CASE STUDY

The Role of Flexibility and Adaptability in Extending the Lifespan of Traditional Houses, the Case of Sabzevar, Iran

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ABSTRACT

A house is not primarily a solid building; it is a system of activities. It has to accommodate a broad range of diurnal and nocturnal activities throughout the entire year, and this can best be achieved by means of a flexible spatial configuration. Any changes in the house users and their needs affect the space requirements, but we cannot predict and control these processes.

This (case study) paper focuses on fourteen traditional houses in Sabzevar (a city in a hot and arid region of Iran) that are/were registered on the Iranian national heritage list. Due to rapid economic development in Iran during the past decades, changing lifestyles and the inability of the authorities to preserve the historic buildings, most of the valuable traditional houses have been destroyed or have lost their original function. This study tries to explore the role of flexibility and adaptability in demolition process of traditional houses in this region.

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INTRODUCTION

The economy of pre-modern families in the central plateau of Iran was mainly based on agriculture. Since Sabzevar is a small historical city, far away from the capital, the transition from traditional to modern architecture did not take place until the first Pahlavi period (1925-1941). The current changes in lifestyle and in the economy of families from agriculture to business and administrative occupations entailed changes in spatial requirements.

Until the Qajar period, a household consisted of the extended family that comprised several generations; the grandparents, parents, married sons and their wives and children. They lived in a large house with shared kitchen, storage, and service rooms. Any changes in the size and structure of the family (such as marriage) required new spaces.

When in the last decades the structure of households changed from extended to nuclear families and smaller flats were required. With the new lifestyle, the kitchen lost its central role; contemporary houses do not need large storage or a large reception room; guests are now hosted in a restaurant. The new lifestyle calls for separate sleeping rooms for each member of the family, a place for watching television, space to work at home, and a garage for the car(s).

As long as cultural concepts and ways of living developed at a slow pace, the traditional houses could respond to these changes by modifying the relationship between spaces. A sudden increase in population,

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rapid economic growth, and change in family structures challenged this ability to accommodate. Rapid changes happened in two stages; around 1975 the municipalities commissioned a master plan for Sabzevar with the goal of widening the streets in the city and making them suitable for individual motor car traffic. The urban fabric was cut by new streets, some of the old buildings were demolished and the layout of the existing neighborhoods was changed. The second phase began around 2000 when the common types of courtyard houses were replaced by multi-story apartment blocks. There are many traditional houses that require a higher level of flexibility to cope with and adapt to these rapid changes.

Research Methodology and the Cases

Case study research is essentially a mixed-method strategy because here the researcher investigates the cases from different points of view by using various methods. Since the house is a place for human activities; it cannot be viewed independently from its context and users. The use of a mixed methodology that integrates qualitative and quantitative techniques has become increasingly popular since the 1980s [1]. The combination of qualitative and quantitative methods (mixed methodology) can provide more nuanced results on the issues being investigated. Looking at a case from multiple points of view (triangulation) improves the accuracy of research [2].

This study more uses the logical and historical research. The historical research is a study on a particular topic that has happened in the past, 'because the "something from the past" is not empirically accessible' [3]. In this kind of research, the researcher tries to obtain the right insights through data collection, evaluation and verifying the information. This study analyses different historical research material such as old photos, plans, and maps to consider the traditional houses in their real context in the past.

Logical argumentation is a complementary research method along with other methods, for this reason, in the literature it is known less as a research method. As an example shows categorizing, the data obtained by any research methods are often based on logical argumentation. But researchers usually do not call it logical research and would only typically mention the method(s) that helped them to collect data [3].

Figure 1 shows the targeted houses ordered

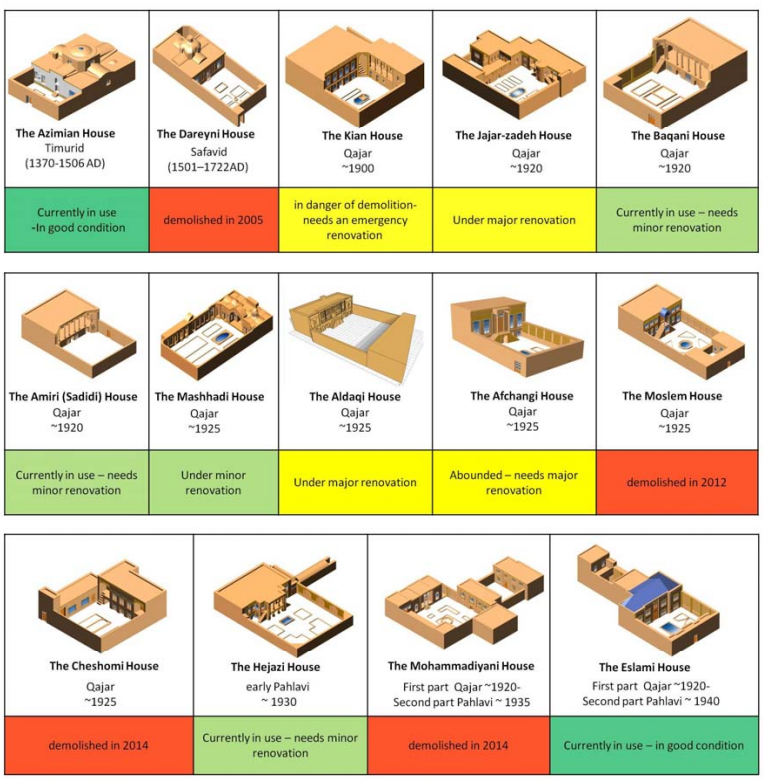

Fig. 1: Traditional houses of Sabzevar (the cases)

chronologically. They represent the last examples of the autochthonous architectural style (Isfahani) before the emergence of Modernism in Iran.

Flexibility and Adaptability of Traditional Houses

In general, the potential of change is described in terms of flexibility and adaptability. These two words are sometimes confused or used synonymously in the literature [4] [5].

Usually, researchers and architects use "flexible" for physical changes and "adaptable" for non-physical changes [4]. Steven Groák (1944–1998) proposed a distinction between these two terms; he defined "adaptability as capable of different social uses and flexibility as capable of different physical arrangements" [6] cited by [5].

Using a space in a variety of ways without making physical changes refers to the adaptability [4], and according to the Groák's definition the flexibility is achieved by modifying the physical form of the building; by joining, splitting, extending, and merging spaces [5].

Almost all the researchers working on traditional Iranian architecture mentioned the flexibility and adaptability of residential buildings in their studies, but there are not many comprehensive studies that specifically focus on these very aspects. Alireza Eini Far (2003), in a research project, examined the aspects of flexibility in pre-modern Iranian houses. He describes three types of flexibility. The first one is multi-functionality. He argues that by using a space for different purposes, reducing the access spaces, and using rooms in a way that facilitates the functional changes traditional houses are able to increase their flexibility. The second factor is versatility (adaptability) that means the use of different spaces at different times, which takes place in two ways, i.e., daily movement between the ground floor and first floor and seasonal movement between the summer zone and winter zone. And finally, there is changeability, which refers to the ability of a house to be expanded in response to new needs or be broken down into smaller units (divisibility) [7].

The studies of the relationship of different spaces in the individual buildings (cases) by means of the Space Syntax methods confirm that an important of the houses regarding flexibility is the maximum selective connectivity between rooms. Thanks to a large number of openings (doors) to the rooms the residents can alter the arrangement of the spaces if the need arises. The most integrated spaces with maximum connectivity in all of the cases are the courtyard and the central domes of the Azimian and Dareyni houses.

The following chart (Figure 2) compares the mean connectivity of all spaces with the mean connectivity of main rooms. There is no significant difference between the mean connectivity of houses; they range from 2.82 (Hejazi) to 2 (Dareyni). However, there are remarkable differences in the mean connectivity of the main rooms; they range from 5 (Mashhadi) to 1.57 (Eslami). Figure 2 classifies the houses according to the average connectivity of main rooms.

There are only two main rooms in the Mashhadi house with five openings to each room. Three different ways provide access to the rooms; from the interior vestibule, the Eivan, and the courtyard. The Mashhad

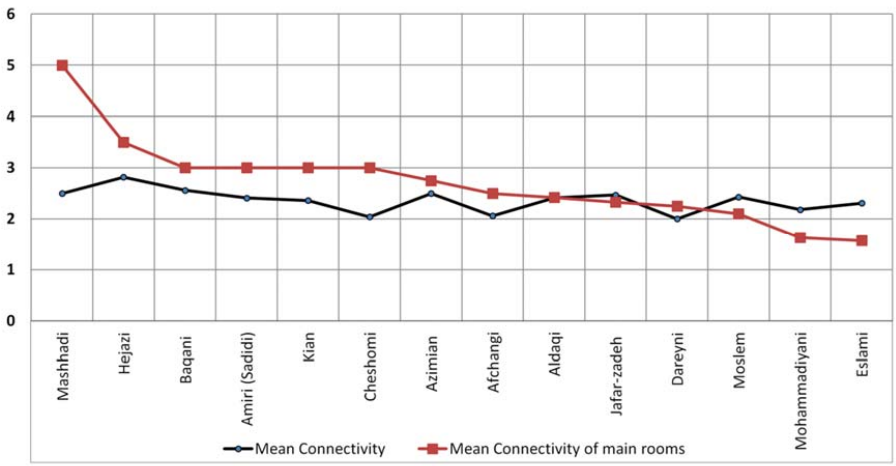

Fig. 2: the average of doors (opening) to each space and room

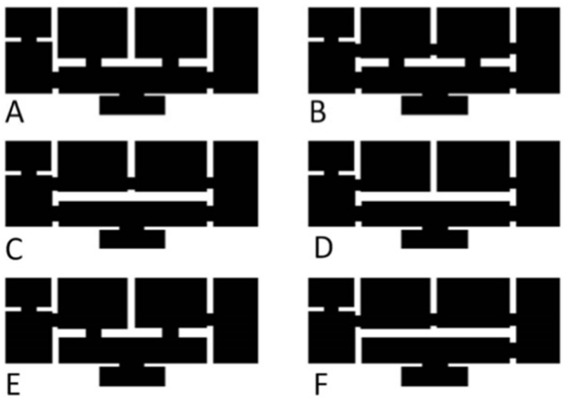

Fig. 3: Some possible scenarios for the first floor of the Aldaqi house [8]

building is an exception among the houses, being a large building with only two living rooms. The Hejazi house ranks second; it is a large house with twelve rooms with an average of 3.5 doors to each room. The Baqani, Amiri, Kian, and Cheshomi houses with an average of three doors to each room rank third. Two houses from the Pahlavi period, Mohammadiyani and Eslami houses, with a mean of 1.63 and 1.57 doors to each room rank lowest. It can be concluded that the organization of rooms changed from nested spaces to independent rooms in the Pahlavi Period.

Due to doors between all adjacent spaces, the spatial configuration of rooms could easily be changed. Some of these possible alternatives are presented in the following graph. (Figure 3)

A: Each room is separately accessible and can accommodate family members or guests.

B: Maximum spatial permeability by opening all doors and connecting the rooms to the veranda

C: Individual rooms distanced from the veranda.

D, E: Subdivision to create two independent units for living (or working); or the family opts for compact living in hard winter, only heating two rooms and leaving the other rooms unheated [8].

F: Even extreme scenarios are possible.

The multifunctionality of spaces (rooms) is another common characteristic of traditional houses in this region. Traditional Iranian houses are a space-based system as opposed to furniture- based; there was no fixed furniture in the rooms, so the residents could easily change the function of rooms as needed. It is important to mention that this strategy arose from the simple traditional lifestyle before the modern period. Nowadays people tend to cook in fully equipped kitchens with fixed shelves, refrigerators, and cooking equipment or sleep in a bedroom with large beds. It means that the buildings studied here were flexible buildings in their own time, but it should not be expected that now with the new needs of residents this strategy works as in the past.

Demolition Process

The following charts (Figure 4) depict a general lifecycle scheme of buildings. Non-flexible houses shortly after construction reach their maximum performance. Then due to the increasing age of the building, as well as the changing needs of users a downward trend begins. This process continues until the building value falls below the price of the land plot. After this critical point, the house is: in danger of being demolished because it is profitable to tear the old building down and replace it with a new one. Flexible buildings can be adapted to the new condition

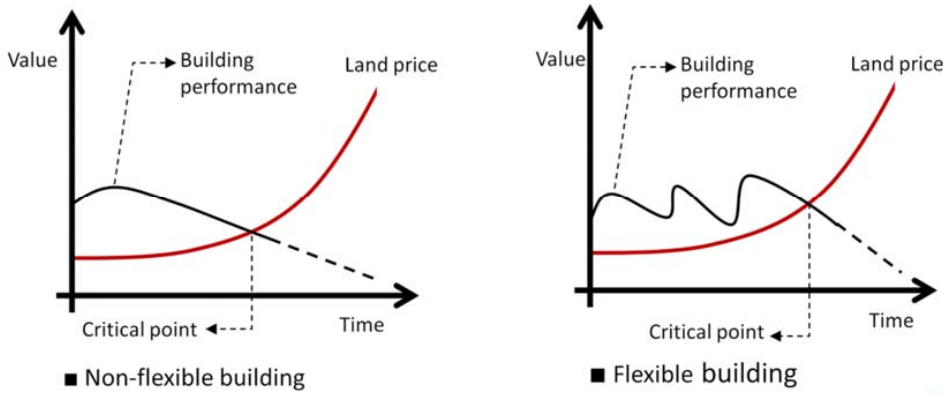

Fig. 4: the life analysis of flexible and non-flexible buildings

with minor changes. This changeability helps residents to use the buildings for a longer time.

The following diagrams Figure 5 shows what will happen to an old building when it does not meet the needs of residents. There are two options: renovation or demolition.

The value of the renovated building must be more than the sum of the land price and renovation costs. Otherwise, the renovation is not cost-effective, and the landlords will think about demolition.

The costs of replacing an old building with a new one include the demolition costs, costs for building permits, and construction costs. As soon as the value of units that will be built exceed the sum of the land price and other costs, the demolition alarms will be rung.

New lifestyles require new spaces; residents nowadays prefer closed spaces for moving between rooms and building floors and demand private toilets and bathrooms. It requires a lot of proficiency, inventiveness and architectural sensitivity to integrate internal staircases and wet rooms into the old structures without destroying the proportions and beauty of the main spaces. Especially the service spaces lend themselves to accommodate these new facilities. At best, there is a vacant lot available where stairs and sanitary spaces can be built. This layer can also serve to another extended layer. (Figure 6)

As in previous methods, the value of the renovated and added building (house expansion) must be more than the sum of the price of the old plot and the added land, renovation costs, building permits, and

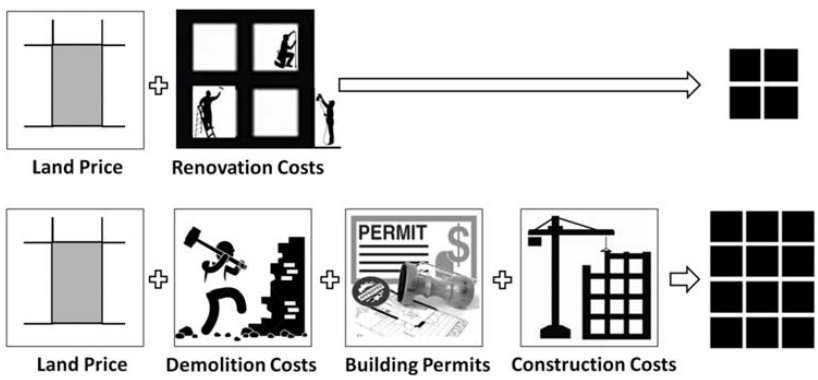

Fig. 5: renovation or demolition

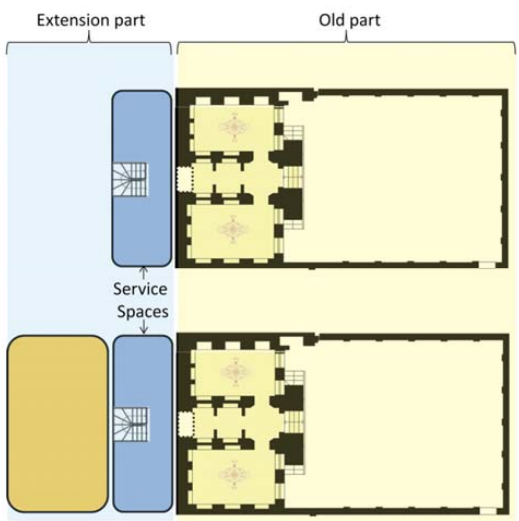

Fig. 6: adding new service spaces to the Afchangi house

construction costs. (Figure 7)

The old houses need a higher level of flexibility to overcome the steep increase in land prices. In all of the above examples, the value of the renovated or added buildings is a main determining factor in preserving old buildings. One way to increase the value of a building is changing the function of it. One useful strategy can be to modify the function of the building from residential to commercial. This change increases the value of the building; such a move can also serve as a way to motivate the owners to maintain the buildings. (Figure 8)

The higher scale of multifunctionality allows changing the function of a part of a building or the entire building. Some of these houses have experienced these changes in their lifecycles. A wing of the Aldaqi house was converted from storage spaces into commercial premises. By changing the lifestyle of the Aldaqi family from agriculture to business around 1960, they changed the function of the eastern side of the house, with the storerooms now becoming shops. Business in the shops and renting out some of them were and continued to be a stable income source for the family (Figure 9). For this reason, the house owner had no problem paying for maintenance of the building until 2005. The building is located on a main commercial street in the city center. Direct access to the street and the flexible spatial configuration of the building allow for changes in the way the building is used. Given a large number of spaces (rooms) in the building, the house can be transformed into a large office. Currently, negotiations are underway between the Aldaghi family and the municipal authorities that, if possible, the site can be leased to the municipality (based on an interview with Mr. Aldaqi's daughter). The ground floor can be used as a small exhibition hall, and the first floor can be converted into an office. The building has the potential to be changed to a stand-alone commercial unit.

The Kian house is another example of a flexible house, it is currently used as a residential building, but the ground floor has been abandoned and the left external staircase destroyed. In general, the house is in danger and needs urgent conservation. Due to the high cost of conservation and maintenance of the building, the house owners who have inherited it have not made any effort to restore it and use it as a house. In fact, residential use of the building is not cost-effective anymore.

Once, in 1907, the house, which was originally a residential building, was turned into a commercial one (bank office). Now again, after around a century the house needs to be restructured for a new commercial use. Two large halls (Talar) and several supporting

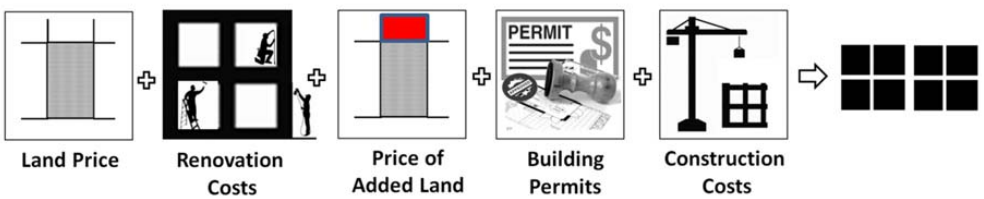

Fig. 7: House expansion costs

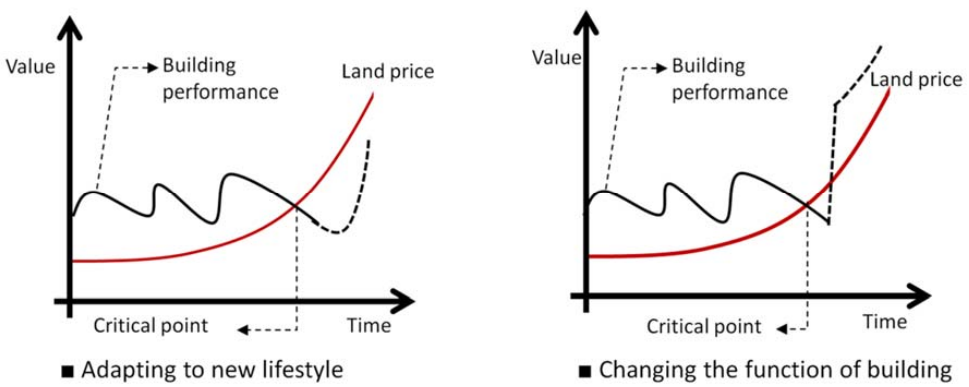

Fig. 8: different levels of changes in flexible buildings

spaces with flexible spatial configuration enable the building to be rearranged to serve as a private art gallery or a small museum (Figure 10). The building, such as Aldaqi house, has the potential to be changed into a standalone commercial unit and it could also be one of the main buildings in the network of old constructions.

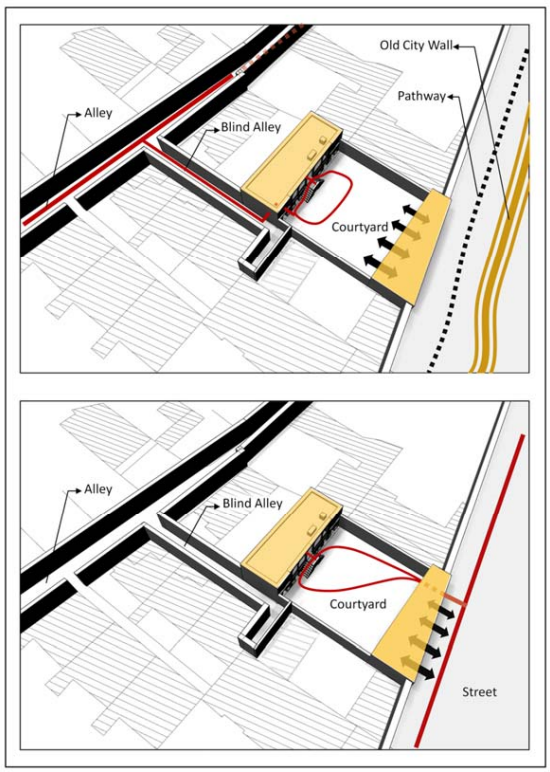

Fig. 9: changing the face of the rooms and transforming them from storerooms into shops in around 1960

The Eslami house was used as a private school for two years before 2000 after which it was used again as a residential building [9]. In 2015, the Sabzevar Municipality rented it out and turned it into the 'Sabzevarian Artists Forum'. (Figure 11)

The functions of Mashhadi and Jafar-Zade houses have been modified several times and were used as an office and cultural building in different periods. The study on the traditional houses in Sabzevar confirms that multi-functional buildings can survive better than mono-functional ones.

RESULTS AND SUGGESTIONS

In all of the above calculations, there is a missing factor, namely, the cultural, historical and social value of the traditional building. The first duty of municipal authorities, Cultural Heritage Organization, NGOs and elite people is to make people aware of this valuable factor. The Azimian house is a successful example that shows how a wealthy family can preserve an old house with some cultural awareness. In addition to public awareness, public funding for restoration is a motivation for house owners.

The current laws do not allow house owners to modify the function of their houses, to make major changes in the buildings that are registered in the list of Iranian cultural heritage.

By removing administrative barriers and rigid legal rules and providing some financial incentives, local authorities can encourage the house owners to preserve and maintain their buildings. If people found that registration of a house on the cultural heritage list is beneficial to them, they would welcome it.

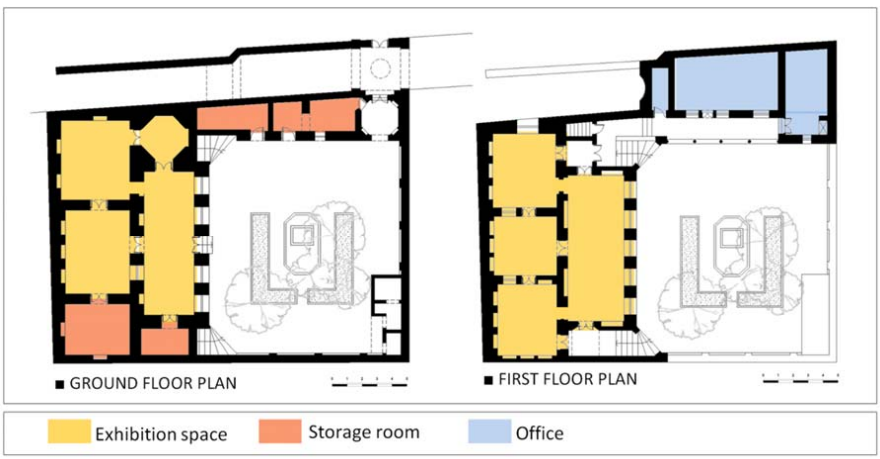

Fig. 10: a proposal for changing the Kian house into an art gallery or a small museum

Fig. 11: opening ceremony of Sabzevarian Artists Forum in the Eslami house (Sabzevar Municipality, 2015)

Some of the large traditional houses in Sabzevar such as the Aldaqi, Hejazi, Eslami, and Jafar- Zade examples have the potential to be converted into stand-alone commercial units, but the use of small houses as commercial units is not so cost-effective for the house owner. All of the traditional houses in Sabzevar could be united under a single management. In this model each building supports the others, thus reducing operating costs and increasing the variety of functions.

Flexibility and multi-functionality were the main features of the buildings that have proven conducive to changes and protection from demolition. Once again, these two factors can be used for planning the new network of traditional houses.

Possible alternatives to residential use include uses as a boutique hotel, restaurant, conference space, art gallery, a small museum, educational and cultural center, a workshop for production and supply of handicrafts and similar functions. Due to the fluctuations in the number of visitors in different seasons, the functions of the buildings must be flexible. For example, the spaces can be used for tourists in the high seasons and provide services, e.g., organizing local festivals, cultural exhibitions, and educational workshops to the local people in the low seasons. This strategy increases the flexibility of the system with respect to unknown and unpredictable changes in the future.

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