



Role of Designers, Builders and Users in Association with Management of Sustainable Development in Construction; Samples

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Abstract. With the occurrence of energy crises in the recent years and with the specification of the fact that building industry has had the highest rate of energy consumption compared to other energy consuming domains, a change of serious and fundamental approaches has been made in how to use energy in building. Activities associated with construction consume 40 percent of societies' energy and resources and some actions shall be done to minimize this energy consumption. Undoubtedly, Iran's society is a society that is strongly consumption-oriented in terms of consuming renewable and non-renewable energies. The purpose of this research is to create sustainable development without destroying the available resources for the future generations, paying attention to people and meeting their basic and preliminary needs; including proper housing and proper technology for all in the construction industry of the country. In this research, a qualitative and field research method was used, library studies and some interviews with the officials in this field were done and according to the studies, in order to improve the sustainable development in construction, we can refer to making culture, education and specialization, investment security, proper use of energy resources and etc.

Keywords: Sustainable Development, Management, Construction, Energy

INTRODUCTION

Crisis in 1970s and subsequent environmental problems have overshadowed many human activities. Therefore, concepts associated with reduction of energy consumption have been among the topics addressed in the recent decades in developing and developed countries (Kazemi, M, 2014, p 2-3). All countries and societies are seeking sustainable development and each of them is somehow planning to achieve sustainable development. Therefore, we can consider sustainable development as a human phenomenon that is formed in the shadow of human efforts and exploitations in a geographical space. Although sustainable development might be the same throughout the world, but in various living conditions, specific approaches are needed in order to pay attention to the local environmental conditions so that we would have a better concept of sustainable buildings and sustainable development (personal relation, 05.08.2014).

European countries have quickly revised the process of design and production due to the fact that energy is limited, but countries that have energy resources including Iran, with delay and under the pressure of the world community, have done some actions symbolically in this field and one of the current problems of the countries of the third world is not paying enough attention to construction with principle with an approach to maintain environment and lack of compliance of these constructions with the purposes of sustainable development, but in practice, they still continue their own common and traditional methods. In our country, with the existence of rich energies and resources, proper solutions are not used for using the available energy and resources properly in the construction industry and the obvious and problematic feature of the construction industry of the country is applying modern building materials by using traditional construction methods. By identifying and reviewing the managing role of designers, builders and users of the country, we can take some steps toward improving the sustainable development in construction

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and by presenting some recommendations, we can help them in this regards to that next generations would be able to use these energies (personal relation 05.03.2014).

LITERATURE OF THE ISSUE

Reduction of energy consumption and building

The domain of architectural and urban design has a huge part in energy consumption and environmental pollutions, thus paying attention to exploiting environmental forces and designing coordinated with ecology is crucially significant in this respect. Modern technologies and improvements have provided a proper situation for modern building materials in most specialties including in designing and construction.

Using people's participation in the plans of developing and maintaining energy is emphasized. Since optimal energy consumption depends on the comprehensive participation of people and officials and has an important role in determining the patterns of energy consumption and can be of effective help to reduce and improve the energy consumption, so necessary knowledge shall be provided throughout the society so that this purpose which is the optimal energy consumption will be realized (personal relation, 05.03.2014).

People's role in reduction of energy consumption

Many people of the world, either directly or indirectly, are involved in construction activities including exploiters, architects, engineers, contractors, providers of construction materials an etc. by considering the development and diversity of construction activities and consumption of 40 percent of productive energy resources, activities of the people involved in the construction industry shall be reviewed with an approach to reduction of energy consumption. Each of the beneficiaries, who directly or indirectly influence the buildings which have been built or are being constructed or who are affected by them, given their own role, they can have a significant impact on reduction of energy consumption. This group can include all of the classes of the society. Unfortunately, many of them are not aware of their very important role in the field of reduction of energy consumption, for instance, educational centers and professors and teachers and officials of engineering council, electricity, housing foundation, roads and urban development, Oil Company, standardization and TV and radio, can play a significant impact on increasing the length of useful life of the buildings with their efforts (Khatami, Seyed M. Fallah, M, 2010, pp 21-23).

METHODOLOGY

Project implementation method

Library

Interview

By identifying people responsible in this field and using the guidance, we gathered the obtained results in terms of quality. The information of this article was gathered through field information and the interviews that were done based on the subject of the article "role of designers, builders and users in association with management of sustainable development in construction", by referring to organizations, offices, universities and companies that had been active in this field. The first interview was in 05.03.2014, at 10 am in the road and urban development office of Chaharmahal va Bakhtiari province and the last interview ended in 05.14.2014 at 2pm in the TV and radio of Chaharmahal va Bakhtiari province. So, in order to improve management of

sustainable development in construction, we can refer to making culture, education and specialization, investment security, proper use of energy resources and etc.

IMPORTANT FACTORS IN ORDER TO IMPROVE MANAGEMENT OF SUSTAINABLE DEVELOPMENT IN CONSTRUCTION

Making culture

Lack of false advertisements

See the newspapers today, there are all kinds of advertisements about building materials and equipments and no one prevents them. Whereas this issue is specialized and it requires an expert and it shall have standard material and certificate. When will our country finally achieve its standard? All countries, even Turkey, have solved the issue of their standard years ago. Who does these? The note of this law say that housing and urbanization ministries and industries of the country are obligated to advertise and announce those group of construction materials and components that shall be confirmed by a standard institution and Iran's industrial researches in a list, given the facilities and situation of each location. Since the announcement date, all of the producers, importers and distributors of building materials and components will be obligated to produce and distribute and use standard materials and since the date of approval of this law, the minister of housing and urban development will become a member of Standard Supreme Council (personal relation, April 2014).

Using the cultural budget of the ministries

According to the interviews done with TV and radio, it was stated that we have invited various experts from organizations such as building engineering system, gas department and etc, several times to come to TV and radio and somehow make people familiar with how to accurately use energy in buildings, but unfortunately, these organizations do not cooperate enough, for example, engineering organization states that gas, electricity department receive interest through people's participation and engineering organization is only responsible for monitoring the buildings. The government gives cultural budget to the governmental offices each year and these offices are obligated to use this budget in TV and radio to inform people of how to manage energy in buildings (personal relation, 05.03.2014).

Give priority to the energy issues while purchasing

The governing culture in our country is this that people think traditionally in association with construction and do not have enough information about it. When the buyer does not have information about the compound of materials, this will lead to his lack of knowledge about how to properly use it and energy consumption increases (personal relation, 05.14.2014).

So many times, we buy goods which are economically good, a water heater might be cheap while purchasing but when using, it might bring more expenses to the bills in terms of energy consumption.

Making people familiar with the graders on the goods and the difference of them helps a lot (personal relation, 05.05.2014).

Education and specialization

Presence of energy advisor

In Iran, at the time of construction, the earliest stage of the map is prepared. People pay the least expenses for the preparation of the map. The job of designing buildings in Iran is done individually and without seeking help from the experts of mechanical equipments and energy advisor. In developed countries, in order to prepare the maps of the buildings, a designing team

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is formed and each member will be responsible for one part of the building. Throughout the process of designing, the team members consult with one another (personal relation, 2014.14.05). At the time of designing a building, since the very first stage, there shall be an energy advisor who monitors the process of designing and after that construction so that it wouldn't cost a lot in terms of energy consumption at the time of exploitation (personal relation, 05.03.2014).

Required education for the associated engineers

Engineering organizations and road and urban development and other organizations can arrange some classes in proportion with the knowledge and technology of construction and through talks, educational films and practical works, they can make them familiar with the day's knowledge in proportion with new technology and in this field, they can publish monthly journals and newspapers and give them to the engineers (personal relation, 05.03.2014).

Proper course in the undergraduate period

Country's education in the undergraduate period is like this, an architecture student passes 40 units of architectural design without visiting a building and becoming familiar with the method and quality of construction, in addition, the issue of energy and sustainable development only contains a low percentage in the designs. Ministry of science can have a program in which students of the undergraduate period would spend most of their time in construction workshops so that they will observe the process of construction closely (personal relation, 05.03.2014).

Investment security (insurance of post-construction quality)

Pursuant to the article 18 of executive regulations of article 33 of law of construction engineering, the quality of building execution, for which the executer is responsible, shall be guaranteed in favor of employer or employers and users by a insurance letter of guarantee of building quality. In this regulation, it has been stated that all of the building executers are obligated to cover all of their constructed buildings with building quality insurance. And it is determined through specialized insurance companies and by Iran's central insurance in favor of employers, buyer or buyers and users. Purchasing this insurance letter will be the employer's responsibility and the buyers or users will be its beneficiaries.

This insurance will have controlling criteria which are necessary for covering insurance. We can refer to standards, national regulations, technical documents, check lists, maps and approved instructions as some of these criteria. The length of quality insurance is since the beginning of exploitation and after the executer delivers the building to the employer or the buyer, it will be at least 10 years in the structural section, 5 years for façade of the building, at least 3 years for moisture insulation, and 2 years for electrical equipments and facilities and elevator and powerhouse (personal relation, April 2014).

Accurate use of energy resources

Iran is rich in terms of water and soil and renewable energy resources due to good geographical conditions. As we export our oil and gas to other countries, we must create necessary information in the country in order to manage, and properly use the resources. Unfortunately, in our country, due to the fact that there are many resources, they are not used carefully and people do not know that paying the water, electricity and gas bills is not related to the cost of these resources, but it is the cost of transferring energy inside the building (personal relation, 05.03.2014).

The 11th government has done some actions for optimal energy consumption that was due to happen with the execution of the second phase of subsidies. This action increases the price of energy in the country. It would have good results if the inflation wasn't high in the country. As

expenses get higher in the country, execution of the second phase of subsidies will have diverse result (personal relation, 05.08.2014).

In the developed countries, the per capita of a building is 70-80m² but in Iran, it is 110-120m², this large per capita in our country includes a great deal of energy consumption and we shall inform the people of the country to do standard construction (personal relation, 05.04.2014).

CASE SAMPLE

Residential complex of Shahid Mohammad Montazeri Isfahan's oil refining company

Residential complex of Shahid Mohammad Montazeri Isfahan's oil refining company with the area of 100 hectare includes 2 types of residential house and public places. In the educational field, first the preliminary stage was to review the surface of the complex and as the result, it was specified that the residents and employees of this complex haven't yet been educated in order to optimize energy consumption and are not familiar with this field.

Educating the residents was executed in the location of the complex by presenting notebooks and articles in the field of energy consumption solutions in the domestic part and holding a seminar and in order to educate the students, at first educational notes were provided for elementary, guidance and high school. For the same purpose, a competition was held between the students and by presenting the accurate answer sheet of the presented questions, some awards were given to three of the winners by chance (Be'nooni, S. et al, p 7-8).



Figure 1. Residential complex of Shahid Mohammad Montazeri, Isfahan's oil refining company (Sources: hamgoon.ir).

Niavaran residential complex in Tehran

This 6-floor residential complex in Niavaran, the north part of Tehran, has been designed in combination with the existing trees in the site and it has been attempted to bring trees closer to the human life. The concept of preliminary design was divided the mass of the building to 2 main sections based on the existing trees in the building's location and by considering the main axis of the inside trees. The green space beside this axis also influences the formation of core on the side of mass of the building and the whole shape of it. This project has 30 residential apartments of 80-300m² in five levels, each of them has been designed in accordance with 6 apartment and 3 lower floors are mutual for the facilities. Designing this complex has been done in such way that it hasn't damaged its surrounding environment and the urban life has been linked to its surrounding natural environment with the least harm (personal relation, 05.06.2014).

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Figure 2. Site of the plan of Niavaran residential complex of Tehran (source: Arcinfo.ir).



Figure 3. Niavaran residential complex in Tehran (source: Archigram.ir).

Iran's embassy in Seoul

The building of Iran's embassy in Seoul (South Korea) in its totality has been composed of four concrete cube-shaped towers on the four corners of a large cube and empty space in the middle and above the four concrete towers, 3 steel bridges with glass covers and metal sheets have been placed. In the east body, the staircase, elevator and hallway are in a glass box so that it would be possible to access the 6 floors (3 floors on the ground and 3 floors under the ground) of the building. The space between the stairs is empty which acts like an energy storage room in the winter like a central yard with transparent floor, roof, and walls. One of the surfaces of this central yard which has been designed diagonally, in addition to conduct the below moderated air in summer, unifies the space of the floors with the communication space (lower floors). This building has been composed of multiple separate functional layers; a group of spaces is the service spaces, like spaces for serving the guest which doesn't need direct light much and is placed around the garden pit. The other one is consulate activities which is largely related to people and visitors and is completely accessible in the ground floor. The middle layer or the second floor is for the employees and the latest layer or the third floor has been assigned to the main space of the embassy which is placed a place that is not easily accessible to some extent due to security reasons (HosseiniNejad, S. et al, 2013, p 7).

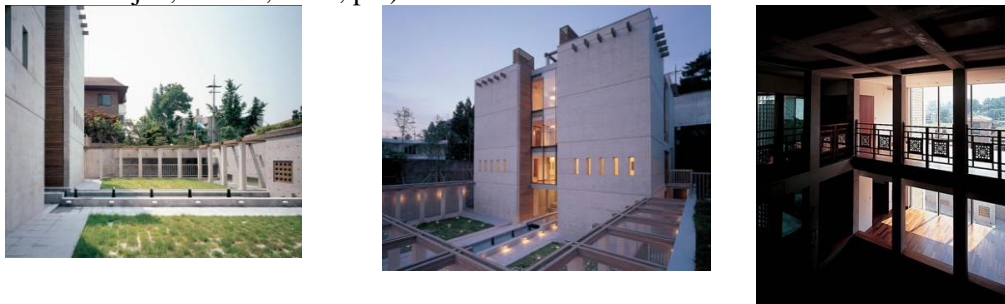


Figure 4. Iran's embassy in Seoul (Source: non.niloblog.com).

CONCLUSION

During the past few decades, the concepts associated with the reduction of energy consumption have been researched and studied in the developed societies and in some of the developing ones. And by considering the considerable rate of resources and energy in Iran, the value of this energy is not accurately understood and how to consume energy in building and various sections, especially governmental sections, is inaccurate and according to the statistics provided in the country, the most energy consumption is in governmental buildings. By considering the complexity and diversity of the effective factors in architectural designing, the method or way of designing shall be in accordance with each project. The required activities of the project shall be reviewed from all aspects including design and analysis of the land and construction methods and choosing and using proper building materials and construction technology so that achieving sustainable development's purposes would be possible according to the subject of the research. Investment security shall be guaranteed based on quality effectiveness, especially in allocation of public goods of the city in the urban development. Making culture, informing and educating for evoking a sense of responsibility in the citizens in providing the resources shall be considered as one of the main strategies.

REFERENCES

- [1] Kazemi, M. (2014), a review of the literature of the domain of sustainability together with an analysis of the concepts associated with it. National conference on sustainable urban site and architecture. International Institute for Architecture and Urban Development Studies of MehrzadShahr in Mashhad, 2-3.
- [2] RayatiIlbeygi, A. Personal conversation with Ali Sadeghi [technical director]. Shahr-e Kord: 05.03.2014. Construction Engineering Organization of ChaharmahalvaBakhtiari province.
- [3] Khatami, Seyed, M. Fallah, M. (2010), Position of educating sustainability in architecture and construction, Saffeh journal, issue 5, 21-23.
- [4] RayatiIlbeygi, A. Personal conversation with NaserRezghkchah, Tehran: April 2014. Engineering Organization of Tehran.
- [5] RayatiIlbeygi, A. Personal conversation with Ali Ghaedi, Shahr-e Kord: 05.03.2014. Department of road and urban development of ChaharmahalvaBakhtiari province
- [6] RayatiIlbeygi, A. Personal conversation with TourajDavoud, Shahr-e Kord: 05.11.2014. TV and radio of ChaharmahalvaBakhtiari province.
- [7] RayatiIlbeygi, A. Personal conversation with Mohammad Forouzandeh, Shahr-e Kord: 05.03.2014. Department of Standardization of ChaharmahalvaBakhtiari province.
- [8] RayatiIlbeygi, A. Personal conversation with BahadorZeylabi, Shahr-e Kord, 05.03.2014. Housing Foundation of Shahr-e Kord City.
- [9] RayatiIlbeygi, A. Personal conversation with Jalal Ashrafi, Shahr-e Kord: 05.03.2014, Department of road and urban development of ChaharmahalvaBakhtiari province.
- [10] RayatiIlbeygi, A. Personal conversation with Mohammad Karimi [facilities], Shahr-e Kord: 05.03.2014. Department of road and urban development of ChaharmahalvaBakhtiari province.
- [11] RayatiIlbeygi, A. Pishva, F. Personal conversation with NasrinNasirbani, Yazd: (05.08.2014, Company of consulting engineers of Mahmood Abad of Yazd City.
- [12] RayatiIlbeygi, A. Personal conversation with Navid Mohammad Saleh, Shahr-e Kord: 05.04.2014. Electricity department of ChaharmahalvaBakhtiari province.
- [13] Be'nooni, S. Mir Shmas, A. Shah Passandi, A, Afzal Moghadam, A. (2003), Engineering company of Asia Wat.Management of Energy in Shahid Mohammad Montazeri complex of Isfahan's oil refining company.Third international conference on optimization of fuel consumption in building.Organizational of fuel consumption organization of the country, 7-8.

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- [14] RayatiIlbeygi, A. Personal conversation with ShahabTaghipoor, Shahr-e Kord: 05.06.2014. Islamic Azad University of Shahr-e Kord.
- [15] HosseiniNejad, S. Shaghaghi, Sh, Shafizadeh, A. (2013). Role of improvement of sustainable technology in creating architectural design by reviewing identity in embassy (case sample: Iran's embassy in Seoul, South Korea) International Conference on Engineering and Architecture and urban sustainable development. Islamic Azad University of Tabriz. 7.