

ASSESSMENT OF THE PHYSICAL CONDITION OF BYZANTINE CHURCHES IN NORTH MACEDONIA

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Abstract

Byzantine civilization is one of the longest-lived cultures, well known for the large number of constructed religious buildings, which today represent part of the world cultural heritage. Byzantine churches are a significant part of North Macedonia's tangible heritage; one of the most valuable and numerous medieval monuments, with exceptional architectural and artistic values. These churches appear in several characteristic concepts: basilica, conch, cross-in-square and smaller single-nave buildings. During their long-term existence they have been exposed to diverse impacts including earthquakes, so despite the visually good physical condition, they may hide many weaknesses.

This paper presents the investigation campaign carried out on 50 Byzantine churches in North Macedonia that included archival searches, review of church documentation and field inspections. The main objective was to assess the current state of the buildings, based on previously defined methodology and criteria for physical condition assessment. This research resulted in a data-base for Byzantine churches and their classification to several criteria: construction period, typology, previous intervention, current condition and authenticity. The collected data enabled to propose the future measures for their protection, graded as: monitoring, regular maintenance, repair or emergency protection.

Keywords: Byzantine churches, uniform methodology, assessment, physical condition, data base, classification

1. Introduction

The Byzantine Empire, lasting from the 4th to the 15th century, stands as one of the longest-lasting civilizations, enduring for over eleven centuries before being conquered by the Ottoman Empire in the 15th century. As a continuation of the Roman Empire, centered in Constantinople, it represented a link between the antiquity and the modern world, [1]. During the centuries, the Empire possessed territories of Asia Minor, Balkans, Greece, Italy and North Africa. The Byzantines developed their own culture, mainly presented by the architecture and art, [2].

The Byzantine architectural style developed as a combination of Roman traditions and innovative engineering techniques. While Byzantine buildings still incorporated Classical orders, they became more eclectic and irregular, with a greater emphasis on functionality over strict adherence to form. Byzantines continued to build baths, amphitheaters, villas and other arched structures, but also added new structures like churches, monasteries and fortifications. To support the spread of Christianity, a large number of churches were erected. Following the Roman design, the early churches (4th - 5th century) were basilica type – designed as long halls with timber roofs. In the 6th century the timber roof was replaced with a dome-vault roof system. By the 9th century these monumental structures were replaced with smaller churches and the domed cross-in-square plans became the most common typology. Over time, the high of the central dome was raised using polygonal drum, [3]. In the later period (13th - 14th century) there was a variability in the churches plans, which in a way reflected the political condition of the Empire, [1]. One of the most famous Byzantine buildings is Hagia Sophia in Istanbul, built in the 6th century. The dome of the church has a span of 31.8m and rests on the system of arches and pendentives which is a significant architectural achievement of that period. The interior of the church was originally decorated with wall paintings and mosaics, [3].

During the existence of the Byzantine Empire, the territory of today's North Macedonia was influenced by various cultures, including the Byzantine one. The development of the cultural values in this region began in the second half of the 9th century. At the same time significant architectural achievements were made, particularly in the realm of sacred architecture. Most churches from this period are characterized by a structural concept influenced from the Near East and presence of byzantine ornamental features, [2]. There are still many fine examples of Byzantine churches (9th – 14th century) preserved on the territory of North Macedonia and today they represent significant part of the tangible heritage in the country.

2. Byzantine churches in North Macedonia - general information

Byzantine churches are one of the most preserved and numerous medieval monuments in the territory of North Macedonia. So far, 54 Byzantine churches have been registered, built between from 9th - 14th century. These churches appear in several different concepts—basilica, conch, cross-in-square and small single-nave structures, (fig. 2.1). Although there are some variations, generally, the structural system of these buildings consists of peripheral walls, inner columns and vaults. The vaulted (roof) structure generally rests on a system of arches, pendentives and columns, except for the single-nave churches where the vaulted structure rests directly on the walls. In most churches there is also an additional wooden system of horizontal belts placed into the walls and visible timber ties in the interior upper zones. This wooden system improves the stability of the structure, especially during seismic actions, [4][5].

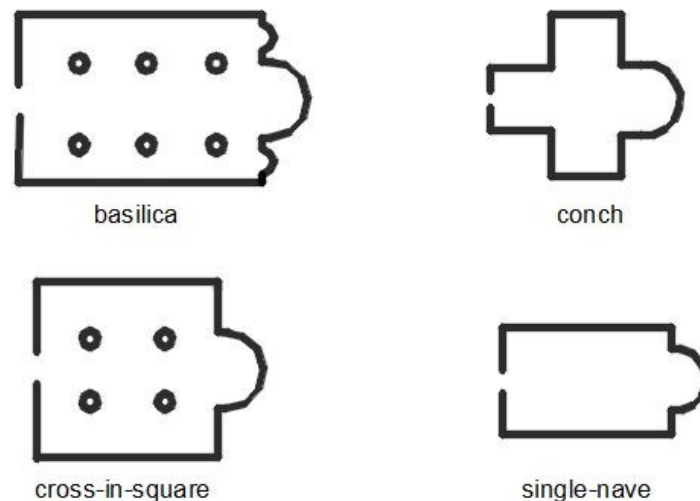


Figure 2.1 Main concepts of the Byzantine churches

The building materials are local stones, bricks and lime mortar. The walls usually consist of two outer layers of horizontal stone and brick masonry, separated by the core of rubble masonry and lime mortar. The columns are often constructed as monolithic elements of granite or marble blocks, or in some cases, from the same materials as the walls. Vaults are mainly built of limestone, and for the construction of drum and dome, bricks and lime-mortar are most often used, [4].

The domes are the most symbolic structural elements in Byzantine churches, which historically suffered most damage and sometimes were completely destroyed. The drum is a particularly significant element in the overall dome appearance. The octagonal drum is the most common shape, which corresponds to the span of the domes in most buildings, which ranges between 3.0 - 3.5m. Twelve-sided drum rarely exists in the medieval architecture; one example is the church of St. Demetrius in Prilep from 13th century. The apses are another specific element in the facade design of the churches. They appear in several forms - polygonal, semi-circular and often as three-sided, [6].

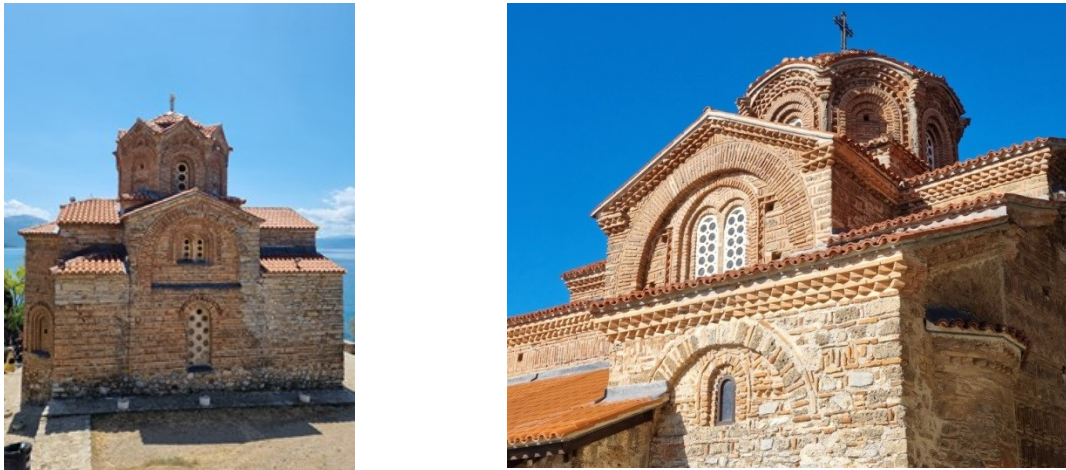


Figure 2.2 Dynamic facades of the Byzantine churches in the Ohrid region

The facades of the churches (fig. 2.2) are characterized by vibrant and dynamic appearance, combining pilasters, arches, niches and cornices with three-dimensional effects. In some Byzantine churches the facade surfaces are formed in a so called "cloisonné" technique, where alternating rows of stone and brick are combined with two vertically placed bricks in the joints to create a distinct pattern. In the church of St. John the Theologian in Ohrid this technique is most consistently implemented. The rich ornamentation of the facades (fig. 2.3) is mainly achieved using bricks placed in different patterns - horizontally, vertically, inclined, which creates different forms of fishbone, zigzag stripes, rhombs, letter shapes etc. Combination of bricks and limestone is used for shaping the decorative arches and inscriptions. The polychromatic effect is gained using stones in diverse colors and mortar ranging from white to light rose, [4][6].



Figure 2.3 Ornamental facades of Byzantine churches: St. Nicholas in Varosh (left), St. John the Theologian in Ohrid (middle), St. Archangel Michael in Shtip (right)

The interior surfaces of the Byzantine churches have perforations for windows or blind niches. These surfaces were originally covered with frescoes (fig. 2.4) depicting various scenes from the Bible, in accordance with certain canons. Some of the most preserved examples of these frescoes can be found in the church of St. George in Kurbinovo (12th century), St. Nicholas in Varosh (late 13th century), St. Nikita in Banjani (14th century) etc. Floors of the churches are moderately finished with stones and sometimes bricks in a mosaic pattern (original floors of the churches St. Sophia in Ohrid and St. Holy Mother Eleusa in Veljusa), [4].



Figure 2.4 Interior of the church of George, Kurbinovo (left) and of St. Nicholas in Varosh, Prilep (right)

3. Classification of the investigated churches

The investigation included a total of 50 Byzantine churches within its scope. They are located in several regions across the country, but mostly in Ohrid, Skopje, Prilep and Shtip region, (fig. 3.1).

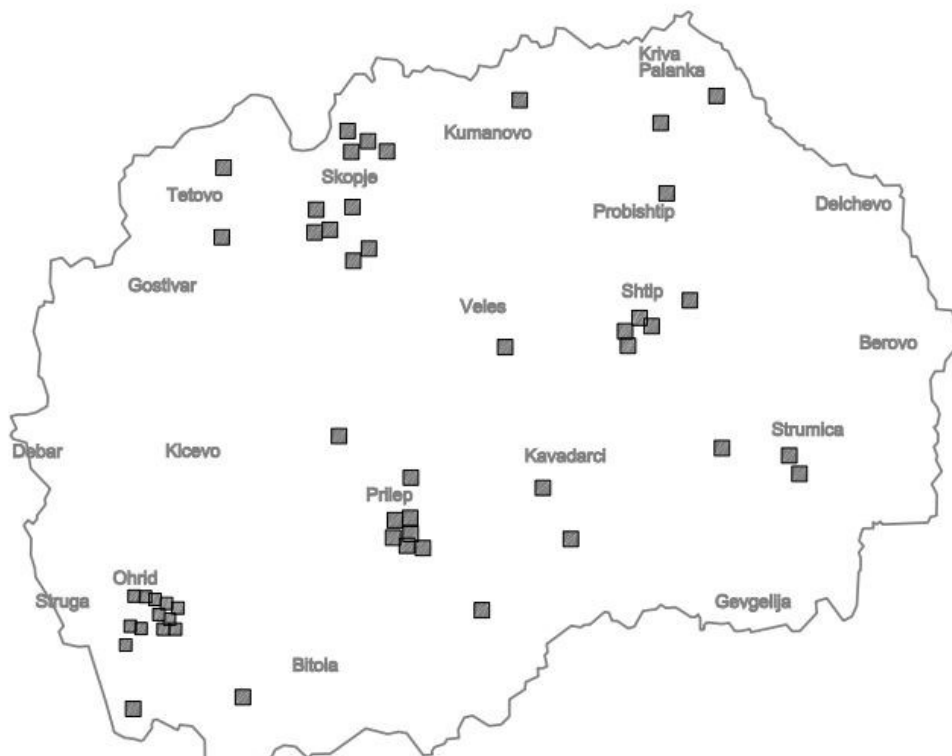


Figure 3.1 Location of Byzantine churches in the territory of North Macedonia

The investigation began with archival research and a systematic review of historical documents and records related to the churches. This process yielded valuable information regarding the historical context, construction phases, and changes over time. Additionally, field surveys were conducted to assess the physical condition of both the exterior and interior of the churches, highlighting any past

interventions. The field activities took place between 2021 and 2023, with some being part of the "Monitoring of the Orthodox Cultural Heritage" project organized by ICOMOS Macedonia., [7].

For the purpose of this research, a uniform recording form was designed (fig. 3.2) and completed for each church during the field surveys, thus representing an ID sheet for the monument that includes both general and specific information.

General information		photo
Name		
Date of built		
Corresponding institution		
Location and surrounding		
Address		
Coordinates		
Altitude		
Surrounding		
Seismicity zone		
Architecture		
Typology		
Functional units		
Horizontal plan		
Arch. / structural elements		
Exterior	Surfaces	
	Ornament	
	Specific features	
	Damages	
	Condition	
Interior	Surfaces	
	Damages	
	Condition	
Previous interventions		
Level of authenticity		
Future measures		

Figure 3.2 Designed recording form

The data collected in this manner allowed for the classification of the churches based on several criteria: construction period, typology, condition, interventions, and authenticity. The condition of the churches, referring to an evaluation of their tangible state and considering the extent to which they have deteriorated or been altered over time due to natural elements, human activity, insufficient or incorrect maintenance, was assessed using predefined criteria and rated as good, satisfactory, poor, or very poor. Past interventions were categorized into structural and non-structural, closely linked to their level of authenticity, which was rated as high, medium, or low. The data led to the final conclusion in the recording form (fig. 3.2) which refers to proposed future measures for the churches, graded as monitoring, regular maintenance, repair or emergency measures.

The churches were built between 9th and 14th century (fig. 3.3). Among the oldest are the first phase of the church of St. Leontius in the village of Vodocha (7th -9th century), St. George in the village of Goren Kozjak (9th century), St. Sophia in Ohrid (11th century), St. Holy Mother Eleusa in Veljusa (11th century) and St. George in Staro Nagorichane (11th century). Few churches were built during 12th and 13th century and most of the churches (over 60%) were built in the 14th century.

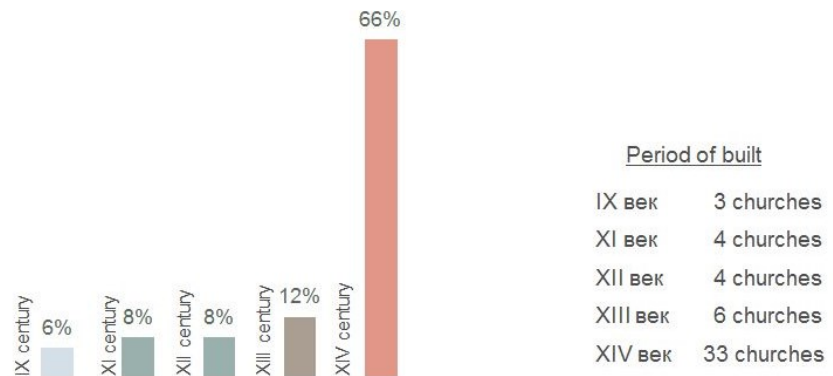


Figure 3.3 Classification of the churches - period of built

In relation to their typology, the most numerous are the domed cross-in-square and the small single nave buildings, (fig. 3.4). In the Skopje region most of the churches belong to the typology cross-in-square (fig. 3.5) – St. Nikita in Banjani, St. Panteleimon in Nerezi, St. Nicholas in Ljuboten, St. Holy Mother in Matka etc. Many examples of the small single-nave churches could be found in Ohrid region (fig. 3.6) - St. Cosmas & Damian, St. Demetrius, St. Holy Mother Bolnichka, St. Nicholas Bolnichki, Small St. Clement etc. Basilicas are rarely present. The church of St. Sophia in Ohrid and St. Nicholas in Mariovo belong to this typology. The conch churches appear as three-conch (St. Andrea in Matka and St. Holy Mother in Leshok) and four-conch (St. Holy Mother Eleusa in Veljusa). The only example of a two-nave concept is the church of St. Holy Mother Chelnichka in Ohrid. Some of the churches are combination of two typologies - inscribed cross and basilica, like the churches St. George in Staro Nagorichane, St. Holy Mother in Drenovo and St. Leontius in Vodocha.

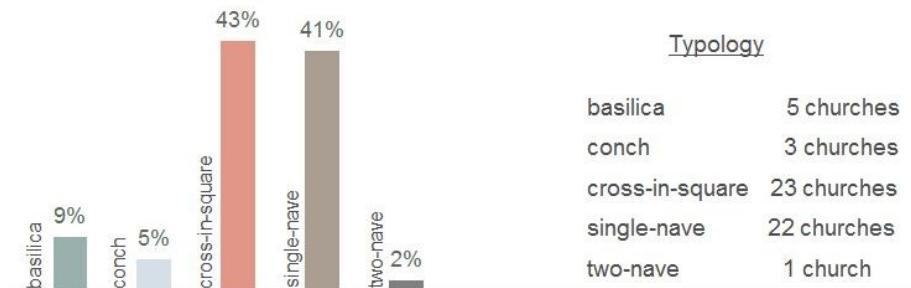


Figure 3.4 Classification of the churches – typology



Figure 3.5 Cross-in-square churches in the Skopje region



Figure 3.6 Single-nave churches in the Ohrid region

Field inspections enabled to visually assess the condition of the churches and to identify some visible damage/irregularities on the exterior and interior surfaces. Although these churches existed for centuries it was noted that most churches (around 85%) are in a “good” or “satisfactory” physical condition, fig. 3.7. More severe damages, such as: structural cracks, material degradation or poor structural connections were observed at six churches - St. John the Baptist in Shtip, St. Stefan in Konche, St. George in Staro Nagorichane, St. Holy Mother in Drenovo, St. Holy Mother in Treskavec Monastery and St. Nicholas in Shishevo. The condition of these buildings was assessed as “bad”. The one church in a “very bad” condition is located in the Prilep region – church St. Atanasius in Varosh, (fig. 3.8). This building is completely abandoned and overgrown with vegetation. The roof structure and the upper parts of the walls are completely destroyed and the wooden elements in the walls are burnt and rotted due to previous fire. Since the building is in high risk, emergency measures are proposed.

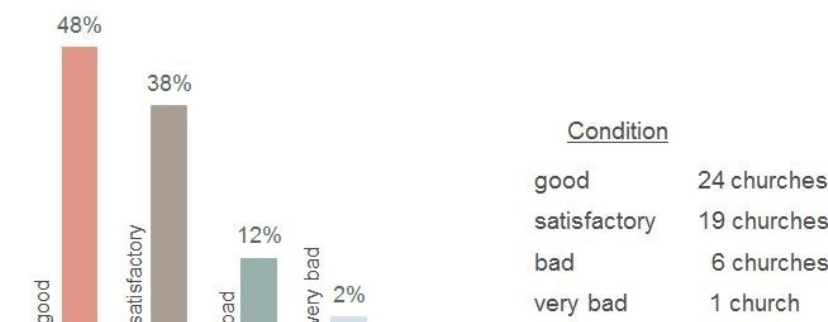


Figure 3.7 Classification of the churches - condition



Fig. 3.8 Exterior and interior of the St. Atanasius church in Varosh, Prilep

The documentation review and the visual inspections indicated that all churches have undergone some past interventions on a smaller or larger scale. Additions in form of porch or narthex were often built in the later periods, fig. 3.9. Facade, structural and interior interventions were also performed. These interventions range from minor protective works (replacement of the roof or floor material, rearrangement of the cornices, injection of cracks, forming drainage channels), up to extensive works (structural strengthening with reinforce concrete, reconstruction of damaged parts, partial or complete replacement of the roof structure etc.). Such extensive works were noted in a few churches – St. Panteleimon in Nerezi, St. Holy Mother Perivlepta in Ohrid, St. Sophia in Ohrid, St. Holy Mother in Drenovo, St. Archangel Michael in Varosh, St. Nicholas in Mariovo and St. Holy Mother in Trescavec Monastery. The church of St. Athanasius in Varosh is the only church with no records for past conservation activities or other interventions.



Figure 3.9 Additions from later periods in form of narthex and porch

The authenticity of these churches (fig. 3.10) is directly related to the scope and type of the past interventions. Part of the churches (30%) are preserved true to their origins in terms of materials, forms and structure, so these churches have high level of authenticity (St. Archangel Michael in Shtip, St. John the Theologian in Ohrid, St. Nicholas in Varosh, St. Nikita in Banjani, etc). Most of the churches (over 60%) have medium level of authenticity, due to later additions or conservation efforts that somehow impacted the original appearance of the monuments. The only church with low level of authenticity is the church of St. Panteleimon in Ohrid since it was completely rebuilt in 2002 on the remains of the original walls and modern materials were used.

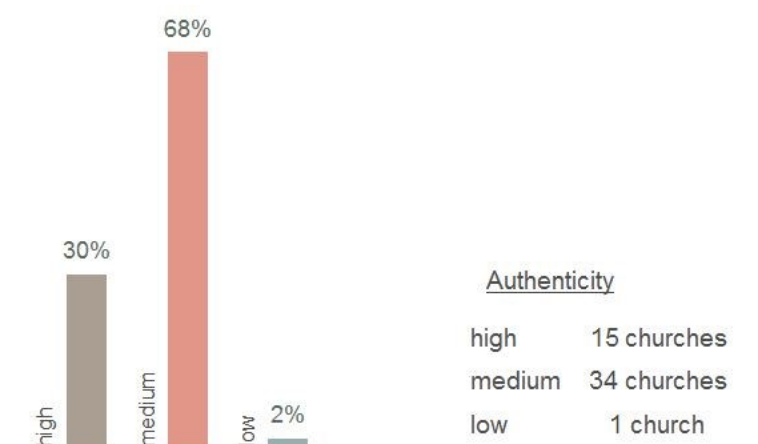


Figure 3.10 Classification of the churches - authenticity

4. Conclusion

Byzantine churches (9th-14th century) are a significant part of the tangible heritage in North Macedonia. These medieval monuments hold exceptional architectural and artistic value, and today, they serve as a bridge that connects us to the culture and people who created them.

The presented investigation provides information on the current state of the Byzantine churches in North Macedonia (a total of 50 churches), using a uniform methodology with clearly defined criteria for condition assessment. The methodology included archival research, a review of available documentation, and field surveys for each church. Based on the collected data, the churches were categorized according to several criteria: construction period, typology, condition, degree of interventions, and authenticity.

Within the presented research, a database for the Byzantine churches in North Macedonia was created, offering new and updated information on their condition, all in one place. This database can help update and synchronize official national registers, support future conservation efforts, and provide a deeper understanding of the country's Byzantine heritage. Additionally, some of the relevant information could serve as an exposure model for national risk assessment activities related to potential natural hazards and climate change.

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