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Increasing the efficiency of worn-out urban fabric areas with an emphasis on the segmentation of buildings in the 4th district of Tabriz in Iran

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Keywords

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Tabriz
Buildings segmentation
Efficiency

Abstract

Today, residential units are the most important building blocks of cities, which occupy larger land in comparison with other uses. In the dilapidated context, the majority of the existing land use is dedicated to residential plots, but the existing dwellings in this context are not very efficient and even fail to respond to the residents' need for housing as a place of residence and peace. The purpose of the current research is to investigate the effectiveness of increasing the efficiency of the worn-out urban fabric areas with emphasis on the segmentation of buildings in the 4th area of Tabriz, which ends at Ostad Jafari Street from the north and Qods Street from the south. The research method used is a descriptive-analytical method and ArcGIS 10.8.1 software was also used to analyze the desired indicators (area, quality of buildings, orientation of residential parts, and compatibility of parts) of the range. The results of the research showed that in terms of the efficiency of building parts, they are in an unfavorable condition, and the criteria compiled for the modification of these structures will lead to an increase in the efficiency of buildings and residential parts compared to the situation before the intervention.

Introduction

The dilapidated urban fabric refers to the areas of the legal boundaries of the cities that are vulnerable due to physical wear and tear, inadequate vehicle access, facilities, services and urban infrastructures and have a low spatial, environmental and economic value (2). In general, reducing the efficiency of any phenomenon leads to its wear and tear. When life stagnates in an area of the city for any reason, the urban fabric of that area is in the process of wear and tear (5). The wear and tear of the tissue and its internal elements is either due to old age or the lack of development program and technical supervision on the formation of that tissue (4). Due to the poverty of the residents and their owners, these structures do not have the possibility of spontaneous renovation, and investors do not have an incentive to invest in them.

In the country of Iran, several factors have been effective in changing the living conditions in cities since 1961, including the increase in the number of urban dwellers, changes in the household situation, and changes in residential patterns caused by modernization. Kurdish (1). The effect of housing wear and tear on dilapidated structures is so great that, according to the approval of the Supreme Council of Architecture and Urban Planning, 3 characteristics are mentioned to identify dilapidated structures, 2 of which are smallness and building dilapidation related to the issue of housing (6). Improper housing in a dilapidated context is one of the reasons for creating or aggravating problems such as leaving the neighborhood on the part of native residents, reducing the sense of belonging and identity of new residents, reducing the willingness to repair and maintain housing, which has a significant negative impact on these areas (6). Also, it seems that the houses in the worn-out urban fabric have problems in terms of physical, infrastructure, zoning, arrangement of parts, density, occupancy level of the residential unit, proper lighting, etc., and in general, in their efficiency. They have lost their past efficiency or their efficiency has decreased.

In the city of Tabriz, due to its historical age, we are faced with many neighborhoods with old and historical contexts, about 43% of the area of the worn-out context of the city of Tabriz is located in region 4, where 44,613 people are settled. Therefore, the existing buildings in the study area are not in good physical condition, and the

rules and regulations of worn-out structures will lead to an increase in the efficiency of these units (3). Therefore, the current research aims to investigate the effectiveness of increasing the efficiency of worn-out urban fabric areas with an emphasis on the segmentation of buildings in area 4 of Tabriz city.

Material and Method

The collected data has been obtained through observation and recording of information, as well as from the data available in past research, official and unofficial statistics, organizational documents and documents that include maps of the studied area using Arc GIS 10.8.1 software.

The area studied in this research is a part of the worn-out fabric related to the 4th area of Tabriz city, which covers an area of about 2550 hectares, about 1.10% of the total area of the city. The minimum height of the area is about 1335 and the maximum is 1406 meters. In this way, the small difference of about 70 meters and the large area indicates the absence of slope and the smoothness of the land in this area. So, no slope and topography restrictions are envisaged for this area (3). 2137 hectares of the area of this area are located in flat and low slope lands, which is 83.8% of the total area of the area and 15.4% of all the flat lands in Tabriz city "Figure 1".

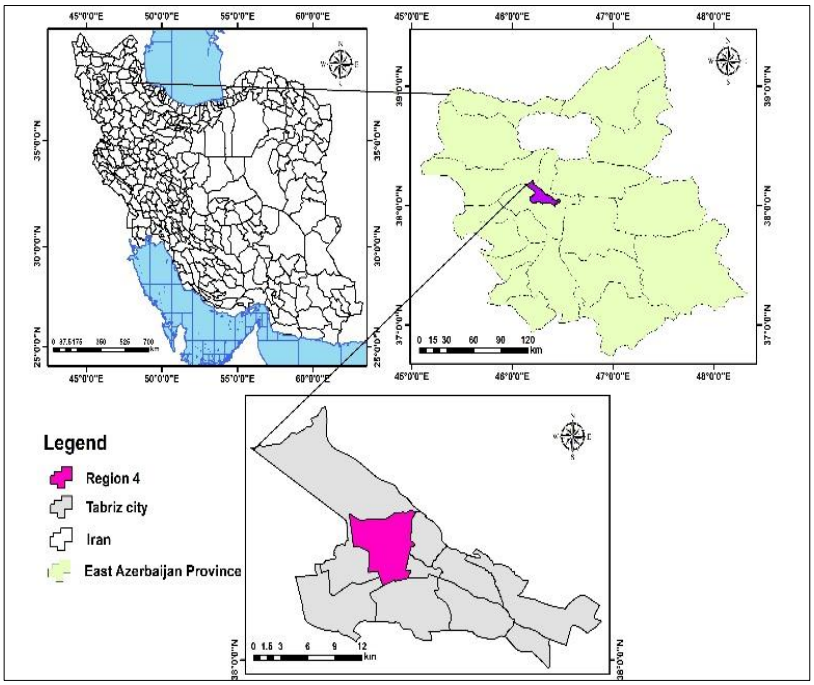

Figure 1. Map of the geographical location of the study area

Results

The area studied in this research is a part of the worn-out fabric related to area 4 of Tabriz city, which is limited between Ostad Jafari Streets from the north and Quds Street from the south, Air Force from the east and Azarbaijan Boulevard from the west. This area has been chosen as an example to measure the efficiency of housing due to its location in the worn-out context of Tabriz city. According to the calculations and estimates, the population of the studied area has decreased to 34,521 people due to the negative growth rate of region 4 in 2016. However, because the last quantitative statistics of the studied area are related to 2012, therefore, the statistics of 2012 have been used to calculate the indicators of the area. The area of the studied area is equal to 202 hectares, and the residential area of the area is 114 hectares. Among the 11,576 plots in the area, 9,801 plots or 84% of the plots have residential use. The evaluation of indicators related to residential parts are as follows:

Examining parts in terms of area

According to the information obtained about the characteristics of the area, the small size of the plots in the area is evident, so that 6726 plots, or 68.6% of the plots have an area of less than 150 square meters. The smallness of the pieces is one of the main characteristics of identifying worn fabrics in Iran. According to the studies conducted, about 46.4% of the pieces are below 100 square meters and 69.8% of the pieces are less than 150 square meters, in other words, more than half of the pieces are below the standard defined for worn texture (200 square meters). Most of the pieces are between 50 and 100 square meters. With the analysis done, it can be concluded that in terms of area, the parts are not in a very good condition "Table 1".

Table 1. Area of residential plots

Area of parts	Number	Percent
Under 50 square meters	901	9.2
Between 50 and 100 square meters	3509	35.8
Between 100 and 150 square meters	2316	23.6
Between 150 and 175 square meters	949	9..7
Between 175 and 200 square meters	800	8.2
Between 200 and 250 square meters	830	8.5
Between 250 and 300 square meters	261	2.7
Above 300 square meters	235	2.4
Total	9801	100

Orientation of residential parts

The parts in the range are divided into 2 categories according to their location: north-south parts and east-west parts. The importance of this case is from the point of view that if the proper orientation is defined for the parts, the buildings will get the best and most benefit from natural energies such as solar radiation, wind, etc. and the use of heating systems which costs the burden on the family will decrease. In the studied area, the parts are classified into 2 categories: north-south and east-west, 74% of the parts are north-south, and have a more suitable orientation for absorbing sunlight and natural energies compared to the east-west parts. are. But the east-west parts are not suitable because of keeping and directing the heat of the midday sun “Table 2”.

Table 2. Orientation of residential parts

Orientation of parts	Number	Percent
East-west piece	2552	26
North-South piece	7249	74
Total	9801	100

Compatibility of residential parts

Considering that the studied area is residential, it is necessary to measure the compatibility of other uses with residential parts. The number of uses in the area has been measured in terms of compatibility with the residential area with medium density. According to the studies, about 97.5% of the parts are suitable for residential use. Therefore, in terms of compatibility, the limited state is in favorable conditions. only 1.4% of the parts are incompatible and relatively incompatible “Table 3”.

Table 3. Compatibility of parts

Compatibility of users	Number	Percent
Compatible	11286	97.5
Relatively compatible	4	0.03
incompatible	6	0.1
Relatively inconsistent	152	1.3
indifferent	128	1.1
Total	11576	100

Quality of buildings

Among the parts in the studied area, nearly 70% of the parts are in worn and damaged condition. which indicates the poor efficiency of these residential buildings. that this wear and tear is caused by the passage of time (the age of the building), the effect of the weather, or improper and undesirable maintenance. The wear and tear of a building, in addition to affecting the body of the building, also affects the materials and resistance of the building. Therefore, the safety of buildings is reduced under the influence of the mentioned factors, and as a result of any natural or human accident, there is a possibility of damage to the residents, so the house and housing, in this case, lose their efficiency as a safe place for comfort and convenience “Table 4”.

Table 3. The quality of the building

Quality of building	Number	Percent
Under Construction	132	1.3
Worn out	6725	68.6
Can be kept	1688	17.2
Ruined	54	0.6
Restoration	205	2.1
Newly built	997	10.2
Total	9801	100

Discussion

Today, due to the increase in population and the development of cities in areas where the cities do not have enough land for development due to various reasons, such as natural obstacles, worn-out tissues are considered as urban potentials for development, and the ability to plan and provide land and develop the city in this There are contexts. Therefore, these contexts need to be identified, planned, and regulated, and rules and laws and implemented.

Conclusion

In dilapidated contexts, many facilities and spaces are old and dilapidated and need to be reconstructed. Many new facilities for life have not yet been created in these areas. Therefore, these contexts are facing a lack of living and welfare facilities. Due to the unfavorable economic situation, the residents of these areas often cannot solve these problems, and due to the lack of economic efficiency, the private sector is often unwilling to invest in these areas. They have lost their usefulness for their old inhabitants and gradually the inhabitants have migrated from these contexts.

The rapid growth of today's cities has turned housing into one of the acute issues facing development. What was considered in this research is the physical problems faced by worn-out urban tissues. The physical weakness in the worn-out tissue includes the weakness of the housing's physical condition, so weakness will be felt in the indicators that affect the efficiency of the housing. In the first step, the weak efficiency of housing will affect the residents in meeting their needs. Because housing as a bed for human life is in interaction with other dimensions and needs. Therefore, the need for intervention programs and criteria will be felt in worn-out tissues. However, the lack of consistency in the regulations for worn-out fabric and the lack of monitoring of the implementation of these rules has caused the problem of wear and tear in urban fabrics to remain practically unanswered.

According to the studies, the housing in the dilapidated context is in poor condition both in terms of the indicators related to the plot and the residential building, so it is necessary to pay attention to the components related to the residential plots. Also, in the renovation of old structures, the category of culture and climate should be prioritized in improvement and renovation projects.

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