Indian J.Sci.Res. 5(1) : 25-30, 2014 ISSN : 0976-2876 (Print)
ISSN : 2250-0138 (Online)

A STUDY OF CONSTRUCTION TECHNOLOGY AND OPTIMAL URBANE MANAGEMENT TO IMPROVE SUSTAINABILITY

ZAHRAHAJILOU[a1], ABBASARGHAN[b] AND AMIRARSALANHAJJLOU[c]

[ab]Department of Geography, Islamicazad University, Semnan branch, Semnan, Iran
[c]Department of Architect, Islamicazad University, Rudehen Branch, Rudehen, Iran

ABSTRACT

Every year, a huge number of projects are introduced and implemented in various infrastructural, civil, industrial, and service sections. Successful implementation of such volume of projects needs to the familiarity of investors, employers, engineers, constructors, and contractors about knowledge management. The projects need a specific place to be constructed and here is the intersection point of geography and civil engineering. The present study attempts to investigate the effect of construction technology and optimal urbane management to improve sustainability. The data has been gathered using library method and studying documents through note taking. Notably, for the sustainability of whole city, components of city, importantly buildings should be firstly studied. As the research findings reveal, sustainable city need to optimal urbane management and having optimal and new technologies in construction and their management are the necessary prerequisite of optimal urbane management

KEYWORDS : Construction technology, Urbane management, construction management, urban sustainability

Today, some flows such as industrialization, globalization and other phenomena caused various changes in all communities. These changes encompass various effects such as global economy, communication revolution, environmental issues, local cultures renewal, science and technology globalization, daily life`s change, and individual identities in terms of cultural, scientific, economic, political, security, and technological aspects (Castells, 2001, p. 32).

These changes have evolved all aspects of lifestyle and subsequently, construction techniques. Due to population growth during the recent years, the increase of construction demand has revealed inefficiency of conventional construction techniques and made the use of construction industrialization inevitable in various communities. The advent of new construction methods is owned to the development of sciences and technology during the last years (Golabchi, 2006).

On the other hand, followed by lifestyle changes and complex environmental problems, a new concept has been introduced as sustainable development; and due to the important role of constructed environment through sustainable development, sustainable architecture hasconsidered by scholars. Environmental issue is an important areaemphasizing on sustainable development. Architectures play a significant role in this scope since they are responsible for 75% of climatic changes both directly and indirectly (Rodgers, 2005).

The association between architecture and technology is viewed differently by different viewpoints. Generally, there are three definitions regarding this relation:

Firstly, technology and architecture is a kind of human activity; secondly, both are the means to achieve a certain objective; and thirdly, architecture and technology are introduced as a quality to discover and express realities.

As it is observed, the first two cases consider technology and architecture as two separate things while the third case expresses the reality of them. Such definition focuses on the nature of contemporary life and modern technology but not their appearance (Heidgger, 1996).

As evidences show, information and experiences about new skills and many new technologies cannot be transferred easily to another cultures and countries. Usually, in case of introducing these technologies into a new cultural context, they have been executed partially or have not been consistent and ignored.

It seems that such problem can be solved by those who have not taken the local cultural needs, desires and expectations into consideration to design and promote new technologies. Before claiming that these technologies are applicable and valuable as a reality, it should be found that they have been associated with culturesophisticatedly and the technologies accepted by one group of people will not be accepted by others necessarily (Cole et al., 2004) and

[1]**Corresponding author**

indeed, this fact indicates the sustainability of those systems.

Therefore, in order to improve new construction technologies as well as improving sustainability, it is necessary to make a better understanding about local-cultural context and content to implement and transfer technology and knowledge successfully. New construction technologies should be consistent with expectations and needs, people and their cultures, climate and environment in order to be applied properly.

In this regards, Mora, 2007 conducted a study on"the quality and sustainability of construction materials and the feasibility of constructing sustainable buildings" investigating the effect of urbane metabolism and its infrastructures in environment through consuming raw materials and energy. Based on the study, he asserted that urbane metabolism is a main reason in environmental deterioration and existing tendencies predicts continue of increasing urbane and infrastructural development.

Another study was done by Gao et al. (2006) examining the approaches of construction improvement approaches in perspective of contractors.Gao et al. believed that construction team (such as owner, designer, and contractor) have highly considered the enhancement of communications and cooperation during the process of design and design development.

Niroumand et al., 2013 also evaluated sustainability improvement, soil architecture and soil buildings as a manifestation of sustainability improvement in various countries. They asserted that the principles of traditional architecture can be used to improve construction quality by integrating with new technologies.

Considering the aforementioned, the main question raised in the study is how new construction technologies and optimal management affect sustainability improvement?

To answer such question, library method has been used by studying documents and books related to the subject through note taking the required materials and the data has been analyzed to provide the proper response.

RESULTS AND DISCUSSION

According to Heidgger, 1996, the nature of technology is a certain attribute manifested in new era for human based on which has treated and organized the world in a specific way. He believed that this attribute and treatment is the basis of new sciences development. New sciences have not led to the achievement of such attribute and in fact, these sciences have acted as a tool to achieve the nature of what is called technology. Therefore, it should be said that new sciences are the tools of technology; i.e. the tool of expanding and achieving the certain attribute of human but not vice versa (Rikhtegaran, 2001).

Technological productions are created based on the special role considered for them. What the special role is, it will be used to facilitate meeting ends and needs. Today, industrial production of buildings is to apply modern and organized design methods, production planning, control, and mechanized production process and automation including applying technologies to replace manual work with machine. Such phenomenon occurs naturally in workshop, factory or site (Thompson, 2007).

As a feature of industrial building systems, it can be firstly stated that construction elements are produced in a precast form out of site; it is done in a central building in which the specialized equipmentsare available. Also, various construction activities have been integrated with the minimum need to setting up, connecting and final payment for elements in site in precast elements which can be assembled (Wright, 2010).

On the other hand, applying concrete constitutes, standard steel elements and concrete pumps are used; also, the operations of designing, producing and setting up in the site are closely related and should be considered as a part of a convergence process and by this way, the operations are planned and arranged and automation interferes the construction process to decrease human involvement and improve the operations of designing, producing and setting up in the site.

Optimal or holistic urbane management

There are various definitions for management that some of them can be presented as follows:

- Coordinating human resources and financial

resources to achieve specific objectives.

- Accomplishing tasks through others.

If management is similized to a tree with various branches of industrial management, financial management, and so forth, holistic urbane management will be a new branch in management tree. Certainly, each country has different characteristics and structures of legal urbane management institutes and each society has a specific definition of holistic urbane management with regards to its own economic, social, and political structure.

Population, major job of people, municipality and like that have been the city identification criteria. Today, cities are of importance in terms of two aspects: first, as the gathering center of a large number of peopleand second, as the main economic player in total national economy. Therefore, the related issues and problems should be taken into consideration more precisely since failure in solving urbane problems will lead to economic recession, social and political dissatisfaction, poverty, unemployment, and environmental destruction while proper and accurate planning causes economic growth, political stability and increase of social participation in people (Fokouhi, 2004).

The combination of management and city evokes the concept of organizing affairs related to planning and organizingresources and facilities, directing and controlling in urbane area (Rezazade, 2005).

According to World Bank, holistic urbane management is a semi commercial activity for states. in other words, urbane management is to mange urbane affairs and use world bank`s loans more efficiently. Sometimes, holistic urbane management is considered as a tool to execute urbane policies. Urbane management is a process that will lead to a decision making system consequently. The extent of success or failure of urban management depends on power, legitimacy, social and economic structure of a certain community. From a perspective, such management can be considered as a kind of local and autonomous government to gain public participation leading to the decrease of some responsibilities of states (Farjami, 2006).

To recognize the concept of urbane management, it is necessary to consider the combination of two terms of management and city. Management includes the art of fulfilling tasks through others and can be considered as the process of planning, organizing, directing, and controlling members of organization to achieve determined objectives. But the concept of city is more sophisticated. On one hand, it refers to a kind of life and on the other hand, it addresses a style of construction and combination of human made environments with natural environments. In the provided definitions about city, population thresholds, dominant occupation, public autonomy, and population density can be seen. However, geographical and social considerations have created different definitions about such residential type.

The combination of management and city indicates the establishment of the process of planning to control all social, economic, spatial, and environmental dimensions related to city. In Iran, urbane management reduced to management of municipal affairs includes municipality, city council, citizens, and civil scociety1s institutes; but this concept implies a broader range of institutes involved in cities` management (Habibi, 2004).

In another definition, urbane management includes the city affairs in order to improve sustainable management of urbane regions with regard to objectives, national, economic and social policies of the country; or urbane management is treated as an organizational framework of urban development which can adjust with population growth with access to basic infrastructures such as house and occupation (Zahedi, 2010).

Holistic urbane management patterns

Holistic urbane management patterns in developed countries and developing countries are different and each of these communities applies a kind of urbane management with respect to its governing policy.

Focused management pattern is specific to developing countries while unfocused management method is specific to developed communities. Such classification has been considered with respect to the extent of local managers` authority and their duties; in each pattern, citizens play different roles (Habibi, 2004).

Focused urbane management

Infocused urbane management, central states are

directly involved in city affairs and undertake duties with local aspects. This pattern is based on bureaucracy and is usually followed by states which are independent from people`s work and effort and supply their costs through national earnings source. According to the chairman of the Board of urban planning engineers, "in focused urban management pattern, people have no place and significant role so that their opinions are less regarded in basic issues like policy making and planning. He asserted that "such pattern has been omitted from European countries currently and has no place in developed communities. The most important role of people in urban management pattern is the election of the members of city council. However, people cannot selectmayor directly but such election is done by city council (Farjami, 2006).

Unfocused urbane management

In unfocused urban management, states have no responsibility for communities and cities of country but policy making, planning and supplying people`s security. In such pattern, states undertake only duties with governmental aspects and the rest are assigned to municipalities, private sectors and NGOs. In this case, municipalities are mainly responsible for local affairs, even for tourism, urban development designs, library building, marriage and divorce; they supply needed costs through local taxes or tolls (Amiryar, 2009).

Urban sustainability

The theory of sustainable urban development is the result of environment advocates` discussions regarding environmental issues, especially urban environment which was presented as a result of "sustainable development" theory to support environmental resources. Sustainable urban development needs to identify environmental limitations of human activities regarding cities and adjusting design methods in these limitations. This theory discusses about preserving resources for present and future through optimal use of earth.

The theory of sustainable urban development discusses about urban and aerial pollutions prevention, local, aerial and national -environmental production capacities, recycles support, lack of harmful development support, and removing the gap between poverty and richness. It also considers urban, rural, aerial, and national planning as the way of achieving the mentioned objectives. The theory highly regards the role of state in the planning and believes that states should provide comprehensive support for urban environment.

The discussions associated with economic growth and development and their relation with environment and human communities was an introduction to create a new paradigm for development concept; a development that supports environment and emphasizes on advanced social justice and similar interpretations. This irregular development has caused most of the planning cannot solve the problems and make cities and residents to face with various dilemmas such as spatial dimensions` overextension, separation of work place and house, separation of work place and recreation place, staying way from nature, as well as decrease of open areas with identity.In fact, such cities are distant from sustainable city (Saberifar, 2007).

Sustainable development is an undeniable necessity for all sections of human communities, so urban communities are superior with regard to the current conditions since the trend of urban regions development in general, especially in developing countries, has been widely extended. The term of "sustainability" is applied as principles to direct public and private reactions influencing environmental, economic and social conditions in the present time and future (PCPC, 2005)

The interest to urban sustainability evaluation has been increased from the late of 1990. Sustainability of an urban system can be interpreted as the range of urban development and streams that can meet common needs without harming the next generations` capabilities (Maoh, 2009). The modern notion of urban development is that cities should be adjusted with natural environment as much as possible and act to maintain the balance of natural cycle of life. In other words, cities should move towards sustainability and consider urban sustainable development (Rahnama and Abbaszade, 2008).

CONCLUSION

As mentioned earlier, materials and constitutes

application is mechanized in the site. In case of applying concrete constitutes, standard steel elements and concrete pumps are used; also, the operations of designing, producing and setting up in the site are closely related and should be considered as a part of a convergence process and by this way, the operations are planned and arranged and automation interferes the construction process to decrease human involvement and improve the operations of designing, producing and setting up in the site. By improving the quality of design, production and implementation in a building or so called a site, the acquired quality of a community, region or city is enhanced leading to the development of sustainability in that city. Using such argument, it can be concluded that construction technology is highly influential in urbane sustainability development and constitute of a city, i.e. buildings, should be firstly considered for the sustainability of whole city.

On the other hand, according to the definition of holistic or optimal urbane management, holistic urbane managementis considered as a tool to execute urbane policies which are referred as the concept of the knowledge of community management, so improving sustainability is the objective and optimal urbane management is the tool to achieve such goal.

Finally, it should be noted that sustainable city need to optimal urbane management and having optimal and new technologies in construction and their management are the necessary prerequisite of optimal urbane management.

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