Studying of Urban Environment Sustainability Indicators by Emphasizing on Value Engineering in Iran *(Case Study: Mashhad Metropolitan)*

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Abstract

The sustainable development concept is one of the basic issue in 21 century . one of the its aspect is urban environment . In 21 agenda [1] has been considered special role for municipalities as local government in implementation sustainable principles . in future development document of Mashhad , creation of healthy environment is one of the basic objectives . Also, has been studied urban development with emphasis on sustainable principles. Municipals are connected to urban issues such as : transportation , green spaces , waste collection , traffic , urban sewage , land-use locating and etc . So value engineering is as efficient and effective technique for reducing costs and increasing environment quality. Therefore value engineering have special place in planning of urban issues. The propose of the paper is, studying the role of value engineering in Mashhad Municipal and urban planning.

Keywords: value engineering, sustainable development, environment, Mashhad municipality

1. Introduction

Every year the large section of financial budget is investigated in industrial and construction projects. While, these projects are evaluated advantageous in national, provincial and regional levels, but it is possible that damage environment natural recourses. So these projects don't have economic justification in country. The natural environment approach or urban ecologic and sustainable city is new approach in urban planning. Three aspects are important in this approach, such as: economic, social and natural environment. So economic justification with other aspects is led to improvement of citizen life. Therefore, the natural environment approach to industrial and construction projects has accordance with value engineering.

Value engineering is discussed with Milez innovation (father of value engineering) and has maintained its position in scientific communities over 60 years. Value engineering as an efficient technique in order to presentation of project goals and quality protection, have appropriate place between developing countries.

If development process be adapted to environmental, the GDP growth will continue by the more acceleration. Because, on the one hand, deposit costs in environmental section is used in investigations and growth of protection, and the other hand with promotion of environmental in cities, will increase productivity. It also is led to further development.

2. Value engineering

The Value engineering is the method for balance between costs and function of produce or project. The value engineering with preservation of characters , propose methods that has deleted extra costs and replace desirable methods with law cost & high quality and function . In other words, the value engineering is organized and creative method .Also, its propos is suitable function with lowest cost and with highest quality. (*Boroujerdi: 2009, 32*). This method is used over 50 years in world. Now days, it is as one of the 10 methods that is used in engineering activity at united state. This method is very important in other countries, for example, Saudi Arabia has used value engineering, so save billions of dollars (*Boroujerdi: 2009, 12*).

2.1. Relation between value engineering & environment

The propose of value engineering is utilization in short time without increasing of costs or reducing of quality. The propose of environment is, decreasing of destroyer effects on sources and deposit economical costs. So these sections (value engineering & environment) have clean relation. Also, they have positive effects in production.
In other definition, the value engineering is organized & innovation method that its propose identify unnecessary costs. The inessential costs don't increase quality and function; on the other hand they aren't customer favorites.
Issues of environment that has been done due to different action in cities are effects of development. Not only, they emphasis on environmental quality but also they are let to increase of action costs. Therefore, these issues are led to dissatisfaction of citizens.

Could be used of value engineering in determination of project proposes, getting of effective decision, increasing of function & quality and balance of proposes & management.

We can use from environment in improving different urban project, incrassating efficiency and development. Thus, these two issues can be complementing each other.

The propose of studies value engineering is, to reach desirable functions by using the least sources and costs possible. The structure of this method is step by step. Also, deleting of unnecessary is the most important propose.

2.2. Value engineering & sustainable development

Today, sustainable development is very important in urban issues. Comprehensive management is one of the principles of sustainable development in communities. The implementation programs that is led to sustainable development, should consider social and environmental indicators next to technical and economic consideration.

2.3. Value engineering in Iran

In Iran according to importance of value engineering, has been attended in last 91th decade in third and especially fourth Economic, Social and Cultural development programs[2] in Islamic Republic of Iran. In these program has been emphasized on value engineering approach in different projects process especially construction projects.

2.4. Value engineering & transportation

Transportation as main infrastructure of sustainable development, spend huge section of construction budget and municipalities. Further more; transportation is one of the main factors that create environment issues in country and cities levels. Today, reliance to individual vehicles has been led to metropolitans in our country are faced to environmental, air pollution and urban traffic challenges. This problem, not only damage quality of people life, but also, creates expensive costs. Because, it has been led to expensive costs due to reduction of air pollution. On the other hand, traffic is led to financial and psychological problems in society that engineer and designer don't pay attention to them. Therefore, it is necessary that increase quality of people life with reduction financial costs.
During the last 20 years, the value engineering has been section of transportation industry. The value engineering is innovation source and qualitative accomplishment in this issue. The public transportation face with increased of costs, so it use value engineering to reduction using of sources and costs.

According to done conducted surveys, eight reasons have been identified for using value engineering in transportation projects. *(Porreza: 2009, 54*) They are:

1- high costs of projects
2- long time of implement
3- difficult to implement
4- safety and security problems
5- environmental problems
6- difficult to utilization
7- social and cultural issues
8- political issues

The score of importance of reasons has been shown in figure (1) .

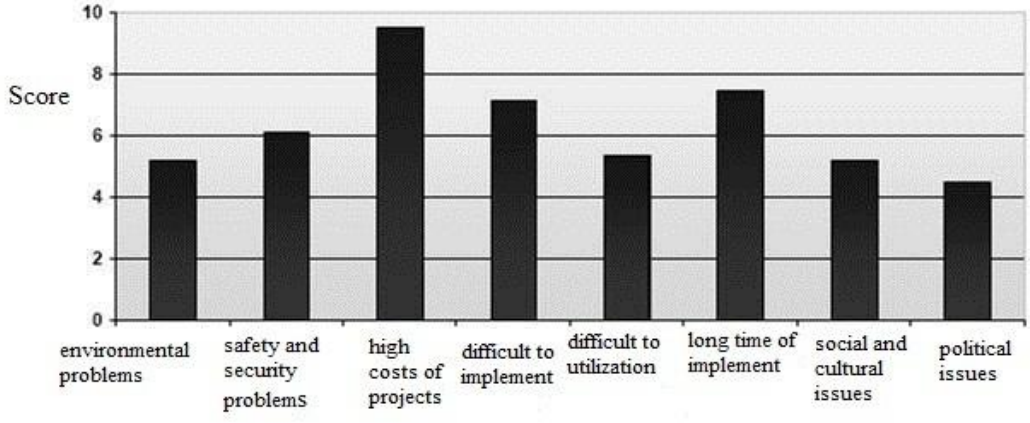


Figure (1): The reasons of study value engineering

2.5. Value engineering & energy consumption

According to existing problems for production of energy, different countries in world are seeking appropriate methods for optimized consumption. Optimization of energy consumption is important evolution in economic structure in industry countries. It is led to growth of economic and reduction of costs (*Saqati: 1999)*

Consumption of energy is one of the main issues in urbanism and urban planning. Due to growth the number of cities and sharp crowd, increase consumption of energy. On the other hand, in urban design and construction don't pay attention to energy. The reduction of consumption of energy and using of clean energy is led to promotion of environment and decrease energy costs.

On the other word, if the rate of energy consumption per unit of production (or energy intensity) is high, Per capita health expenditure will be higher (*Mehrara: 2012, 86*). Therefore, the value engineering is very important in desirable management for optimized consumption of energy.

2.6. Value engineering and land-use locating

Locating of various land-uses is one of the most important urban issues. In locating of land-use should be studied some factors, such as: adaptability, comfort, legibility, animation and etc. it is obvious that appropriate locating decrease costs, also satisfy citizens. So, by using value engineering not only, decrease costs but also create surplus advantages.

2.7. Value engineering & waste collection

One of the main urban services is continuous waste collection. Every year spent expensive expenditure. According to 2010 census, has been collected 647972 tons garbage. Also per capita of production of household garbage has been 502gr daily *(Mashhad municipal: 2010, 35*). Improvement of waste collection process with vale engineering decrease urban management expenditures. On the other hand, value engineering has positive influence in decreasing of environment problems.

2.8. Value engineering & urban green spaces

Creating and development of urban green spaces is municipal tasks. Today, creating of green spaces is very important due to population growth. Making urban green spaces need high expenditure. According to 2010 census, maintenance cost of urban green spaces per square meter of lawn is 8175 Rls , trees is 5100 RLs and flowers is 9477 RLs *(Mashhad municipal : 2010 ,47*) . Also Mashhad green spaces per capita is low .

So by using value engineering will be developed green spaces with effective technique. Value engineering have very advantages in this field such as : creating developed green spaces , decreasing air pollution , saving expenditure and improvement urban environment .

2.9. Value engineering & air pollution

In economic analysis of air pollution, should be studied damages of air pollution, prevention costs with pollution and scientific research costs (*kusha: 1991, 77*). According to American research that has been in 1999, the costs of respiratory disease has been calculated 1681 to 10812 USD (*Wilde, 2001*).

The social, economic and sanitary costs of air pollution are high. So, using value engineering could be effected in reduction costs. Based on above subjects, attention to urban environment, environment management system and energy management not only promote urban environment quality, but also save expenditures and will delete additional fees. Indeed these are proposes of value engineering.

3. The advantages of environment management systems (ISO14001-2004 ،ISO14002 ،ISO14004)

- decreasing costs from waste reduction and using natural sources effectively
- avoid risks that always destroy environment
- partnership in environment projects

4. The advantages of energy management systems (ISO50001)

ISO 50001 is a systematic framework for organization in order to increasing of efficiency energy, decreasing of costs and improvement function of energy. This is adaptation with ISO 9001& ISO 14001. Some advantages of energy management system are:

- Help to organizations make better use of energy i.e. Electric energy, thermal energy, etc.
- Creating adaptation between management and energy consumption
- Reduction energy costs, decreasing greenhouse gas and other environmental impacts.
- Enhance and improve the behaviors related to energy management.
- Help to organization in order to evaluation new techniques view from management.
- Energy management system is full adaptability with other system, such as: energy management, health and safety management systems, environmental management systems and etc.

5. Water management by using value engineering

One of the main factors to reach sustainable development is water source management due to water impact to social, economical and environmental issues. Make decision for water sources plans should be evaluated based on natural and regional factors. Value engineering have comprehensive approach in this stage. Value engineering make codification policies with according to sustainable development factors.

6. Structure and development documents Mashhad Municipality

Mashhad Municipality as second metropolitan in Iran , has been organized in 7 different sections due to vast urban services .

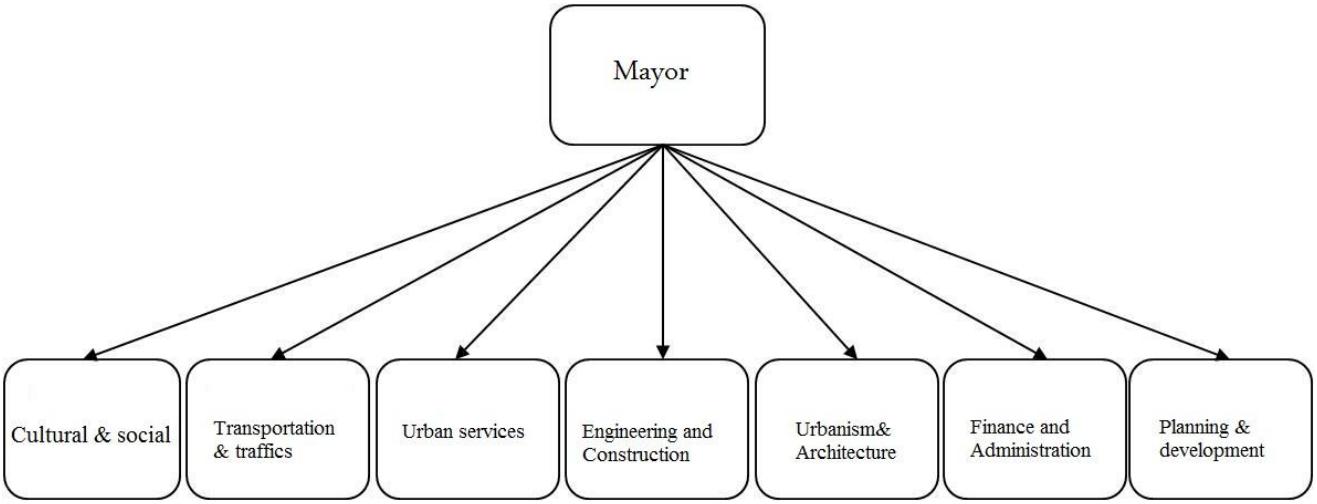


Figure3: 7 sections of Mashhad Municipality

These sections pull together under the supervision of mayor. Function of each section effect to other sections, for example transportation section relate to urban services and etc. So these sections don't word separate. Therefore, preparing development document as agenda for each section is importance. The development document that has been prepared in different Municipality of our country is comprehensive plans, Thematic and topical projects at finally operational plans.

According to Structural views and strategic planning in developed countries, also our Municipalities in county has used from strategic planning.

In Mashhad, future plan was approved in 2005. Studies and Planning of Mashhad development office have prepared development plan due to, should be adapted to specified strategies. According to, were identified 28 basic urban issues in Mashhad. At finally, 11 strategies were proposed.

Future development plane of Mashhad metropolitan in 20 next years (2027)
Mashhad metropolitan are:

- The unique identify religious- cultural in natural & global scale
- Pioneer in urban sustainable development by global approach with emphasis on economic , advanced industries & appropriate services
- By activate , animate , safety urban spaces for all of citizens and truism

Natural ecosystem doesn't balance in Mashhad due to, sharp concentration of population. These metropolitan has been faced with serious environment problems. So, one of the important propose of development plan is, reduction of destroyer influents of environment. Development of city is consisting of physical, social economical environmental and management sections. But in Iran has been prepared development document only for physical aspect. Also, generally has been done comprehensive plan just this.

In Mashhad has been defied some Thematic and topical projects , for example : green space comprehensive plan , transportation comprehensive plan, urban advertising comprehensive plan …. .

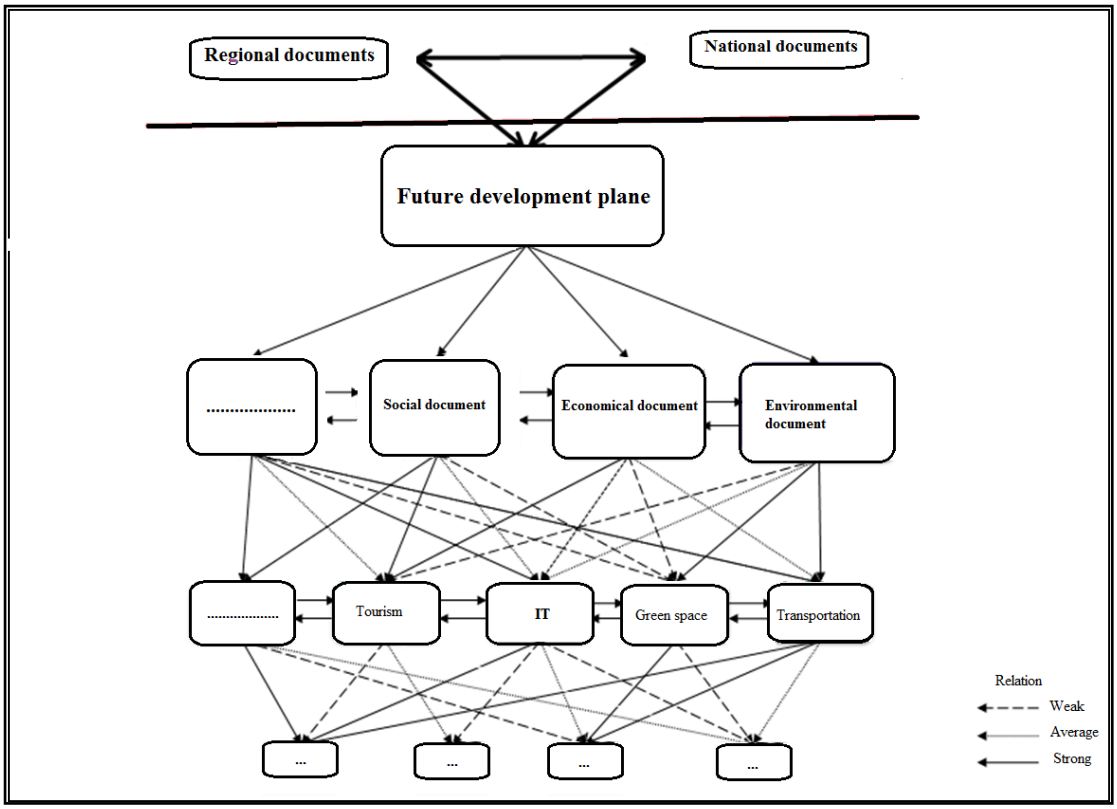
Topical projects are defined for different issues , such as : improvement urban traffic ,improvement of green space , promote public transportation , revival of urban traditional culture , reorganization of old fabric .

7. Conclusion

Developing country attempt to reach economic growth. On the other hand, don't pay attention to environmental issues.

Thus, according to mention problems, value engineering have special place in urban issues. Value engineering is as one technique that is led to reduction costs, promote environment condition. Also value engineering increase profitability and productivity. In development document of Mashhad one of the main aspects is healthy environment. Environment relate to all of aspects, so value engineering is effective in, promoting life quality. Therefore value engineering and environment are, complement each other. Moreover, don't pay attention environment aspects until now , so value engineering is effective for it . In figure (4) has been shown the hierarchy structure urban development document. Also has been shown the relation between value engineering and transportation, green space and etc .

Figure (4) : the hierarchy structure urban development document



Therefore, the value engineering will be saved economic section from two aspects, one: attention to environmental costs, second: preservation additional environmental costs. Consequent, value engineering and environment approach should be combined; also developer and planner should pay attention to these aspects. The combination of two aspects has some advantages. They are:

- Combining simultaneous values and the Environment
- Combining is led to increasing the efficiency study
- By using combining approach, are created common principles for problems.
- By utilization value engineering & environment , could be presented different & optimum methods for urban environmental developing

At finally, development influence in developing countries is one of the most important issues. Value engineering emphasis on decreasing unnecessary costs in various actions, so combining of these different section (sustainable economic & environment quality) have positive influence in sustainable development process.

Note

1. The 21 agenda is comprehensive and global agenda for to reach sustainable development in twenty-one century. Both in developing and developed countries.
2. A third and fourth Economic, Social and Cultural development program is important program in Iran that make plan for urban issues.

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