JSACE 1/30

Evaluation of Adaptive Reuse in the Context of Sustainability: Cases from Kastamonu, Türkiye

Received 2022/01/20

Accepted after revision 2022/03/28

Evaluation of Adaptive Reuse in the Context of Sustainability: Cases from Kastamonu, Türkiye

Filiz Karakuş

Ankara Yıldırım Beyazıt University, Faculty of Architecture and Fine Arts, Department of Architecture, Dumlupınar Mahallesi, Esenboğa Külliyesi D-Blok Esenboğa/ANKARA

*Corresponding author: **fkarakus@ybu.edu.tr, ferdemir06@gmail.com**

http://dx.doi.org/10.5755/j01.sace.30.1.30555

Abstract

Changes in today's living and comfort conditions negatively affect the use of historical buildings in accordance with their original functions, and as a result, these buildings can become idle. It is very important to preserve and maintain the original identities of historical buildings, as they carry the accumulation of the period in which they were built, which is an important element of the urban identity. With the adaptive reuse method, historical buildings that have lost their original functions are given a function again, these structures are revived, and their sustainability is ensured. This study uses the survey data of five historical khans in Kastamonu to reveal the success of adaptive reuse practices and their contribution to the sustainability of the historical environment. It includes analyzes made in the sample area, on-site examinations and observations, archive and literature review. The research shows that some of the adaptive reuses are made without considering the spatial and structural features of the existing structures and that the applications are not suitable for the material and color texture of the structures. For this reason, adaptive reuse studies should be well analyzed and implemented by authorized institutions and organizations both in the project and restoration stages. The study is important in terms of determining criteria for evaluating adaptive reuse in terms of international standards and evaluating adaptive reuse applications in Kastamonu historical city center within the framework of these criteria and emphasizing the problems.

Keywords: adaptive reuse, conservation, khans, Kastamonu, sustainability.

Introduction

The structures, which make up the traditional architecture and historical environment, may become unusable due to various reasons such as changing economic and industrial practices, demographic changes and increasing maintenance costs (Orbaşlı, 2008). One of the ways to ensure the preservation of these structures is to adapt them to contemporary uses (Ismail and Wan, 2013). Adaptive reuse is the replacement of an old building to adapt to the current needs and environmentally friendly uses of new users (Latham, 2000). The increasing pressure of recycling costs and the growing interest in sustainability have brought adaptive reuse to the fore (Bullen & Love, 2010). New requirements brought by social and economic change make it necessary to reuse historical buildings (Arabacıoğlu & Aydemir, 2007). Today, the benefits of increasing the number of reused historic buildings in historic neighborhoods and centers are widely recognized and strongly believed to help achieve sustainability goals (Rudlin and Falk, 1999). Understanding and adopting the potential socio-economic and cultural opportunities of historical buildings, the physical and

ktu 1922

Journal of Sustainable Architecture and Civil Engineering
Vol. 1 / No. 30 / 2022
pp. 32-49
DOI 10.5755/j01.sace.30.1.30555

social textures they offer will help achieve these goals (Ijla and Brostöm, 2015). The concept of sustainability, which has come to the fore in many fields as a solution to various problems such as industrialization, urbanization, and rapid population growth, appears as Sustainable Architecture in the field of architecture. Bringing the historical buildings that have fallen into a state of idleness to use again in the living space in accordance with the determined function is closely related to the success of sustainability (Kincaid, 2002).

The Operational Guidelines for the Implementation of the World Heritage Convention (Intergovernmental Committee for the Protection of the World Cultural and Natural Heritage, UNESCO, 2008) stated that it can support adaptive reuses of world heritage assets that are culturally sustainable. Sustainability is "meeting the needs of the present without compromising the ability of future generations to meet their own needs" (WCED, 1987). In conservation practice, sustainability is the continuous use of the built heritage in a more rational way, adapting to current needs and prolonging the life of the asset (Norma and Cervantes, 2007). Sustainable reuse proposals aim to transfer the value of historical buildings to the next generations by increasing the local culture and economic level (Wang and Zeng, 2010). Adaptive reuse is also a physically, economically, and environmentally sound approach to conservation (Tam & Hao, 2019). The World Heritage Convention concerning the protection of the World Cultural and Natural Heritage (UNESCO, 1972) urged governments to adopt a policy aimed at providing cultural and natural heritage with a role in the life of communities. The desired outcome of sustainability is the management of resources to meet economic, social, and aesthetic needs and the preservation of cultural integrity (Pedersen, 2002). The most important aspect of the conservation movement today is the recycling of historical buildings by adapting them to different uses from their original purpose. Adaptive reuse contributes to our pride in our heritage by creating a bond with the past and creating an opportunity for architectural innovation and problem solving (Diamonstein, 1978). The importance of adaptive reuse is that it supports the basic concepts of sustainability by reducing material, transportation and energy consumption and pollution as well as extending the useful life of existing buildings (Gregory, 2004).

Adaptive reuse of buildings is a form of sustainable urban regeneration as it extends the life of the building and avoids demolition waste, promotes embodied energy reuse, and provides significant social and economic benefits to society (Yung and Chan, 2012). Proper adaptive reuse of a heritage building is essential to preserve its value, strengthen its qualities, reduce operating costs, and meet developer expectations (Philokyprou 2014, Strumitto, 2016). The stakeholders of heritage buildings are mainly property owners, investors, conservators, administrative authorities, municipalities, designers, local people, and related organizations (Plevoets and Van Cleempoel, 2014). Primary stakeholders with direct influence on the process and secondary stakeholders with less power should cooperate to agree on features that need to be preserved (Spanos and Goulas, 2017). Decision makers are responsible for balancing user needs with careful consideration of sustainable adaptive reuse (Strumillo, 2016; Elsorady, 2020). As stated by Fielden (2003), decision makers should take care to choose the function that will require the least interference with the originality of the building while determining the most appropriate reuse (Fielden, 2003). Therefore, the first step of adaptive reuse is to identify the most appropriate and least disruptive function to the structure. Care should be taken not to lose the original values during the adaptive reuse of the building. It should also be noted that additions that crush and suffocate the structure should be avoided.

Considering the historical khans[1] within the Kastamonu historical site in terms of adaptive reuse and sustainability is considered important in terms of conservation. There are various studies on the architecture and history of the buildings examined within the scope of the article (Gökoğlu,

1 Khans are functional structures where various goods and merchandises brought and sold, where travelers, voyagers, and traders from far aways are accommodated, and animals are sheltered.

1952; Bilici, 1991; Karabiberoğlu, 1997; Koç and Asar, 2017) and archival documents (Kastamonu Regional Directorate of Foundations) that include previous restorations and projects of the buildings. All these available documents focus on the architecture and history of buildings and do not address the issue in terms of adaptive reuse and sustainability. The study is important because it deals with adaptive reuse of khans in the historical city center of Kastamonu in terms of international regulations and charters and evaluates the issue in terms of sustainability.

Methods

This research examines the adaptive reuse of five historical khans located in the historical city center of Kastamonu. The aim of the study is to evaluate the sample structures in terms of adaptive reuse that contributes to the sustainable development of historical sites and to question the compliance of the subject with international standards. In addition, it is to help decision makers implement their management plans to protect historical structures. The study begins with a literature review on sustainability and adaptive reuse, followed by a discussion of international standards. Then, it continues with the examination of the case studies located in the commercial area in the historical city center of Kastamonu. Criteria are determined in line with international standards to evaluate the adaptive reuses applied in the case studies under consideration. The most important feature of the selected buildings is that they form the focal points of the historical environment in the city center of Kastamonu, maintain their originality significantly and have an important place in the memory of the people. Although there are other re-functionalized buildings in the historical city center of Kastamonu, examples of civil architecture (housing structures) are excluded from the scope of this study. Their presence in the historical site and commercial area has been effective in the selection of the buildings.

Determination of Theoretical Framework and Evaluation Criteria

The Athens Declaration (1931) can be regarded as the first detailed document containing basic scientific principles and recommendations for the conservation and restoration of historical monuments. With this document, the admiration for stylistic unity has left its place to respect for a historical and artistic work and its past interventions. The use of modern materials and modern techniques for the consolidation of monuments was also expressed for the first time in this document (ICOMOS, Athens Declaration, 1931). In the 30-year period after the Athens Declaration, European countries struggled with World War II, and this period taught people the importance of the unity of common values and became more conscious of preserving monuments for future generations. As a result, the 2nd International Congress of Monuments, Architects and Technicians met in Venice in 1964 to determine the principles that will guide the conservation of monuments and the Venice Charter was approved.

In Article 1 of the Venice Charter, it is stated that the concept of historical monument includes not only an architectural work, but also an urban or rural settlement that bears witness to a certain civilization, an important development, a historical event. It was emphasized that the preservation of monuments would be possible by using them for a beneficial social purpose, but that the plan or decorations of the building should not be changed for such use. In Article 6 of the regulation, it is emphasized that no additions that will change the mass and color relations are allowed. In Article 9, it is stated that the purpose of the repair is to preserve and reveal the aesthetic and historical value of the monument, and that the repair should stop where the assumption begins. Where traditional techniques are insufficient in reinforcing the historical structure, modern techniques should be used as described in Article 10. The importance of respecting the interventions applied to the building in various periods and the need to avoid stylistic integrity are stated in Article 11. In Article 12, it is emphasized that while the missing parts are being completed, there should be harmony with the whole, but it should be done in a way that can be distinguished from the original. In Article 13, it is stated that additions are allowed only if the interesting parts of the building, its

traditional location, composition, balance, and connection with its surroundings are not harmed (ICOMOS, Venice Charter, 1964).

According to the results of the Symposium on Introducing Contemporary Architecture to Old Building Groups at the 3rd ICOMOS General Assembly in 1972: "...contemporary architecture, which consciously uses today's techniques and materials, is the appropriate form of mass, scale, rhythm, and appearance without affecting the structural and aesthetic qualities of the historical environment. It will adapt to the historical environment with its use". This means that if a contemporary architecture is used for the addition, it must be arranged so that it does not overwhelm the original work. Additions must be made to match the mass, scale, rhythm, and appearance of the original building.

Rapid urbanization and increasing population all over the world have brought along many environmental problems, and as a result, unplanned, unidentified, unconnected structures have emerged. Historical buildings, which are an important component of the urban identity, are trying to survive in the city centers despite the new structures emerging. It is very important that these structures, which lost their functional and social characteristics over time, convey the characteristics and knowledge of the period in which they were built, and that they preserve their original identities in this process of change, as they create a link between the past and the future (Tanrısever, 2019; Enlil 1992). To solve the problems faced by these structures, an integrated conservation approach should be established. After the Council of Europe declared 1975 as the World Architectural Heritage Year, the Amsterdam Declaration and the European Architectural Heritage Charter were published. In these bylaws, the determination of the appropriate function for the building, the preservation of the social texture in which the building is located, the necessity of paying attention to the protection of the people living in the physical environment of the historical building, the application of sensitive restoration techniques and integrated conservation are emphasized. One of the key considerations guiding the proposals was that the future of architectural heritage depends on its integration into the context of contemporary living conditions and its implications in urban planning schemes. As one of the problems threatening the European Architectural Heritage, the charter drew attention to misapplied contemporary technology and unconsidered restoration. Again, on the same issue, to preserve the educational value of a building, the Regulation emphasized the necessity of respecting the interventions of different periods and the current situation with the original materials, proportions, forms, dimensions, and scale of the building. The Amsterdam Declaration also states that rehabilitation of old monuments is less costly than new construction and that "social costs" must be considered when deciding which one to choose (Amsterdam Declaration, Aksoy et al). Based on this idea, adaptive reuse of historical buildings has become a strong alternative in many countries of the world, in line with an integrated conservation approach (Langston & Shen, 2007). Both the Charter and the Declaration stress the importance of conservation as the main objective of city and country planning, apart from architectural preservation, which means that contemporary intervention criteria for architectural preservation must meet the building's adoption in the historic neighborhood. In this context, the texture, structure, functions of urban areas and the architectural and spatial characteristics of their built and open spaces should be examined, so that the necessary contemporary interventions for the needs of today's conditions should be determined with respect to these values (ICOMOS, Amsterdam Declaration).

The Burra Charter, which was prepared by Australian ICOMOS in 1988 and aimed at the protection of places of cultural importance, was based on the Venice Charter, as in various other documents. The regulation stated that the interventions mentioned in the conservation principles, which are based on the existing texture and the annexes of all periods, should include minimal intervention. On the other hand, it allows the use of modern techniques supported by relevant scientific foundations. As stated in Article 8 of the Regulation, the visual character of the historical heritage includ-

ing form, scale, color, texture, and material should be preserved while making interventions. In cases where the adaptation of the building to today's conditions can only be achieved by changing it with a compatible use, functional intervention can be accepted (ICOMOS Australia, Burra Charter, 1988).

The Nara Certificate of Authenticity, which was prepared at the Nara Authenticity Conference (1-6 November 1994) regarding the World Heritage Convention held in Nara, Japan, was issued. The sense of authenticity plays an important role in the preservation of cultural heritage, determining the type and extent of interventions. With the Nara Document, attention was drawn to the need for each society to determine its own uniqueness and to develop an analytical process to maintain its own cultural expression (ICOMOS, Nara Certificate of Authenticity). Since the architectural heritage is a complex work and its meaning depends on the legibility and originality of its components, these components should be considered. It should not be seen as changeable features that may cause a decrease in its historical importance (Erder, 1986).

The common obligations derived from the recommendations of the documents guiding the intervention of the architectural heritage can be summarized as follows: All physical, archival, and other evidence before and after any intervention should be documented to preserve the value of the information the building contains. Interventions of all epochs must be respected to represent the continuity of human activities, including cultural values, materials, and techniques. Considering future interventions, the intervention should be recyclable.

The first test of any design approach to conservation is to determine whether the spatial requirements of the proposed project fit within the boundaries of the existing building (Shopsin, 1986). If there are different use alternatives, it should be considered how these uses will contribute actively to the understanding of the heritage value of the place. Management policy should determine whether a particular use is compatible (Pearson & Sullivan, 1999). Investigating the reuse of historical khans in Kastamonu revealed that the traditional functions of these buildings were adapted for commercial and social purposes. The khans were reused as restaurants, hotels, and bazaars for commercial purposes.

Adaptive Reuse Practices and Their Contributions to Sustainability: Cases from Kastamonu, Türkiye

The case studies discussed in this section are the historical khans located in the center of Kastamonu, in the square and its surroundings, where commercial activities are intense. The practices examined exhibit both compliant and incompatible interventions according to international guidelines. The selected examples were built during the Candaroğulları Principality and the Ottoman Empire, and they were re-functionalized and restored in the early 2000s. Within the scope of restoration works, small and large-scale interventions were made to the structures. It was observed that the khan structures examined were generally used for touristic purposes. One of the buildings is used as a hotel and restaurant, one as a restaurant, one as a cafe, one as a cafe and local product sales place, and the other as a bazaar.

Kastamonu, which was called 'Paphlogonia' in ancient times, has remained under the rule of many states until today and since 1071, the dominance between the Byzantines and the Turks has changed frequently. Kastamonu, which was the capital of the Candaroğulları Principality between 1291-1461, came under the rule of the Ottoman Empire in 1461 during the reign of Fatih Sultan Mehmet and became one of the important sanjak centers where the shahzadah were educated (Eyüpgiller, 1999).

In Kastamonu, as in other Anatolian cities, streets have been named according to the commercial activities throughout history. When the street names in the city are examined, it is possible to identify the regions where traditional commercial activities and crafts are common (Eyüpgiller

et al., 2008). Nasrullah Square, which was created because of the demolition of some historical buildings and located in the north of Nasrullah Mosque, is one of the most important squares of Kastamonu today. The texture of the bazaar, which developed around the structures such as Kurşunlu Khan and Aşir Efendi Khan (Urgan Khan) in the west of this square, starting from the Candaroğulları period, consists of streets bearing the names of trade and craft branches of the Ottoman period. The fact that the area is suitable for construction has enabled many khans, and shops to come together in this environment. As a general feature of Ottoman cities, the fact that the bath structures are concentrated in the bazaar is valid in Kastamonu (Koç and Asar, 2017).

Cases of historic buildings with adaptive reuse:

Deve Khan, Kurşunlu Khan, Cem Sultan Bedesten, Penbe Khan (Balkapanı Khan), Aşiroğlu Khan (Urgan Khan), which are discussed within the scope of this study, are in the protected area of the city of Kastamonu. Deve Khan is a part of İsmail Bey Complex (Külliye) and the other four khans are located in the bazaar area, where trade is still active (Fig. 1-2).

Fig. 1

Google earth images of Kastamonu historical city center and sample buildings (Source: https://earth.google.com/)

Fig. 2

Site plans (Source: Rearanged from the Archieves of Kastamonu Municipality)

Deve Khan: The building, which belongs to the Candaroğulları Principality period, is in the north of İsmail Bey Complex. Although the khan does not have an inscription, it is thought to have been built before this date, since the building is mentioned in the foundation charter dated H.861/M.1457 (Karabiberoğlu, 1997). The plan scheme of the Deve Khan, which is in the group of closed type khans

without a courtyard, was included in the group of single-story, single-nave, and front-space khans by Baş (1989) (Baş, 1989). The khan, which was used as a warehouse during the War of Independence, was repaired between 1990-92 in line with the project prepared by the METU Faculty of Architecture.

Deve Khan, which was restored by the General Directorate of Foundations in 2006-2007, is now used as a cafe and local product sales place for tourism purposes. During the restoration carried out within the scope of adaptive reuse, the cement mortars made in the previous periods were re-

Fig. 3

Deve Khan interior and exterior view (Photo archives of the author, 2021)

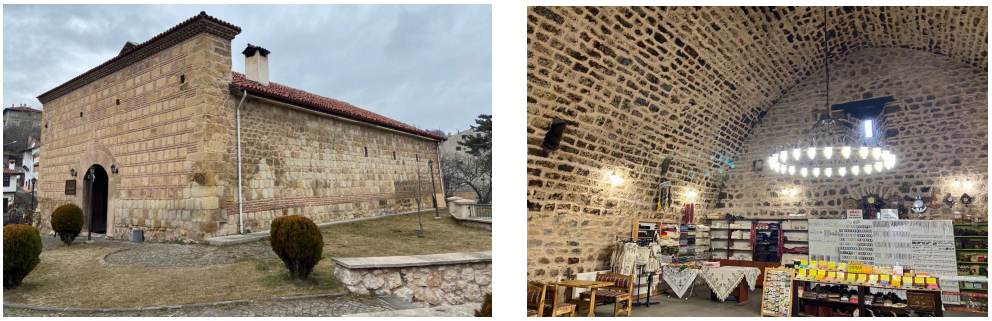
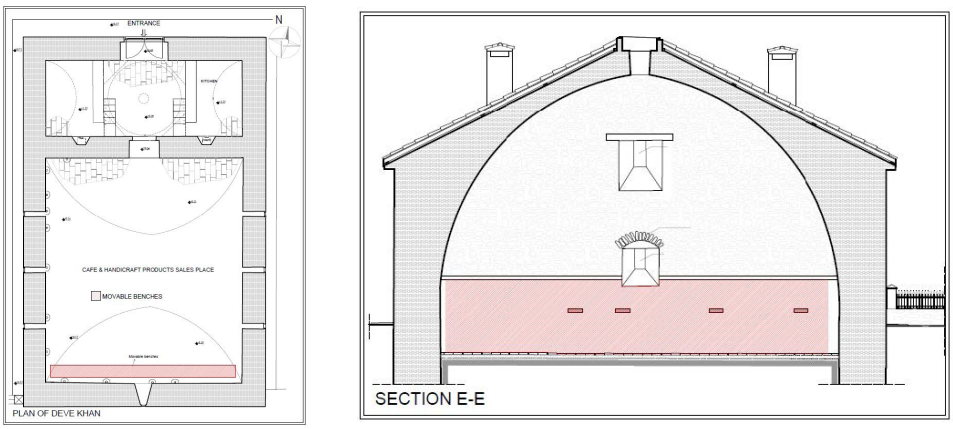


Fig. 4

Deve Khan plan and section (Source: Rearanged from the Archieves of General Directorate of Foundations, file on Deve Khan)



moved on the stone surfaces of the interior and exterior walls, and khorasan[2] mortar was used in accordance with the original. In addition, the atermit[3] roof covering, which was built in the previous periods, was removed and mission tiles were placed on the wooden roof (**Fig. 3**). Depending on the function given in the building, there is no additional mass intervention (**Fig. 4**). It has been observed that mobile shelves have been created to place the products sold in the shelter (*develik*[4]) section of the khan. There was no change in the plan scheme, form, and material properties of the building.

Kurşunlu Khan (İsmail Bey Khan): Located in the west of Nasrullah Square, the khan is surrounded by the Aşir Efendi Khan from the south, the Penbe Khan from the west, and the Frenkşah Hamam (Bathhouse) from the east and is a range khan built for the accommodation of caravans (Bilici, 1991). The khan, which was built during the Candaroğlu Principality Period, does not have

2 The mortar obtained by crushing and grinding baked clay materials such as tiles, bricks, pottery and mixing them with limewater in certain proportions is called Khorasan mortar.

3 Roofing material made of fiber cement material.

4 Develik section is used for the accommodation of camels in caravans in ancient times.

an inscription, and its founder is İsmail Bey from the Candaroğlu Principality. Considering its foundation charter[5], it is thought that the building was built between 1460-61, the date of the enthronement of İsmail Bey and the issue date of the foundation charter.

The building (Fig. 5), which has a rectangular plan close to a square, has a two-story, single-courtyard plan (Fig. 6). The central courtyard with a square plan, measuring 19x19 m, is surrounded in two floors by pointed arches resting on sequential rectangular plan and cut stone masonry massive pillars and porticoes opening to the courtyard. There are double rows of porticoes that open to the courtyard, covered with cross vaults, with a rectangular plan at the back and a square plan at the front.

Kurşunlu Khan was restored as a hotel and restaurant within the scope of adaptive reuse between 2003 and 2009. It is seen that the most important intervention made depending on the new function in Kurşunlu Khan is the creation of bathrooms and the covering of the courtyard with a steel-glass system (Fig. 6-7). On the ground floor, partition walls were created with brick type material to arrange rooms. In addition, partitions were created in the portico section for the reception. The service areas of the cafe and restaurant were also extended towards the portico and the portico was closed with wooden windows. Partition walls are made of plasterboard type material to create bathrooms in the hotel rooms located on the ground floor and on the upper floor. In addition, some transitions between the rooms were closed during the creation of the upper floor rooms. Aluminum profiled glass closure system has been made so that the courtyard can be used as a restaurant and the building is not affected by precipitation such as rain and snow. As a result of these applications, it was observed that there was a partial change in the plan scheme of the building, but the material properties were not interfered with. It can be said that the system used to cover the courtyard can be distinguished from the old ones due to the use of contemporary materials, besides, it is compatible with the original texture of the khan in terms of mass, form, size, color, and material and is recyclable. However, when it is desired to recycle the wall spaces and bathroom walls that were closed during the creation of hotel rooms, it is thought that it will not be possible to achieve this without damaging the original texture. The stone walls of the khan were cleaned, and the joints were renewed with khorasan mortar. The roof cover was removed, the mud plaster was applied, and the lead sheets were renewed.

Cem Sultan Bedesten: The covered bazaar, which is one of the works of the Ottoman Period, is located on the İç Terziler Street in Nasrullah Square. Since the covered bazaar does not have an inscription, the exact date of its construction is not known, but it is dated between 1469-1475, based on the information that Cem Sultan, the son of Fatih Sultan Mehmet, came to Kastamonu in 1469 as a Sanjak Bey and stayed there for 5-6 years (Baysun, 1945; Gökoğlu, 1952). The square planned covered bazaar is covered with nine domes supported by four masonry pillars.

The main walls of the building were constructed with an alternating system *(almaşık)* (three rows of rubble and rough stone, three rows of bricks). Cut stone material was used in the shops. Despite the building added to the western façade, the originality of the part in front of the entrance has been partially preserved (Fig. 8).

Adaptable reuse projects of Cem Sultan Bedesten were prepared, and it was restored in accordance with the restaurant function between 2003-2009. To create areas such as oven, toilet, and prayer room, depending on the restaurant function, partition walls were made with brick type material on the ground floor of the building (Fig. 9-10). In addition, a mezzanine floor was arranged using wooden carriers, leaving a space (9.15x10.05 m) in the middle of the building (Fig. 9-11). The mezzanine floor covers a very large area and makes it very difficult to understand the plan scheme of the building. There is no significant change in the existing material properties of the building. However, the use of wooden material for the mezzanine floor makes it difficult to understand that

5 Yaman, T., M. (1935). *Kastamonu Tarihi*, Kastamonu: Ahmed İhsan Matbaası.

Fig. 5

Kurşunlu Khan exterior view (Photo archives of the author, 2021)

Fig. 6

Kurşunlu Khan ground and first plan (Source: Rearanged from the Archieves of General Directorate of Foundations, file on Kurşunlu Khan)

Fig. 7

Kurşunlu Khan interior view (Photo archives of the author, 2021)

this section is an extension. The mezzanine floor is quite incompatible with the building in terms of mass, form, and size, and it is thought to have a negative impact on the aesthetic value of the monument. The shops that were added to the building from the outside were accepted as period annexes and preserved. However, the roof covering created for these shops makes it difficult to perceive the façade. It is thought that the mezzanine floor application and the spaces created on the

Fig. 8

Cem Sultan Bedesten exterior view (Photo archives of the author, 2021)

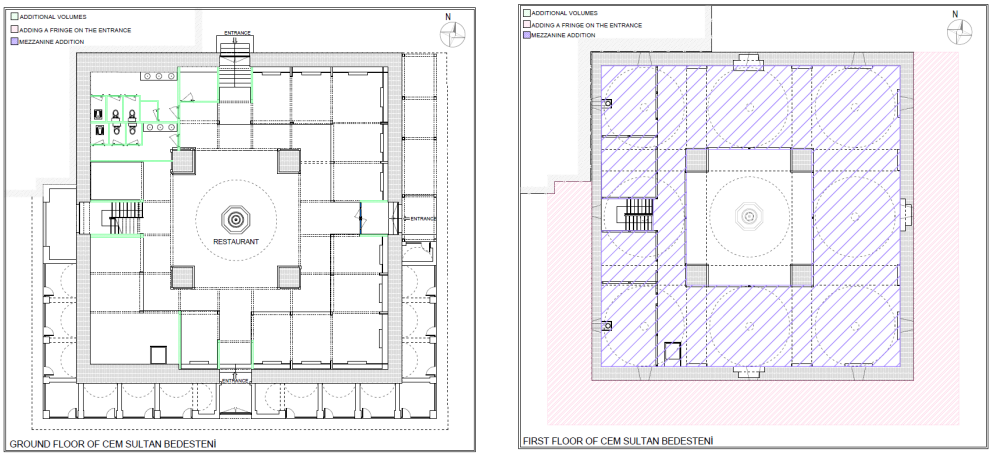


Fig. 9

Cem Sultan Bedesten ground and mezzanine floor plans (Source: Rearanged from the Archieves of General Directorate of Foundations, file on Cem Sultan Bedesten)

Fig. 10

Service areas arranged on the ground floor (Photo archives of the author, 2021)

Fig. 11

Mezzanine floor arrangement (Photo archives of the author, 2021)

ground floor can be recycled without causing major damage to the structure. Within the scope of this restoration, the existing wooden joinery of the outer shops was removed, and windows with a uniform wooden joinery were built to form a unity throughout the building. Khorasan mortar joint was made on the outer body walls of the building and the lead cover on the roof has been renewed.

Penbe (Balkapanı[6] Khan) Khan: The khan, which was built during the Ottoman Period, is in the city center, in Hepkebirler District, in the area bordered by Iplikçiler Street and Nalburlar Street. It is next to İsmail Bey Khan and south of the Cem Sultan Bedesten. The structure was built by the Ottoman Sultan Bayezid II between 1481-1512 (Gökoğlu, 1952).

Today, only the northern part of the building, which is thought to have a rectangular or square plan, a central courtyard, and a two-story plan, is still standing (Fig. 13) (Eyüpgiller, 1999). The main entrance door of the khan is the cut stone round arched door on the northern façade, but there is also a door on the south that opens directly to the courtyard. The door in the south is a recent addition (Fig. 15).

Penbe Han, which was partially destroyed in the fire in 1958, was re-functioned as a cafe-restaurant and was restored between 2003-2009. In this restoration, the walls of the rooms were completed based on the foundation traces of the khan. In addition, the stone was cleaned on the existing walls and the joint was made with khorasan mortar. It has been seen that the spaces facing the courtyard and originally a shop were used as the cooking sections of the restaurant. The shops on the upper floor are arranged as private rooms for customers. The most important mass additions in the building are the sitting and cooking areas arranged in the courtyard (Fig. 13-14-15). Some of these sections are made of wood and glass, the top cover is aluminum type material, and there are also those made with awning type material to cover only the seating areas. The portico on the upper floor is arranged as a seating area for customers and the portico is covered with wooden joinery. The applications made generally do not create a change in the plan scheme of the building. However, although the spaces created in the courtyard can be distinguished from the existing ones with the contemporary materials used, they give the impression of being created completely

6 The term *"kapan"* (trap) is used for the commercial khans where food and clothing are sold and distributed, and which also has a big scale. It is known as *Balkapanı* because the honey produced in Kastamonu is traded here (Çiftçi, 1995).

ment and show incompatibility with the original material in terms of color and material. A similar situation is also valid for the façades of the shops facing the street, and all of them have different types of awning and eaves applications.

Fig. 12

Penbe Khan exterior view (Photo archives of the author, 2021)

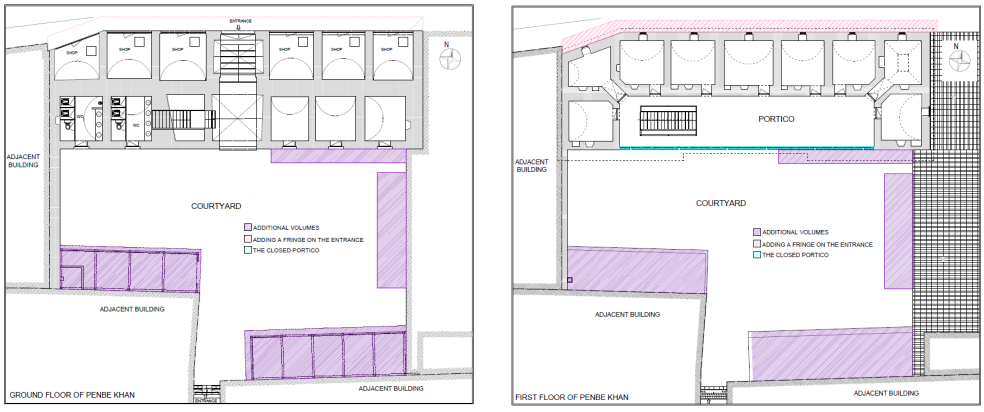


Fig. 13

Penbe Khan ground and first floor (Source: Rearanged from the Archieves of General Directorate of Foundations, file on Penbe Khan)

Fig. 14

New additions visible from the khan's upper floor and courtyard (Photo archives of the author, 2021)

Fig. 15

Applications in the courtyard and entrance to the south (Photo archives of the author, 2021)

Fig. 16

Aşir Efendi Khan exterior view (Photo archives of the author, 2021)

randomly and create a visual pollution. The new applications are not in harmony with the old ones in terms of mass, form, size, color, and material. On the ground floor, eaves were formed for the shops facing the main road and covered with tiles (Fig. 12). It is thought that the additions made are recyclable without damaging the original structure of the building.

Aşir Efendi Khan (Urgan Khan): The khan, located on the west side of Nasrullah Mosque and south of Kurşunlu Khan, was built during the Ottoman Empire Period. From the inscription on the inside of the low-arched entrance door in the middle of the eastern façade, it is understood that the construction was started by Reis-ül Küttab Hacı Mustafa Efendi and completed by his son Aşir Efendi in 1748 (Gökoğlu, 1952). The building has a rectangular plan, two stories and a single courtyard plan (Fig. 18).

There are three shops on both sides of the entrance door on the east side of the khan. These rooms, which were once included in the khan, were turned into shops by opening their front façades (Fig. 16) (Bilici, 1991). This is also the case for the shops near the north-west corner of the western façade of the khan. In a later period, new shops divided by arches were added to the western façade of the khan.

Fig. 17

View of the shops from the courtyard of Aşir Efendi Khan (Photo archives of the author, 2021)

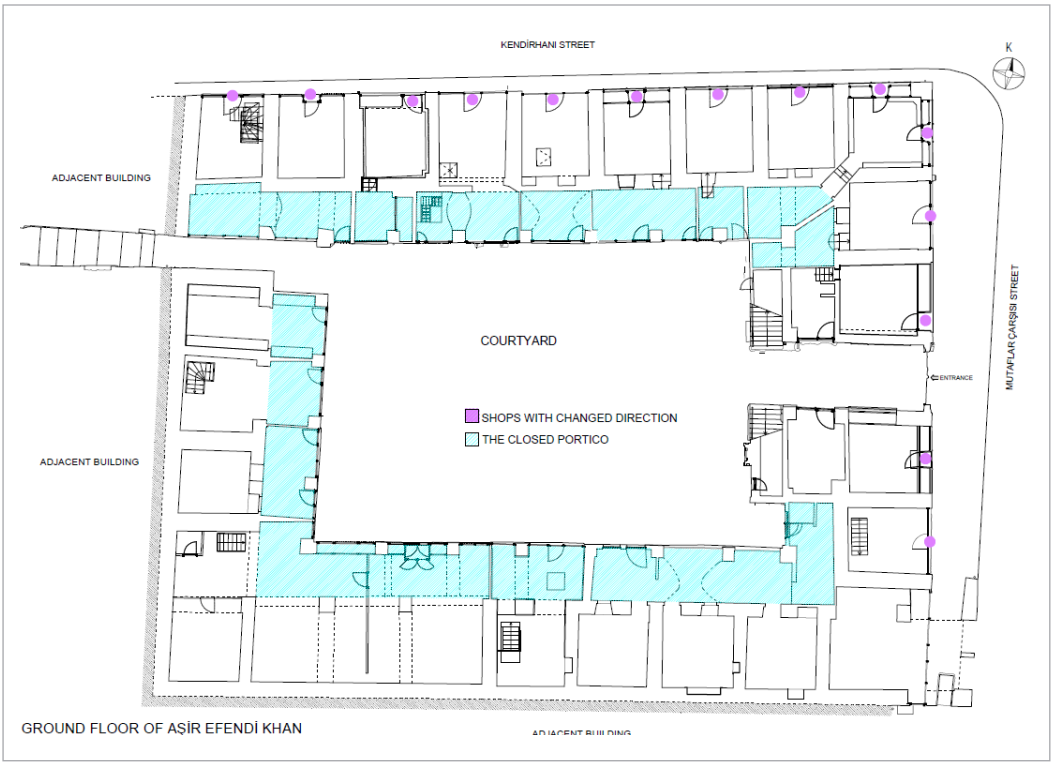


Fig. 18

Aşir Efendi Khan ground floor plan (Source: Rearanged from the Archieves of General Directorate of Foundations, file on Aşir Efendi Khan)

The Aşir Efendi Khan was restored in 1972 by the General Directorate of Foundations and it functions as a bazaar where shops are located. The stairs extending in the north-south direction in the east of the courtyard lead to the upper floor (**Fig. 17**). On the upper floor, behind the porticoes, the rooms covered with mirrored vaults were turned into shops later, and the façades opening to the portico were completely renovated. The arches on the ground floor surrounding the courtyard have become square-planned shops by being divided by windows on the front façades facing the courtyard in a way that does not include the entrance in the north and south, and by walls between the arches on the sides. The walls facing the courtyard of the rooms in the west and south, which were once opened to the portico, were also demolished, and included in these shops (**Fig. 18**). The fact that the porticoes are closed with various joinery in the direction of the courtyard makes it difficult to perceive the plan scheme of the building. In addition, the different joinery and awnings used in the sections of the shops facing the courtyard damage the aesthetic value of the monu-

Evaluation of case studies in terms of international standards and sustainability

Evaluation criteria were determined according to the international protection regulations and standards examined, and case studies were evaluated in line with these criteria. In addition, the effects of adaptive reuse practices on sustainability are discussed.

Deve Khan is the least disturbed one among the case studies examined. It is seen that the most important intervention made depending on the function in Kurşunlu Khan is the creation of bathrooms and the covering of the courtyard with a steel-glass system. The Cem Sultan Bedesten is the building where the largest mass annex was observed due to the mezzanine floor added to the building. The most important mass additions in Penbe Khan are the sitting and cooking areas arranged in the courtyard. The last building examined, Aşir Efendi Khan, functions as a bazaar where shops are located. However, to enlarge the shops, all of them were combined with porticoes and the porticoes were closed with various joinery in the direction of the courtyard.

Adaptive reuse increases the long-term usefulness of a building and is a more sustainable option than demolition and rebuilding. When the subject is considered in the context of case studies, it clearly reveals the economic, social, and environmental value with the new additions of the buildings and

Table 1

Assessment of case studies through evaluation criteria

Evaluation Criteria	Deve Khan	Kurşunlu Khan	Cem Sultan Bedesten	Penbe Khan	Aşir Efendi Khan
What is the new function?	Cafe and local product sales place	Otel+ Restaurant	Restaurant	Cafe	Bazaar
Is there a change in the plan diagram due to the new function?	X	✓	✓	✓	✓
Are there any changes in the form and material properties of the building?	X	X	✓	✓	✓
Are the applications respectful to the term suffixes?	✓	✓	✓	✓	✓
Has the aesthetic and historical value of the monument been preserved because of the adaptive reuse?	✓	✓	✓, X	✓, X	✓, X
Are the interventions reversible?	✓	✓, X	✓	✓	X
Has attention been paid to the protection of the social fabric?	✓	✓	✓	✓	✓
Are there any additions due to the new function?	X	✓	✓	✓	✓
Can new applications be distinguished from old ones?	-	✓	X	✓	X
Are the new applications compatible with the old ones in terms of mass, form, size, color, and material?	-	✓	X	X	X

new income generating functions. Adapting these khan buildings to cafes, restaurants, hotels, and shopping places has increased the financial value of the buildings, while at the same time creating a socio-cultural space in the historical city center of Kastamonu. These examples demonstrate the importance of functional change and modernization for sustainability and demonstrate the role of heritage preservation in urban revitalization. The structures examined became important meeting and visiting points in the region, attracting the attention of both local and foreign tourists, positively increasing the quality of their surroundings, and contributing to the economic, cultural, and social development of the local people. Kurşunlu Khan, Cem Sultan Bedesten, Penbe Khan and Aşir Efendi Khan gained a new function to meet the needs of contemporary conditions with new additions and interior changes.Since these structures are still standing and can be transferred to future generations, they contribute positively to the historical continuity and thus to the sustainability of the heritage structures and urban fabric. Good practices show that adaptive reuse of historic buildings can make them sustainable places that connect the past with the present while at the same time preserving their historic character. In addition, adaptive reuse of historical buildings or preservation of their original uses, considering construction waste and cost, is also important from an economic and environmental point of view. The case studies examined in this research show that adaptive reuse reduces construction waste from demolition and has significant environmental benefits in terms of conserving the energy contained in reused materials.

Conclusion

In this study, five khan structures located in the historical site of the city of Kastamonu are discussed in terms of adaptive reuse. In these five samples, the changes created by the new functions given to the buildings were evaluated in terms of international conservation regulations and standards. Studies show that it is possible for historical buildings to survive socially, functionally, culturally, and economically thanks to adaptive reuse. Due to the hotel-restaurant given to Kurşunlu Khan and the restaurant function given to Cem Sultan Bedesten, it was observed that the intervention was more than the other structures. In addition, the efforts to expand the shops in Aşir Efendi Khan prevented the legibility of the plan scheme of the building and there were harmful practices in terms of recyclability.

By examining the sample buildings in the old historical bazaar center within the historical site of Kastamonu, it has been seen how important the use and survival of these structures is in terms of the sustainability of the city. The importance of these buildings, which were built for commercial purposes in the past, to be used for commercial purposes and to be open to the public, should not be overlooked in terms of urban memory. For this reason, when making adaptive reuse decisions, both these benefits should be considered, and the issue should be evaluated in terms of protection. Due to the given function, care should be taken not to change or deteriorate the plan, mass, and material properties of the building. Institutions that decide and approve adaptive reuse and restoration interventions should make this assessment in accordance with international regulations and directives, and it should not be ignored that the interventions should be recyclable.

Acknowledgment

The author would like to thank to the General Directorate of Foundations for sharing its archives related to the case study area.

References

Aksoy, A., Enlil, Z., Ünsal, D., F., Pulhan, G., Dinçer, İ, Zeren, G., Ahunbay, Z., Köksal, G. (2012). Kültürel miras yönetimi, 1. Baskı, Eskişehir: T.C. Anadolu Üniversitesi Yayını; 2012.

Arabacıoğlu, P. ve Aydemir, I. The concept of revalorization in historical environments. Yıldız Technical University, Architecture Faculty E Jornal; 2007, 2(4): 204-212.

Baş, A. Beylikler dönemi hanları, Master Thesis, Konya: Selçuk Üniversitesi Sosyal Bilimler Enstitüsü; 1989.

Baysun, M. C. Cem Sultan, İslam Ansiklopedisi, 3. Cilt, İstanbul: 69-81;1942.

Bilici, Z., K. Kastamonu'da Türk Devri mimarisi ve şehir dokusunun gelişimi (18. yüzyıl sonuna kadar), PhD thesis, Ankara Üniversitesi Sosyal Bilimler Enstitüsü; 1991.

Bullen, P., A. & Love, P. The rhetoric of adaptive reuse of reality of demolition: views from the field. Cities; 2010, 27(4): 215-224. https://doi.org/10.1016/j.cities.2009.12.005

Çiftçi, F., H. Kastamonu camileri, türbeleri ve diğer tarihi eserler, Ankara: Türkiye Diyanet Vakfı Yayınevi; 1995.

Diamonstein, B. Buildings reborn: new uses, old places, New York: Harper&Row Publishers; 1978.

Enlil, Z. Tarihi bir çevreyi yaşatmak: Paris ve Bologna'da bütüncül koruma yaklaşımları, YTÜ Mimarlık Fakültesi Yayını, Mf Şbp; 1992, 92 (02), 199-204.

Elsorady, D., A. Adaptive reuse decision making of a heritage building Antoniadis Palace, Egypt, International Journal of Architectural Heritage; 2020. 14(5), 658-677, https://doi.org/10.1080/15583058.2018.1558313Erder, C. Our architectural heritage from consciousness to conservation. Paris: United Nations Educational Scientific and Cultural Organization; 1986.

Eyüpgiller, K. Bir kent tarihi: Kastamonu, İstanbul: Eren Yayıncılık; 1999.

Fielden, M., B. Conservation of historic buildings. Rome: International Centre for the Study of the Preservation and the Restoration of Cultural Property (ICCROM); 2003.

Gökoğlu, A. Paphlagonia, Kastamonu: Doğrusöz Matbaası; 1952.

Gregory, J. Rehabilitation-new ways for older housing, New South Wales Department of Housing; 2004, available at: www.housing.nsw.gov.au/rehab.htm.

Ijla, A. and Broström, T. The sustainable viability of adaptive reuse of historic buildings: the experiences of two world heritage old cities; Bethlehem in Palestine and Visby in Sweden, International Invention Journal of Arts and Social Sciences; 2015, 2(4), 52-66.

International Charter for the Conservation and Restoration of Monuments and Sites (The Venice Charter 1964) [Internet]. 1964. Available from: https://www.icomos.org/charters/venice_e.pdf [Accessed: 2021-12-21].

Ismail, W., Wan, H. Preservation and recycling of heritage buildings in Malacca. In Procedia - social and behavioral sciences; 2013, 85 574-581, https://doi.org/10.1016/j.sbspro.2013.08.386

Karabiberoğlu, Ü. Kastamonu İsmail Bey Külliyesi, Yüksek Lisans Tezi, Hacettepe Üniversitesi Sosyal Bilimler Enstitüsü; 1997.

Kincaid, D. Adapting buildings for changing uses, guidelines for change of use refurbishment, London: Taylor&Francis Group; 2002. https://doi.org/10.4324/9780203223178

Koç, İ., Asar, H. Tarihi Kastamonu hanlarının ticari ve kültürel fonksiyonlar bağlamında değerlendirilmesi, Artium; 2017, 5(1): 1-13.

Langston, C., Shen, L., Y. Application of the adaptive reuse potential model in Hong Kong: A case study of Lui Seng Chun, International Journal of Strategic Property Management; 2007, 11, 193-207. https://doi.org/10.3846/1648715X.2007.9637569

Langston, C. A. The sustainability implications of building adaptive reuse; 2008, 1-10. Paper presented at The Chinese Research Institute of Construction Management (CRIOCM) International Symposium, Beijing, China.

Latham, D. Creative re-use of buildings. Shaftesbury: Donhead Publishing; 2000.

Norma, E., & Cervantes, R. Urban conservation in Mexican Colonial cities: the historic centre of Morelia. In R. Zetter, & B. Watson (Eds.), Designing sustainable cities in the developing world. Wiltshire: Antony Rowe Ltd; 2007.

Orbaşlı, A. Architectural conservation: Principles and practice. London: Blackwell Publishings; 2008.

Pearson, M. & Sullivan, S. Looking after heritage places: the basics of heritage planning for managers, landowners and administrators, Melbourne: Melbourne University Press; 1999.

Pedersen, A. Managing tourism at world heritage sites: A practical manual for world heritage site managers. 14, UNESCO World Heritage Centre; 2002.

Philokyprou, M. Adaptation of new university uses in old buildings: The case of rehabilitation of listed buildings in Limassol Cyprus for university purposes. International Journal of Architectural Heritage; 2014. 8 (5):758 82. https://doi.org/10.1080/15583058.2012.738282

Plevoets, B., Van Cleempoel, K. Aemulatio and the interior approach of adaptive reuse. Interiors: design, architecture, culture, 2014, 5(1):71-88. Routledge. https://doi.org/10.2752/204191214X13944457108758

Rudlin, D. & Falk, N. Building the 21st century home: The sustainable urban neighborhood, Oxford: Architectural Press; 1999.

Shopsin, W. Restoring old buildings for contemporary uses, an American sourcebook for architects and preservationists. New York: Watson-Gutpill Publications; 1986.

Spanos, V. D., Goulas, A. Cultural heritage displaying: Residents looking in the mirror. Journal of Science & Technology (E-JST); 2017, 14 (7):1-11. http://e-jst.teiath.gr.

Strumiłło, K. Adaptive reuse of buildings as an important factor of sustainable development. In Advances in human factors and sustainable infrastructure, ed. J. Charytonowicz, 51-59. Florida, USA: Advances in Intelligent Systems and Computing (493); 2016, https://doi.org/10.1007/978-3-319-41941-1_5

Tam, V., W., Y., Hao, J., J., L. Adaptive reuse in sustainable development, International Journal of Construction Management; 2019, 19:6, 509-521, https://doi.org/10.1080/15623599.2018.1459154

Tanrısever, C., Saraç, Ö., Aydoğdu, A. Yeniden işlevlendirilen tarihi yapıların sürdürülebilirliği, İktisat ve Girişimcilik Üniversitesi Türk Dünyası Kırgız-Türk Sosyal Bilimler Enstitüsü Dergisi; 2016, 54, 1068-1082.

The Athens Charter for the Restoration of Historic Monuments [Internet]. 1931. Available from: http://www.icomos.org.tr/Dosyalar/ICOMOSTR_en066098400153668l682.pdf [Accessed: 2021-12-21].

The Burra Charter, The Australia ICOMOS Charter for Places of Cultural Significance [Internet]. 2013. Available from: https://australia.icomos.org/wp-content/uploads/ The Burra-Charter- 2013-Adopted-31.10.2013.pdf [Accessed: 2021-12-25].

The Declaration of Amsterdam-1975 Congress On The European Architectural Heritage [Internet]. 1975. Available from: http://www.icomos.org.tr/Dosyalar/ICOMOSTR_08991290014968255552.pdf [Accessed: 2021-12-21].

The Nara Document on Authenticity, ICOMOS Australia [Internet]. 1994. Available from: https://www.icomos.org/charters/nara-e.pdf [Accessed: 2021-12-25].

Wang, H., & Zeng, Z. A multi-objective decision-making process for reuse selection of historic buildings. Expert Systems with Applications; 2010, 37(2), 1241-1249. ttps://doi.org/10.1016/j.eswa.2009.06.034

WCED, World Commission on Environment and Development. Our common future. Oxford: Oxford University Press; 1987.

Yaman, Z. Kastamonu Turizm Envanteri, Kastamonu: Kişisel Basım; 2003.

Yung, E., H., K, Chan, E., H., W. Implementation challenges to the adaptive reuse of heritage buildings: towards the goals of sustainable, low carbon cities. Habitat Int.; 2012, 36(3):352-361. https://doi.org/10.1016/j.habitatint.2011.11.001

About the Author

FİLİZ KARAKUŞ

Assist. Professor

Ankara Yıldırım Beyazıt University, Faculty of Architecture and Fine Arts, Department of Architecture

Main research area

Restoration and conservation, traditional/vernacular architecture

Adress

Ankara Yıldırım Beyazıt Üniversitesi Esenboğa Külliyesi,
Esenboğa/ANKARA, Türkiye.
Tel. +90 312 906 2469
E-mail: fkarakus@ybu.edu.tr

This article is an Open Access article distributed under the terms and conditions of the Creative Commons Attribution 4.0 (CC BY 4.0) License (http://creativecommons.org/licenses/by/4.0/).