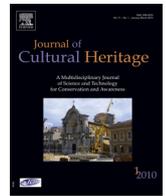




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Historical wooden churches from Banat Region, Romania. Damages: Modern consolidation solutions

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ARTICLE INFO

Article history:

Received 2 November 2012

Accepted 16 November 2012

Available online 9 February 2013

Keywords:

Timber structures

Cultural heritage

Strengthening

Damages

3D analysis

ABSTRACT

Historical wooden churches are spread in several countries in the Balkans and are considered priceless World Heritage values, because of the traditional manufacturing techniques, religious paintings and in plane and elevation forms specific to each geographic region. Over the years, some have disappeared, others have been moved and some have remained present in the same location. Depending on external factors that acted on them, they have recorded various failures and degradations. Among the most important factors we can mention: fire, floods, landslides, earthquakes, biological attacks. In the western part of Romania as in neighboring countries such as Serbia and Hungary, there are many historical wooden churches. Generally they were built between 1650 and 1850 with some exceptions. Since almost 50 years in the communist regime the consolidation of historical monuments was almost forbidden and they were intentionally left to deteriorate, in the present time they are extremely degraded their historical and cultural value is given by religious paintings made directly on the wooden walls. The article tries to focus on these monuments of great cultural heritage importance unknown in this region and present the main damages of these churches and some reversible consolidation and strengthening solutions according to the Chart of Venice.

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1. Introduction

1.1. Location: history

Banat Region is located in the west of Romania, nearby Hungarian and Serbian borders (Fig. 1). Banat Region is part of the geographic area of wood architecture that stretches from northern Europe to the Greek mountains [1]. In this context, religious architecture, represented by wooden churches, is found in Banat Region. Since the mid-eighteenth century, after the Austro–Turkish war and the plague epidemic ended, the area began to develop. In addition, the administration changed, passing from a military to a civil form. A series of large investment programs were completed, such as creating a system of fortifications and hydro works – Bega River channel. Thus it is observed significant migration from poorer neighbor provinces, especially from the Apuseni Mountains. During these migrations, sometimes covering the entire population of a village, with all commodities, the community churches are moved too. From time notes we learn that sometimes these movements were made on rollers, sometimes the churches were dismantled and rebuilt in new location [2].

For these reasons and also the orders given by the habsburgic administration to move the center of the village – having urban or technical reasons – made that most of the wooden churches that exist now in the Banat sustain multiple dislocations over time. Hence this results some structural characteristics of the buildings. Over the time, many of the churches were destroyed from religious reasons or by Turkish invasion in 1788 when more than 20 wooden churches were burned. In 1891 there were about 200 wooden churches in Banat Region, in 1929 there were 54 and in 1935 only 48 remained. There are currently only 25 wooden churches left in Timis County and Caras-Severin County for which are necessary restorations [3].

1.2. Research aims

During the last years, the Romanian Orthodox Church from Banat, together with the authors started developing studies in the vulnerability domain of these buildings [7,8] for strengthening them. The program includes 6 wooden churches: Dobresti, Romanesti, Crivina de Sus, Povergina, Curtea, and Cosevita, all from Timis County (Fig. 2). The studies focus on the consolidation of the wooden bearing structures of these churches, paintings conservation, traditional manufacturing techniques and all architectural elements of heritage value. The project team was made up of expert architects, biologists, geologists, restorers and constructors. Currently the projects are realized and expect approval of funds to start

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Fig. 1. (a) Location of Banat Region in Europe; (b) map of Banat.

the consolidation works only for the church in Dobresti. Due to the fact that in the Banat Region the resistance structure of wooden churches were not consolidated, the authors used the results from the latest researches in the consolidation domain of wooden bearing elements, published at conferences and journals by Mazzolani et al. [5–7,11], Borri et al. [8,9], Kouris and Kappos [10], Jasienko et al. [13,14]. At the base of these consolidation solutions developed by the authors from the “Restauro” Foundation [18] were several studies made on historical wooden buildings within the research contract PROHITECH [12–17]. The authors participated along with researchers from universities and laboratories from all

the countries surrounding the Mediterranean Sea at theoretical and experimental studies in historical bearing structures field. This article presents reversible particular strengthening solutions for these historical buildings.

2. Theoretical and experimental studies

2.1. Introduction: historic building systems and techniques

Wooden churches of Banat are made of oak wood carved with an axe. They are situated in an area in which the average annual

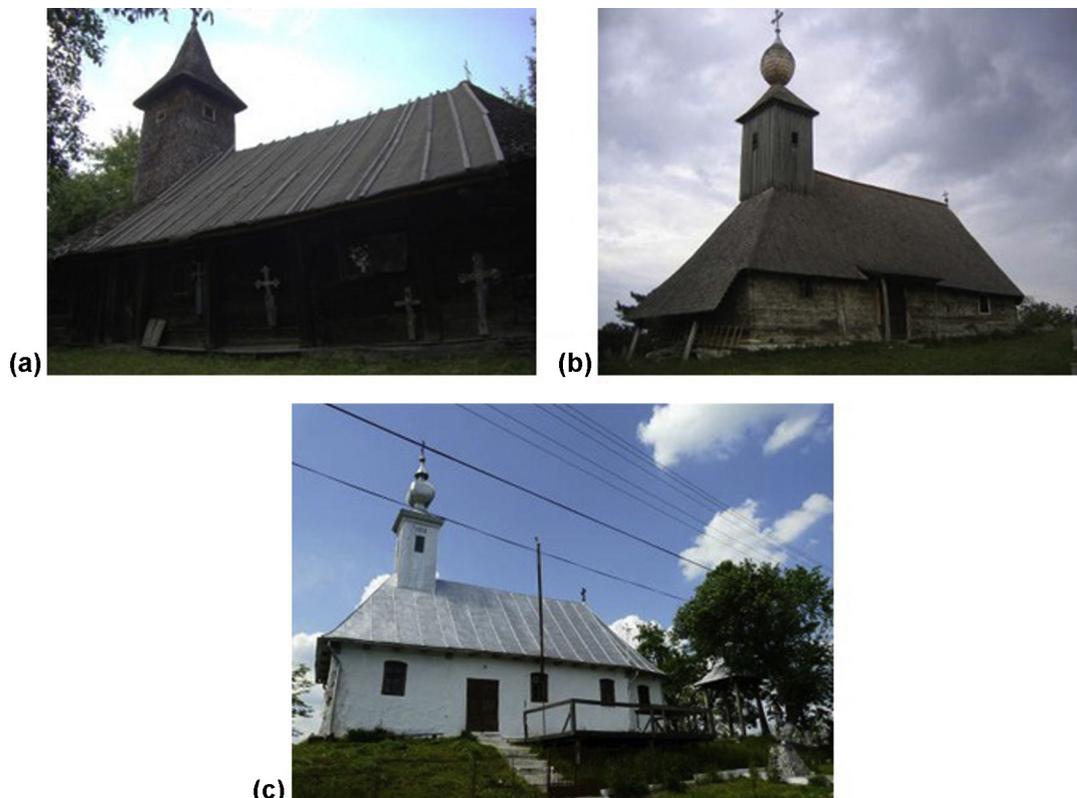


Fig. 2. The wooden church: (a) Povergina de Sus; (b) Romanesti; (c) Dobresti, Banat, Romania.

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