

Effects of Sustainability Paradigm on Architecture

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ABSTRACT: *This paper delves into effects of sustainability on architectural theory and practice. Ideas related to environmental protection from the past decades, cumulated in sustainability as unique global action. Circumstances were not in favour of necessary level of requested changes, but positive effects are evident in adjustment of legal base, new procedures and standards. Concept of sustainable architecture is proclaimed mainstream, faded by selective interpretation and perceptible lag in developing of theoretical background. Real critical observation and researches of sustainability and sustainable architecture are still very rare. Reasons for it are many, first of all not all of architects understand sustainable architecture as relevant and it is not rare misunderstanding of sustainable architecture as energy efficiency eco-tecture or other environmentally related "tecture". Furthermore, building industry in its complexity is typically tardiness in acceptance of anything new in general. However, sustainable architecture is positive in its essence but rising confusion about it has to be halted by more clarified definitions, qualitative researches and developing of more solid theoretical bases. Otherwise it will lose positivity, transferred on semantic level where will spread, and atomise to its limits and fade away.*

Keywords: *Sustainable architecture, main stream, interpretation, lags in developing, new standards.*

I. INTRODUCTION

Mankind and mother earth is a story about relation laden by love and disrespect. Preoccupied by ourselves, we have never take care about negative impact of our activities on life environment. Economic expansion and rapid growth of population in the world was fuelling further spreading of urban areas, demands for services and increasing of consumption. It was not followed by appropriate developing in technology causing imbalanced and uncontrolled depletion of existing resources what resulted in destruction of the environment. During recent decades we were slowly realise that we can't control nature, we are not mighty as we thought and in fact we jeopardized our way of existence. Instinct to survive woke up us from illusive arrogance, triggered serial of discussions on all levels about our future on the planet. As a result, sustainability was imposed as formula, magic remedy, pathway to brighter future, becoming universal "prefix" for activities at all spheres of life.

Aggressive popularization of sustainability in the world of architecture had negative side effect of minimizing space for objective critic. Architecture is in the epicentre of the issue, but not in role of major influencer, so endless discussions about tenet that architecture had power to change the world are pointless in this case. Architects are not inventors of technology or scientists in narrow mean of word, what is fact but doesn't mean underestimation of silent and persistent long term influence which architecture have on humans physical, mental and emotional health, comfort in life, culture of living or on individual sense for aesthetic. Architects should make necessary adjustment of design strategy, to keep focus on implementation of technologies improving energy efficiency, using of available natural resources and reducing of harmful impact on environment.

1.1 Background

"Humanity has the ability to make development sustainable to ensure that it meets the needs of the present without compromising the ability of future generations to meet their own needs." (Gro Harlem Brundtland - The Brundtland Commission 1987)

Global production of energy and consumption of fossil fuels are permanently increasing. Statistics data about energy consumption in the world vary from country to country as well as their interpretations vary depend on purpose. According to International Energy Agency (IAE) 45 % of world energy consumption in average is in buildings (domestic and industrial).

Urban areas are important in economy, big consumers of energy and natural resources but sources of high pollution.

UNEP - Division of Technology, Industry and Economics, data about impact of the cities on world level:

- Cities occupy 3% of land surface
- Cities produce 50% of global waste
- Cities account for 60- 80% of global GHG emissions
- Cities consume 75% of natural resources
- Cities produce 80% of global GDP,

Thus, building industry is identified as one of the major sources of pollution and very important for strategy of sustainability. Architects should rethink logic of urban planning toward creation of sustainable urban environment, what as essential precondition request truly, not declarative support from establishment.

1.2 Aims, objectives and research methodology

Sustainable architecture is not so new but regardless significant number of scientific research papers there is still a great discordance between the theories, definitions, experience and opinions. This paper is theoretical and explorative researching of sustainable architecture, in the aim of creating proper attitude about its real effects, supported by the undisputable facts.

In order to achieve this aim, the main objectives are:

1. To clarify what is sustainable architecture;
2. To identify real values of sustainable architecture;
3. Is sustainable means more expensive in architecture;
4. Sustainability and style
5. Future of sustainable architecture;

2. SUSTAINABLE ARCHITECTURE

2.1 Definition of sustainable architecture

Sustainable architecture is something what is nominally widely accepted. Since very first theorizing about it, architects trying to understand what it is about and how to transfer it and implement in own works. Definitions of sustainable architecture are many, some of them relay on definition of sustainability, or reinterpretation of green, ecological – eco architecture, or to identify it as philosophy which complies with three pillars of sustainability etc. All of them are somehow valid but none of them is recognized as the right one.

Sustainable city is intuitively more understandable term as city is a complex system with its limits and capacity which can be sustainable or not. UN definition of sustainable city: “Sustainable cities are environmentally safe, socially inclusive and economically productive “. Another term “eco-city” related to same subject is also very often used. Numerous researches and conferences have been made about it but there is no definition again.

It seems architects accepting sustainable architecture but they cannot agree what it is exactly. Obviously we have insufficient scientific, technical and operational knowledge, there is no a law, rules or guidance which are regulate sustainable architecture. Standards we can consider to correlate sustainable architecture are about energy efficiency, quality of air, water, soil and urban space. Maybe the most correct and appropriate way at the moment is to understand sustainable architecture as fusion and updating of previous techniques, directly or indirectly, related to reduction of impact on environment, inoffensive interaction with nature and interpolation in natural environment.

2.2 What is different in sustainable architecture?

Architects emphasized dedication to environmental protection, struggling to implement new technologies and strategic changes in working philosophy. The list of new achievements in architecture:

- Major change occurred in architecture is in understanding of building as one system with its performance capacity, with inputs and outputs and measurable impact on environment.
- Energy efficiency is not very new in architecture, but never has such importance in architectural design.
- Life cycle assessment is introduced as a new qualitative categorization of materials. Database of ecological impact characteristics of materials from raw phase to recycling is establishing.
- Techniques as are geothermal cooling and heating, passive solar heating, living walls, interactive facades, green roofing, active solar - photovoltaic system, passive ventilation system etc. all of them are improved.
- Passive house is upgraded by new standards and more options.
- Integrated design is new approach to design process, all interested side and participants in designing gathering to interactive exchange of multidisciplinary ideas.
- BIM, as a recently adopted methodology in construction process is developing very progressive.

- Most valuable is accelerated standardization related to environmental protection and adjustment of legal framework.

All of previously mentioned can be, not necessary, attributed to sustainable architecture, but it is axiomatic first result of multi-decades efforts for better environmental protection.

2.2 *Does sustainable means more expensive architecture*

Economic aspect is crucial in developing and implementation of new technologies. If financial parameters are negative, it is hard to believe in its future. Majority of new technologies are not so affordable especially in very beginning. Investment in more “eco” technologies in architecture from financial point of view is usually based on long period of investment return. State of art technologies as for example is interactive facade is extremely expensive. Despite noticeable qualitative improvement of buildings, implementations of new technologies labelled as “eco” in architecture cannot be qualify as cheap.

II. SUSTAINABLE ARCHITECTURE AND STYLE

“‘Green’ and sustainability have nothing to do with architecture.” “Some of the worst buildings I have seen are done by sustainable architects”, words of Peter Eisenman. Similar opinions have Rafael Viñoly, Robert A.M. Stern, Cesar Pelli, Frenk Gehry, and many other famous architects. Some criticisers are finding such reaction, as a sign of final “collapse” of modernism, another as conflict between arts and science. It seems architectural elite doesn’t like “green” at all. Average architects today consider green architecture as something more expensive and not good looking, keeping eye on sustainability as passive observers, supporting it declaratively but not in practice. There is no dilemma, sustainable architecture is not a style, and neither have elements of style. However, eco-friendly building should not be unsightly as well as beautiful one should not be eco unfriendly by default.

III. CONCLUDING REMARKS

Frank Gehry, once called green building standards “bogus,” and about green architecture and global warming he said, “I think the issue is finally a political one.”

Such a words of one of the leaders in architecture and world famous architect making confusion and kind of professional relativism. At least, young architects will and have to think about it, but how many of them will adopt it, what will have negative impact on the status of architecture worldwide. It is high price of improvident aggressive popularization and enforced development of sustainability.

It is unacceptable to deny all positive what have sustainability in its core, as well as is unacceptable its imposition, what is proved in practice. Critics of environmentalism are very loud, and become more louder, what is in fact very positive. It is not enough to hide behind pastoral tale of life in nature and with nature. Couple of solar collectors on the roof, straw bale and mud wall are not something what is anchored in reality it is just oblivious “greenwashing”. Supporters of sustainability in architecture have to make fundamental change of its parochial attitude, to revise values and to create route to transit-oriented development instead of representing an authoritative “single language”. Architects should be sensible and ethical advocates of change, to strive towards regeneration of nature but first have to meet reality of existing gap between arts and science.

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