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SUSTAINABLE URBAN CONTEXT

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Abstract: *In the context of the society development, the urban shape planning is considered to be an important vector in regards to the built environment. The continuous development of the town concept has created various types of volumes with contrasting dimensions and types of materials, therefore in this age the results are leading to a negative effect for the population. Sustainable neighbourhoods could be a solution for a better urban management, preserving the ecosystems and the wellness of the citizens.*

Key words: *urban- microclimate, integrated society, neighbourhood*

1. Introduction

The side effects of the economic development and the modern technological progresses have affected both the environment and the wellness of the population. Even in the middle of the functional-working town areas, which are representing several architectural programs with different urban design.

The developed European countries are building a model for environmental control, having as purpose for a society well integrated in the environment.

Due to the World ONU Conference Statement, for defending the environment (1972), Stockholm, three environments interconnected, consisting together:

- natural environment;
- artificial environment;
- socio-economic environment.

The urban-planning specialists, and also the architect specialists considered the model as a complex vector of integration. They showed the interior relations of each component as:

- bio-geochemical for the natural environment;
- physics-spatial relations and functional relations for the artificial environment;
- social relations, materials and spiritual relations for the socio-economic environment [1, 5].

In the meantime the functionality methods have been described, first for the natural environment, the functionality method is ecological balanced, and for the other two environments, artificial and socio-economic, the functionality method comes along with the development.

In conclusion the environment balance is going through a crisis, due to the contradictions between the two functionality methods.

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2. Objectives. The Environment and the Population Wellness Inside the Urban Shape Planning

In the geographical landscape there are included two geosystems, one natural and the other anthropical. In this context, the geosystem is a functional aspect of the environment, very similar with the body's circulation and neuronal systems, where a small change in the circuits, is generating a dysfunctionality in the entire system.

The sociologists consider the landscape as a first element for understanding a living society, which belongs to an area. The paradigm society-environment presented itself as a socio-cultural phenomenon answer, by means the Geographical area is symbolical compared with The Centre of Universe [2].

In his book "Existence, Space & Architecture", C. Norberg Schultz decoded the levels of hierarchy of the existing living space related to human needs:

- First level- small objects, small actions, utilization, regarding the shape and dimension. Hand objects.
- Second level- related to human body and the using objects, like furniture, ambient, household habitat.
- Third level- the living space of a house, which due to the shape, size, proportions, gives to the people the possibility of motion (traffic).
- Fourth level- determined by social interactions it the natural habitat
- Fifth level- the landscape level, resulted from human interaction with the natural environment
- Sixth level- The geographical level, has a cognitive characteristic but its structures affect directly and entirely the human experiences levels [3].

This structure shows the step by step actions of human decisions, which interconnect with the architectural space, and also proves the development for a whole area, while touching on three important levels.

These are: the interior space as a personal environment represents the building space, the next urban and landscape environment is coming as a result of human interaction with natural environment, and the last is connected with the geographical level as a global environment.

The architectural space is considered the human experiences field, the urban and landscape space is a visual space, limited by obstacles. Continuous and discontinuous space, is the total of perceptions which leads to the living experience for a particular place.

In the urban areas, the process of stuffing as many buildings as possible onto an area of land, for the purpose of a better efficiency for using the plots, has became a rigid conception and has led to random urban planning. During the time, it has become a negative effect for the wellness of the citizens.

2.1. Climate Changes – Challenges for Urban Planning

A century ago all buildings had been built similar to passive and low energy concepts. They were designed to suit the local climates, local traditions, culture, environment and built mainly using local materials. In the last hundred years the world has changed immensely, as witnessed by the much altered faces of the cities we have grown up in.

The predictions made by the Intergovernmental Panel of Climate Change in 1990 have

been born out by the steadily increasing global temperatures over the 1990s, the hottest decade on record (see: www.meto.gov.uk):. However there is currently increasing concern that this report under-estimated the increase of global temperatures. [8]

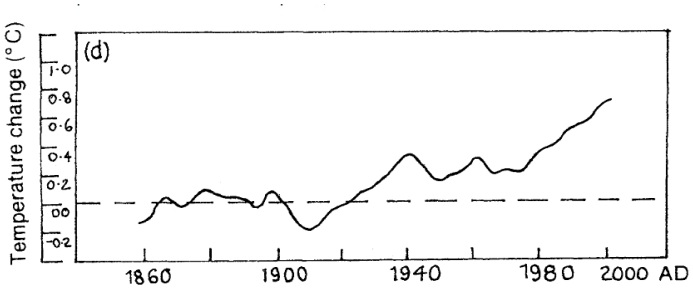

Fig. 1. *Climate change over the last hundred and forty years (Roaf 2001)* [8]

The city nowadays, has a different profile. The growth of the development, created specific local geosystems, unfortunately often very polluted, and lacking the capacity to improve the overall life quality of the citizens. The various shapes and volumes of the buildings, the different types of materials, characterized in general by low specific heat, big caloric conductibility and permeability, and using and covering the streets and side-walks with waterproof surfaces, along with the underground infrastructure, lead to to cities which do not breathe and lead to overheating. This due to the fact that the heat does not have the natural benefits of the evaporation, and is excessive increasing the air heat.

2.2. The Sick-buildings Syndrome

Some of the new technologies, new building materials and installations, have led to a continuous modernization of architecture. But, many people working in buildings with enormous glass-walls, equipped with sophisticated climate installations (office buildings, commercial centers, etc), have in time often developed physical symptoms known as the sick-building syndrome. The symptoms are: respiratory problems, headache, fatigue, eyes irritations, etc.

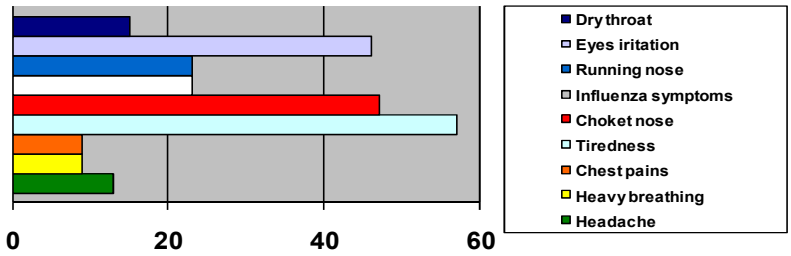

Fig. 2. *Sick-building set aside to the occupants* [6]

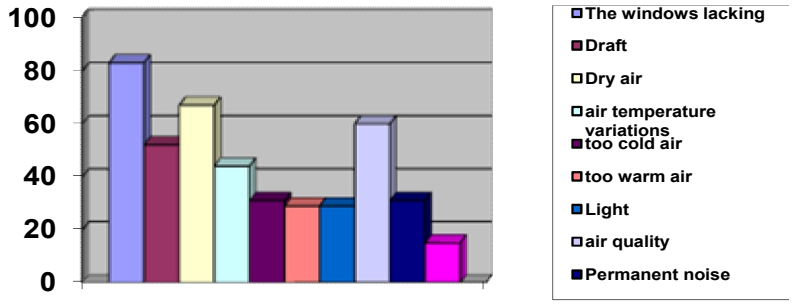

Fig. 3. *The causes of Sick-building syndrome*

The most frequent causes of sick-building syndrome are thermic comfort and the low air quality. The research proved on a group of 4000 persons (43.1% males and 56.9 % females) who are working in a office building in Frankfurt, showed the following discomfort factors: room microclimate 65.4%, noise 32.7%, weak light 25.5%, lack of space to the working place 23,5%, working extra-hours 12.8%, stress from the staff 9.7%, competition 7.1%. The results showed that the rooms microclimate, due to the architecture and equipments, affect not only the comfort of the occupants, but also their health.

Utilizing the modern technologies has become a two sides issue, sometimes the result being opposite to "sustainable ecologic" model. On one hand a "high-tech" system added to an ecological concept, generate important qualities as saving the conventional energy, having as result a lower pollution. On the other hand the "high-tech" technologies are mainly using synthetics materials, with high technical performances. These materials contravene to ecological principals due to the energy amount invested in the producing process or their recycling rate. In the meantime, considering the final result as "ecological effect", regarding less harmful emissions, it is an achievement of "high-tech" systems.

Fig. 4. *Modern "high-tech" architecture* [6]

From this point of view, the relation between ecological architecture and technology is an accomplishment. The "high-tech" systems become intelligent systems, for energy saving and balancing the indoor climate inside the buildings. But, having them in excess, they generate a specific view of the architectural object. Sometimes unpersonal, over-

technologised, but with the contribution of some ecological materials could show the potential of contemporary architecture.

3. Efficient – Diversity of Needs and Desires

The green areas inside the cities, which give a good contribution for bringing shadow and balancing the air humidity, do not have enough impact in improving the bioclimate.

Urban topo-climate and microclimates concepts have been created by people, these concepts are also a goal in the bioclimatic architecture.

The differences for a life style in the village area, where the nature is maintained in the architectural environment, and provide less aggressive climate changes for the local habitat, leads to conclusions that the town creates an active area with different climatic characteristics. The industry is not alone in being guilty for environment pollution, but also the big city areas have created harmful habitats for our planet.

Consider energy-efficient buildings. Twenty years ago in Germany, the standard rate of oil use for heating and cooling the average house was 30 liters per square meter per year. Today, with high-efficiency housing, that number has plummeted to 1.5 liters of oil per square meter. Increasing efficiency is often achieved through better insulation (such as plastic coatings in potential air-exchange areas so that less air comes into the building from outside) and smaller, leak-proof windows. These strategies are meant to optimize the system and reduce wasted energy. But by reducing air-exchange rates, efficient homeowners are actually strengthening the concentration of indoor air pollution from poorly designed materials and products in the home. If indoor air quality is poor because of crude products and building materials, then people require more fresh air to circulate throughout the building, not less.

Unfortunately the efficient buildings can also be dangerous. Several decades ago the Turkish government created inexpensive houses by designing and constructing apartments and houses which were built "efficiently", with minimum of steel and concrete. During the 1999 earthquakes, however, this housing easily collapsed, while older, "inefficient" buildings help up better. In the short term, people saved money on housing, but in the long term, the efficiency strategy turned out to be dangerous. [7].

Eco efficient factories are held up as models, of modern manufacturing. But in truth many of them are only distributing their pollution in less obvious ways. Less efficient factories, instead of sending emissions through high smokestacks into other area from the site (or importing them), tend to contaminate local areas. Efficient destruction is harder to detect and thus harder to stop.

The comprehension of the efficient architecture has different impact over the human communities, in different countries. The technological reality, the psychological impact of the high-teak uniformity encourages the social architecture, to involve in territorial and ambiental studies.

As V. Olgyay opinionates, the architectural expression is connected to a triple relation with economics limits, physical needs and emotional needs [4].

Nowadays the integrated architecture design is focusing on the beneficiary's desires, respect for the environment, and site, also creating a integrated social participation of the communities.

In fact, ancient architecture established the precedent for sustainable design through the use of daylight, sun, night air, and natural ventilation. Courtyards, gardens, water

features, large high spaces with high level windows, large thermal massive structures, combined to form a vernacular that provided thermal and visual comfort.

4. Conclusions

The ecosystemic approach in the frame of sustainable development leads to a better comprehension of natural environment and by integrating the non natural environments, of different areas. The durability could be analysed also with the concepts of *conservatorism* or *progressim*.

Edward Goldsmith, in *The Ecologist,* has considered that it will be better if the urbanisation is slowing down. Norman Foster additionally considers that half of the world population of our age live in cities, and this percent will increase to about 75% towards 2025, and that the human needs can be achieved only with modern scientifical and technological support.

The moderate voices, from the *conservatorism* field, believe in a more rural living style, and preserving the natural habitat as much as can be done. In regards to climate changes, the high-tech technology communities should find solutions for integrating the cladding and façade of buildings in a more suitable volumetric shape, and developing a control system without excessively using energy.

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