

A strategic framework for sustainable construction in Jordan

Dr. Mahmoud Ali Alsubeh

Faculty of Engineering, Al-Ahliyyah Amman University, PO Box 19328, Amman, Jordan

E-mail of corresponding Author: Al_Subeh@yahoo.com

Abstract

Sustainable architecture is a major subject in glow of the environmental degradation that the world faces today. This paper disputes that we must use a strategic framework for sustainable construction in Jordan. There is no doubt that large-scale development in the built environment and its physical infrastructure is needed in the so-called 'developing countries'. However, these problems need to be addressed in a way that is socially and ecologically responsible. There is great urgency to make sustainable interventions now, while these built environments are being created, rather than try and change things after the fact. The architects must improve the energy effectiveness regarding to construction that require high initial venture.

There are a number of challenges to the introduction of sustainable construction technologies and practices, and certain enablers need to be developed to help Jordan adopt a more sustainable path. Technical issue is then seen as the only way of addressing environmental poverty. The role of society such as consumers, customers and decision makers for sustainable architecture has been ignored. Sustainable Construction in Jordan should follow a strategy for addressing medium-term and longterm technological, institutional and value enablers for development. This must be supported by a Stakeholder Plan for Action, and to find the means to implement these suggestions at a local level by developing regional action plans.

Keywords: sustainable architecture, constructions, development, strategy, Jordan.

1. Introduction

Sustainable architecture in Jordan is divided into two approaches - the technical concern rigorous (green architecture) and low cost (alternative architecture). Both issues strain on development that is basically a technical based issue. The paper argues that there is a strong need for expanding the technical confederation of sustainable architecture in Jordan to integrate the socio-cultural features in its creation.

The dialectic in sustainable architecture is a heritage of Jordan's independence period, created through the deviating sights of the builder of the country, His majesty 1st king Abdullah. Although with his deep sight embraced great ideas of nationhood, he believed that Jordan's future depend on developing an association of villages. He sought the villages to have all facilities, a democratic administrative constitution and self-reliant on the contrary, 1st king Abdullah imagined Jordan as a modern country where industrialization and urbanization were key indicators of development (Kalia, 1999). He thought that technical issue had the ability to move ahead the reason for democracy (Ashraf and Belluardo, 1998).

1st king Abdullah's succession to power led to knowledge and technical issues were adopted as the backbone of development. 1st king Abdullah developed the project of modernizing Jordan by construction dams, establishing technical institutes and initiating industries and mines (Prakash, 2002). The country's support of modern architecture and urban forms was replicated in the construction of new cities such as Zarqa, and Aqaba. To 1st king Abdullah, Zarqa represents Jordan's growth towards a technocratic future with a clean break from the past (Ashraf and Belluardo, 1998). The government was looking at construction up a worldly national identity.

At the time of Independence, 1st king Abdullah along with other western educated Jordan best to adopt science as the way of growth. They saw common reason as the only meeting position with the west. And this shaped the basis of new organization of knowledge (Prakash, 2000). The ministries of education and science became established in the early time of independence and it became a part of its character. Science became the sign of 'wisdom and progress' in Jordan (Prakash, 2000). Not only was common reason called as a way of restructuring, it was also the way to

rearrange Jordan culture and emphasize Jordan scientific traditions. Similar to western science sought in invigorated native scientific traditions.

2. Construction

Construction is the broad process/mechanism for the realization of human settlements and the creation of infrastructure that supports development. This includes the extraction and beneficiation of raw materials, the manufacturing of construction materials and components, the construction project cycle from feasibility to deconstruction, and the management and operation of the built environment. In Latin America, the term *construbusiness* has been coined to denote this broadest interpretation of the construction sector.

Construction by itself is a large sector of the economy, responsible for millions of jobs and a significant proportion of GDP in most countries. When allied to other sectors and industries in material production and distribution, as well as service sectors such as transport, finance and the property market, its impact on society and the environment and its influence on the character of our world is tremendous. Construction can be interpreted at four levels: as site activity, as the comprehensive project cycle, as everything related to the business of construction, and as the broader process of human settlement creation. The most common interpretation is as the site activities that lead to the realization of a specific building or other construction project. At this simplest level construction is viewed as a specific stage in the project cycle. However, intervention at this level is limited to those aspects under the direct control of the contractor. Broader concerns need to be addressed at stages earlier or later in the project cycle, leading to the second interpretation of construction as the comprehensive cycle of a construction project, covering key stages such as feasibility, design, building/construction, operation, decommissioning, demolition and disposal.

3. Sustainable construction

Charles Kibert during the First International Conference on Sustainable Construction in Tampa, 1994, defined sustainable construction as: 'the creation and responsible management of a healthy built environment based on resource efficient and ecological principles.

Sustainable construction also defined as: 'Sustainable construction, in its own processes and products during their service life, aims at minimizing the use of energy and emissions that are harmful for environment and health, and produces relevant information to customers for their decision making; or as a way of building which aims at reducing (negative) health and environmental impacts caused by the construction process or by buildings or by the built environment.

The International Council for Research and Innovation in Building and Construction (CIB) defined sustainable construction as 'the sustainable production, use, maintenance, demolition, and reuse of buildings and constructions or their components', while sustainable buildings and built environments are seen as 'the contributions by buildings and the built environment to achieving—components of—sustainable development' (CIB, 2004)

The relationship between humans and their environment is determined by a number of factors. The first is the interpretation of 'quality of life' held by a particular society. This is the main determinant of the needs that have to be met. The second factor is the choices made in terms of the technological, political, economic and other systems adopted by mainstream society. These two factors are informed by the particular value system a society subscribes to. This value system not only determines the relationship between people within that society, but also how a society responds to its biophysical environment. The biophysical, in turn, influences these choices through the limitations of its source and sink capacities. Within this complex relationship (described in Figure 1) a number of responses are possible, some wiser than others.

Sustainable development tries to identify and promote the responses that will allow the continued existence of the community (or species) at the best possible quality of life.

There are a number of systemic problems facing developing countries, such as rapid rates of urbanization, deep poverty, social inequity, low skills levels, institutional incapacity, weak governance, an uncertain economic environment and environmental degradation, which by themselves create a challenging environment within which to work. The sheer enormity of this developmental challenge often results in confusion between what are

developmental interventions and what are interventions that aim to ensure that the development that needs to happen will follow the principles of sustainable development. The result is delivery wish lists based on a specific cultural interpretation of development and acceptable economic models, and underpinned by powerful commercial and political interests (e.g. the Johannesburg Plan of

Implementation) masquerading as sustainable development plans and strategies.

One of the reasons why these Plans confuse ‘development’ with ‘sustainable development’ is the framework used to guide their formulation. In 1987, economist Ed Barbier published a model of sustainable development that has formed the basis of almost every subsequent framework (Barbier, 1987). He postulated that sustainable development rests on three pillars or spheres of development—social, economic and environmental.

The biggest challenge for the construction sector in developing countries thus lies in finding a holistic approach to making sure that its contribution to the physical, economic and human development of these countries meets the requirements of sustainable development.

4. Sustainable architecture in Jordan

Sustainable architecture created a new challenge for Jordan architecture. The Jordan scientific community rapidly responded to the concerns of sustainable progress heralded by the urbanized world. The promising green architecture turned towards science and technical issue to afford good solutions for environmental deprivation. The western technical reliant solutions were adopted to resolve Jordan’s environmental tribulations. In this method energy efficiency 3 was given the priority above all other concerns (Guy and Farmer, 2001). It tended toward of being very quantitative in personality with the accomplishment of the construction that had measured by its energy spending, new material energy, ravage and resource use (Abel, 1997). This type of green architecture built-in easily into the presented power structures. Other techniques towards sustainability such as interchange modes of production, a decentralized technique of planning, accent on suitable technical issue and need for modern regionalism were marginalized. The government and education institutes set up new research centers such as the ‘Royal Scientific Society’, for exploring activist and renewable energy source. Government organizations supported energy effectiveness as a solution for attaining reasonable architecture. The most important features in this technique were rising energy effectiveness, reducing water spending, using alternative energy and recycled materials for production. Afterward the activist following king Husain drew motivation from his at rural ideal (Bhatt and Scriver, 1990). Despite its understandable environmental benefits, it didn’t appeal to the admired modernity of a fast urbanizing population. Adobe represented the temporary housing that the traveler Bedouins and lower income people were trying to leave behind. Their objectives were to get a permanent house made from bricks, concrete and steel, which indicated progress toward mobility. The construction of sustainable architecture restated the old 1st king Abdullah dialectic without verdict less excessive or hybrid solutions.

Following the area situation in beginning of 1990 decade, there was fast economic restructuring, more toward privatization and globalization (Shan Kirtee, 2002). King Husain economics ideas of self-reliance and economic fairness produced way to Jordan’s participation in the world new economy (Ashraf and Belluardo, 1998). The rapidly expanding poor class that symbolized a large customer market was responsible for foretelling a new personality of Jordan as a global power with a strong economy. The successful information technology industry created a new picture of Jordan in the technical field and an evident sector of urban Jordan was equipped to take benefit of its improvement in science. Multinationals (from Chechen, Charkas and later on from Iraq) returned to Jordan with better shade glazed office blocks. Freedom affected sustainable architecture too and it experienced considerable conversion with the implementation of global ‘green rating systems’.

To appreciate the creation of a new Jordan sustainable architecture through these green assessed constructions, the housing bank center CII Green Construction Centre (HBC GBC) in Amman is an interesting case. It made headlines in Jordan when it was supposed to be awarded the (Leadership in Energy and Environmental Design) rating by the US Green Construction 4 Council. With HBCGBC being declared as a green construction amongst the region by an internationally accredited organization, Jordan will gain a new global identity as one of the leaders in sustainable architecture society. Depending on science and technical issues had finally paid off.

5. The challenge of sustainable construction in developing countries

There are a number of systemic problems facing developing countries, such as rapid rates of urbanization, deep poverty, social inequity, low skills levels, institutional incapacity, weak governance, an uncertain economic environment and environmental degradation, which by themselves create a challenging environment within which to work. The sheer enormity of this developmental challenge often results in confusion between what are developmental interventions and what are interventions that aim to ensure that the development that needs to happen will follow the principles of sustainable development. The result is delivery wish lists based on a specific cultural interpretation of development and acceptable economic models, and underpinned by powerful commercial and political interests masquerading as sustainable development plans and strategies.

A sustainable development strategy that creates jobs at the expense of the environment, or a renewable energy project that ignores its environmental and social impact and displaces thousands of people and reduces biodiversity, defeats its own purpose. The notion that sustainable development should be seen as a holistic solution (the whole being more than the sum of its parts) to the complex systems problems of the interconnected and interdependent relationships that determine the interactions between humans, their society, economy and technology, and the biosphere, is well supported in the literature.

The biggest challenge for the construction sector in developing countries thus lies in finding a holistic approach to making sure that its contribution to the physical, economic and human development of these countries meets the requirements of sustainable development as defined by locally identified needs and value systems.

6. Limitations of green constructions

These separate green construction over shadow serious issues of sustainability. The current, award-based production of sustainable architecture, while creating an identity of Jordan as one addressing environmental concerns, twists the Jordan sustainable argue by ignoring important social features in the production of sustainable architecture. In brief the version of sustainability adopted by Jordan exists in the west with familiar systems of cultural & social production.

Although the used technology dependent green constructions have supplied in raising consciousness and stimulating argue about sustainable architecture, they have many limitations. These constructions have about 17.5 percent more initial investment than customary constructions (Majumdar, 2004). High basic costs and then dependence on business or government 5 supports that has also limited the adoption of this kind of architecture to institutional construction types with less inaccessible exceptions of housing residences. Almost 60% of all construction activity in Jordan is in private housing. Efforts to make this large part sustainable have been virtually insignificant. Isolated constructions are refereed, as 'sustainable' while their situation is not considered at all. Unawareness of the social process, underlying the built object has isolated the construction form its context.

Maximizing normal lighting and ventilation to attain energy efficiency is often attained at the cost of using huge quantities of resources with high-embodied energy like wood, glass, aluminum, etc (Jones, 1998). The large quantity of energy that is spent into extracting, dispensation and transporting materials used in these constructions is usually deserted when manipulating the construction's energy efficiency. The asserted reduction in energy usage is then not an exact picture of real energy consumed.

The goal of using technology sustainable architecture in Jordan has been to create spectacular constructions. Construction like HBC GBC is an example of that. As "conspicuous technical issue" has been the goal of science in Jordan since independence, these constructions are an extension of that (Nandy, 1988). Jordan middle classes people depend upon 'spectacular technical issue' to deliver them from community problems. As HBC GBC is supposed to win awards internationally, it has come to represent all that sustainable architecture stands for in Jordan. It has become identical with green rating systems and green techniques as stellar heater.

Environmental plan in Jordan and green constructions are often based on the precedents from developed countries. The 2001 draft National Environmental Policy of Jordan came under heavy censure for this reason. It laid down environmental disputes for Jordan in general terms as lifted from Agenda (Nandy, 1988) without making them related to Jordan or its concerns. In the same way, the issue of energy competence is more relevant for developed

countries where one-third of the whole energy is utilized for heating or cooling of constructions. In accepting energy efficiency as the main criterion for green constructions in Jordan, several more serious issues have been ignored. In Jordan the issues of water and sanitation are more serious than energy efficiency. Studies indicate that at present rates of residents growth and per capita spending of water, there will be a lack of drinking water in urban areas within the next few years. The 60's environmental evolution grew out of anxiety for the environment and as an analysis of modernization and capitalism. The present form of green architecture in Jordan exemplifies all that the earlier evolution critiqued. It had emerged as a social evolution essentially seeking structural alterations in the society. Its imported form in Jordan gradually moved away from the social characteristics of the movement and kept itself only to the technical aspects. In where residents, urbanization and scarcity constitute its most imperative problems, a technical use that is ignorant of these issues is indefensible.

7. A strategy for action

The development of specific enablers is, however, only one part of the strategy. To ensure the development and uptake of these enablers all the different stakeholders in the creation of the built environment need to take specific actions to create a supportive environment.

These actions are centred on the following elements: Capacity building (internally and externally), Developing sustainable and accessible funding streams and methods for accessing these, Establishing partnerships and other vehicles for cooperation across sectoral and national borders, Internal housekeeping to bring organizational practices in line with sustainability principles, Developing programmes and mechanisms to encourage and support implementation, and Developing and using appropriate mechanisms and tools for monitoring and evaluating organizational and industry performance.

The specific actions under each of these categories will differ for research and education, the private sector, service providers, governments and regulatory stakeholders and civil society. In developing countries, where the business case for sustainable construction is still weak, and civil society is focused on the satisfaction of immediate, survival needs, government will have to play a decisive role in setting such a strategy in motion.

8. Necessitate for social sustainability

The wonder on sustainable architecture cannot be limited to quantitative environmental sustainability and it is necessary that relationship between economic environmental and social sustainability ought to become a critical thought for the design of Jordan's built environment. The 'green construction' as an inaccessible object does not incorporate with Jordan's socio-cultural structure any more than say an adobe house does. Furthermore, sustainable architecture in Jordan needs to account for the altering social and environmental conditions since quick population growth, modernization and urbanization have straight impacted the environment.

Almost 39% of Jordan's population lives in urban areas where they estimated to increase to about 50% in the next twenty years.²⁶ Between 1950 and 2000, the total population of Jordan increased more than two times while the urban population increased fourfold. On the one hand the present form of urban growth in Jordan is equivalent to worldwide urban development and obviously unsustainable. Alternatively it is impossible to predict a future not rooted in urban living. That means it is not possible to solve the problem of sustainable architecture if the issue of urban living is not addressed.

The rising urban population with its varying lifestyle is straining the supply of normal resources. The post manufacturer, capitalist personality of society that Jordan is fast acquiring is one of the major sources of environmental squalor. The privileged and the middle class consumption patterns be similar to those of developed countries. This manner affects the environment as the use or mistreatment of nature in a society is straight related to its social formation, its technical means and its worldviews. The western expenditure culture has a vast pressure or 'cultural footprint'. Hence western culture and lifestyle are dispersed by the media far further than the boundaries of Western nation lands and goes through the developing world. As a result, medium- sized towns in Jordan have been defeat by western forms of consumerism. Large air-conditioned shopping centers have sprung in these towns and are catching the attention of people eager on experiencing this new way of life. There is no concern of the sprain it will

place on the environment.

Sustainable architecture became limited to impartial technical feats without attempting to be a part of daily life of the people. For structural design to be sustainable the procedure of its production, use and its situation must be considered. In technical based sustainable architecture, only the procedure of production is highlighted. As technical dependence gains singular importance, the social position of people as customers of and decision makers about sustainable architecture is unnoticed. Environmental problems that are social in environment cannot be resolved through technical resolutions only.

9. Conclusion

Technology can be used for sustainability solutions, hence sustainable architecture in Jordan fails to integrate the critical aspect of social and cultural sustainability without which it might not work in the context of Jordan. If a country needs to be environmentally sustainable, architecture would require to also consider the social, cultural, economical and political context of Jordan and propose solutions that are responsive to its particularities. This precludes common technical solutions in the form of model for environmental sustainability resultant straight from the Western countries.

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