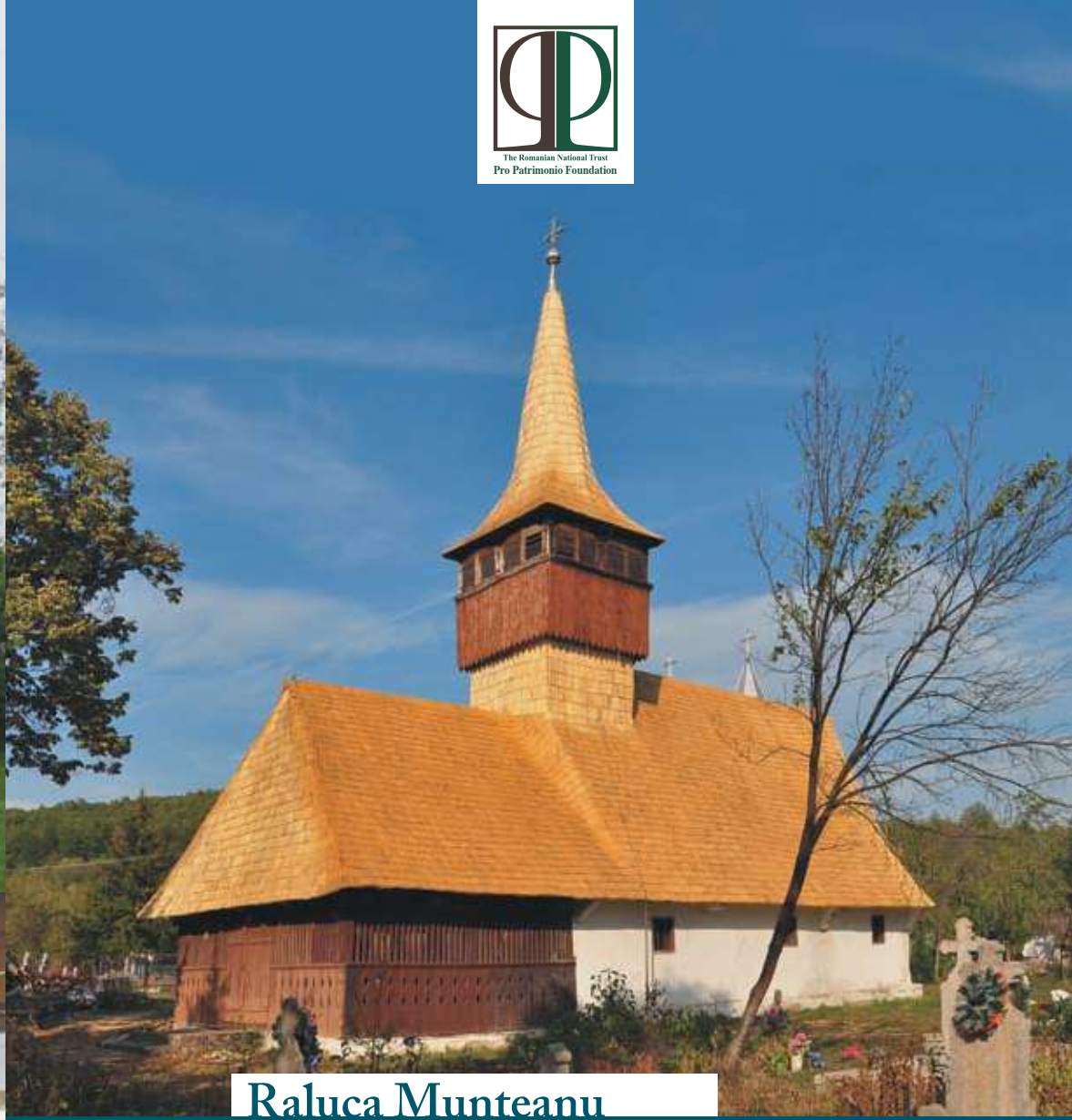


Cover I : wooden church in Boz village  
Cover II : wooden church in Târnavița village;  
interior of the wooden church in Crivina de Sus village



Raluca Munteanu

# Wooden Churches

## Guide for Common Maintenance and Repairs

Bucharest 2017

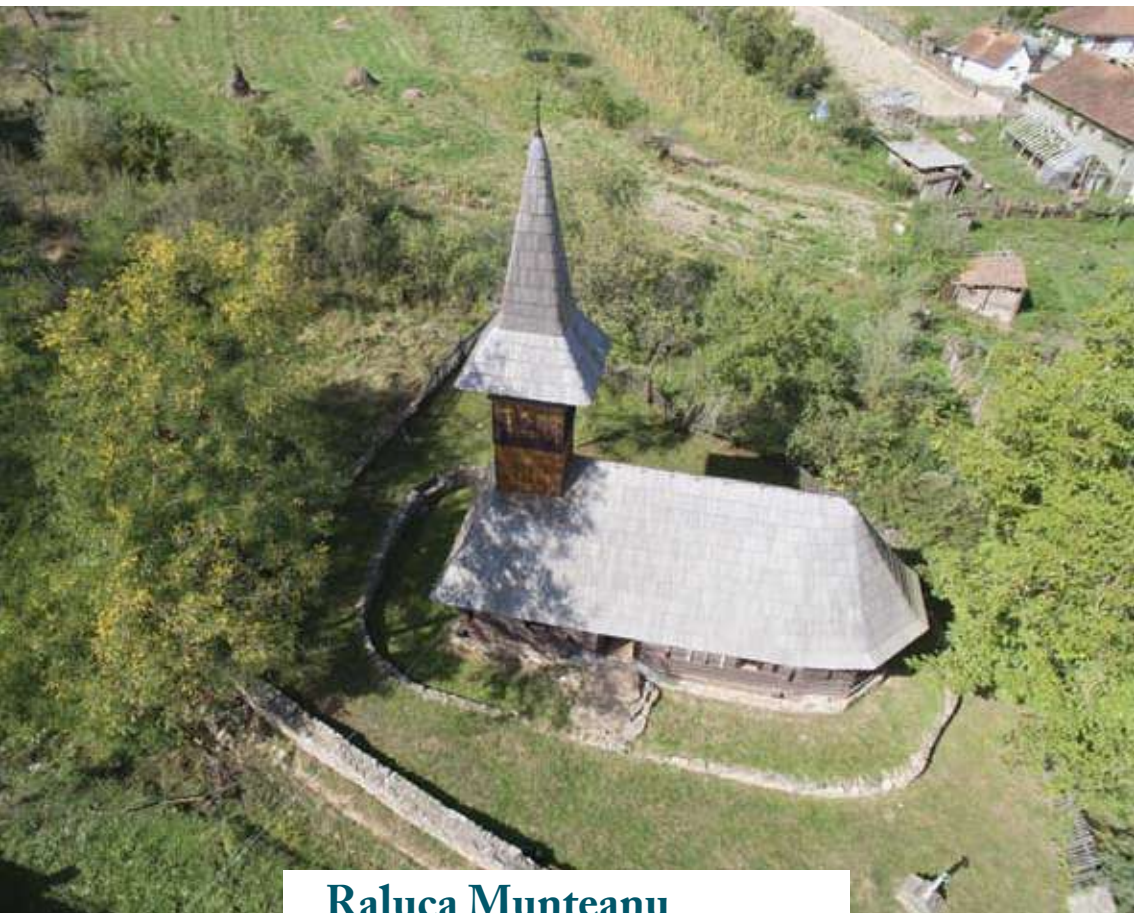


**Wooden Churches**  
Guide for Common  
Maintenance and Repairs





The Romanian National Trust  
Pro Patrimonio Foundation



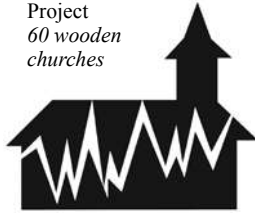
Raluca Munteanu

# Wooden Churches

Guide for Common  
Maintenance and Repairs

Bucharest 2017

Project  
*60 wooden  
churches*



With the support of



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Wooden church in Boz village,  
Hunedoara county

# Foreword

In a world of national identities that are disappearing and of global levelling, returning to the collective memory projected in church architectural monuments is both revelatory, as well as redeeming. Popular church art embroidered skilfully on the old bodies of wooden churches in Hunedoara county unveil to us, first and foremost, the Romanian spirit of these lands in its highest forms of expression.

Throughout our tormented history the church was the natural shelter of language, culture and Romanian specificity. Here, in these humble places of worship, the Transylvanian spirit was moulded and the identity of a nation, fragmented but never divided, took shape. Therefore, these Transylvanian wooden arks keep the greatest treasure inside: Christ embodied for centuries in the unsettled history but forever vanquishing of these lands.

Re-evaluating the wooden churches in Hunedoara county, as well as nationwide, is an attempt at recovering the spiritual that has, for centuries, animated and oriented the history of the Romanian people. Furthermore, our wooden churches represent history's mellow mouth that talk gently but in a determined voice to the whole world about our own identity while offering us the right to say our part in the new European order.

We consider this practical book that offers the technical elements for the minimal maintenance and conservation of wooden churches more than welcome as it endows those responsible for such monuments with a useful guide for proper conservation and maintenance. However, the administrative, political, economical and ecclesiastical elements need to become truly and constantly involved in finding urgent and efficient solutions to consolidate and restore some of the monuments of architecture which, also because of the materials they were built in, are coming close to collapse.

We all hold the responsibility, both the decisional elements stated above and society on the whole, to join forces and find practical solutions from European funding, central, local and county budgets, as well as donations from parishioners with the support of local communities in order to implement the projects that would reinstate these attractive historical places in a liturgical and tourist circuit. We advise with fatherly warmth all mayors, local representatives and parish priests from all villages that have wooden church monuments to join forces to access funds that can save our ancient spiritual heritage.

We congratulate those who have worked on this book and we thank them for their effort derived from a strict awareness of their duty and profession and we ask our Merciful Lord to repay their hard work, blessing them with His heavenly undying gifts.

Curie,  
Bishop of Hunedoara and Deva county





Fresco from wooden church in Ilimbav, Sibiu county

# I. Introduction

Designed as sacred spaces meant for Christian gatherings and ceremonies, the old small churches – built from wood by craftsmen from Romanian villages and painted with inspiration – represent Orthodox spirituality. They are, at the same time, extraordinary items of cultural heritage passed down to us as legacy and valuable teaching from past generations.

This guide consists of a manual for Romanian rural communities that wish to use and properly maintain wooden churches in their villages. It can be used as guide for other areas aside from the ones included in the program *60 Wooden Churches* started in 2009 by architect Șerban Sturdza. That year, the Order of Romanian Architects and Pro Patrimonio Foundation began emergency interventions on wooden churches in Sibiu, Hunedoara, Gorj and Vâlcea counties, most of them cemetery chapels, often abandoned, all of them labelled historical monuments in a serious state of artistic and structural decay.

The guide was published with the help of the European Investment Bank Institute through the program *The Seven Most Endangered Heritage Sites in Europe* in partnership with the organization Europa Nostra that included the wooden churches in Romania in 2014.

The idea to write such a guide came from different talks with priests and mayors charged with old wooden churches placed in cemeteries and abandoned by parishioners. Using and keeping them in a proper state is the duty of the church community; this preserves the tradition, history and identity of their own settlement.

The guide was designed to be user-friendly and to offer suggestions for simple maintenance as well as for understanding the complex repair process, if required. It also contains check lists for church owners (parishes or town halls in certain cases) with the aim to write down and follow current maintenance and observation of the religious building.

The project *60 wooden buildings* works in a medical emergency-type system, with precise, urgent interventions meant to conserve and protect solely in the near future. The actions involve a lot of voluntary work from priests and young people, with funds from private donations and with the involvement of local parishioners. All these restoration operations also have a social dimension that targets the reintegration of the church as valuable heritage item in the parish life by reopening, usage and constant maintenance of the building.

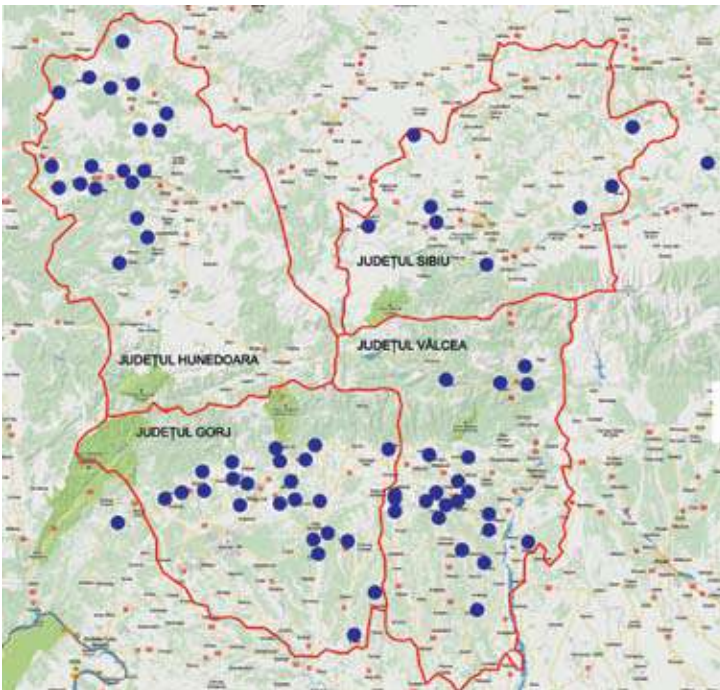
The international World Monuments Fund included the wooden church ensemble in northern Oltenia and southern Transylvania in the program Watch 2014 as testimonial of the imminent danger hovering over this heritage buildings and as acknowledgement of the cultural and economical value they have in the durable development of the communities.

## *About Using Wood in a Village Church*

Wood was the preferred building material in Romanian hill and mountain villages for both residential buildings and places of worship, as it was an accessible and sturdy material.

North Oltenia is the most southern part of Europe where wooden buildings are a tradition and where a few dozen wooden churches from the 18th and 19th centuries have survived. These small-sized churches were tailored to the needs of the small rural communities and were mostly placed in cemeteries. Today, they are seldom used or even abandoned because the villages now have new more spacious brick churches. Similar situations can also be found on the other side of the mountains, in Țara Hațegului, on the river Mureș and in the Sibiu pathway (Hunedoara and Sibiu county).

The program *60 wooden churches* monitors the churches in north Oltenia and south Transylvania (Vâlcea, Gorj, Sibiu and Hunedoara counties).





Wooden church in Căzănești village, Hunedoara county (photo 2013)

Wooden churches are spread throughout the country, the most well-known, also on the UNESCO World Heritage List, are the ones in Maramureș. The architecture and painting differs from one region to the other, but current maintenance problems are similar.

These buildings are spread on a hillside landscape stretching from the mountain footing specific in its scattered villages with wide households, orchards, grazing planes and few agricultural areas. Most often, the church towers above the settlement but, as it has stopped being used, vegetation covers it and has now completely hidden it.

After 1990 the aspect of the village suffered a dramatic change. The old traditional houses were demolished (while the wooden ones were dismantled and burnt) and replaced with bigger houses painted in violent colours contrasting with the landscape. The traditional household with barn, animals and vegetable garden is transformed more often into a concrete yard similar to ones in cities, with building materials and plants foreign to the area.

Wood traditionally used in villages is no longer used in buildings today; industrial materials are preferred instead (brick, AAC, concrete, metal sheets).



Church in Mlăceni village, Vâlcea county  
(photo from 2014, before restoration)



Church in Vălari village, Hunedoara county  
(top – photo 2009, bottom – photo 2015)



Church in Rovina village, Hunedoara county  
(photo 2009)



Church in Ponoarele village, Mehedinți county  
(photo 2014)



Wooden church in Bunești, Hunedoara county (photo 2015)



Wooden church in Gothatea village, Hunedoara county (photo 2013)



Wooden church in Almașu Mic, Hunedoara county (photo 2009)



Degraded roofing with wooden shingles



Wooden church in Budurăști, Vâlcea county (photo 2014)



Wooden church in Chimindia, Hunedoara county (photo 2013)

Consequently, not only is wood abandoned as building material, but so is the knowledge related to craftsmanship and its behaviour over time. There are fewer and fewer craftsmen and they no longer have apprentices to pass down their knowledge in woodwork to, as it was passed down to them by their ancestors.

The most common building system for wooden churches uses horizontal logs stacked and interlocked at the corners by notching. The types of joints vary from one area to the other, depending on the craftsman and the local tradition. There are a few cases where one can also find structures with timber posts and beams that have broad timber logs placed between posts, similar to the construction techniques used in traditional houses. The narthex is most often covered with a wooden vault (from broad logs placed on wooden arches) and in a few cases the vault was made out of wattle and plaster smoothed into a flat surface. Wood is often carved with decorations representing traditional symbols.



Posts fixed with mortise and tenon joints in a horizontal bottom log and an upper beam. The walls are made from timber planks pinned between posts



Clay mixture on timber binding strip



Horizontal timber logs in "dovetail" woodwork joint



Church in village cemetery, Copăceni, Vâlcea county (photo 2014)

The artistic components of the wooden churches include the mural painting, the iconostasis, the furniture (lecterns, standing icon cases etc.), objects used during the religious service, but also other wooden decorative elements that are part of the ensemble.

Mural painting in wooden churches is a decorative element important to the religious ritual and also for its documentary and artistic value. The scenes depicted show historical events with characters and details (clothes, tools) inspired from the daily life 18<sup>th</sup> and 19<sup>th</sup> century communities. In most cases, the painting has survived only partly and is in a poor state of conservation: dirt, scrapes, scratches... It is estimated that the painted fragments—that make up a remarkable patrimony—preserved in these churches add up to approx. 3000 m<sup>2</sup>. Mural painting can be applied using two techniques: *al fresco*, fresco painting executed on freshly-laid plaster, and *al secco*, painting executed directly on wood or dry plaster. In the case of frescoes, the binding medium is always calcium carbonate that results from drying lime after the pigments have already been placed. In the case of *al secco* painting, the binding media can be different: flaxseed oil (oil mural painting), egg yolk (tempera painting). A different type of *al secco* painting used in wooden churches uses animal clay as binding medium. In the case of *al secco* painting technique, recipes can vary widely according to the region and to the painter's knowledge. In order to recognize the type of painting present, a close analysis is required and, especially in the case of *al secco* painting, lab analyses are needed to establish the exact type of materials used (mortar or primer composition the painting is laid on, pigments, binding media) can decide upon the type of conservation or restoration intervention and maintenance of the painted surfaces.

The iconostasis and other polychrome elements are also painted using different techniques. Interventions on this type of components can only be carried out after approval of a project that consists of a complete expert documentation.





Exterior fresco in wooden church in Șirineasa village, Vâlcea county



Al secco painting in wooden church in Târnavița village, Hunedoara county



Cleaning and consolidation work for the interior painting of a wooden church in Copăceni village, Vâlcea county



Interior fresco in wooden church in Urși village, Vâlcea county



Fresco on church vault in Urși village, Vâlcea county



Icon from wooden church in Boz village, Hunedoara county



Iconostasis and *al fresco* painting from wooden church in Ponoarele village, Mehedinți county



*Painted decoration details*

Interior fresco from wooden church in Copăceni village, Vâlcea county

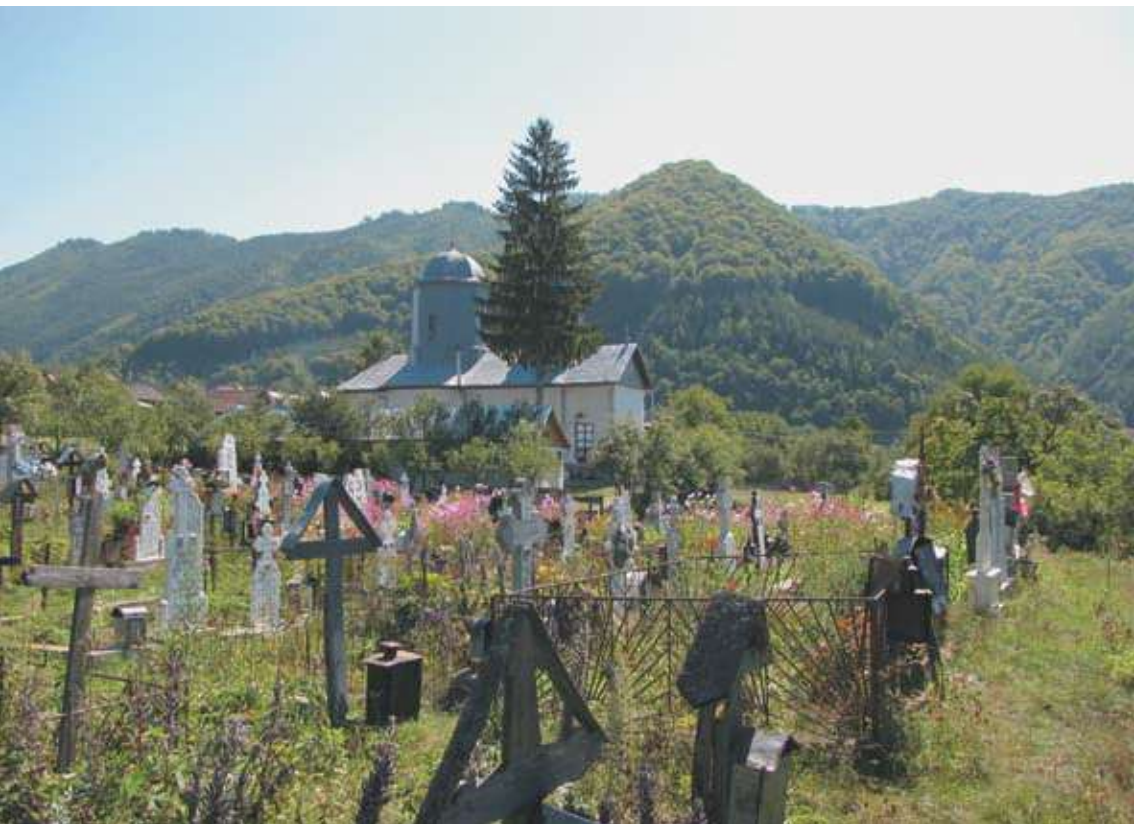


Exterior fresco detail from wooden church in Urși village, Vâlcea county

There are many wooden churches that require different maintenance, conservation and / or restoration interventions. Serious cases are growing in numbers and postponing conservation actions will only worsen the situation. Lack of intervention is most often caused by church abandonment, nonexistent church funds, bureaucracy, village depopulation, lack of interest, ignorance etc.

Usually, small communities of believers have insufficient funds. Lack of funds is a problem when a monument church needs to be saved because the community can't afford hiring experts. In addition, the lack of an intervention or inappropriate repairs cause very rapid degradation. By preventing decay, money is saved, while delay increases the risk of higher costs or loss of an important part of our national heritage.

Even if apparently, a specific ruin is a small loss, on the whole, we are talking about an important dimension of loss for the identity of the community and of European culture.



Church and cemetery in Mlăceni village, Vâlcea county

## 2. Tradition. Churches. Historical Monuments

Wooden churches found in these villages are representative for our people's spiritual and cultural tradition. Through them, we receive a set of habits, beliefs, knowledge and practices from our tangible and intangible heritage.

Tradition means appreciation and respect for what was passed down to us as good and valuable. Tradition that is wisely integrated is our most important source of knowledge. Most wooden churches are classified as historic monuments of national heritage. According to Romanian legislation, the buildings valuable for their history, architecture, memory of the space, are protected and preserved in order to be passed down to future generations. Including them on the heritage list means recognizing their value and demands that the community preserve and maintain them.

The buildings included on the heritage list are divided into: category A, buildings of national importance and category B, those of local importance. Maintenance, protection and conservation are similar for both categories and aren't influenced by this differentiation. Properly executed maintenance works don't require approval from authorities. However, repair, conservation and restoration imply a technical documentation and obtaining a construction permit.<sup>1</sup>

<sup>1</sup> According to Law 50/1991, revised in 2014, regarding permits for undertaking works of construction.



Wooden church in Vălari village, Hunedoara county

*Maintenance interventions: the surrounding vegetation is constantly cut, the grass is cut and the degraded areas are temporarily protected while awaiting future repairs.*



Wooden church in Dumbrăvița, Hunedoara county



Wooden church in Căzănești, Hunedoara county

### *What Should we Understand by Maintenance Work?<sup>2</sup>*

Maintenance implies permanent grooming of the building and of the neighbouring space like: cleaning, airing, checking building elements (roof, foot etc.), refreshing the whitewash or paint (according to the case), removing overgrown vegetation and dried leaves.

Maintenance is absolutely necessary in order to prevent and resort as rare as possible to expensive and long works of conservation and restoration.

<sup>2</sup> According to Burra Charter 2013 / ICOMOS (International Council on Monuments and Sites), "art. 1.5: Maintenance means the continuous protective care of a place, and its setting." see <http://australia.icomos.org/wp-content/uploads/The-Burra-Charter-2013-Adopted-31.10.2013.pdf>



Conservation: structure protection and church wooden supports in Urși village, Vâlcea county

### *What Should we Understand by Conservation Work?<sup>3</sup>*

Conservation work implies reviving part of the construction qualities, which is part of the structural frame or not in order to ensure its integrity. The works are done with the same materials and techniques used for the damaged parts or with other components that do not irreversibly affect the structure or aspect of the element that is under conservation. For example, conservation of paintings, plaster, wooden logs using different treatments. Works of conservation can only be undertaken by experts.

### *What Should we Understand by Restoration Work?<sup>4</sup>*

Restoration is a complex process that involves bringing a part or the whole to the original state that historical documentation indicates as most valuable. The work requires studies and analyses and execution implies using the same techniques and materials as the original. Restoration work can only be undertaken by experts.

3 According to Burra Charter 2013 / ICOMOS “art. 1.4.: Conservation means all the processes of looking after a place so as to retain its cultural significance.” see <http://australia.icomos.org/wp-content/uploads/The-Burra-Charter-2013-Adopted-31.10.2013.pdf>

4 According to Burra Charter 2013 / ICOMOS, “art. 1.7: Restoration means returning a place to a known earlier state by removing accretions or by reassembling existing elements without the introduction of new material.” see <http://australia.icomos.org/wp-content/uploads/The-Burra-Charter-2013-Adopted-31.10.2013.pdf>



Wooden church in Tisa village,  
Hunedoara county (photo 2013)



Wooden church in Copăceni village, Vâlcea county (photo 2015)

#### Restoration work



Wooden church in Grânari, Braşov county (photo 2014)

### *What Should we Understand by Repair Work?<sup>5</sup>*

Repair work is the work that replaces deteriorated pieces partly or entirely, for example, repairing the wooden shingles, the doors, the windows etc. The same materials and techniques used in the deteriorated parts must be used for repair. Repair involves either restoration work or reconstruction work (in the case of fabric that is completely missing or is gravely deteriorated). This work can only be undertaken by experts.

<sup>5</sup> According to execution norm from Law 50/1991.



Repair work on church wooden shingles in Tărnăvița, Hunedoara county (photo 2012)

### *What Technical Documentation Is needed for a Construction Permit?*

„Activities and measures for protection of historical monuments are done for the general interest.” (Law 422/2001).

Protecting historical monuments implies proper maintenance and conservation or repair works, depending on the case. For work that requires a construction permit, a specific technical documentation is elaborated that justifies and states the exact means of intervention. Both the documentation process and the permit are not mere formalities apparently trying to hinder work, but they are instruments necessary for



choosing the appropriate intervention for the building-type, and also for preserving important information about the history of the building. The technical documentation and official permits are acts that oblige both owners and the team of experts as well as authorities to act responsibly. Their duty is to preserve the cultural value and historical essence of the historical monument and to make reversible interventions using compatible systems that don't affect the building.

The construction permit file is a historic source that passes onto the next generations important information about the building structure, repairs and interventions as well as about the professionalism of people involved in the project and in the process of obtaining a permit. Consequently, the building permit is the house legacy for future generations and its "health" card is documented memory.

### *How can I Obtain a Construction Permit?*

The technical documentation for construction and execution is done by specialized architects and engineers. They have the duty to follow the execution process throughout and are responsible for the project and permit outcome. Both the elaboration of the studies and project, as well as the technical assistance during the execution process are services that the owner must repay accordingly.

The owner of the church historic monument together with the architect choose the project concept (what requirements the owner identified for the building's proper functioning). Based on this concept, an urbanism certificate is requested from the town hall the building is ascribed to.

A few preliminary reports are required for the project: measured survey of the building, structural expertise, biological analysis of wooden elements, topographic elevation, geotechnical investigation, historical study, bio-chemical analysis in the case of painted decorations. Depending on the case, auxiliary reports can be requested: foundation inspection, durability test in structural elements, material identification analyses (wood, mortar etc.), archaeological investigations. The architect together with the team of experts (engineers, restoration specialists, biologists etc.) composes the documentation for the permit based on the conclusions drawn from the preliminary reports and forwards it to be approved by the County Department of Culture.

The technical documentation together with the above-noted permits mentioned in the certificate of urbanism and the property deed to the historic monument are sent forward to the town hall in order to obtain the construction permit.

The project is detailed and completed with all the information necessary for the executing craftsmen/ constructors. The architect is responsible for the following of the project and construction permit.

### 3. Commonly-occurring Maintenance and Repair Problems

Deterioration in wooden churches and their painted decorations can be caused by humidity, fire, biological attacks, abandonment or vandalism. Quality maintenance prevents degradation and keeps the building in a good condition in order to be used in appropriate circumstances. Water and fire are wood's greatest enemies. Wooden churches should firstly be protected against water. Wood left wet over a longer period of time can be easily attacked by fungi (wood decay) and insects and loses its structural strength. On the outside, dampness can appear on both shaded sides overgrown with vegetation where the sun or wind don't reach; at the level of the stone base and bottom logs, dampness is caused by snow or rainwater stagnation; at the roof level, dampness is present when damages in the roofing appear. Inside, the wooden flooring is the most exposed to dampness, as is wood on the walls or vaulting through water infiltration from external sources.

#### *Climate Issues*

Wood is a material that reacts to changes in temperature and humidity. Romania's specific climate has major differences in temperature between winter and summer, but also between day and night. Generally, in winter extreme temperatures range between



Serious degradation of the log wall caused by rain water infiltrated through the deteriorated roof.



The surrounding pathway is permeable (earth) with an outer gradient that discharges rain water.



Around the church a cement layer was added that retains humidity and caused the bottom logs to rot.

-10°C and -15°C and in summer between 30°C and 34°C. Daily variation in summer and winter is of app. 20°C: in summer, average daily temperatures vary between 10°C and 30°C and in winter between -10°C and 10°C.

Relative humidity alters between 60-70% in summer and 70-80% in winter.

In periods of high humidity, temperatures are low enough to hinder the development of biological organisms (fungi and insects). Inside, however, temperatures are higher than those outside, thus, if humidity is high for a longer period of time, the risk appears that fungi will develop on the wooden elements. The first sign can be seen on the surface of the wood, i.e. mold. Climatic conditions can vary a lot between different villages or areas. Villages located in vpathways and surrounded by woods—specific to the land of Pădureni, Hunedoara county—have higher atmospheric humidity and lower temperatures which create conditions for faster wood decay. In these areas, the roofing wooden shingles need to be changed more often, once every 25 to 30 years.

Villages located on the hills in open areas and surrounded by planes and orchards have lower atmospheric humidity and stronger winds, such as the case in the villages in northern Oltenia. Winds help dry the moister wooden parts. Temperatures, however, vary greatly between day and night or winter and summer. Installing a monitoring device for the specific microclimate—outside and inside temperature and humidity—is advised in order to observe when humidity is persistent. In this case, ventilation of the spaces is recommended.

### ***Vertical Systematisation and Surrounding Vegetation***

It is advised that the vegetation on the outer contour of the wooden church be cleared regularly: dried leaves, bushes or branches that grow too close to the church wall. The pathway around must have a gentle outer slope in order to discharge rainwater from the foundation. It is advised that the foundation be made of gravel or stone tiles laid on a permeable support. Impermeable concrete or asphalt pathways are not advised. For optimal water drainage, it is advised to create a surface drain on the outline of the church following the eaves' line: a 30 cm wide and 30 cm long trench should be made and filled with gravel. The gravel level needs to be lower than the level of the terrain near the church foundation so that the water can seep through the drain. The water around the surrounding pathway will seep faster in the earth through the gravel. With time, the drain area will be covered in grass.

If the church is plastered on the outside, the plaster degrades faster in the area of the foundation. Exterior plaster is made of clay or lime. Damaged areas are cleared by removing the falling pieces and repaired with plaster from the same material.

**Caution: Do not use cement or any mixture with cement and lime!**

### ***Church Bottom Logs and Stone Base***

In many cases, the wooden churches are placed directly on the ground without a foundation. During maintenance works, special attention should be given to the perimeter pathway for proper water drainage and maintenance of earth permeability. If the bottom logs are not deteriorated and the church has no deformations (tilting or displaced wooden elements), then the building stability is fine and interventions that involve building a foundation are not necessary. Regular observation of the bottom logs is advised as well as maintenance of the surrounding pathway to identify possible decay on time. Work done around the church (e.g. new concrete graves, pathways or roads) can change the behaviour of the land and determine an increase in humidity in the church area.



The stone base has been covered in concrete all along the church outline and will deteriorate the wood.



A concrete belt covering the bottom logs was placed over the stone base. This intervention is not appropriate because it will degrade the wood by rooting and weaken the structure.

## *Roofing*

Most of the wooden churches are covered with wooden shingles or shakes. In Sibiu county and sometimes in Hunedoara county, churches covered with ceramic tiles can also be found. In recent times, some churches have been covered with metal sheets or, even more recently, with zinc steel tiles. The zinc steel roofing is not specific to the area and strongly alters the aspect of the church.

Maintaining the wooden shingle or shake roofing implies regular removal of dried leaves and branches that give excess shade or hit the roofing. The wooden roofing is changed once every 30 to 50 years. It is important that during the process of change, the shingle shape and fixture (in 3 or 5 layers, on wooden pieces, with curved edges etc.) stays as faithful to the original as possible.



Details of new roofing shingles



Details of shingles degraded over time

### *Treatment for Shingles*

The shingle (shake or Moldavian “draniță”) can be treated with biocide substances that protect against insects and stop microorganism proliferation. The roofing, however, is exposed to rain so surface treatments do not offer long-term protection and are not recommended. Correctly set shingles—made by splitting, with a minimum 5 mm-depth—can live for up to 30 years. Resinous timber is commonly used to obtain shingles, but they can be made from other types of timber that are more durable (for example, oak).

Applying bitumen membranes or bitumen-based paints over shingle roofing is not recommended. These materials increase the risk of fires, are toxic and pollutant and, in reality, do not efficiently help protect the roofing.



*Handmade ceramic tiles  
specific to Sibiu county*



### *Tile Roofing*

For churches covered with ceramic tiles, repairs consist in replacing the damaged tiles (broken, ground or missing) with similar ones. We find a great variety of tiles, especially in Sibiu county; old tiles are mostly handmade.

Replacing them with industrial tiles is not recommended. Maintenance work also involves checking the tile support slats, changing the damaged ones, doubling or reinforcing weak spots or filling in the missing ones.

We can identify three types of interventions: replacing some isolated tiles, rearranging the roofing, dismantling and complete replacement of roofing. Old tiles are checked, cleared of dust, moss and lichens with a brush or spatula. Using chemicals is not recommended. During dismantling, the tiles should be stored in a dry shelter, on wooden planks or pallets, stacked one against the front of the other to protect fixture holes. Lichens do not harm the surface of the tiles.



*Zinc metal roofing often placed over the degraded shingle roofing*

### *Zinc metal roofing*

Flat zinc metal roofing is widely spread as an alternative to shingle roofing and, often enough, it is placed directly over the degraded shingles. Standing seam metal can be modelled after the curbed shapes of the roofing and preserves the specific volume, but changes the aesthetical value of the wooden churches.

In the case of already existing standing seam metal roofing, maintenance involves supervision of seams (joints between the metal sheets) and surface in order to observe any rust spots. In case rust spots appear, the sheets need to be cleaned and, eventually, painted. If the sheets are in a too poor condition, it is necessary that they are replaced and returning to the wooden shingle roofing is advised.

Lindab-type zinc steel sheets are not appropriate for the small wooden churches; using them is, on the contrary, forbidden in the case of historical monument because it alters the aesthetical and symbolic value of the religious building.





Example of external electrical connection that is not fireproof.



Example of common electrical connection through the roof where the shingles will deteriorate the fastest.

## *Electrical Wiring*

Most of the wooden churches placed in cemeteries don't have an electrical connection. It is recommended that they be connected to the village electrical system in order to be used.

The electrical wiring process must be done according to a project, using suitable materials and with great care to the decorative elements (painting or carved elements). Fireproof tubes will be used and the electric panel should be placed so as to not damage the decoration and be out of reach (it is preferred that it should be placed in the altar). It is better to have the electrical connection buried through the ground so that the entrance cable can come through the flooring. It is most often done through the air, through the roof, a spot that is difficult to seal and, in time, leads to serious damage.

In case a new electrical connection is made or the existing one is rehabilitated, it is advised that any kind of circuit on the wooden walls, including installation of electrical appliances (doses, sockets, switches) be avoided. Circuits can be made under the flooring and above the vault and sockets and switches can be mounted on new supports detachable from the wall. For safe usage, it is recommended that the switches and electrical panels be installed in the altar where only the priest and the administration personnel have access. If churches have an electrical connection, the electrical system often doesn't completely correspond to safety operation procedures. The following improper situations can be found: fuse boxes in wooden boxes, electricity wires without insulation for wooden buildings, outdated electricity systems, lighting sources placed on



Example of lightning rod fixed on roofing in the process of replacing. Fixing spots are spots where the shingle deteriorates faster.

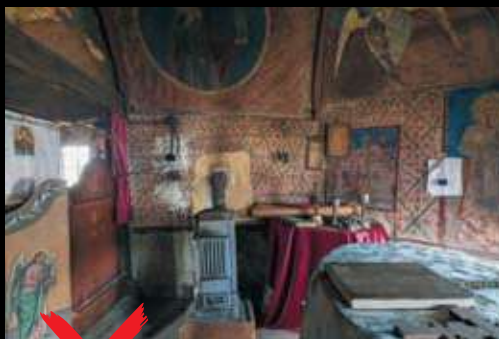


Lightning rod fixed on wooden shingle roofing; it is the most commonly-occurring system. Fixing spots should be insulated so that in case of overheating, it won't cause fire. Joining points on the shingles are usually vulnerable spots where the shingles deteriorate faster.

logs or over the painting, cabling fixed non-aesthetically that damages the authenticity of the space, too much light for painted decoration etc. There are several solutions for lighting in wooden churches that respect both building security standards (protection against overheating, fire, electric shocks, short circuits), as well as those necessary to the church ritual (lamps, chandeliers). These must be executed with an architect or specialist.

Chosen lighting sources must be the least harmful for wood and interior painting and respect the following conditions: they must have a minimal heat release below the level of wood flame spread ( $120^{\circ}\text{C}$ ), to be placed at a distance that doesn't damage the painting and the wooden material, painting direct lighting should be avoided and light intensity should not exceed 150 lumens, have a low consumption rate etc.

Most wooden churches have lightning rods. They are typically surrounded by tall vegetation that can be struck first by electrical discharges during storms. Installing a protection against lightning on the wooden shingle requires special attention. Peak capture and discharge strip mustn't come into direct contact with the wood, but should be insulated so as to prevent fires. However, installing the lightning rod on the shingles creates weak points that will, in time, cause damage and allow water infiltration. Not lastly, the aspect of the authentic church is affected by the metallic elements of the lightning rod (the receiver can overshadow the wooden cross at the ridge end). A recommended solution is mounting the lightning rod on the nearby belfry (in case there is one and the distance allows the lightning rod to protect the church as well) or on a separate pole nearby.



Examples of improvised heating systems. The stove horn pierces the wall and can cause a fire because it's not protected against overheating. It also damaged the painted decoration.



## *Heating Systems*

The old wooden churches don't have heating systems. In the past, their small size and wooden walls made it possible to be used in the cold seasons and the air would grow warm from the numerous believers attending church. Nowadays, church heating is necessary for comfortable usage. Installing a fixed heating system is not advised (radiators or stoves), but electrical portable heaters can be used.

Any open flame source (stoves, candles) should be completely avoided and even prohibited. Centralized heating systems with boiler and radiators don't fit visually into the small churches and require heavy use and maintenance. In case of disuse during winter the water in the radiators can freeze and crack the radiator heaters causing damage to the wood.

Traditionally, sealing and insulation of wooden churches was done as follows: by filling the spaces between logs and beams with hemp or a hemp and lime mixture; by placing a linen or hemp cloth with one or more layers of lime / chalk / plaster over the linen (this cloth was painted resulting in an iconographic plan); by closing with the walls, the vaults, the arks etc. with wooden slats / boards. These methods can be reused in churches that have had this type of insulation.



*Al secco* painting that is flaking from the wall because of persistent humidity.



Candle stand placed under the icon and in the proximity of the wooden wall. Placement of candles can also cause a fire.



*Al secco* painting cleaned by scrubbing until the painted image almost completely disappeared.

### ***Painted Decorations***

Main problems are caused by humidity. Water favours the overspread of microorganisms that attack the organic compounds in paints: wood, cloth, organic substances...

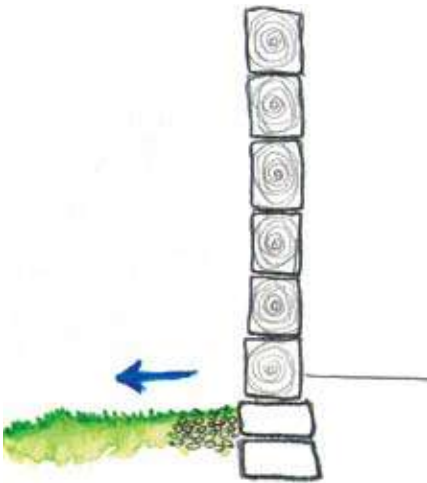
Microorganisms develop rapidly and act both on the surface of the painting and on the support layers (cloth, wood, paper).

Candles lit in the church cause great deteriorations: if placed too close to the icons of mural painting, they can cause burns; even at some distance, the heat emanating from each flame produces transformations in the painting support layers; the smoke resulting after putting out the candle settles over the entire painting and affects it both aesthetically and chemically.

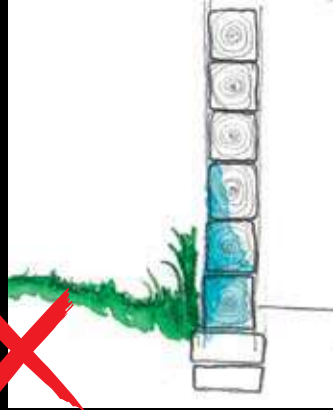
## 4. About Commonly-occurring Maintenance and Repair Mistakes

### *Exterior design*

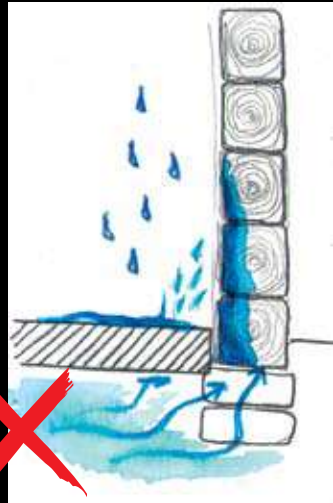
Making or repairing the pathway surrounding the church—by completely closing it with concrete or closing the joint between the cement stones—stops water evaporating from the ground and humidity rises through the wall damaging, in time, the church wooden structure.



Correct drawing for design of the church surrounding area.



Overgrown vegetation and wrong gradient cause long-lasting humidity inside the wall leading to wood decay.



Designing a waterproof pathway (concrete, stone set on a cement layer or other similar systems) retains humidity in the earth around the wall. This way, the wall will deteriorate in time because of accumulating humidity stagnating in the wood.

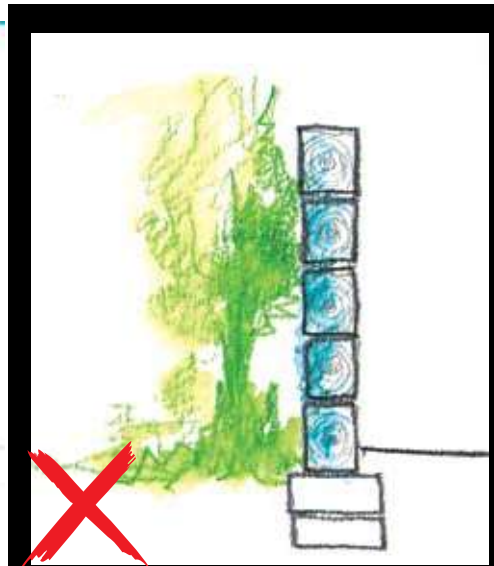


Growing vegetation covers churches that are not used and not maintained.

**Wild vegetation and uncontrolled growth** (due to lack of maintenance) around wooden churches create a microclimate that allows development of fungi and insects in the wooden structure (increased humidity). Vegetation should be constantly cleared and branches that hit the roofing must be removed. Vegetation around the base must be kept short.



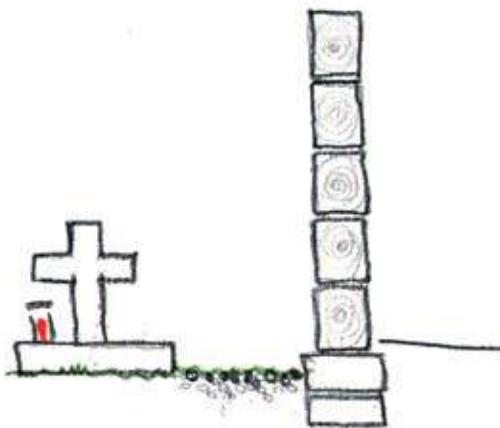
Drawing for exterior design of vegetation around the church. It is recommended that tall vegetation (trees, bushes) be placed far from the church wall and the surrounding pathway have an outer drainage gradient.



Grown vegetation that is too close retains humidity in the building, roots grown under the foundations cause displacement of the building and cracks, and vines damage the painting.

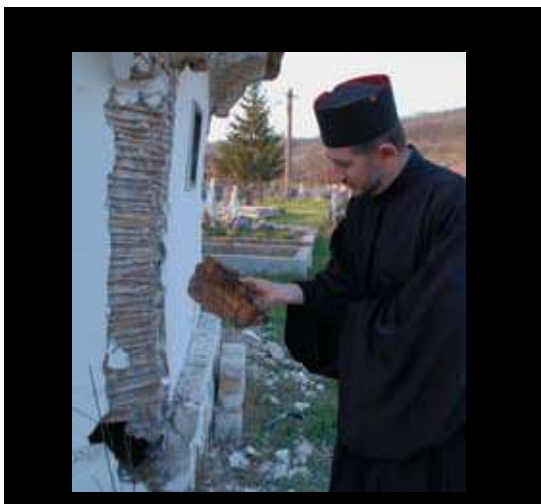
**Graves placed close to the church wooden wall** prevent proper rainwater drainage from the base and endangers the wooden structure when candles are lit on the grave.

Graves should be placed at a safe distance from the church wall. There should be enough space around to allow passage, candles can be lit without endangering the wooden structure and allows rainwater drainage around the church.



Example of replacement of deteriorated bottom logs with new logs set on stone base.

Upper case: detail,  
lower case: overview

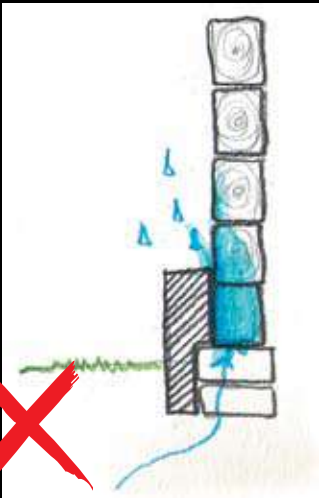


This is what wood dressed in cement on the exterior looks like.

## Stone Base and Structure Repairs

**Repairing the stone base with cement** is another mistake often encountered. Applying cement on the stone base or directly over the bottom logs retains humidity in the wall and creates favourable conditions for mould development.

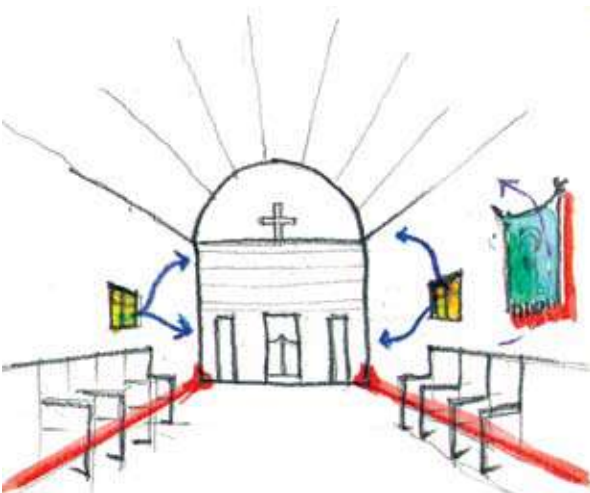
**Exterior rendering of wooden walls with cement** is a widely spread misfortunate practice motivated by the desire to make the building more durable. Cement doesn't consolidate wood, on the contrary, it weakens it by increasing inner humidity. In time, the render becomes non-adhesive, cracks and peels off while the wood rots.



Covering the wood on the outside with a concrete belt doesn't protect the church, but weakens its resistance because humidity stagnates in the wooden logs that rot much faster.

**Filling the log joints with polyurethane foam** for sealing purposes is a recent practice appeared with the advent of synthetic materials on the construction market. Traditionally, hemp and clay or lime were used for sealing between logs. Polyurethane foam maintains humidity and favours the development of insects and fungi which attack wood. Moreover, it damages the aesthetical value of the traditional church.

**Wall covering at the interior with textiles which retain humidity and obstruct ventilation** contributes to an increase in wood humidity and developing mould. Tissues, carpets and textiles inside the church should regularly be aired.



Airing and good ventilation is needed inside the church. Behind hung elements on the wall or at the bonding between wall and floor mould or humidity spots can appear because these are areas less aired. They should be checked regularly and cleaned.



Example of improper replacement of wooden shingle roofing with bitumen-membrane.



### *Roofing Repairs*

**Replacing shingles with modern materials** (like metal tiles or bituminous shingles) is a common practice because shingles are difficult to obtain and there are few craftsmen with know-how to place them.

Modern materials completely alter the aspect and may be incompatible with the original church body. For example, metal shingles can't be moulded after the curved shape with the same pliability as wooden shingles which, in turn, alters completely the volume.

**Setting roof drainage at the eaves** is a recent practice, justified by the desire to protect the wooden church as best as possible from humidity.

But the gutters and downspouts alter the visual aspect of the church. Most churches have very wide eaves that protect the walls against rain making controlled rainwater downpour unnecessary.



Example of water collection through gutters and downspouts. These must be checked regularly, leaned and even repaired. Otherwise, they cause much more and faster damage than the free rainwater flow. In winter, icicles appear and can cause injuries if not removed.

**Applying varnish or bituminous paint on the shingle** for protection doesn't offer conservation in time and greatly alters the aspect of the church. They disappear in time because of exposure to the sun and weather elements. Bitumen-based materials increase the risk of fire.

**Protecting the degraded areas with plastic foil** shouldn't exceed a few months. The plastic foil gets grind in time and it maintains humidity inside the wood. In severe cases, the spots waters seeps in through must be covered and the roofing need be repaired as soon as possible.

**Replacement of traditional ceramic tiles with industrial tiles or metal shingles** has become more frequent in Sibiu area and degrades the aspect of the church. Often, only part of the traditional tiles are broken and only the deteriorated pieced can be replaced, preserving as much as possible from the original material.

### *Electrical Connection*

**Electricity post wiring through the roof** is the most common way to achieve power distribution, but the crossing point through the roofing is a weak spot where infiltration most often occurs.



Examples of improvised electrical connections that can cause damages and can affect the church image.



Examples of improvised electrical wiring placed over the painted decoration.

**Electrical equipment placed over the decorative elements** damages the painting and diminishes the esthetic value of the church. Cables and electrical doses placed in broad sight made from non-fireproof materials represent a danger for church safe use.

**Improvised stoves with a non-fireproof chimney** perforating the wall affects the structure and is a great fire and water infiltration risk.



Improper stove chimney piercing the wall.

### ***Painted decoration***

**Dusting de painting for dust, smoke, cobweb etc.** using rough methods like “washing”, “rubbing”, “brushing”, leads to irreversible losses. Each church has its own technique for mural painting and making portable objects (icons, lecterns etc). Therefore, each resulting degradation phenomena is specific. Adhesive and non-adhesive layers should be removed after a professional survey accompanied by laboratory analysis. Using a “cleaning recipe” that worked in another church is not allowed! Most paintings show signs of exfoliation and powdering of the color film. This occurs because of unsuitable microclimate (humidity and temperature) that acted and damaged the painting binder. Through the manual act of removing the residue without a previously carried out fixing, the color is lost in the mural, iconostasis, furniture and icon painting. Under no circumstance should cleaning be done with chemical products recommended by trading advisers without consulting a specialist and undertaking specific analyses.



Example of painting darkened by dust and smoke.



Example of painting scraped by possible attempt at cleaning or vandalism.

**Interventions and repairs to the painting made by oneself** with the purpose of repairing the degraded surfaces most often introduce materials incompatible with the original ones. By introducing a new material, often rougher than the original (like cement or plaster), very serious damage is done. Construction materials available on the market are rich in salts that dissolve under the action of humidity and rise to the surface of the painting.

**Insulation (waterproofing or sealing)** made without a microclimate survey can lead to degradation of the entire ensemble. Existing materials in the church became adapted and stabilized in time to the microclimate conditions inside and outside. Through a radical change of the environmental conditions (humidity, temperature), the physical and chemical processes change and degradation can occur.

**Interventions consisting of items of furniture or equipment on the painted walls** (pegs, racks, sockets, switches, electrical panels...) are most often done without consideration for the painting which leads to the irreversible loss of the decoration in the areas subject to intervention. Also, to fill resulting holes, incompatible materials are erroneously used and subsequently have a negative effect on the decoration around the newly introduced material. Planting nails in the painting or fixing electrical systems of lighting in the painting is forbidden.

Furniture element set over the painting.



**Erosion and flaking of painting** caused by repeated touch appear from improper use. During services, parishioners rest against the walls or deposit objects or clothing against the painting. Periodic friction causes the colour pigment to erode and flake off. In the case of churches where painting conservation is in a risky state and the painting is flaking off the wall, touching the surface can lead to severe displacements and irreversible losses.

**Aesthetical discontinuity between the interior and the exterior** appears when modern inappropriate objects not used in the liturgical service – like unsuitable storage furniture, clocks, synthetic traditional towels with non-specific pattern, calendars. These objects crowd and shrink the space, reduce visibility of the painted decoration and, by excessive crowding, grow and maintain humidity that stimulates biological damage.



Object unsuitable with the image and specific of the church, placed on an outer wall.

**Repainting** is an attempt to “refresh” or restore lost painting. This falsifies the original image, the painting specificity and decreases the monument’s value. Loss of authenticity can even lead to downgrading the church from the monument list. Although repainting seems like an “easy” feat, filling in the missing areas must be done according to scientific methods that establish how to chromatically integrate the colours and which materials are compatible. This is done only during the restoration process. Filling in missing visual pieces can be made only after undertaking a historical survey to accurately determine what is missing from the image. In many cases, it is not possible. Removing repainting is, also, a complex operation that must be done by specialists as it can affect the original layer under the repainting.

## 5. Basic Elements for Wood Protection

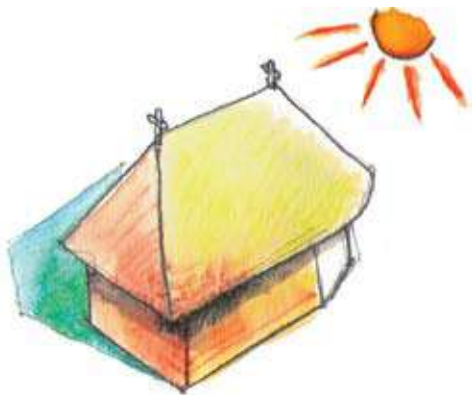
The main reason for wood decay is humidity. A wooden building needs “boots and a hat”, that is stone base and bottom logs protection and a roof with large eaves. Protection at ground level is achieved through a correct gradient line of the terrain, clearing of vegetation, maintaining the soil, and, where appropriate, the base permeable. Water favors penetration of fungi spores (which are naturally present in the air) in the wooden fiber and, if humidity persists, helps these spores develop into fungi. The most well-known of these is the wood-decay fungus. The fungus feeds on the cellulose in the wood fiber, the element that offers the material durability. Thus, in time, because of fiber deterioration, wood loses its strength and the building loses its stability. The fungal attack is in most cases extremely quick and it is recommended that the damaged elements be removed to limit the spread of the fungus. Limiting the attack involves firstly, adjusting humidity conditions and temperature – allowing wood to dry. If fungi is visible on the surface of the wood, the attack is in an extremely advanced state and the wood is very damaged. Degradation starts most of the times from inside the timber.



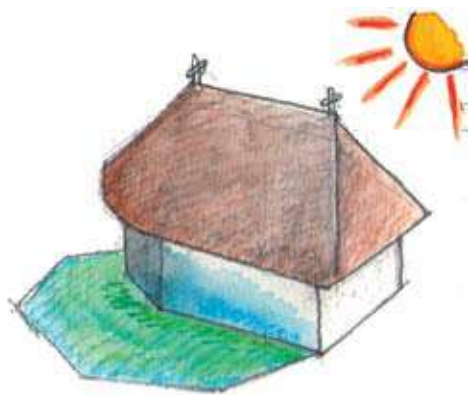
Biological wood decay in areas with increased humidity levels (fungi causing decay).

The most vulnerable areas are those where humidity persists, there is no ventilation and temperature has little variation. When raining, the lower part gets wet, but wind and sun dry it quickly. In the case of snow left uncleared, the bottom logs stay longer in contact with water while under the snow the air is less cold and not ventilated, thus creating a suitable environment for an emerging biological attack.

In areas with abundant vegetation in contact with the church base or wooden walls, a wet microclimate without ventilation is created favoring decay. In the case of unsealed holes in the roofing, rainwater seeps in unventilated areas (joints, enclosed spaces in the loft etc.) leading to fungi development which extends rapidly and increases degradation, weakening the roofing structural elements and the walls.



The sunny sides of the church (east, south and west) don't have significant humidity problems, but there are great variations in temperature on the wooden surface that cause contractions and cracks. These don't weaken the wood durability unless a biological attack sets in (insects or fungi).



The north side is shaded, so there are greater chances that the walls present persistent humidity. For prevention, ventilation and removal of overgrown vegetation are important.

Insects that attack wood (caries) penetrate especially the softer area of the wood ("alburn" or "albuleț"), if it has not been removed, but also areas already damaged by the fungus. Insect larvae feed on the soft wood and form galleries inside the wood. Galleries visible at the surface are used to exit the wood and where they developed as adult larvae. The presence of holes means the insects have exited, but other larvae might still be inside. To determine whether there is an active attack against the wood, a biologist's help is needed. Fine sawdust is observed in the area of the holes or a sticky flypaper is placed and it is observed whether there are insects caught on it. Insects consume little wood, so loosening of the structural element occurs after a long period of time in which wood is not properly maintained and that favors the



development of insects. Wooden elements attacked by caries need not be replaced after the insects have been removed.

In most cases, wooden churches are built out of oak but in certain cases weaker wood, like resinous wood, was used. Oak timber has more durability, it is a dens wood with strong resistance against biological attacks if protected against persistent humidity and the roofing is regularly maintained.

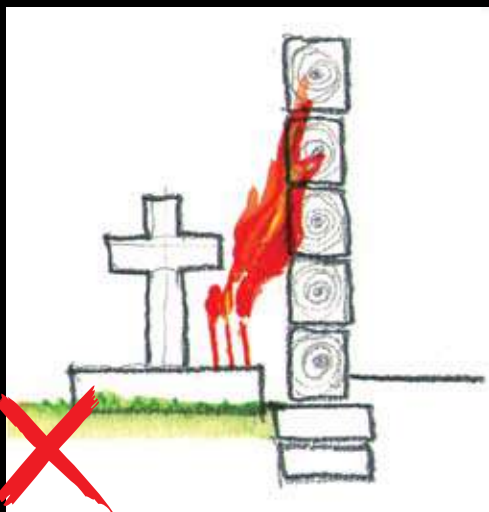


Softwood (resinous wood) is more sensitive to insect attack.

## 6. Protection against Fire

**W**ood is an easily inflammable material. This is why it's important that wooden churches be protected against possible fires. Frequent fire causes are: candles lit inside, electrical connection incorrectly made (non-insulated cables, short circuits...) or improvised heating systems (poorly built stoves, non-insulated smoke chimneys...).

Fires can be accidental, like the ones caused by lightning, if the church is not equipped with lightning rod. A special category is that of criminal fires intentionally caused by people. For such cases it is advised that an alarm or monitoring system and minimal tools for fast intervention exist (for example, fire extinguishers).



Lit candles can cause the graves too close to the church wall to catch fire. Also, the graves obstruct perimeter circulation and proper rainwater drainage.



A fire extinguisher is recommended in the church but his presence should be as unobtrusive as possible.

To prevent fires, the following aspects should be noted: creating specific spaces for candle lighting at a minimum distance from church (8-10 m); avoiding candle lighting on graves neighboring the church; regular wiring check and avoiding more electrical consumers than the ones included in the project; ban smoking in the proximity of the church over 10 m distance; design a place for waste far enough from the wooden church (over 10 m distance).

Fire alarm systems should be installed which can automatically notify the local fire squad. There are self-triggered fire extinguishing systems and the entire equipment must be chosen and placed so that it doesn't affect the church aspect.

The systems will be designed by professionals who will choose the appropriate aesthetical and quality models; they will be placed in the required areas and be made as invisible as possible.

Measures to ensure safety compliance in case of fire are a priority for wooden churches and make impending investments necessary. Fire is the cause of destruction for most wooden churches both in our country and abroad.

## 7. Recommendations for Use and Maintenance

Unused churches without any maintenance become degraded. Regular use and minimal maintenance can keep a building in a good condition. Constant use of the space is recommended: once a week or every two weeks, on all seasons.

In the warm season, heating is not required so the church can easily be used for services or for community gatherings, music rehearsals, religion classes etc.

In the cold seasons (autumn, winter and beginning of spring) the space needs heating. Occasional heating of the space—preferably with electrical radiators—produces variations in temperature and air humidity which, if often repeated, can, in time, affect the wood. Ideally, the space should be used as frequent as possible and the interior space should be heated to a constant minimum temperature (12-16°C). If this is not possible, church conservation can be achieved during winter without heating, by ensuring minimal regular air ventilation (once a week or every two weeks) and current maintenance (snow and dry leaves removal, monitoring temperature and humidity). Airing should not be made on days with elevated levels of air humidity (rainy, snowy, cloudy).

Constant **ventilation** evenly spread throughout the church is easily done by attaching insect, rodent and bird nets on windows and keeping them open for as long as possible, under a person's or camera supervision.

This measure should be done in a controlled manner if the church is permanently aired (daily ventilation). After people exit the church, the church should be ventilated because during service humidity and temperature rise considerably and cause damage to the interior painting.

Old wooden churches are largely disused because there are more spacious churches in the villages. Although the small churches are located in cemeteries, the funeral services are no longer held in them, but in separate chapels built according to current regulations. However, memorial services, the church dedication day and services on work days when few believers come can be held in the small church in order to reintroduce it in the sacred space. Religious services held in the small churches can be supplemented with other community activities that can take place in the church: religion classes, music/choir, drawing (especially in churches with still visible painted decorations), community exhibitions.

Not lastly, the wooden churches can be a tourist attraction. In this respect, visiting hours should be established as well as a poster with **visiting rules**, as follows:

- **Tourists are asked to have a decent outfit**
- **Tourists are asked not to touch the painting on the walls**
- **Tourists are asked not to use flash photos**

- **Smoking prohibited!**
- **Tourists are asked to keep quiet and not disturb the people who are praying in the holy church.**

### **Inventory**

It is recommended that the wooden church have a complete inventory of portable objects inside, including those stored in the attic. Often, the attic holds icons, old valuable objects that require conservation and repair. They need to be checked by an expert before being reintroduced in the church to prevent spreading of a possible biological attack. It is advised that the inventory be made with a professional (architect, etc.).

Nothing belonging to the monument church patrimony should be discarded. Objects in poor conditions should be stored accordingly (in a dry ventilated place with constant temperature) and preserved until a possible restoration.

### **Permanent and Seasonal Supervision**

Humidity and temperature variation should be monitored because these indicators can offer information about a biological attack, possible infiltrations, condensation, great variations of wooden items etc. The observations can be recorded in a log that will be of great use to specialists who aim to gather the necessary documentation for a conservation or restoration intervention. To select the type of monitoring device and understand how this occurs, a specialist should be consulted.

### **Church Cleaning**

Indoor regular cleaning is recommended, even when the church is rarely used. The floor should be vacuumed, not swept, to avoid raising dust that would set on the painted decoration. The furniture and candlesticks that don't have painted decorations can be dusted with soft cloths or brushes. In the case of mural decoration and other painted artistic components, residue should only be removed by hand or with the aid of a specialist.

During general cleaning usually carried out before any major holiday, the painted artistic components should never be intervened upon. It is recommended that the cobwebs be removed with a swab or a soft cloth, but carefully so as not to hit the painted areas.

Wax traces should not be hand-removed from the painting! They can be dissolved using special substances that don't affect the painting underneath only with expert guidance and supervision. To clean the Beautiful Gates or the Deacon Doors, corrosive cleaning substances or substances that can affect the painting should not

be used. Metallic elements like censers or chandeliers can be dusted using soft cloths without modern cleaning substances.

### **Church Maintenance Log**

It is recommended that the church administrator keep a log of the building where he can take down information about common events, cleaning dates, climate data monitoring, regular observations, maintenance and repair works. Aside from the date, the notes should include a description of the action. Notes can be added even regarding the decision to not intervene or the impossibility of intervention followed by a motivation (e.g.: lack of funds or impossibility to cooperate with authorities or experts). This log is very important for the history of the church and for documentation and finding solutions in possible future interventions. It is of use to both the owner and the experts in cases when intervention is necessary, to understand how the building behaves. Not lastly, the information constitute a very useful documentation in case the parish priest changes and even for future generations.

## **8. Check Lists for Owners**

**R**egular inspection of the building is recommended. The following lists indicate the things that need monitoring and when it is recommended they be checked. Church administrators are encouraged to jot down the inspection date on the lists and keep personal observations in a personal log.



Wooden church  
in Alun village,  
Hunedoara county

## Observation List

		What can be observed	When	Means of intervention
<b>Condition check-up</b>				
1	Roofing	Loft infiltrations	In spring after snow melts (after March 15) on rainless days and after long periods of abounding rain	Roofing repairs if there are any infiltrations.
2	Roofing	Shingle/tile condition: if they are torn, broken or cracked	In spring after snow melts (after March 15) on rainless days	The broken shingles are replaced. Displaced tiles are repositioned. Cracked tiles are replaced.
3	Surrounding pathway	If and where puddles appear	In spring after snow melts (after March 15) on rainless days and after long periods of abounding rain	If there are water puddles, the pathway gradients should be redone to remove the water.
4	Surrounding pathway	Spontaneous vegetation	Before Easter Before St. Mary's Day	Overgrown vegetation is cut.
5	Exterior	New cracks in the plasterwork	Twice a year on rainless days	If there are any, the source is identified, and development over a longer time period is monitored and an architect is consulted.
6	Exterior	Cracks or plasterwork peeling	Twice a year, in spring and autumn	If there are any, their development over a longer time period is monitored and an architect is consulted.
7	Exterior	Cracks or plasterwork peeling	Twice a year, in spring and autumn	If there are any, an architect should be consulted and repairs made.
8	Interior	Palpable increased humidity, painting bubbling, decay, humidity halo, water drainage during rainfalls	In spring after snow melts (after March 15) on rainless days	If there are any, the source is identified and development over a longer time period is monitored and an architect is consulted.
9	Interior	Cracks in the plasterwork	Twice a year, in spring and autumn	If there are any, the source is identified, and development over a longer time period is monitored and an architect is consulted.
10	Interior	Cracks or peeling of the painted decoration	Twice a year, in spring and autumn	If there are any, an architect should be consulted and repairs made.
11	Furniture	Fine wooden dust on the floor close to the furniture piece	Spring (April-June)	If there is any, an architect should be consulted regarding a biocide treatment for the object.
12	Doors and windows	Water or snow infiltration	After raining or snowing	If there is any, an architect should be consulted for repairs.
13	Doors and windows	Cracked / broken window glass	Always	The glass is replaced.
14	Doors and windows	Bent window framework	In spring after snow melts (after March 15)	If this occurs, an architect should be consulted for repairs.
15	Interior climate	Interpreting humidity and temperature sensors	Once a week, if there is no automatic recording	If extreme values are noted on a longer period of time, fungi and insect danger is present. An architect should be consulted.

<b>Interventions</b>			
1	Flooring	Waxing or oil treatment	Once every 3 years
2	Whitewashing	Only in the case of churches with plaster or render, without painted decoration	Before Easter
3	Roofing	Shingle replacement	Once every 20-30 years
4	Roofing	Tile positioning	When needed
5	Roofing	Tile replacement	When needed

### **Minimal Regular Cleaning List**

		Advice	Date
1	Removal of snow around the church	After each snowfall	
2	Cutting overgrown vegetation	Before Easter Before St. Mary's Day	
3	Raking the surrounding pathway	Once a month (in spring, summer and autumn)	
4	Removing dried leaves from the roof	In September-November	
5	Window washing	Before Easter	
6	Airing carpets and all interior textiles	Before Easter Before St. Mary's Day	
7	Dusting furniture and unpainted objects with a soft cloth	Before Easter Before St. Mary's Day	
8	Removing the cobwebs	Before Easter Before St. Mary's Day	
9	Vacuuming the interior	At least twice a year or after each service or event involving over 10 people	
10	Opening windows for at least one hour	After each service or event that involved over 10 people	

### **Maintenance Kit**

It is recommended that each wooden church be provided with tools and materials at hand which can be used for regular and necessary repairs. Such a maintenance kit which should not be stored in the church, but in a nearby covered closed space should contain the following:

- hammer
- shears for cutting vegetation
- rake and hoe for restoring the pathway around the church
- nails
- wooden slats and boards
- polyethylene or plastic foil for emergency covering
- sand box and shovel (in case of fire)
- powder extinguishers (a fire extinguisher should be stored in the alter)
- cleaning tools: vacuum cleaner, broom, dust cloths, brush dust.

## 9. Useful Information

To obtain a construction permit or potential funding request for the monument church restoration, the following papers are required from the church owner:

- document proving **ownership** of the building;
- **cadastre** – a technical plan measuring the surface features of a region (building and/or land). Topometric measurements of the surface convey property limits, neighbours, traced address of the building;
- **tabulation** – ownership registration in Cartea Funciară (Land Registration);
- obligation regarding usage of the **historic monument** – a document that specifies the conditions and rules of use or exploitation and maintenance of a historic monument. It accompanies ownership deeds throughout the life of the building and is a law-established easement in favour of the building written down in the Cartea Funciară (Land Registration). Obligation regarding historic monuments is issued by the County Department of Culture.

To gather the technical documentation necessary for repair / conservation works of wooden churches, an architect should be consulted and the following documents and preliminary studies are elaborated together:

- **measured building survey** – the church plan with sectional drawings and views, accurate measures, materials used, marking of physical condition of the elements;
- **historic study of wooden church** – results from archive research of information on the place and building history;
- **geotechnical study** – to assess land layers the church is placed on and minimal foundation requirements;
- **structural technical expertise** – assessing the structure's physical condition and recommending improvements.

Depending on the complexity of the issues and the need for more exact information, further studies can be requested:

- **biological study of the wooden material** – identifies the type used and the degree of biological attack;
- **chemical study of binder / painted decoration** – necessary to identify the used materials and their strength;
- **archaeological study** – required to determine more precisely the building stages and, eventually, dating possible different phases.



## 10. Examples of Use and Maintenance

From the start of the program *60 wooden building* since 2009 around 14 emergency interventions, 10 complete replacements of wooden shingle roofing, 8 church restorations were carried out. Over 50 wooden churches were documented (through measured building survey) and different exhibitions and concerts were organized for fundraising purposes both in Bucharest and in local communities.

Emergency intervention or conservation works were combined with events and exhibitions that aimed to highlight the wooden church and revive interest in the parish of the wooden church monument. In this regard, two community museums were opened in a close relation to the wooden church, one in Târnăvița, Hunedoara county and another in Urși, Vâlcea county.

The first community museum is located in the old wooden church in **Târnăvița** (1661), 3 m away from the new one and houses the church and community objects. The church was reopened after nearly 70 years and its reintegration into the life of village parishioners is underway.



Information panel made in 2012 by the volunteer students who supervised the roofing repair works.



Image from shingle replacement process.



Exhibition created by volunteer students in 2012 with objects found in the church and objects donated by the community.

In the case of the wooden church in **Urși** village (1784), the museum is housed in a room in the village kindergarten and comprises damaged elements that have been replaced, pictures from restoration, explanations about the technique, art and value of the church. Since 2010, a comprehensive restoration site is taking place that involves conservation of interior and exterior frescoes. The works are supported by the community who want to see the works reach an end and reopen the church for daily use, as well as for tourism. Restoration works are being supported by the international foundation World Monuments Fund.



The church in 2009 before the collapse of the vault.



Elevation of the church to replace bottom logs and build a stone foundation in 2013.



Reassembly of wooden vault in 2015.



Rebuilding the wooden shingle roofing, 2015.



Vault painting restoration at the National University of Art in Bucharest, 2012-2015.

After an emergency intervention on the wooden church in **Boz** (1791), Hunedoara county, in order to protect the roofing using plastic foil, in 2012 the wooden shingles were completely repaired. The church is occasionally used for services and houses on its porch different temporary exhibitions about the place history and customs and its community life. The Pro Patrimonio volunteers involved in the project launched this initiative in an attempt to find ways of reintroducing the church in the community.



Church after shingle replacement in 2012.



Exhibition designed by volunteer students in 2012 with objects found in the church and objects donated by the community.



The wooden church in **Pojogeni** village (1797), Gorj county, is a special case because it was found in a state of near collapse and saved by dismantling and reassembly at Cămărășeasca Monastery (1780) in Târgul Cărbunari which is 10 km away.

The wooden church quickly became part of the monastic life and of the neighbouring community; it is now properly used and taken care of.



The church in 2009.



Reassembly on a new site.



Roofing reconstruction.



After works ended, 2009.



In 2012 the program *60 wooden churches* included an intervention on a wooden church in Botoșani at the request of the parish priest and the founder's family who wanted to bring to light the small church in **Cervicești** (1861). Repairs were supervised by Pro Patrimonio volunteers who, through small interventions, caught the villagers' interest for the old church. Even when the repair works were in progress, a demand for a wedding service in the wooden church was forwarded.



The church before repairs.



The church after repairs and replacement of zinc steel roofing with wooden shingles.



A stag made from the removed zinc roofing sheets. The stag is the symbol of the village and at the origin of its name.

## Afterword

Romania is a country of forests with a long tradition of timber construction particularly for religious buildings. Among these are many distinguished and well known monasteries and churches but there are also small historic village churches built by traditional means in wood, many of which are now neglected and in a poor state of repair.

Against this background, it is no surprise that a proposal was selected to save a number of small wooden churches in southern Transylvania and northern Oltenia as part of the Europa Nostra / European Investment Bank (EIB) Institute's initiative "The Seven Most Endangered Heritage Sites in Europe - 2014". The submission was made by the Pro Patrimonio Foundation under the name of its Vice President, Architect Șerban Sturdza.

As part of the follow-up to this award a technical mission visited the area to understand the context and the issues before proposing an action plan. The churches presented in the programme were in very different conditions ranging from some which were virtually restored, to others which were in a state of almost total collapse. In some of the latter cases deterioration had been rapid even though viable structures had existed not many years before.

After discussions with the various parties involved, including the Romanian Orthodox Church as the owner of the properties, and the concerned Government Agencies, a phased programme was proposed to address the concerns, with priorities being set out within the existing constraints.

During discussions, Bishop Gurie of Deva and Hunedoara asked for practical guidelines for preserving and maintaining these wooden churches. He suggested that the village priests or other village residents who now carry out some maintenance work might be better informed on technical matters in order to improve the preservation of the existing building stock. This request was incorporated as a recommendation in the report as part of the proposed Action Plan.

Subsequent to the Europa Nostra / EIB Institute report\* being issued and after further discussions, the EIB Institute decided exceptionally to assist the Action Plan further by providing some seed funds to prepare technical dossiers for the repair/

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\* The document is fully available on [www.europanostra.org](http://www.europanostra.org)

restoration of two of the most suitable churches and also to finance a maintenance manual. This Maintenance Manual is in response to the initial wishes of Bishop Gurie to act as guidelines for those locally responsible for the wooden churches and has been extended to cover a wider remit as a practical manual for the regular maintenance of wooden churches or equivalent buildings in similar contexts. The original text is in Romanian and an English translation has been undertaken with an eye to a wider distribution as it should also be of interest elsewhere.

The considerable experience obtained in the region so far in repairing and renovating these churches and the observation of the reasons for the past deterioration has provided a strong knowledge base which is now summarised in this practical Manual.

Many thanks and congratulations to all those involved in its production, notably the Pro Patrimonio Foundation through its Vice President Șerban Sturdza and Architect Raluca Munteanu who has coordinated and led the work.

We hope that the Manual will help contribute to preserving and improving the condition of many of these wooden churches which represent an important national and even European heritage. It is also hoped that the Manual will contribute to an exchange of views, encouraging interest in improving the care of historic wooden buildings in general. It may also help to encourage sponsors and donors to support the restoration of these Romanian wooden churches as an important example of rural cultural heritage.

The EIB Institute is particularly pleased to be associated with this initiative which has its genesis in the Europa Nostra / EIB Institute programme of “The Seven Most Endangered Heritage Sites in Europe”.

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On site visit of the Europa  
Nostra delegation and  
Pro Patrimonio team, 2014



## **Bibliography**

Burra Charter 1999, <http://australia.icomos.org/wp-content/uploads/The-Burra-Charter-2013-Adopted-31.10.2013.pdf>

Jan Hülsemann, *Casa țărănească săsească din Transilvania. Ghid pentru restaurarea caselor vechi*, Simetria, 2014

Law 50/1991 regarding permit for executing construction works with all its following changes

Law 422/2001 regarding protection of historical monuments with all its following changes

xxx. *Strămutarea bisericii din Pojogeni: septembrie-octombrie 2009*, Simetria, 2010



# Church Maintenance Log

Dotted lines for log entries.

