

Sustainability Assessment of Urban Fabrics with Emphasis on the Legal Improvement Strategies (Case Study: Golshan District, Mashhad Metropolis)

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ABSTRACT: Due to rapid growth of urbanization in recent decades, various aspects of human life has been affected. Today, cities are the main actors causing unsustainability in the world. In fact, urban sustainability is related to the world's sustainability. Accordingly, the role of cities and their impact on the sustainability index has attracted the attention of many scientists. To achieve the aim of this paper, Golshan district with over 1500 years old and organic structure was chosen as the case study to determine its urban fabric's sustainability and studying improvements via legal approaches. The research method is descriptive-analytical using content analysis and hierarchical analysis. Software such as SPSS and Arc Map were utilized in case of quantitative and qualitative indicators calculating, and other data processing and preparing maps. The results of this study about unsustainable zones in Golshan district indicate that not only regulations are not in line with the principles of sustainability, but also physical-environmental regulations have been neglected and there is no integrated approach to implement guidelines; leading to reduced social, economic and managerial sustainability. Finally, the effective rules of National Building Regulation were considered to propose amendments, making them more efficient. The proposed supplements for the National Building Regulations are exposed as the organic urban fabrics legal improvement guidelines.

Keywords: Organic Urban Fabric, Urban Sustainable Development, AHP, National Building Regulations, Golshan District of Mashhad.

ORIGINAL ARTICLE
Received 18 Aug. 2013
Accepted 24 Nov. 2013

INTRODUCTION

Due to rapid development of urbanization in recent decades, various aspects of human life have been affected. Today, cities are the main actors causing unsustainability in the world. In fact, urban sustainability is related to the world sustainability. Accordingly, the role of cities and their impact on the sustainability criteria has attracted the attention of many scientists.

Sustainability can be defined in many ways such as ecological, economic, or social (Azizi, 2006). The term "sustainable" means to save, to continue life and existence, and to not give up and do not stop. If sustainability be used in form of abstract meaning, it will not work in urban communities. Civil society is a complex system that cannot be in a uniform status, so evolution is a constant flow. In fact, in order to remain viable and able to match with this evolution, sustainable approach is inevitable (Masnavi, 2003). Urban sustainability can be defined by three global characteristics: 1- Strong culture and community 2- efficiency in economic and administration 3- and equilibrium in physical - space (Aliakbari, 2006).

Thus we can define sustainability indices in six areas: physical, ecological, social, economic, and administrative functions. Two major theories have been proposed in the field of urban sustainability: 1- the theory of compact city or dense urban form, 2- the theory of sprawl or a low-density urban form. Although

the theory of compact city was accepted mostly by European countries and compact city was admitted largely by Americans and Brits, researches done in this field show that the impact of compact city form on urban sustainability performance, was obviously more. Urban fabric reflects the effects of the complex interplay of various forces and factors such as natural conditions, geographical situation, social conditions, cultural characteristics, political sustainability, governance system and the economy growth ratio. So making any changes in the urban fabric, is related to possibility of intervention in each of these areas; which is limited and conditional (Bahraini, 1998). This system is a set of physical spaces, different applications and communication networks between them, and it is one of the basic factors to be considered in determining urban sustainability.

It is obvious that achieving a desirable physical space, depends on the deep understanding of communication networks, wellness level of services for populations, quality of life, education service, health, economy, cultural issues and so on (Javan, 2003). What should be noted is that sustainability does not necessarily reflect the urban sustainable development. Here is the concept of sustainability as a situation or favourable condition, or set of conditions that have perpetuated. But

in terms of urban sustainable development, it is a process which cause sustainability in a long term plan.

RESEARCH METHODOLOGY

The aim of this paper is exploring the principles of relatively more sustainable blocks inside urban historical fabrics and draw them out with an updated applied form in relation with building laws. Golshan district in Noghhan neighbourhood of Mashhad city, with 1500 years history and special organic structure was considered as the case study for sustainability zoning in the first step. The research method of this paper is descriptive- analytical with collecting data by means of field survey. Surveys were done utilizing questionnaires, structured interviews, observation and content analysis. The formula for determining the statistical sample community was the Cochran. Evaluation matrix, standardized values using linear elasticity, paired comparisons to evaluate multifactor and hierarchical analysis were used for measurements and assessments. The SPSS and Arc Map software were operated to analyze the collection of data and reach the final graphical output.

LITERATURE REVIEW

The sustainable development was introduced in 1961 for the first time, when the United Nations applied to the preparation of conservation about sustainable issues formally. Prior to this date, as well as efforts to create urban wastewater systems, waste disposal practices had been done, but they were not known as sustainable development (Sarafi, 2000). Background and origin of sustainable development is based on the improvements of urban ecosystem; as "Sachez", World Conservation Union, United Nations environmental plan and other individuals and institutions declared. Environmental development in regional or local level, is combined with local potential, and emphasizes on the rational use of resources and technology, in relation with nature and human communities.

As part of the preparatory process of the Summit Conference of the Phoenix 1973 in the UN, referred as the human environment. Phoenix report, the 1972 Stockholm Declaration, 1974 Declaration of Kokovic, while acknowledging the complexity and seriousness of the social and environmental crises that human society is facing, cause the promising consequences; because all participants were obliged to develop and implement environmental strategies to clean up environment. In order to promote social - economic or environmental development.

In 1987 the International Commission on Environment and Development (WCED) which is familiar as the Brundtland Commission, called a request: "public assistance for the implementation of new forms of behaviour at all levels in the public interest". The implications of global cooperation and mutual support between the countries, at all levels and stages of economic, was released in a report entitled "Our Common Future". Following the theory of sustainable development, the 21st century has been called the century of the environment. According to Agenda 21, to

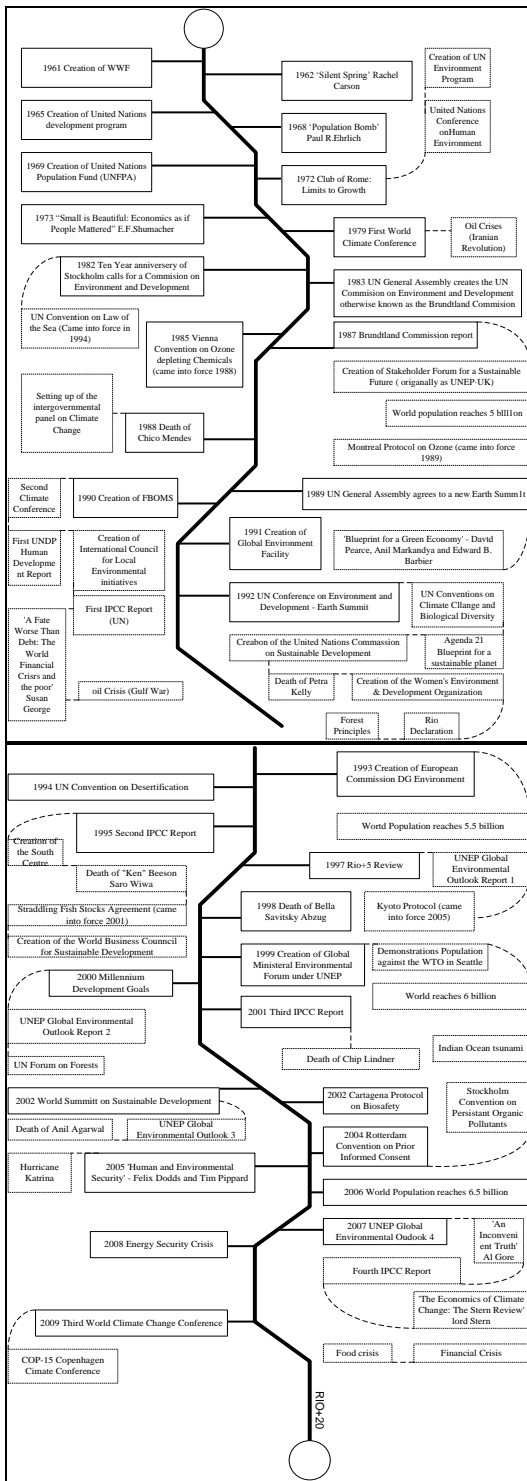
enter the 21st century, the Rio Summit was issued in 1992. Major issues in field of sustainability, especially sustainable urban development and the environmental care were addressed (Hall, 1993). The permanent secretariat of Sustainable Development for United Nations Conference on Environment and Development was initialized in 1992. Coincide with the twentieth anniversary of the Stockholm Conference in Rio de Janeiro (Brazil). The conference "Earth Summit" is known as the sustainable development plan (Agenda 21) for the final years of the twentieth century. Since states were committed that year, Agenda 21 is an international upstream as the document used to develop national and local agendas. Ten years after the Rio Summit, the United Nations World Summit were held in other countries to provide reports of their performances. As well as the Agenda 21 in Johannesburg, South Africa Summit were held. Johannesburg Summit of the third millennium, is the largest and most important one, which is known as a milestone in human destiny (Mirabzadeh, 1993).

Agenda 21 gathered guidelines as an important document that must be addressed today. The most important lines are about needs of future generations and current usage of the resources, as the centre of attention. It represents the consensus of all countries worldwide for the highest level of cooperation, sustainable development and protecting the environment. Successful implementation of people, Non-governmental organizations, national and regional organizations, even international formations participation is anticipated. Agenda 21 is a dynamic program and implementation of the program in each country, depending on the circumstances, needs and priorities and based on the fundamentals of "Rio Declaration on Environment and Development" is different (Hosseinzadeh, 2008). Agenda 21 is summarized as follows:

- Environmental issues must be simultaneously considered in developing and developed countries to jointly solve the challenges.
- National and international consultation and cooperation should be considered at all levels.
- All people have equal rights and should be encouraged to have an active participation in the decision-making process.
- Developing of training in various sectors of society, should be implemented in all human societies.
- To achieve sustainable development, integrated planning system for economic, social and environmental planning should be utilized.
- Capacity building of local institutions, leading to the ability of delegate responsibilities to local governance system should be among the priorities of the governmental system.
- Finally, the exchange of detailed information of the economic, social and environmental problems will help to find the solutions.

To provide a clear picture of what we bring to Agenda 21 from 1960 to 2010, Figure 1 overview the events.

Figure 1. Structural Diagram of the Sustainable Development Theory Evolution 1960-2010 (Akbari Motlaq, 2013)



DEFINITIONS DEVELOPMENT

All countries lagged behind the development of the world intend to rehabilitation of the material, human and spiritual capacity increase to get developed and in addition of capacities and abilities, have a strong economy. Keep people healthy, skilled, resourceful and enthusiastic, with a wide variety of industries, infrastructure, communication and technology, transportation and well equipped ports, modern medical

facilities and powerful educational system like the developed countries, is a desirable goal for developing countries (Motevaseli, 2003).

It seems that the term of growth and differentiation, must be carefully defined. Because fundamental differences in the physical and multi-dimensional nature of them are understandable. Purely economic conception of development in the 1960s due to the necessity of social, environmental and political undertone had made the dissimilarity. As the emphasis on economic growth, social change was also considered in the context of modernity and modernism.

Metropolitan economy increase in the early 1970s led to inequality and unfair distribution. This situation highlighted a new concern to developing countries: the destruction of natural and human resources. So that the United Nations Conference in summer 1972, which was held in Stockholm in relation to the environment, considered on the importance of global equality and social justice in case of natural resources distribution, and international negative effects caused by the irresponsible exploitation of resources. According to the statement, the meeting was declared that countries should commit strategies for equitable distribution of wealth, poverty reduction to apply (Papoli, 1990).

"Hyran" believes that development is something which affects our lives. He notes that development is not only related to a country, city, or a person, but also the nature of this concept is universal. The purpose of developing is a comprehensive and coordinated plan to improve the quality of life for everyone. So attempts to achieve development include long-term benefits for the majority. This principle should always be on top for the leaders in the world. Development is the process of improving the quality of life for all citizens. Three important dimensions of development include:

Improving the living standards, income for household, food basket, the quality of medical services and education, and other public services, through appropriate processes of economic growth.

Create an environment that promotes self-esteem in people using the incentives systems and institutions of social, political and economic with respect for human dignity.

Increased freedom of choice by expanding the variety of selection for citizens.

Rubin Atfield and Barry wikens agree on the definition of development: Development is a comprehensive process of economic, social, cultural and political changes; the goal of continuously improving is to provide quality of life and freedom for all people, the right to participate and equitable distribution of benefits, it is just one of the fundamental basics.

SUSTAINABLE DEVELOPMENT

Human life on Earth is dependent to the earth. This means that the usage of non-renewable resources must be logical due to the next generations' requirements. Sustainability is ideal in terms of moral reasoning towards future generations, and it is the reason for general acceptance and legitimacy of the theory in the whole world. Sustainable development is a long-term plan, with focus on future generation's needs. Brundtland

Commission considers the sustainable development, while the needs of the current generation get resolved without reducing the ability of future generations (Rahimi, 2004). Considering this definition, Sustainable development can be described as the integration blossom of three main treats: Environment, Economy and Equity (Turskis, 2006).

SUSTAINABLE DEVELOPMENT PRIORITIES

A) Ecological Integrity:

- Meet basic human needs for air, water and healthy food and non-contaminated food.
- Maintaining of local and regional ecosystems and biological diversity.
- Conserve water, land, energy and non-renewable resources through maximum possible recycling and reuse of waste retreatment.
- Utilization of preventive strategies and appropriate technology to minimize emissions.
- The use of renewable sources of energy and no more fossil fuels.

B) Economic Security:

- Strong and diverse economic base.
- Resources for reinvestment in the local economy.
- Maximum locally-owned businesses.
- Economic opportunities for all citizens.
- Provide education and job training to help the workforce to meet future needs.

C) Empowerment of and Responsibility for Citizens:

- Equal opportunities for all citizens to participate and be involved in decisions that affect their lives.
- Adequate access to information and public awareness to prevent data black boxing.
- Decision-making with/for/by people.
- Create an atmosphere of mutual respect and tolerance, attitudes, beliefs, and social values.
- Encourage people of all ages, genders, races and religions to be responsible based on knowledge.
- Political sustainability.
- General rules and respect other countries' sustainable urban development.

D) Public health:

- Adequate diet based on local produce.
- Access to health care, adequate housing, and safe, healthy, high quality education for all members of society.
- Preventing and combating crime, and rape.
- Promote public confidence in the sense of spirit, a sense of place and sense of self-worth.
- Emphasize on the use of art to promote creativity and innovation in the society.
- Strengthening of public resources and cultural heritage.
- Providing a healthy work environment for all citizens.
- Adapt to changing circumstances and tolerance (Pricopi, 2005).

SUSTAINABLE URBAN DEVELOPMENT

The concept of urban sustainability was introduced by McLaren in the 1980s. It is characterized by a favourable situation or condition or set of circumstances known to be continued. In the other words, sustainable urban development is a process by

which we can achieve sustainability. McLaren noted some key features of urban sustainability Including intergenerational equity, equality between countries and peoples in case of natural resources conservation (and life within nature's capacity), use of renewable resources, economic viability and diversity, community self-reliance, individual prosperity and sustainable response to the basic needs of citizens (McLaren, 1996). The sustainable city is somewhere with the efficient use of energy and material resources, most prevention of overproduction of waste, recycling as much as possible, adoption of effective policies and synchronizing with nature; it will last forever (Turner, 1997). According to the definition of sustainable urban development, urban development and step by step infrastructure improvements are necessary to achieve sustainable conditions in the city. Creating balanced conditions for a city in harmony with the environment, should be aimed at maintaining the historical traditions and social practices, with combining in new forms of urban management and IT; synchronized and cohesive to retain ideal sustainability (Mukomo, 1996).

PRINCIPLES OF SUSTAINABLE URBAN DEVELOPMENT

Contemporary thoughts about sustainable urban development indicates that firstly, the adaptation with the environment should be maximized and secondly, the balance between natural cycles and manmade elements should not affect the nature negatively. Based on sustainable development theory, principles can be summarized as follows for sustainable urban development:

- Saving energy (fuel),
- Reduce the distance between home and work place,
- Reduce the use of fossil fuel cars for travel within the city,
- Develop a network of public transport, pedestrian and bicycle access,
- Conservation of biodiversity and cultural rites,
- Hundred percent rubbish and wastewater recycling,
- Reduce environmental pollution caused by urban metabolism (industry, automobiles, etc),
- Utilizing the efficient and sustainable ideas, like the compact city (Rahnama, 2006).

CASE STUDY: GOLSHAN DISTRICT IN CITY OF MASHHAD

The location of this research's case study is Golshan district in Nohan neighbourhood situated in Mashhad city. This is one of coral parts of city of Mashhad city, with over 1500 years old which is surrounded by extended urban fabrics during the time. Because of that history, it has been called an organ-historical urban fabric. The surroundings is now destroyed and scattered in reason of renovations, and unprincipled building happens. So without implementing regulations related to the city transportation network based on the district master plans, high-raised building license has sold by municipality of Mashhad. Now, 5 and 7 floor buildings among 2-6 meters width allies is an

ordinary image in Golshan district. According to the Census Bureau of Mashhad municipality,

Noghan neighbourhood has 6,087 population and 317,442 square meters area (Seppidar R&D Group, 2011). The Golshan District has an area of 34,672 square meters with the population of 493 residents (Akbari Motlaq, 2013). The analysis of changes in the Mashhad city downtown shows the origin of Golshan district changes; So far, it has seen less change in comparison with other zones.

Figure 2. Satellite Image of the Noghan Neighborhood in Mashhad City (Google Earth, 2013)



Figure 3. Small Changes during the Years 2003 To 2013 Compared With the City Downtown (Google Earth, 2013)



DEFINING INDICATORS OF SUSTAINABILITY MEASUREMENT

In this study, with the review of international experiences, a collection of 150 qualitative and quantitative indicators, were gathered. They were classified into six categories: physical, ecological, social, economic, functional and managerial; then 35 of them were chosen for the sustainability assessment plus the explanation of how they could be calculated. According to the organic structure of Golshan district and rapid changes in reason of urban projects, selected parameters were well-matched with local situation. Figure 4 shows the criteria, their impacts and their calculation formula. In order to enable the zoning for large scale factors (such

as air quality) and perform a comparative analogy, Golshan District was divided into 9 sub- zones.

Figure 4. Urban Fabrics Sustainability Assessment Indicators (Akbari Motlaq, 2013)

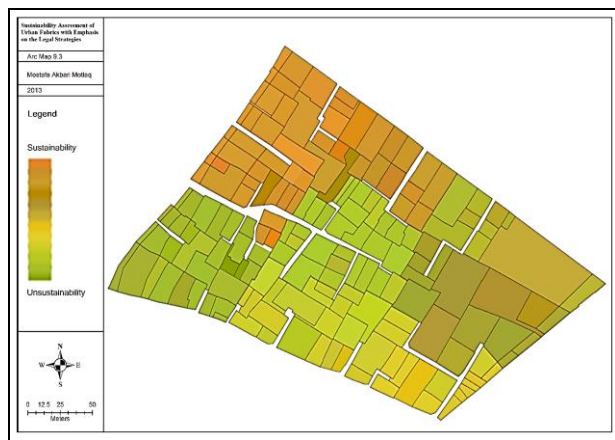
Rows	Category	Criteria	Impact	Type
1	physical	Building Aging	+	Qualitative
2		Buildings' Quality	-	Qualitative
3		Number of Floors of the Building	*	Quantitative
4		Building Density	*	Quantitative
5		Small Land Parts	-	Qualitative
6	environmental	Per Capita Household Waste	-	Quantitative
7		Electrical Energy Usage	-	Quantitative
8		Per Capita Water Consumption	-	Quantitative
9		Vegetation	+	Qualitative
10		Pure Water	-	Qualitative
11		Air Quality	+	Qualitative
12	social	Age Structure	+	Qualitative
13		Literacy Rate	+	Quantitative
14		Natives Immigration	-	Quantitative
15		Indigenous Population Segregation	-	Quantitative
16		Social Crime	-	Qualitative
17		Desire to Participate	+	Qualitative
18		Population Growth Rate	*	Quantitative
19		Sex Ratio	*	Quantitative
20	economic	Economic Empowerment	+	Qualitative
21		Employment Rate	+	Quantitative
22		Dependency Rate	-	Quantitative
23		Income Equity	-	Qualitative
24	functional	Incompatible Land Use	-	Qualitative
25		Commercial Appropriate Land Use	+	Qualitative
26		Green And Recreational Capita	+	Quantitative
27		Dilapidated Buildings	-	Qualitative
28		Permeability and Accessibility	+	Qualitative
29	managerial	Arid Lands	-	Qualitative
30		Legal Brownfields	-	Qualitative
31		Resident Participation	+	Qualitative
32		Participation Of Investors And Cooperatives	+	Qualitative

SUSTAINABILITY ZONING MAP OF GOLSHAN DISTRICT

The procedure of determining the urban fabric sustainability in Golshan district has been done for the six categories: physical, ecological, social, economic, functional and managerial. Sustainable and unsustainable regions were extracted using data analysis. The first step

was assigning weights to each of the parameters for elaboration of their impact, and in the next step weighting and data calculations were operated with SPSS software. After calculating the standardized values of each indicator, via entering them into an Arc Map database, zoning has been done for all of criteria. The values were summarized and zoning summary was done. In the last step of summing up the data, the spectrum of sustainable and unsustainable areas was drew out. The production of this process in the shows the level of sustainability for each parts of Golshan district. This process can be developed and used in a hierarchical process from small to large scale on other urban fabrics considering indicators localization. Figure 5 illustrates the final output of sustainability map for Golshan district's urban fabric.

Figure 5. The Summary Map of all Sustainability Indexes for Golshan District (Akbari Motlaq, 2013)



CURRENT STATUS ANALYSIS OF GOLSHAN DISTRICT

To illustrate various aspects of the existing urban fabric in Golshan districts based on sustainability zoning map, its strengths and weaknesses are summarized in SWOT table format with Trent method, shown in figure 6.

Figure 6. SWOT Analysis of Golshan District Current Status (Akbari Motlaq, 2013)

Weaknesses And Threats (Unsustainability)	Strengths And Opportunities (Sustainability)
<ul style="list-style-type: none"> * Extreme physical exhaustion in Golshan district Increased concerns about projects * Due to lack of proper maintenance of buildings, durability is reduced * Lack of inspiration * Renovation caused lack of vernacular organic architectural texture arrays * The low level of new high-quality constructions * Converted villas to apartment buildings is in conflict with traditional norms * Small spaces and buildings ignored urban design and architectural desirable qualities * Passive defense and crisis 	<ul style="list-style-type: none"> * Ability to develop local materials usage based on new technology of building * Ability to maintain the structure of organic urban fabric with routes widening * Presence of vernacular architectural arrays in old buildings * Advantages of the thatch facade of the historical buildings * Improvement possibility of the construction quality used ecologically compatible materials * Presence of safety rules for construction of new buildings * Ability to take advantage of

management in new construction is overlooked

- * Disregarding of the local climate and the optimal proportions
- * New buildings incorrect orientation caused by aggregated land parts
- * Legal high density building credit selling clashes Golshan historic urban fabric's form
- * Lack of urban infrastructure
- * Lack of adequate green space as the city lungs
- * Lack of open green spaces and urban public spaces
- * Noise and air pollution
- * Intelligible/undefined terms of citizen participation
- * Golshan district poor landscape
- * Lack of city signs and indicators
- * Lack of interest in the preservation of historical buildings
- * Unfair distribution of urban facilities
- * The conversion of residential areas to business centers
- * Incorrect distribution of urban land use
- * The presence of adverse land use
- * Poor access to traffic roads
- * Lack of access to many land units
- * Access break off to some land parts because of the assembly
- * Low rate of public transportation safety
- * Poor access to public transportation
- * The streets were full of cars parked on the lack of parking
- * Lack of access to markets for residents daily needs
- * Lack of integrity of pedestrian street network
- * No bike network
- * Lack of strong center and public gathering place Golshan district
- * Distribution of tourist center accommodations in the residential parts of urban fabric
- * No low-cost housing facilities establishment for the new generation of Golshan district
- * Insufficient awareness about urban residents' rights
- * Reduced sense of indigenous population growth
- * Lack of adequate security and public oversight on public spaces
- * Weak economy and the large number of households living below the poverty line
- * Replacing the native population with increasing rate of immigrants
- * Changes in the age structure of the population
- * Lack of adequate funding for the education of children and youth
- * Lack of sufficient trust between residents and national/local governments
- * Lack of a sense of participation among Golshan district's residents
- * Forgotten Golshan district and neighborhood cultural norms and traditions
- * Reduced growing of community unity
- * Lack of an integrated management system
- * Brownfields increase

the climate as a factor in reducing energy consumption in buildings

- * Ability to upgrade the quality of the historic urban
- * Ability to repair and refurbishment and re-use of derelict houses
- * Trends toward urban fabric congestion
- * Ability to prepare local detailed designs programs based on the theme of the historic urban fabric of downtown
- * Possibility to take advantage of the promoting organic urban fabric mental perspective of residents and tourists
- * Ability to establish harmonious facade during renovation and improvement of historic urban fabric
- * possibility of identifying buildings' facade united style
- * Ability to define religious institutions such as mosques as a sign of Golshan district
- * Possibility to increase residents' sense of belonging to the Golshan District with an emphasis on identifying elements
- * Historical religious character of Golshan district
- * Possibility of viewing taxa based on vernacular architecture
- * Possibility of unused land change to green and public open spaces
- * Souvenir and handicraft shops as an economic potential
- * Creation of parking areas on unused land parts
- * Presence of several tourist services centers
- * Ability to create local participation centers for land aggregation
- * Ability to define old buildings as tourist centers
- * Ability to provide a tourism biking service
- * Closeness of Golshan district with pilgrim centers
- * Possibility of traffic network improvement based on urban fabric's land rearrangement
- * Possibility of mixed land use planning
- * Inspiration about local commercial presentations
- * Ability to reduce noise and air pollution by promoting green lands and increasing public non-fossil fuel transportation
- * Ability to define pedestrian oriented streets network
- * Possibility of Safety improvement for pedestrians and bikers
- * Ability to define the unified pedestrians and bicyclists network
- * Presence of modern communication technology infrastructure
- * Rising rate of awareness among citizens via mass media
- * Ability to provide affordable housing for new generations

CONCLUSIONS

Experts pointed out that the theory of sustainable urban development is an attempt to find a strategic solution for the city, in order to protect the environment in the whole world. This study indicates the possibility of applying the principles of sustainable zones within unsustainable parts of urban fabrics, and its usage to promote sustainability in urban areas. This research is in line with a key question: How can we bring the principles of sustainability in urban fabrics in order to improve that in less sustainable and unsustainable areas? So when sustainability is considered essential to achieve urban communities improvement, it is also significant to be noted for urban fabrics, and the powers of municipal plans and programs get their terms and Conditions validity from environmental impacts analysis (Curwell, 2009).

The analysis of the Golshan district sustainability summary map highlights some tips about sustainable and unsustainable zones. This set of points are focused on historic urban fabrics resident's needs, which requires a special understanding of the citizenship concept based on democratic planning and urban programs (Papoli, 1990). On the basis of these principles and objectives towards sustainable urban development three items can be declared: community integrity, social equity, and the public facilities (Piran, 1992).

Cultural strategies arise in social programs, and to revive and strengthen the trust between citizens and governments should be initiated as a primary key; to protect what the integration of government agencies and public space (especially in the city's civic centre) has been remained with it. Initiatives such as the promotion of cultural activities, development of social-economic spheres, recreational and leisure construction of public spaces, restoring mobility in urban areas, urban vitality to inspire indigenous generation stay, should be injected in soul and body of urban fabrics in order to promote sustainable urban development.

OFFERS TO PROMOTE SUSTAINABILITY IN HISTORIC URBAN FABRICS

According to the 22 issues of the National Building Regulations, as administrative legal documents and considering their significant impact on the design process of urban constructions, it was necessary to scrutinize their contents to adapt them with attained sustainability principles from Golshan district. The extraction of topics related to physical changes through urban design, comparative analogy was done and some additional offers were presented as supplementary. As said by the study, one out of 22 subjects in the National Building Regulations found in direct relation with historic urban fabric physical changes, which is the fourth volume: General Requirements of the Building. The fourth issue of the National Building Regulations is a guideline for building placement permits in urban areas, regulations of open spaces and procedures related

to different cases, and the minimum required spaces for light and ventilation. An important part of these rules are about frameworks, while in some cases they are in direct contact with an organic urban structure. The most important legal topics, which are associated with the historic urban fabric changes, are listed in figure 7 with their related supplementary.

Figure 7. Regulations and Supplementary for Historic Urban Fabrics Sustainable Development (Akbari Motlaq, 2013)

Classification	Regulations	Recommended Supplements
Requirements of adjoining buildings and spaces	During the operation, the usage of building should not be defined in contrary to the principles of urban development. Variant referee detector are municipalities and other related authorities (N.B.R., 2009). The possibility of building placement and adjacent land uses should be defined in urban development projects are anticipated (ibid.)	Master plan report for the old organic urban fabrics should be prepared with respect to the organic structure based on the minimum standards as widening streets, building occupancy and proximity to existing body, mass changes should be proposed to the local council for voting.
	Neighborhood buildings shall be done in such a way that the transparency and perspective to the other buildings through windows or doors, reduced to a minimum (ibid.). Entrances and other areas within the residential neighborhood must somehow be hidden from strangers and sight to the interior spaces should be limited to a minimum (ibid.).	Increase of building density in organic urban fabrics should be based on the average height of the surrounding buildings, and in case of the openings view to neighboring buildings neighbors should be satisfied.
Requirements of the building placement on land	Construction is allowed on the grounds with accessibility to public transportation (ibid.). The grounds with only access to foot paths, construction is restricted to groups of 1 to 3 (7.3 to 8.5 meters height) and is permitted if it is possible to access on emergency (ibid.).	Old building in organic urban fabrics should be restricted to groups of 1 to 3 and integrating of land parts must be done with respect to the neighbors' access, given the building permit have to declare widening rules.
	The height of the building and its placement should be in terms of the historical contexts and cultural heritage, Tourism and Handicrafts is (ibid.).	Cultural Heritage, Handicrafts and Tourism Organization in cooperation with the Municipality are obliged to provide detailed design and planning, and business ideas centered on the historic social-cultural values, regarding urban fabric development, and local participation.
	Principles of urban development projects in relation to the construction site, building envelope volume, congestion and infrastructure building requires the permit (ibid.).	Detailed design of the building and number of floors and urban fabric density should be done carefully, and be clear for all, and should be put to public vote.
	Principles of urban development projects relating to building facade and	Physical optimization for old buildings (greater than 25 years) in the organic

	orientation of the ground should be applied according to climatic conditions and in compliance with the nineteenth volume (saving energy) (ibid.).	urban fabrics should be done in a prosperous collaborative process with government agencies and the owner of the building.		main living spaces of two independent residential occupancy, reach light and air from an inner courtyard, their windows should not be placed in less than 6 meters distance (ibid.).	construction or modification of historic organic urban fabric, subject to compliance with the intervals of the proximity of other buildings.
	Specifications on the ground floor: 1- in harmony with streets' outline, neighborhoods and the urban landscape, and elimination of irregularities 2- above the floor or the ground access to neighboring streets should be in harmony with the general height 3- vain excavation and embankment should be prevented. Determination of the floor line and the necessary correction should be approved by authorities with the provisions of the National Building Regulations (ibid.).	Any modification to the design of buildings and floor plans must be adapted within the organic urban fabric, using local, environmental materials.		In all buildings, entrances and stairs should not exceed 10 cm of ramp in pathway (ibid.).	Owners applying for a new building in the old organic urban fabric is required at both building entrances and windows with 20-50 cm dents.
	Height limits breaking in the specified groups, need a special permission from the municipality and other authorities (ibid.).	Owner's request to build out of the old organic urban fabrics boundaries of 1 to 3 groups, should be put in voting in local planning council.		Outer edge of the projection and its extensions (such as paintings, drawings, etc.) should be less than 90 cm away from the edge on the roadway (ibid.). Lean and overpass creating between buildings and streets on the side streets, could be done with the permission of authorities if the minimum height of 3.5 m are observed (ibid.).	If there is a lean on the old pathways of organic urban fabric, the owner is responsible for cooperating with municipality to strengthen it and create a minimum height of 2.5 m.
Requirements of building height	Buildings should be designed and implemented in harmony with landscape, street, neighborhood, cultural manifestations, and valuable characteristics (ibid.). Buildings should be designed so that the form, scale, materials, color and size proportions be harmonious with the environment (ibid.). Suitability of buildings and urban elements identified in the above paragraphs should be approved by authorities (ibid.).	The base of new buildings' design in old organic urban fabrics, is local archetypes and materials. Suitability of the building, must be approved by the organization of local planning.		In grand parking besides pedestrian crossing should be considered a minimum width of 60 cm, which is at least 20 cm above the roadway crossing (ibid.).	Owners applying for a public building such as hotels, motels and restaurants, while providing ample indoor parking area, it is necessary to comply with the standards for outdoor parking.
	Exterior building materials shall be designed in accordance with approved standards and urban design guidelines, in the absence of regulations it can be done based on previous occasions (ibid.).	Building facades should be related to urban design criteria: color, material, proportion and pattern; to fit with the detailed design of old buildings of organic urban fabric.		In all buildings, protection against rain, rainfall and soil moisture is required. Flat roofs, porches, floors in contact with moist ground floor, floors and walls in contact with the ground damp basement walls, floor and walls, ponds and water bodies should be insulation. Inclined, curved roofs and domes and shots which are vulnerable to seasonal changes, should be protected in a suitable method (ibid.).	Municipal shall, in cooperation with local planning council and homeowners, insulate the old buildings, especially for poor households with support packages. Local planning council is responsible for working with owners of valuable buildings to protect them.
Frontage requirements	All exterior surfaces of buildings, in terms of safety and beautifying the urban landscape must be maintained in good condition. All exterior walls are actually exposed to atmospheric conditions, should be free of holes and gaps and additional rusting materials. Hanger Attachments to structure, including canopy, signs, escape stairs and external staircases and chimneys should be kept in good condition and their connections should be secured (ibid.).	Building owners are obliged to clean their buildings' facade and local governments should monitor their conditions quarterly and alert in case of unsuitable situation.		Surface waters, according to the National Building Regulations 16th topic in stations, should include the appropriate surface water disposal system (ibid.).	Detailed plans for the disposal of surface water in narrow streets should consider the prevention of erosion.
	All side walls that enclose all levels and yards with direct view must be designed (ibid.).	Owner is responsible for the approval of building design for visible facades from the street by an urban design expert.		All the walls of the buildings, due to withstand against quakes, as 6th volume of National Building Regulations and Building Earthquake Regulations (2800) declared, must be observed (ibid.).	City council is obliged to identify vulnerable buildings during the six-month period and inform municipality to grant facilities to the owners.
Requirements for urban enclaves	In some cases where the	The building permit for the		All doors and windows should be consistent with the National Standards (ibid.). Exit doors and windows, and emergency access which are used in fire and earthquake must be built with resistant materials and in compliance with the provisions of the 3rd volume of National Building Regulations (the protection of buildings against fire) (ibid.).	Old doors and windows fit in accordance with the general proportions of organic urban fabric, should be proposed for improvement of cityscape. Access to emergency exits in all buildings with a narrower approach than 6 meters is required.
				Window placement in locations that are out of provisions limits of view to	All windows on the second floor or higher must be at least 1.5 meter higher and
			Requirements of the projection		
			Requirements of vaharta narkhina		
			Sewage disposal requirements for insulation of buildings		
			Requirements for Building Enclaves		
			Doors and windows		

Construction requirements for protection against accidents	courtyard and adjoining buildings shall be prohibited (ibid.). If possible, in case of indoors view from outside, window placement will stay above the recommended height (ibid.).	the window should include shelf with at least 20cm.
	Door and window dimensions and manufacturing of modular buildings is recommended (ibid.).	The use of specific module for creating facades of old buildings should be emphasized.
	Windows, entrance doors and basements of all buildings should be designed in such a way that the safety of residents be provided (ibid.). In all buildings, the provision of safe exit routes in accordance with the 3rd issue (protecting buildings against fire) is needed for emergencies (ibid.).	Providing access to land parts with 6 meters or narrower passages access, should be considered as the executive local council priorities to define the detailed design historic organic urban fabric.
	Buildings should be designed in such a way that does not harm neighboring buildings and structures in earthquake. Provisions contained in the 6th volume (loads into the building), especially the embedded discontinuity gap is required between buildings (ibid.).	Creating embedded discontinuity gap between old buildings, especially those with central courtyard or orangery, is a priority based on detailed design program in collaboration with the local council and the owners.

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