Sustainable master planning and urban design for the “buffer zone” of Nicosia

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ABSTRACT

This paper will describe how the urban projects or the new master plans must consider the environmental impact of the proposed intervention and minimise them through a sustainable planning. The Nicosia’s bi-communal master plan project has as development objective the improvement of the existing habitat and the human settlement conditions with a preservation and rehabilitation policy in particular way for the walled city (historical centre) that is almost abandoned since the Turkish invasion of 1974. Our contribution consists in the reinterpretation of the previsions of the existing master plan, translating them in sustainable ones. The principal objective of the project is to “break down” the last European wall and to think Nicosia in the future as a unique city revitalising the historical centre through a sustainable rehabilitation and urban design. In this vision we focused our attention at the “buffer-zone” of Nicosia’s walled city considered as the most important “gluing area” for the functional integration where we have translate the master plan propose for new open spaces in a network of open green spaces as “green islands” capable to create a microclimate and to reduce the “heat islands”. This network of open green spaces is going to be planned after an accurate local monitoring and evaluation of the existing climate conditions.

The creation of attractive green spaces for visual and physical relief such as the reduction of psychological stress and external temperature, creating a pleasant local microclimate, becomes ever more important especially for the high summer-temperatures of the Mediterranean climates and in particular way of Cyprus. Creating high quality sustainable and thermic comfort external spaces that are safe and they encourage social interaction and integration is what sustainable landscape and urban design strives to achieve. This paper outlines the proposal for a sustainable master planning and urban design through the application of the Project Management model as successful tool for decision maker to define the low energy strategies objectives in buildings and to evaluate different scenarios of sustainable urban design, as well as to implement the cost/benefit analysis of renewable energy integration during all the phases of sustainable urban design.

1. INTRODUCTION

1.1 The urban climate

Urban forms can modify the climate of a city, creating the famous urban microclimate and differentiate it from the climate of the surrounding rural areas. The urban climate and particularly the urban microclimate within the urban space are one of the most important aspects to consider for the improvement of the overheating summer effect of the Mediterranean cities. The replacement of vegetation or soil by concrete or asphalt such as the impermeable surfaces, the massive buildings and the pollutants help to make the cities hotter. The solar energy raises the surface temperature of the different materials instead of being used for the evaporation process of a natural vegetative cover. The urban comfort and quality of the open spaces depends also to the layer of atmosphere enclosed within the street canyons up to the buildings roof height, called “urban canopy”.

The form and layout of buildings as well as the street’s section and orientation, and the size or the shape of all urban open areas, affect mainly the urban microclimate. Afterwards, more investigation is needed on this field in order to evaluate the interactions between the geometric characteristics of the urban texture and the most important microclimate factors. Microclimate is affected by the following parameters: topography, soil structure, ground cover and urban forms. To evaluate the impact of the urban microclimatic we have to consider the wind speed, the ambient temperature and the relative humidity measurements such as the building materials and their respective colors.

1.2 The heat island effect

The urban heat island effect is the higher summer temperatures in urban areas than the rural surroundings. This phenomenon can also exist as the different temperature of two different open spaces in the same city. Studies have shown that the heat island effect depends
to the city size and the urban population. This phenomenon is related to climate, topography, physical layout and short term weather conditions. Factors such as canyon radiative geometry, thermal properties of the different materials, anthropogenic heat effect, urban greenhouse effect, canyon radiative geometry of the surfaces, reduction of the evaporating surfaces and the reduce speed of the wind within the cities streets can influence the creation of the heat island effect. Different studies can demonstrate that green reduces this heat effect and it’s capable to reduce the ambient temperature until 3°C. The open green spaces used as “green islands” are capable to create a microclimate and to reduce the “heat island” effect in an urban zone of a city.

2. SUSTAINABLE MASTER PLAN

2.1 What is a “sustainable master plan”

Usually, a master plan is a set of guidelines for land use and development. A comprehensive master plan might also take economic aspects into account. But a sustainable master plan combines economic growth, environmental issues, community needs and social equity. Here are only 10 goals to achieve for a sustainable master plan:  
• green building  
• energy efficiency and saving  
• use of renewable energies  
• open green spaces  
• a safe, clean place to live and work,  
• with adequate and affordable healthcare,  
• full employment,  
• 70 percent home ownership,  
• vibrant downtown with stores and community parks in walking distances,  
• education as a community priority

The plan also lays out strategies for achieving these goals through the Project Management process, and sets target dates (milestones) for measuring movement toward them. For example, one goal is incorporating green building by maximizing energy efficiency, minimizing negative impacts on human and environmental health, complying with green standards, and providing citizens with safe, efficient places to work and to live. A master plan has to set a target date and the percent number to implement energy conservation and efficiency measures, to reduce energy costs, and to reduce carbon emissions. One of the principal strategies for accomplishing this is, first, to educate residents and businesses about green building and green renovation, and then, offer special building loans and tax incentives to encourage energy conservation.

2.2 Nicosia’s existing urban conditions

The Cyprus dispute is the conflict between Greek Cypriots and Turkish Cypriots and also Republic of Cyprus and Turkey over Cyprus, an island nation in the eastern Mediterranean Sea. The problem has involved Turkey, Greece, the United Kingdom, the USA, the United Nations and recently the European Union. Since 1974 the internationally recognised Republic of Cyprus has been divided. The dividing line which cuts across the country has created a physical and social barrier between the Greek and Turkish Cypriot Communities. The Turkish Cypriot community declared itself Turkish Republic of Northern Cyprus, condemned by UN Security Council Resolutions as legally invalid and it is recognised only by Turkey. In 1963 the English military divide the city in two parts drawing a line on a map with a green pencil, which was to become known as the “Green Line”. The centre of Nicosia and especially the buffer zone created, still today, looks like a war zone and has lost its uniqueness. The historic centre was subject to physical decay and socio-economic decline conditions almost until today and become periphery. The existing conditions can be better described through a traveller’s diary writing: “Finding one’s way in the labyrinthian heart of Nicosia is no easy matter. Seemingly at every turn, and providing some sense of direction, are the sandbags, soldiers and blue UN flags of the buffer zone, running across the city, east to west. Straddling either side of the zone, in the centre of the city, are two hauntingly beautiful neighbourhoods - Arab Ahmet on the north and Chrysaliniotissa on the south. They seem deserted except for a few stray cats, a flight of swallows or the occasional wizened face that appears unexpectedly through a window. Many of the buildings have fallen in on themselves, their crumbling plaster exposing mud and straw brick structures. Weathered, painted doors, decorated with iron filigree, hang loosely on their hinges. A look
inside reveals inner courtyards, wildflowers springing up through the floorboards."

2.2 Nicosia’s existing Master plan
The NICOSIA MASTER PLAN is the Bi-Communal Initiative to change the image of the city formed by the NMP TEAM in 1981. A bi-communal multidisciplinary team was formed in order to prepare a common planning strategy for Nicosia. The Nicosia Master Plan reflects the courageous future unique vision of the Greek Cypriot and Turkish Cypriot communities of Nicosia. While both communities look forward to a common solution to the political crisis, they believe that no time should be lost in dealing with the immediate problems of today, reversing the decay and centrifugal growth of the city. With funding from UNDP and technical support from the UNOPS Centre for Human Settlements (Habitat), Master Plan teams of urban planners, architects, sociologists and economists from both sides have met routinely in the UN-patrolled buffer zone since 1980 to make a common project for the city. In this respect, the project has been one of the few continuous links between Greek and Turkish Cypriots. The Nicosia Master Plan not only represents an extraordinary effort in bi-communal co-operation but it is also a bold departure in urban planning for Cyprus. While the city is blessed with a dynamic private sector, this has failed, so far, to provide the impetus needed to restore Old Nicosia’s economic base, protect its cultural legacy, or enhance the quality of life for its inhabitants. The strength and challenge of the Master Plan is that it goes beyond traditional, more or less reactive, urban development controls. Rather, it relies on the initiative of the public sector to actively shape the future direction of the city. The NMP rehabilitation policy is:

• Social objectives: Relating to the rehabilitation of old residential neighbourhoods, community development and population increase.
• Economic objectives: Aiming to revitalise the commercial core and increase employment Opportunities.
• Architectural objectives: Preservation and restoration of individual historic monuments and of groups of buildings, with significant architectural and environmental qualities.

3. NICOSIA’S SUSTAINABLE MASTER PLAN

3.1. The “Green across the Green line” project
The Nicosia’s project, called “Green across the Green line” was a project elaborated in the Master course exam of sustainable planning through the Project management Model that use strategies for the plan of low energy building and sustainable urban design. Our project consists in the translation of the existing master plan indications, in sustainable ones.

Figure 2

The central objective of the “Green across the Green line” project is to “break down” the last European wall and to think Nicosia in the future as a unique sustainable city with a new and “green” revitalised historical centre. Furthermore after the evaluation of the local climate conditions, a sustainable plan for the rehabilitation and the urban design, improving the existing habitat and the human settlement conditions, is to be carried out. Another important objective of this project is to create attractive green open spaces which will be valued and cherished by the future bi-communal citizens of the now uninhabited walled city. This “new” environments will be socially, economically and environmentally complete spaces that can add to the quality of life for all the residents and the visitors alike. The deliverables and the project quality consists principally in:

• Unification and revitalization of the divided city through a network of green spaces able to improve the microclimate comfort of the urban spaces. Projects also capable to improve the accessibility and to remove the architectural feature that denies access to the handicapped.
• Projects capable to stimulate the morphological quality trough the use of local and ecological materials for the paving and the building rehabilitation, increasing that way the value of the natural heritage.
• Promotional plans for the sustainable economic and social development, able to increase the value of the city’s image as a unique one trough the investment on culture, tourism, trade, traditions and environment.
• Energy saving of 60% for the buildings through the benefits of the microclimate created from the “green islands”, the building rehabilitation, the natural ventilation and the use of rennovable sources. Pilot plans will aim at the social awareness and the energy saving such as the creation of photovoltaic installations for the
urban lighting using the solar energy.

3.2. The Project Management Model
The project was developed through the Project management Model, creating a complete “charter” indicated by the PMI (Project Management Institute) and the structured work programme. Furthermore was based on WBS (work breakdown structure), stakeholders analysis and budget evaluation, focusing on low energy building design and the integration of renewable energy strategies and technologies since the scope/objects definition using the TADA (think, ask, decide, act) process.

Six different scales of projects allowed to apply the project management model (13 steps) at building scale (technological and material approach), as well as to district (with the evaluation of “District contracts energy experiment objects”) and urban scale, where the evaluation of different scenarios of renewable energy integration plays a strategically rule.

REFERENCES