factory area, it conducted interesting experiments which merit careful study by all who are concerned with the economics of large-scale development [Ebenez Howard 1918:2]. Garden City is a Town designed for healthy living and industry; of a size that makes possible a full measure of social life, but not larger; surrounded by a rural belt; the whole of the land being in public ownership or held in trust for the community [Ebenez Howard 1918:5].

There are several obstacles prevent us to achieve a biophilic city and/or neighborhood, and many interruptions in contemporary life navigate as far afield from nature. Such technological interruptions as digital communications devices are often seen as substantial permanent factors in our rising interruption with the natural ecosphere. Biophilic cities reflect a humility that understands the wisdom of nature and natural systems and the need to learn from them and model design and planning after them. McDonough is famous for imploring us to design “buildings like trees, cities like forests.” A city the functions like a tree is a model for our time, as we imagine cities that are carbon neutral and energy-balanced (that produce as much power as they need and live within the limits of current solar income), that are zero-waste, and that integrate and celebrate diversity (from which cities will become more resilient in the face of climate change and a highly dynamic world) [Timothy Beatley 2011:49].

CLIMATE CONDITIONS IN ACTING THEATER

The average temperatures in Basrah range from higher than 48 degree °C in July and August to below freezing in January [Gideon Golany 1977:6]. The summer months are marked by two kinds of wind phenomena: the south and southeast, a dry, dusty wind with occasional gusts to eighty kilometers an hour, occurs from April to early June and again from late September through November. Basra climate is hot, dry summer, cold winter, and a pleasant spring and fall [Daniel E. Williams 2007:32]. Roughly 90% of the annual rainfall occur between November and April, most of it in the winter months from December through March [Amjad Almusaed 2004:12]. The remaining six months, particularly the hottest ones of June, July, and August, at approximately 32 °C, air dry. The influence of the Arabic Gulf on the climate of Basrah is limited. But near the gulf the relative humidity is higher than in other parts of the country. Most nights are clear in the summer, and about one third of the nights are cloudy in the winter [Amjad Almusaed 2004:13].

PROBLEM PROPOSED

There were two major catastrophic actions caused a great environmental catastrophe over Basrah

city from 1980 until now. The first starts after the terrible consequence of the Iraq –Iran war and recently USA attack over Iraq the urban green covering disappeared from large areas of the city, beside the extension of the city development axes over the green areas. The negative effect of the heat island phenomenon over the city area, consequently the human’s thermal comfort becomes more perceptible [Amjad Almusaed 2004:176]. Other action was after the decision of the Iraqi regime over the south Iraqi marshes, which is located in the north part of Basrah city. The Mesopotamian Marshlands, nearly destroyed in the 1990s, have been partially restored but remain at risk. The Mesopotamian Marshlands are the largest wetland ecosystem in the Middle East [William J. Mitsch et al 2010]. Construction of numerous dams, water diversions and hydropower facilities on the Tigris and Euphrates Rivers over the past century and the deliberate draining of the marshes by the Iraqi regime in the early 1990s had almost destroyed the wetlands by 2000 [Aoki, C. and Kugaprasatham, S. (2009)]. Iraq’s southern marshes were a historic area, which had been a traditional hideaway for rebels. They were the largest wetlands in the Middle East, and some believed they were where the first human civilization began.

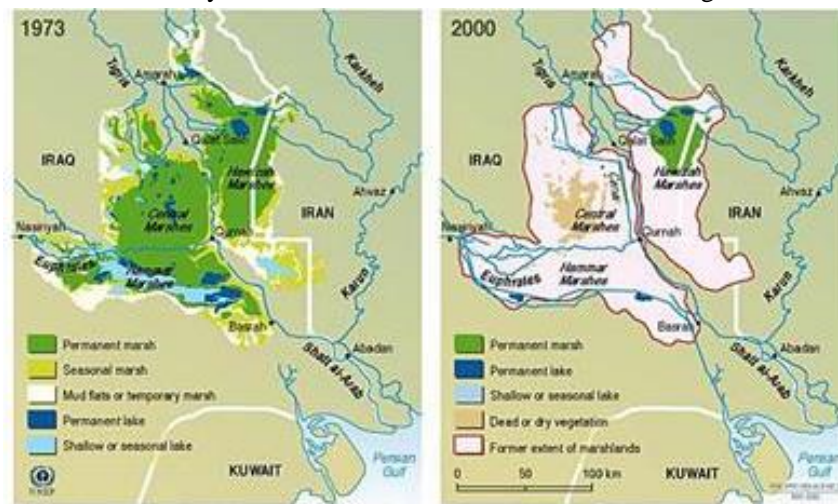


Figure 1 The southern marshes before and after Saddam's campaign of destruction [Herbert Girardet 1999]

Ecosystem recovery, however, has been seriously undermined by a severe drought (2008-2010) and uncoordinated water-related developments in the Tigris-Euphrates basin [Garsteck and Amr 2011]. The lack of a water sharing agreement between riparian countries and potential declines in Euphrates flows are a major threat to the wetlands’ survival [Herbert Girardet 1999]. Today we can observe clearly the negative effect of urban heat island in the center of Basrah city, precisely in physical frameworks of the city, where we can detect a typical phenomenon with a large negative effect for the period of summer heating that is a natural thermodynamic phenomenon. International sanctions are supposed Iraq in 1990 prevented the development process of the civil city requirements. Therefore the city requires many civil elements. The major negative acting is:

- Basrah is a rich petroleum city; therefore city development axes are under governor petroleum minister control.

- A bad city zoning after 1989’s reforming

The city today is in a bad condition, where the main urgent requirements are:

- A huge requirement for residential units for more than 1.5 million inhabitants
- Efficient social and cultural zones
- Additional open green areas

- Efficient management of vernacular buildings existent
- Competent and suitable civic centers and arteries

Sustainable cities are created by people who are knowledgeable about sustainable solutions. Decisions about sustainable development made by people whose have knowledge of the opportunities and implications inherent in sustainable choices. Decision makers can only choose sustainable solutions if they know they exist. Arid settlement and development in virgin areas require, as we noted, vision and pioneering spirit or ideological motives in the young, dynamic settlers for quite a long time after its initiation [Golany, Gideon S. 1995:4].

DISCUSSIONS AND RECOMMENDATIONS

Good stories and narratives are crucial to change in the future. Key questions are therefore:

- How town's functions do is that we make a difference in the city?
- What visions they have for how they can and will contribute to the city in the future?

We are looking to condense and in outline form / imagery to translate into a strategy proposal [UNITED NATIONS CONFERENCE ON HUMAN SETTLEMENTS (HABITAT II)]. Understanding the natural history of a city helps us to see cities as ever-changing, ever-evolving palettes of life [Timothy Beatley 2011:14]. The study aims to achieve an overall development strategy with the following strategies:

Activation of vernacular concepts of urban texture structure

Where vernacular habitat units are compact with interior courtyard; the streets are sinuous and pass through houses volumes. The shady interior courtyard has the effect that the rooms do not communicate directly with the overheated air outside, but through intermediate buffer spaces. Windows are often protected from the appalling [Amjad Almusaed 2004:23].

Moving towards a compact urban city

A compact form can reduce the length of utility networks, the maintenance they require, and the expenditures of energy and thereby prove economical. However, such a form mandates special designs that may increase construction cost [Golany, Gideon S. 1995:16]. It is necessary to create a more judicious urban microclimate than that dominant in the neighborhoods. They have to reflect the requirement for verticality (as opposed to horizontally) in the conceptual process of urban structures; this could involve some subterranean construction.

Implementation of a Linear City model

In old regions of the city we can implicitly, the concept of the linear city to rebuild and recover the deteriorate regions of the city, in a new ecological one that can go beyond the laws and restrictions of Iraqi petroleum ministers, where the main feature of the linear urban form is its ability to deal with the rapid and efficient mass movement of people and goods within and between cities. A further quality of the linear structure is its ability to deal, in theory, with infinite growth. Fig. 2 shows the possible extension in linear of the city by axes and the positioning of civic centers.

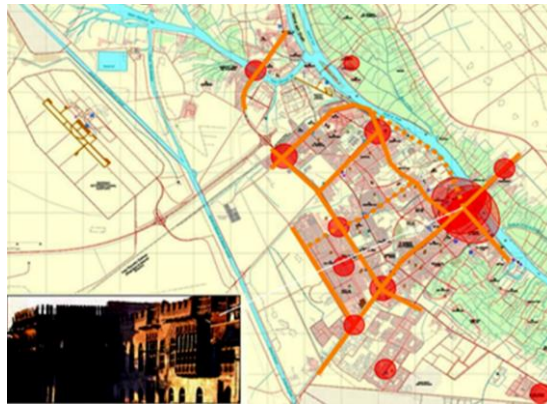


Figure 2 the possibility of linear city extensions by axes and civic centers

In this context, it be required to respect the following parametric factors:

- Divide Basrah in a great main center includes all private and public buildings, and many other small centers. The centers can be connected through a large classified transport network.
- A better organization of the Basrah has to divided city in many different levels
- The city has to be built by determining an urban point called 0 zone. Development process and city orientation start on this form.
- The city's borders have to be Determined through roads and streets.
- City district and development process can be arises by redefinition of the streets and buildings with sustainable vision
- Divide the city in many environmental zones can help in improving the macro- climate
- The city has to give city coherence through a clear road and transport networks.
- Conversion of Basrah marsh has to be built in an optimal way.

Application of bioclimatic architecture policy

The building design likewise should be governed by the climatic realities. The architecture itself is important, as are the shading devices, the landscaping, the shielding that a designer provides against adverse conditions, and the ventilation. The heating and air-conditioning plants of a structure must be designed with the climate in mind. Another very important element in arid-zone building design is insulation, because it is the one thing that tempers extreme outside variations in climatic factors. The easiest way to reduce the variations between daytime and nighttime temperatures is to put something between the inside and outside worlds: insulation does just this [Golany, Gideon S. 1995:32].

Initiated the concept of biophilic city and healthy environmental concept

The biophilic structure of the earth is a valued and appreciated part of life, where areas and human carrier green is not only an excellent synthesis of both qualitative and quantitative research that documents the bond between people and plants, it is a synthesis of the life's work and thinking of one of the most important figures in people-plant relationships. A biophilic community is a place where residents can easily get outside, where walking, strolling, and meandering is permissible, indeed encouraged, and evidence suggests that these qualities now carry an economic premium [Timothy Beatley 2011:3]. A green building uses considerably less energy and water than a conventional building, has fewer site impacts and generally higher levels of indoor air quality [New York City Department of Parks and Recreation]. It also accounts for some measure of the life-cycle impact of building materials,

furniture and furnishings. These benefits result from better site development practices; design and construction choices; and the cumulative effects of operation, maintenance, removal, and possible reuse of building materials and systems [Jerry Yudelson, 2006:19]. A biophilic city is one that is full of varied sights, sounds, smells, and textures, many, but not all of which are natural [Brian Burton 2009].

First of all, an urban area invariably absorbs more heat from the sun than does an undeveloped one because the building materials usually have an albedo lower than that of most natural land environment. Thus, they necessarily absorb more energy [Ken Yeang, 2006:294]. Second, an urban area rejects man-made heat because machinery, combustion processes, and a man in a city are heat rejecting [Gideon Golany 1977:33]. The urban heat island mitigation strategies, can support to diminish direct energy utilize in buildings, and if applied in a community-wide basis, can decrease generally ambient air temperature in a specified region [Gallo, K.P.; Tarpley, J.D (1996)]. There are many assumptions, average leaf, and average plant. Hospitals and health facilities utilize the therapeutic benefits of green areas [Wolf K. L. 2007]. . These facilities sometimes use gardening as a tool to enhance the healing process for patients. In addition, the person can enjoy the comfort, fresh air, and landscape while restoring their health [Ismail Said (Jun 2003)].

Reducing of CO2 emissions and increasing energy saving and efficiency concept

We require to control the traffic-systems reduction, distraction and rerouting to reduce the production of air and noise pollution, and heat discharges. For parking the optimal solution is in building vehicular parking spaces underground or as covered structured parking. Use an open-grid pavement system (with impervious surfacing such as porous concrete) for the parking-lot areas [Ken Yeang, 2006:318]. Reducing carbon dioxide emissions from the building sector is critical to our ability to combat global warming. Green buildings are an important component in the effort to bring carbon dioxide emissions back to 1990 levels, as required by the Kyoto Protocol, so that we can begin to stabilize carbon dioxide concentrations in the atmosphere at levels no more than 20 percent above today's [Jerry Yudelson, 2006:41]. Topography by vertical variations in the landscape is helpful in creating potential energy saving idea. Gravity is one of the most significant sustainable forces. It can distribute water for free, and even stratification of microclimatic air temperature is related to its presence.

Increasing of environmental, human thermal comfort

Communities can take as many steps to lower the temperature of the environment. These temperature reduction strategies include: By means of the greater concept of biophilic city, vegetated green roofs, living green walls and planting trees and vegetation employ the evapotranspiration and evaporative-cooling procedures of vegetation on construction surfaces and integrate open green spaces. In addition, trees, shrubs, and other plants help reduce ambient air temperatures during a process known as "evapotranspiration." This happens when water absorbed by vegetation evaporates off of the leaves and surrounding soil to naturally cool the surrounding air. Trees also insert oxygen to the atmosphere, break down a quantity of pollutants and diminish dust [Amjad Almusaed 2004:231].

Decreasing the level of heat-absorbing surfaces

Adjust current and new urban city block layouts and configurations with explain patterns, materials and surfaces that absorb a small amount of solar energy [Berdahl, P. Bretz, S., 1997:25, 149-158]. Building materials and finishes appropriate to the impacts from the climate and the weather. Earth building can achieve great heights of structural and aesthetic achievement [J.C. Moughtin 1985:21]. Earth can be used in a variety of ways which encompasses a wide range of architectural styles and aesthetic appeal [Peter Shirley, J. C. Moughtin 2006: 30].

Facade cladding systems is a most popular building material uses for façade in Basrah today. It's

made of different materials such as steel, aluminum, Cor-Ten and glass. The material absorbs a huge amount of heat in the day at summer period and its release it at night. It works such as thermal mass. The montage of this material in Basra is without thermal insulation. This contributes in amelioration of the heat island phenomenon. Application of other environmental material is essential today. [Myer, W. B (1991)]. The current surfaces (roofs, infrastructure, pavements, etc.) with vegetated surfaces such as green roofs or green gardens and open - network road surface or specify cool materials to decrease the heat absorption. In other hand, we need to employ the well reflective and high emissivity building surfaces, materials upon walls and roofs, or by installing of a green roof or walls. Therefore, we have to increase the reflectivity of building surfaces such as rooftops and using frequently of light colors to create a highly reflective building climatic surface to keep buildings cooler in summer season to reduce energy consumption

CONCLUSION

Planning and architecture must work together to be sustainable. To design sustainable is to integrate the design into the ecology of the place the flows of materials and energy residing in the community [William D. Solecki, et al,2005]. One of the major problems facing us is how to establish and maintain environments that support human health and at the same time are ecologically sustainable. Green areas seem too important to people. Most people today believe that the green world is beautiful. Biophilic habitats are still often seen as an unadulterated esthetical element in architecture, as a spleen of some “Greenies”. In fact, green areas by now contribute, some extent, to a better microclimate through evaporation, filtering of dust from the air and reduce inside temperatures at the building's surface. Besides improving the microclimate and the indoor climate, the retention of rainwater is another important advantage. The aesthetic form requires, escalating the value of the possessions and the marketability of the building as a complete, mainly for accessible green areas. Urban and regional planners should view the world's arid zones as potential locations for future urban expansion and for food production, and as energy resources. No matter what function these areas serve, the construction of settlements of different forms and functions which respond to the unique nature of a desert climate will be needed. Generating more biophilic cities will also necessitate political governance, of course, and there are currently strong suggestions that politicians are capable to gain political benefits from sustenance for green developments. The green areas can take a differ places in relation to the non-greenly areas where the green area appearance aim to be synchronized by means of another area in concordance with architectural perception upon biophilic habitat.

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