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Bushehr as an Energetic City

Nasser Sabatsani

Department of Architecture, Faculty of Art, Urmia University, Urmia, Iran

Abstract: Bushehr city is one of the famous city in the south of Iran which is situated in the coastal part of Persian Gulf. This paper try to discuss one of the most important theme which threat the sustainability and comfortability of tomorrow's life. Changing Bushehr into an Energetic city is one of the effective ways to solve the cities problem. For this purpose, we try to answer these questions: what is called as an energetic city?; What are its main characteristics?; What are the aims of changing a city into an energetic city? And what should be done to obtain the aims? For these purposes we offer a model which responds to the sustainability of Bushehr. This model uses 3 levels of activity that each level should respond to 5 significant characteristics of an energetic city. For this purpose we present some applied ways in each category to obtain those characteristics.

Key words: Post-modernism, energetic city, compact city, Bushehr

THE MODEL OF ENERGETIC CITY

In the middle of 20th century the environmental problems played an important role in international researches. When phenomena such as deforestation, ozone depletion, global warming, pollution, acidic rains, nuclear waste and etc. threaten our lives, we have nothing to do but think about it. Although we take into consideration, such global environmental challenges but we-as human-beings, who have occupied the world-have done nothing for the issues of urban sustainable development, however, cities all over the world are the most hesitated consumers of natural resources and refuse producers.

After modern age and industrial revolution, the growth in the urbanization meant to the formation of mega-cities. This process is so extended that we can guess someday earth will change into an urban world. So specialists do their best to determine their definition and present a model which will be very helpful in designing future cities and constrain this uncontrolled development.

Hulmes model (1988) (Hosseini, 1988) in Manchester, Hockerton model (1992) (Vahid, 1992) in Nottinghamshire, HTA model (1993) in Greenwich Millennium, are some good examples of presenting a model. But what is important about these models is that, they are all about small cities. We always wanted to present a model which is comprehensive and has the ability to apply in all kinds of cities.

So, presenting a comprehensive definition which can be applied in future cities-that seems to be mega one's-becomes one of our main mental disturbances.

The aim of an energetic city is to make cities a model of environmental excellence. This involves translating the

concept of sustainable development into city-wide action-making it understandable, Putting it in place on a local scale and setting up practical projects to show environmentally friendly alternatives to our current life styles. But what is called an energetic city? This is the first question which should be answered.

What an energetic city is? One of the most important themes which threat the sustainability and comfort ability of tomorrow life, is energy conservation or what is nowadays called as energy crisis. changing the cities into an ecological cities or as we called it, an energetic city, is one of the effective ways to solve this problem.

According to the title of energetic city we can guess, that they are cities in which we have low energy consumption, or in better words, we can say cities with optimum use of energy.

The idea that whether this description can include all characteristics of an energetic city or not, has engaged our minds for a long-time. Statistics researches show that there are many towns that have low energy consumption but just this factor cannot make a city into energetic one, because along with energy consumption, there is an important factor which has been neglected for sometime in a passive reaction towards modern movement. That is technology.

As we know, we live in an information age. Daily development of technology is going to influence human beings life, but does that let us take passive reaction towards technology like premier post-modernism fans? It is obvious that energy consumption is related to technology application, so from this aspect, energetic cities are cities with low use of technology. But contrary to most theoreticians, we believe that in digital life of today

passive reaction toward technology, would lead to the same dead end which guides who believed in modernism criteria.

Energetic cities are cities which become successful in the challenge between technology and energy consumption. we believe that tomorrow cities not only should not be devoid of technology application like barbarism age but also should keep along with daily progressing of technology in digital life of tomorrow.

One of the other themes which is neglected is what Elkins (1991) includes as an important factor for sustainable development. This is futurity (Elkin, 1991) this is the first time when we face human-beings as the main users of cities.

What is very important in that case is to design in a way that responds to tomorrow's life of human's future needs and wills of users. They play an effective role which should be taken into consideration in every description that wants to be compatible with sustainable development Criteria. So apart from energy conservation and technology application what should be taken as a main part for each design is responding to future needs of human-beings. To gain these characteristics, cities should be designed in a flexible way. After all what we present as definition for an energetic city is:

An energetic city is a city that apart from low energy consumption use it's own Potential to obtain needs of humans future life and respond to daily progress of technology.

What are the characteristics of an energetic city?

Sustainability is a process, energetic city is the product. The process must, in the field of housing, address fire distinct fields, which describes the characteristic of an energetic city. In our opinion any national having housing strategy or design of an energetic city should, therefore, establish targets in these fields (Fig. 1).

- **Low energy consumption:**
 - Local generation of energy using renewable sources such as wind solar and biomass.
 - Reduce energy waste either by changing energy. wasting habits or by improving energy efficiency.
 - Optimum use of non-renewable energy resources:
- **Optimum technology application:**
 - New digital design compatible with more sustainable life styles.
 - Use of smart technologies to enhance comfort ability.
 - Using networking systems of life to reduce city journeys.

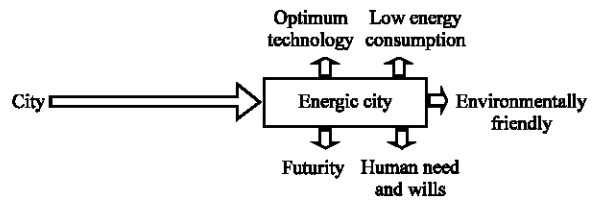


Fig. 1: Strategy of design an energetic city

- **Considering humans needs and wills:**
 - Of health, safety, security opportunities for local employment The provision.
 - The interconnection of work, housing, community and leisure facilities.
 - Equity between generations, people and classes.
- **Futurity:**
 - Flexible in use and designed for long-life (Norman, 1999)
 - Designed in ability to upgrade (Brain and David, 2000).
 - User's able to adapt at extend space.
 - Designing in a way that fulfill flexibility (Miller, 1992).
 - Meet the needs of present without compromising the ability of future (Brundtland, 1987).
- **Environmentally friendly:**
 - The conservation of nature resources (land, energy, water) (Koorosh, 2003)
 - The sensible re-use of man made resources.
 - Maintenance of ecosystems and their regenerative potential.

Any national housing strategy at designing of an energetic city should, therefore, establish targets in these fields.

What should be done to obtain the aims? The most important question which should be asked is, what should be done to obtain an energetic city? Despite its importance, this pivotal question rarely considered by government officials, energy company executives and most people. Changing the situation is probably the most important difficult challenge we face as a designer. After describing an energetic city and its characteristics, now it's turn to know how we can obtain them. As it was mentioned, sustainability is a process and energetic city is the product, so to have an energetic city we should pass a process which we called City Energization.

Nowadays many things have been done to obtain a sustainable community (Fig. 2) but we believe that any attempt to get closer to an energetic city concept is categorized under one of these three activity levels:

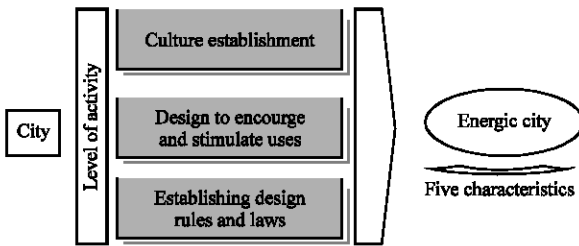


Fig. 2: Obtaining a sustainable community

- Culture establishment.
- Design to encourage and stimulate users.
- Design rules and laws establishing.

CULTURE ESTABLISHMENT

No society is balanced and sustainable unless its people as the main users have the knowledge how to obtain the sustainability goals and much more important how to extend them (Hosseini, 1978).

It is the easiest, quickest and cheapest way to make more energy available with the least environmental impact. That's why we call it doing more with less.

The more people get familiar with global crisis, the more they will know its effects on their life. When people know the importance of their roles to serve such problems which occurs just because they don't know what should be done, everything changes (Simon, 1999).

As this theme belongs to community, it is very obvious that reaching to the aims of an energetic city is impossible unless the community itself does its best to gain those goals. There are lots of instructions which can be done to reach this aims, for example, encouraging people to use public transportation instead of individual ones with explaining the advantages of such an activity and its positive reflects on their personal life. This never happens unless using cycles or walking in the pedestrians is just part of human's customs (Hosseini, 2000). When people despite lower incomes are ready to find a job near their homes, then we can claim we have won the game.

DESIGN AND PLAN TO ENCOURAGE AND STIMULATE USERS

Certainly encouraging and stimulating of users to do what is favorable to establish a public culture are not enough to enhance the society.

The other activity which can be done is to design in a way that consciously and unconsciously affect human's custom to develop them according to sustainable manner.

In the previous example advertising to use public transport is not enough to make people, do that. The majority of people were brought up in a manner that they are not ready to loose some recognizable benefits today, in order to get some unrecognizable ones tomorrow. So in the previous example to encourage public transport we can design some other facilities such as exhibitions, study places, relax rooms, street library, or etc near the bus stops.

For encouraging people to use pedestrians or Cyclists we can design the path in a way that pass through various function places such as markets, exhibitions, Greenland or some other natural attractions or give some bonus to whom who use pedestrians or bicycles for example there are lots of programs which can be designed to make people eager to do what should be done in order to have a sustainable community, for example apart from safety of pedestrians and cyclists we can design some painted walls or paint the ground underneath in a way that the whole ground is a full story.

DETERMINING RULES AND LAWS

There are some cases that none of above activity levels respond to fulfill the requirements. in this case we should have some rules and laws which constrain our wills and make us do the things which should be done. Of course these ideas will be used as guidelines. the third level of activity usually result in expensive costs that caused many community not to engage in.

The expensive costs are a logical result of reconstruction. another theme which should be taken into consideration are preservation costs which should be paid to maintain the environment, sustainable. In Iran as we performed weakly in the 1st and 2nd levels it seems that a comprehensive rule is needed. The researches show that although the 3rd level will help society to be in a straight route to sustainability, but the people passive reaction upon these rules usually reduce the speed. This reaction is inevitable because providing comprehensive rules which can respond to all aspects of today and tomorrow life is not easily possible.

Bushehr as a model of energetic city: With 27,653 square kilometers and with 60 kilometers sea border, the province of Bushehr is located on the south-west of Iran and near the Persian Gulf (Fig. 3) thus this province has remarkable strategic importance for the country and the whole region.

The traditional fabric of Bushehr has a special compactness which lead to the formation of an attractive cityscape and make Bushehr as one of the most specified city in Iran (Hosseini, 1999). Despite its warm and humid

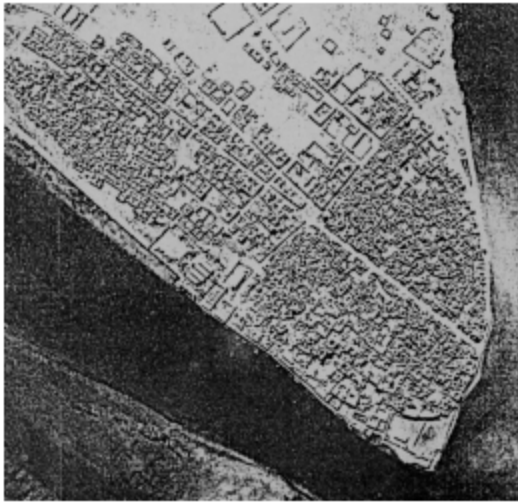


Fig. 3: Bushehr is located on the south-west of Iran



Fig. 4: The traditional fabric of Bushehr has a special compactness

climate which cause buildings to need an open space for ventilation beyond themselves, the city at the first glance seems to be a compact large building (Fig. 4).

As we focus on the site we will find some separated blocks of buildings that in order to respond to the climate issues have the least adjoinment with its neighborhood.

Examination of Bushehr's architecture characteristics provoked us to choose Bushehr as a case study. Bushehr is a traditional compact city which has many potentials to convert into the energetic city (Hossein and Gholnaz, 2000).

The researches which have been done in determining the relation between population and physical compactness in cities from one hand and reducing the rate of energy consumption in the other hand, meant to the formation of compact city theory in urban designing literature. One of the most important problems in urban designing of 20th century was urban sprawl. As time passes Cities start developing in all directions. This mal-development lead to the formation of megacities. So the idea of compact city, increase? the tendency to have a controlled growth around the cities and also make the cities more livable and sustainable. Compactness of cities is a potential bonus that ease converting of a city to an energetic one (Table 1).

Of course the idea of compact city cannot be accepted as a comprehensive theory for sustainability because it causes some social crisis and behavioral discontinuity but it will reduce the process of sustainability (Karla, 1996).

Table 1 shows the BRE and DETR table (1999) which is presented the advantages and disadvantages of these kinds of cities.

For these purposes we offer a model which responds to the sustainability of Bushehr. This model uses 3 levels of activity that each level should respond to 5 significant characteristics of an energetic city (Fig. 5). For this purpose we present some applied ways in each category to obtain those characteristics.

▪ **Low energy consumption**

▪ **Culture establishment:**

- Streets are for walking.
- Streets should encourage through movement.
- Public transport should be planned as an integral part of the street layout.
- The aim of sustainable development is not necessarily to eliminate the car but to reduce car use.

▪ **Design to encourage and stimulate users:**

- The grain of streets should be finer around modes of activity.
- Street design should reduce vehicle speed rather than ease traffic flow.
- Safe roads for cyclists should be provided.
- Consideration needs to be given to provision of secure cycle storage in or adjacent to the dwelling

	Low energy consumption	Optimum technology appliance	Considering human's needs and wills	Futurity	Environmentally friendly
Culture establishment					
Design to encourage and stimulate users					
Design rules and laws establishing					

Fig. 5: Model which responds to the sustainability of Bushehr

Table 1: Implication of density for sustainable housing comparison of three paradigms

Type	Houses ha ⁻¹	Advantages	Disadvantages
Low density	10	Renewable energy can readily be exploited. Rainwater and greywater systems can be employed. Food production in gardens. High biodiversity. High tranquility.	Poor land utilisation. Infrastructure costs high. High transport energy costs. High building energy costs unless renewables used.
Medium density	30	Renewable energy can be exploited. Some local food and energy crops can be grown in gardens. Movement by bicycle viable. Community greywater systems possible.	Public transport will need large subsidy. Careful design needed to exploit renewable energy.
High density	60	Compact forms are energy efficient. Support mixed use development. Most journeys on foot, bicycle or public transport. Good urban design. Good microclimate.	Neighbour disputes can occur over waste or recycling initiatives. Poor urban form. Crime and vandalism can be a problem. Anti-social behavior undermines community spirit. Low tranquility. Good design essential. Costs can be high per unit.

- **Establishing design rules and laws:**
 - Housing should average 90 units per hectare
 - Development should be along main routes and focal points first
- **Optimum technology**
- **Culture establishment:**
 - The impact of the car should be minimized.
 - Using energy-efficient appliance should be encouraged.
- **Design to encourage and stimulate users**
 - New buildings should be designed for low maintenance-
 - All new housing should attain good on the city scale.
 - Housing should maximize solar gains.
 - Build to high insulation standards and design for good ventilation-
- **Establishing design rules and laws:**
 - New homes should achieve at least level 8 on the national energy rating.
- **Futurity**
- **Culture establishment:**
 - Design for change of use is encouraged.
- **Design to encourage and stimulate users:**
 - Considering the sustainable urban design rules in the construction of new neighborhood.
 - Design for variety of uses.
- **Establishing design rules and laws:**
 - Prudent use of nonrenewable energy.
 - Accomplish the interrelated rules with high supervision.
- **Considering human wills and needs:**
 - Users need to be involved in the process of design and management of their estates.
- **Environmentally friendly**
- **Culture establishment:**
 - Urban nature conservation measures should be provided.
 - Effective protection of the environment.
- **Design to encourage and stimulate users:**
 - Landscape need to be integrated with housing and wildlife encouraged.
- **Establishing design rules and laws:**
 - Existing trees should be retained and new street trees provided.
 - Natural materials such as timber, stone and linoleum should be used in preference to polymer based products.
 - Avoid synthetic toxic materials.
 - Prudent use of natural resources.

CONCLUSION

Architects can do much to help achieve sustainable housing by using their design skills to create higher

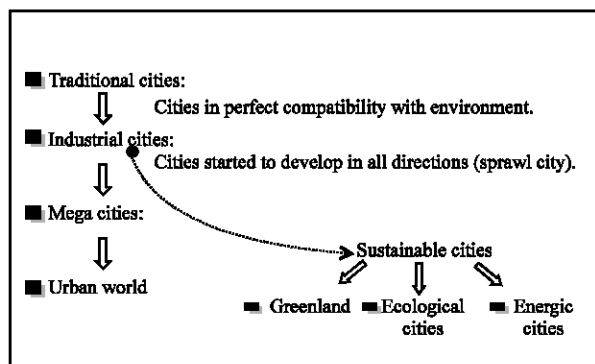


Fig. 6: Establishing design rules and laws

density, mixed use neighborhoods, utilizing smaller urban sites than normally considered viable by volume house builders, in this process applying three levels of activity, culture establishment, design to encourage users, establishing design rules and laws which can lead cities to the goals of an energetic city (Fig. 6).

We believe that our traditional cities despite its failure in some cases have more potential to become an energetic city.

Although traditional cities usually have a low technology application or maybe they are not designed in a way that respond to some of humans future needs but those three levels of activity will done, lots of these problems will be vanished. at last we should add that we also believe our traditional cities are a good points to start changing cities into energetic one which we hope it will lighten the humans future life and will help them to live comfortably in a sustainable environment with all its characteristics.

REFERENCES

Brain, E. and T. David, 2000. Sustainable Housing Principles and Practice. London, E and Fn Spon Publication.

- Brundtland, G., 1987. 21-Brundtland report, our common future, sustainable development. <http://www.francoislevy.com>.
- Elkin, J.J., 1991. Sustainable Development. 2nd Edn. California, Published: Wadsworth.
- Hosseini, A., 1978. Introduction on Civic Sociology. Shabgir. Publication, Tehran.
- Hosseini, B., 1988. Hulmes Model in Manchester. Honarhaye ziba Magazine, No. 3, Tehran University Publication, Tehran.
- Hosseini, B., 1999. Urban Planning Process. Tehran University Publication, Tehran.
- Hosseini, B., 2000. Modernity, Post-Modernity and Afterwards in Urbanism. Tehran University Publication, Tehran.
- Hosseini, B. and T. Golnazi, 2000. Introduction on Concept of Stablecivic Preface, Expanding Development and the Impression of Civic Programming. Honarhaye Ziba Magazine, No. 6, Tehran University Publication, Tehran.
- Karla, B., 1996. Sustainability and Cities. Manchester. 2nd Edn. Tirot Inc. Publication.
- Koorosh, G., 2003. Sketching a Stable City in the Outskirts of Desert. Tehran University Publication, Tehran.
- Miller, T.G., 1992. Living in the Environmental Belment. 7th Edn. California. Wadsworth.
- Norman, F., 1999. New Directions in British Architecture. London, 20, Thames and Hudson.
- Simon, A., 1999. Exploitation of Traditional Architecture in Saving Energy. Honarhaye Ziba Magazine, No. 3, Tehran University Publication, Tehran.
- Vahid, G., 1992. Hockerton Model in Nottinghamshire. Tehran University Publication, Tehran.