THEMATIC REPORT

CONSERVATION OF WALL PAINTINGS

CHURCH OF “SHËN NDOI” (ST. ANTHONY), CAPE OF RODON
CHURCH OF “SHELBUEMI” (MONASTERY CHURCH), RUBIK
RUINS OF ST MARY, MAMURRAS
ETHNOGRAPHIC MUSEUM KRUJA



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UNOPS

EU4CULTURE

Cover Photo Caption

Scaffolding and working platform for conservation works at St Anthony Church, Rodon

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Foreword

The *EU4Culture Thematic Report Series* has been developed by UNOPS to document and share the experience and lessons learned from the conservation works implemented under the EU4Culture programme. This Series aims to serve as a professional resource for those engaged in the field of cultural heritage conservation, contributing to knowledge exchange and the continuous advancement of conservation practices in Albania and beyond.

The *EU4Culture Thematic Report Series* includes:

1. Conservation of the "Shqipëria" Mosaic on the Façade of the National Historical Museum
2. Conservation of Wall Paintings
3. Handling Artefacts
4. Conservation of Fortified Architecture and Archaeological Ruins
5. Conservation of Engineering Works and Historic Residential Dwellings
6. Restoration of the National Puppet Theater and the Building of the Formerly Persecuted

The EU4Culture programme, funded by the European Union and implemented by the United Nations Office for Project Services (UNOPS), was launched in the aftermath of the 2019 earthquake, which caused significant damage to cultural heritage sites and monuments in Albania. While conceived as a heritage recovery initiative, its objectives extended beyond the conservation and restoration of damaged sites. By improving the physical condition, accessibility, safety, and interpretive value of cultural monuments, the programme sought to enhance public understanding and appreciation of Albania's cultural heritage, attract more visitors to restored sites, strengthen their role as tourism assets, and contribute to local socio-economic development. The programme also placed strong emphasis on capacity building, fostering a lasting sense of stewardship and supporting the continued preservation and sustainable use of Albania's cultural heritage.

The EU4Culture programme, running from October 2020 to June 2026, was carried out in close collaboration with the Ministry of Tourism, Culture and Sport[1], as well as its subordinate institutions — including the National Institute for Cultural Heritage and the Regional Directorates of National Culture in Tirana and Shkodra.

1. Formerly Ministry of Culture (2020–2024), and Ministry of Economy, Culture and Innovation (2024–2025)

Cooperation also extended to the Municipalities of Durrës, Kavaja, Lezha, Kruja, Kurbin, Rrogozhina, and Tirana ensuring a locally grounded and inclusive approach to heritage conservation.

Recognizing the importance of capacity building, the project established a strong link with academic institutions, notably the University of Tirana (Department of Archaeology and Cultural Heritage Management) and the Polytechnic University of Tirana (Faculties of Architecture and Civil Engineering). These partnerships enabled young professionals and students to engage directly in fieldwork, transforming ongoing conservation activities into valuable platforms for experiential learning.

In total, the EU4Culture programme engaged 14 licensed conservation contractors, two multidisciplinary design companies, one supervision firm, and one commissioning company. The conservation and restoration interventions alone accounted for approximately 70,000 working days, representing the daily efforts of around 70 professionals from diverse disciplines and contributing to the timely and high-quality completion of the works.

Through this collaborative effort, 19 cultural heritage assets across Albania were restored, while four were equipped with the tools and equipment needed to support improved conservation, documentation, and operation. The outcomes, methodologies, and insights gained from these interventions are presented in a series of six thematic reports, each focusing on a different typology of conservation work: mosaic conservation; wall paintings; artefact handling; fortified architecture and archaeological ruins; engineering works and historic residential dwellings; and the restoration of selected public heritage buildings.

Read together, the six publications offer a comprehensive record of the EU4Culture programme's technical approach and practical lessons learned. They reflect not only the tangible achievements of the programme, but also the collective dedication of all those who contributed to its implementation — from national and local institutions, conservation professionals, designers, contractors, supervisors, academics, students, and community representatives, to the many individuals who supported the works on site. Their commitment, expertise, and collaboration were essential to safeguarding and celebrating Albania's cultural legacy.



IN NUMBERS

Days taken for Implementation

Conservation of wall paintings at St Anthony's Church in Rodon	70 days
Conservation of wall paintings at Monastery Church in Rubik	70 days
Conservation of wall paintings at Ethnographic Museum in Kruja	24 days
Conservation of wall paintings at Ruins of St Mary	21 days

Workforce for implementation

Conservation of wall paintings at St Anthony's Church in Rodon	420 labour days
Conservation of wall paintings at Monastery Church in Rubik	420 labour days
Conservation of wall paintings at Ethnographic Museum in Kruja	48 labour days
Conservation of wall paintings at Ruins of St Mary	42 labour days
Number of approvals received	4

Financial investment

Conservation of wall paintings at St Anthony's Church in Rodon	4,394,597 ALL (45,536.07EUR)
Conservation of wall paintings at Monastery Church in Rubik	4,317,508 ALL (44,754.21EUR)
Conservation of wall paintings at Ethnographic Museum in Kruja	1,907,500 ALL (19,772.66EUR)
Conservation of wall paintings at Ruins of St Mary	1,848,700 ALL (19,162.22EUR)

1. Introduction

1.1 Purpose of the thematic report

The conservation of wall paintings represents one of the most delicate and meaningful interventions in the protection of cultural heritage. In Albania, a country endowed with a rich and layered history, mural art stands as a vivid testimony to the spiritual, artistic, and social expressions of past centuries. Among the most remarkable examples are the wall paintings of the Monastery Church in Rubik, the St Anthony's Church in Rodon, and the Ruins of St Mary in Mamurras, as well as those preserved within the Ethnographic Museum of Kruja, each bearing distinct historical, stylistic, and material values that form an integral part of the national cultural identity. All of these four sites are part of 23 assets prioritised for conservation within the EU4Culture programme.

This thematic report presents the comprehensive conservation process undertaken for these sites, documenting each stage from research and diagnosis to intervention and preventive conservation. The intervention aimed to preserve not only the physical fabric of the paintings but also the authenticity and integrity of the works, ensuring their transmission to future generations. Emphasis was placed on interdisciplinary collaboration—combining expertise in art history, material science, conservation techniques, and environmental monitoring—to establish a model for sustainable heritage management.
The Monastery Church in Rubik, the St Anthony's Church in Rodon and the Ruins of St Mary in Mamurras, are medieval monuments of great religious and artistic significance, containing wall paintings characterised by their iconographic schemes and layered historical interventions. The Ethnographic Museum of Kruja, housed within a traditional Ottoman-era residence, presents a different conservation challenge, where mural decoration integrates with vernacular architecture and domestic cultural heritage. The diversity of these sites offered valuable insight into the range of materials, degradation phenomena, and contextual factors affecting Albanian mural heritage.

In the case of the Ethnographic Museum of Kruja and the Ruins of St Mary, the conservation of wall paintings was implemented in parallel with the overall conservation of both assets. While in the case of the St Anthony's Church in Rodon and the Monastery Church in Rubik, the conservation of wall paintings followed the conservation of the assets and was implemented in the second phase of works. The final result for all the aforementioned sites was full conservation, coupled with functional upgrades and



Photo Caption: Church of St Anthony - Cape of Rodon

interpretation and, in the case of Kruja, reconceptualisation of museum displays. Through this thematic report, the documentation of methodologies, analyses, and results aims to contribute to the broader field of conservation practice in Albania and the region. It serves not only as a technical record, but also as a reflection on the role of conservation in sustaining cultural continuity, community memory, and identity. By sharing experiences, challenges, and lessons learned, the work aspires to support ongoing efforts toward the safeguarding of wall paintings and the built heritage they adorn.

1.2 Objectives of the conservation work

The primary objective of the conservation work was to ensure the long-term preservation, stability, and legibility of the wall paintings while maintaining their historical authenticity and artistic integrity. The interventions were designed in accordance with internationally recognised conservation principles, emphasizing minimal intervention, reversibility, and respect for the original materials and techniques.



Photo Caption: Ruins of St. Mary, Mamurras

Specifically, the conservation work pursued the following objectives:

- **Documentation and Research**
  To carry out comprehensive documentation through visual recording, photographic surveys, condition mapping, and scientific analysis of materials and deterioration phenomena, establishing a reliable baseline for future reference.
- **Diagnosis of Deterioration Causes**
  To identify the physical, chemical, biological, and environmental factors contributing to the deterioration of the wall paintings and their support structures, enabling the design of targeted and sustainable conservation measures.
- **Stabilisation and Structural Consolidation**
  To stabilise the plaster layers and paint surfaces by consolidating detached, flaking, or powdering areas, ensuring the mechanical integrity of both the support and pictorial layers.
- **Cleaning and Aesthetic Recovery**
  To remove surface deposits, accretions, and previous inappropriate restoration materials in order to improve the visual coherence and legibility of the original artwork, while preserving all historical layers of significance.
- **Material Compatibility and Reversibility**
  To employ conservation materials and techniques compatible with the original substances, ensuring that any additions remain distinguishable, reversible, and do not alter the authenticity of the original paintings.



Photo Caption: Ethnographic Museum of Kruja

2. Historical descriptions

St Anthony's Church, located at the Cape of Rodon (also known as Muzhli of Skëndërbey), is one of the oldest Franciscan seats. It is also associated with a popular belief that it was built by Skëndërbeut's sister for the nuns of St Clara. The church suffered significant damage in an earthquake in the mid-19th century. From a technical perspective, it is considered the only church of paleological origin in northern Albania, with frescoes dated to the mid-15th century.

During restoration works in 2000, specialists identified three construction phases:

- Paleochristian phase: 4th-6th century
- Roman-Gothic phase: 14th century
- Latest phase: 15th century

The church has undergone several restoration interventions, notably in 1978, 1983, and 1986, with a more comprehensive intervention taking place in 2000-2001, which included consolidation of walls and the addition of a missing roof. The wall paintings, having been exposed to the elements due to the lack of a roof, suffered severe and irreversible damage.

The Monastery Church in Rubik is a significant cultural monument, reflecting a rich history of religious and architectural evolution in Albania.Its strategic location highlights its importance in controlling historical trade and travel routes.The surviving medieval phases integrated into the current building offer insights into past architectural styles and transformations.The Byzantine frescoes, dating back to the 13th century, are valuable examples of early wall painting and iconography in the region.The church's history, marked by the presence of different religious orders and its resilience through various historical events and natural disasters, underscores its enduring cultural and spiritual importance.

Historically, it was part of the diocese of Lezha and is now included in the bishopric of Rreshen. The church, also known as the Church of Shelbuem, has seen alternation between Benedictines and Friars Minor, with the latter settling there as early as 1640.

The building has undergone radical changes due to previous reconstruction and restoration efforts from the late 19th to early 20th century. The frescoes in the apse date back to 1272, with an earlier inscription on the church gate citing 1267.The wall painting generally follows the classical Byzantine tradition in themes and style.

The Ethnographic Museum of Kruja is housed in the former residence of the illustrious Toptani family, an 18th-century building constructed in a traditional Albanian style dating back to 1764. The original complex consisted of two buildings, but only the second building, known as Haremllëk, remains and has housed the Ethnographic Museum of Kruja since 1989. The building underwent two main restoration interventions in the 1980s and opened to the public in November 1989.

The Church of St. Mary in Mamurras is a medieval church, located in Shënmëri, Mamurras (Kurbin district), Albania. There is some disagreement about its construction date: some sources say around the 11th century, others suggest the 15th century. Archbishop Vinçenc (Visk) Zmajeviç of Tivar wrote in 1702 that Bereti is "*a village located in a prominent position above the hill above the plain mentioned above. It has the church with the patron Saint Mary, former abbey and cathedral of the bishops of Kruja after this city was lost. It is a large church with a magnificent structure, 25 paces long with proportionate width, made in three naves and the side parts serve as cemeteries which, on one side, are uncovered because the walls have collapsed. It is entirely painted in fresco.*" The Church was already in ruins by the time of the 19th century when an Austrian diplomat, Theodor Ippen, recorded it. In his reports he stated that it was one of the largest and most distinguished churches of medieval Albania.

3. Condition Assessment

3.1 St. Anthony's Church in Rodon

The wall paintings and plasters showed signs of severe degradation, with widespread detachment, flaking paint layers, and powdering surfaces.Cracks and voids were present in the preparatory layers, and some areas had multiple overlapping paint layers, indicating successive interventions. The plaster adhesion to masonry was partially lost, requiring consolidation through injection. Biological growth (algae and fungi) was observed across the nave and narthex, particularly in damp areas.Old stucco repairs and non-original overpaint layers from previous restorations (1999–2001) were obscuring original surfaces.Surface dirt, wax residues, and salt efflorescence were visible, especially in the lower registers near the apse and northern walls.

Photo Caption: St. Anthony's Church in Rodon



General Assessment:
Despite structural stability of the support wall, the mural surfaces were in a fragile and unstable state, necessitating immediate conservation to prevent further pigment and plaster loss.

3.2 The Monastery Church in Rubik

The paint layers were flaking and detached, with localised swelling, blistering, and powdering of the pictorial film. The preparatory plaster showed disintegration and detachment from the wall, creating cavities up to several centimeters deep. Surface deposits of soot, wax, and thick layers of limewash covered the murals, particularly in the presbytery and side walls, concealing original decoration. Biological activity and environmental humidity contributed to further deterioration, visible through salt crystallisation and superficial cracks. The edges of the frescoes were brittle and eroded, with extensive losses of the pictorial layer and earlier repainting in poor materials.Previous stucco and filler applications were non-compatible, contributing to surface tension and detachment.

General Assessment:
The mural paintings of the Church were in a critically unstable condition, with mechanical, chemical, and biological deterioration affecting both the plaster and pigment layers. Conservation actions were essential to recover stability and visual legibility.

3.3 Ruins of St Mary

The mural painting is in a problematic state of preservation due to the church being in ruins and constant exposure to climatic changes. The main degradation pathologies include loss of the color pellicle, abrasion of preparatory layers, blackening of the painted surface from candles and paraffin, and acts of vandalism such as graffiti and scratches.

General Assessment:
The remains of the mural paintings at the Ruins of St Mary are in a poor condition given their continuous exposure. Conservation actions are essential to recover stability and visual legibility.

3.4 Ethnographic Museum of Kruja

The condition of the mural painting presents a complexity of problems related to various aspects of its conservation. The degradations have occurred for two main reasons: structural damage to the building, such as cracks in the bride's room or rainwater infil-

tration from the roof, and damage from the continuous use of the dwelling. Additionally, the use of inappropriate restoration materials has caused damage.

Strong abrasions of the preparatory layer are observed, especially in the bride's room, where the phenomenon of detachment and loss of the paint film is widespread, particularly in the ochre color. Leaks caused by rainwater infiltration are visible, as well as blackening over the entire painted surface in the men's room. Salts have been identified in localised areas on the northern wall of the men's room and on the southern and western walls of the bride's room. Remains of lime used for stucco are found near the stuccoed cracks in the bride's room, as well as stucco in lacunae or areas with missing paint surface in the men's room and the western walls of both rooms. Furthermore, surface deposits of various natures are present.

General Assessment:
The mural paintings in several premises of the Ethnographic Museum are in a critically unstable condition, with mechanical, chemical, and biological deterioration affecting both the plaster and pigment layers. Conservation actions were essential to recover stability and visual legibility.

4. Conservation Philosophy and Approach

The conservation of wall paintings at the Monastery Church in Rubik, St. Anthony Church in Rodon, and Ruins of St. Mary in Mamurras, as well as the decorative surfaces of the Ethnographic Museum of Kruja, is grounded in a values-based and scientific approach. The interventions aim to safeguard the authentic material substance, iconographic integrity, and historic context of each site.

The guiding principles include:

- Minimal intervention, ensuring that treatments address deterioration without altering original artistic expression.
- Reversibility, allowing future conservators to retreat surfaces using improved methodologies.
- Compatibility of materials, ensuring physical and chemical stability between old and new elements.
- Authenticity and legibility, maintaining the aesthetic and documentary value of original layers while avoiding over-restoration.

These principles were applied in a site-specific manner, reflecting the distinct conservation needs and environmental conditions of each location:

- In Rubik, the focus is on the preservation of Byzantine-style mural fragments and consolidation of detached plaster layers.
- In Rodon, emphasis is placed on stabilizing polychromy affected by marine humidity and salt crystallisation.
- At St. Mary's Ruins, conservation prioritises the stabilisation and protection of exposed pigment layers within an archaeological setting. Additional measures included were erection of cover as to minimise the effects of elements
- For the Ethnographic Museum of Kruja, the approach includes preventive conservation of interior decorative finishes within a living museum environment.

All interventions are based on prior scientific analysis, documentation, and diagnostic studies, ensuring that conservation decisions are informed and transparent.

4.1 Ethical Considerations

- The conservation philosophy follows the UNESCO, ICOMOS, and ICCROM ethical frameworks, particularly the Venice Charter (1964), the Burra Charter (2013), and the E.C.C.O. Code of Ethics.
- Ethical commitments include:
- Respect for authenticity — maintaining original materials, techniques, and cultural context.
- Integrity of the site — avoiding reconstruction or artistic interpretation beyond what is supported by evidence.
- Interdisciplinary collaboration among conservators, architects, art historians, chemists, and local authorities.
- Documentation and transparency, ensuring all interventions are fully recorded for future reference.
- Community engagement, integrating local stakeholders in decision-making and promoting appreciation for heritage values.
- Sustainability, through materials and methods that minimise environmental and visual impact.
- This ethical stance ensures that each site's unique spiritual, artistic, and historical meanings are preserved for future generations.

4.2 Criteria for Decision-Making

Decisions are guided by an evidence-based and values-oriented process. The main criteria include:

- Cultural significance and heritage value — priority given to areas of high artistic or historical importance.

- State of conservation — urgency determined by the degree of deterioration or active decay.
- Risk exposure — consideration of environmental, structural, or anthropogenic threats.
- Reversibility and compatibility — preference for materials and methods that can be undone or are compatible with originals.
- Visual and historical coherence — ensuring aesthetic balance without falsification.
- Feasibility and sustainability — balancing conservation needs with available resources and long-term maintenance capacity.

At all four sites, these criteria ensure objectivity and transparency, allowing conservation priorities to align with both professional standards and cultural context.

5. Risk Assessment and Prioritisation

Each site underwent a risk-based evaluation to identify vulnerabilities and define priorities:

- Rubik Monastery Church: Risks relate to microclimatic fluctuations, humidity ingress, and detachment of plaster. Preventive stabilisation and micro-environment control are prioritised.

- St. Anthony Church in Rodon: Located near the coast, the main risks involve salt crystallisation, biological growth, and structural cracking; immediate measures include desalination and structural monitoring.

- Ruins of St. Mary: Being exposed to open-air conditions, the site faces weathering, water infiltration, and vandalism risks; conservation focuses on protective sheltering and consolidation of exposed surfaces.

- Ethnographic Museum of Kruja: Risks include fluctuating indoor humidity, visitor impact, and inadequate ventilation; preventive conservation and environmental monitoring are prioritised.

Risk prioritisation follows a probability-impact matrix, addressing first those threats with high likelihood and irreversible loss potential. Long-term resilience is to be ensured through integration of Disaster Risk Reduction (DRR) prescribed through a Disaster Risk Management plan (DRM) developed, emphasizing continuous maintenance and local capacity-building.

6. Conservation design

After the thorough pre-analysis of the condition of wall paintings in all four sites, conservation designs were drawn and approved:

- The conservation design for the wall paintings at the Ethnographic Museum of Kruja was developed in parallel with the overall conservation of the museum. The design was submitted for approval to the Technical and National Councils for Material Heritage and was subsequently approved on 03.08.2021 (Decision nr 510)
- The conservation design for the wall paintings at the Ruins of St Mary was developed alongside the overall conservation of the site. The design was submitted for approval tot the Technical and National Councils for Material Heritage and was subsequently approved on 12.12.2022 (Decision nr 539)
- The conservation designs for the wall paintings of St Anthony's Church in Rodon and the Monastery Church in Rubik were developed during the implementation of conservation works on both sites. The designs were submitted for approval to the Technical and National Councils for Material Heritage and were subsequently approved on 03.08.2021 (Decision nr 510)

7. Conservation Interventions

7.1 Church of "Shën Ndoi" (St Anthony) Cape of Rodon

The intervention conducted on the mural painting at the Church of St Anthony involved several processes:

- Preliminary Documentation: Before restoration, a detailed photographic documentation of the painting and plaster's condition was carried out, including the naos, narthex, and northern environment of the church.
- Conservation Interventions: Fixing the Paint Layer: Acrylic resin (Acryl ME) was used to fix the detached paint layer and preparatory layer, applied with injections after cleaning with water and ethyl alcohol.
- Consolidating Disintegrated Paint: Nanocalcium (Nanorestore) diluted with isopropyl alcohol was used to consolidate disintegrated pictorial layers.

- Fixing Detached Plaster: Injections of diluted Acryl 33 were used for small detachments, and PLM (a natural lime-based injecting material) for stronger bonds. Hydraulic fibers were used with consolidant in the arch area.
- Consolidating Unpainted Plaster: Ethylic esters of silicic acid (Estel 1000) were applied with a nebuliser or brushes to strengthen and stabilise original unpainted plaster.
- Removal of Old Borders and Plaster: Old borders and plaster/stucco applied during 1999-2001 interventions were removed using chisels, hammers, and scalpels from all surfaces of the naos and narthex.
- Consolidation of Fresco Edges: Nano estel, dissolved in distilled water, was applied with a brush to consolidate the edges of the fresco after removing old borders. The treated surfaces were then cleaned with distilled water.
- Biocide Treatment: Biotin T, diluted in distilled water (3% and 4% concentration), was applied several times with a sprayer to eliminate algae and mold from the painted surfaces of the naos and narthex.
- Plaster Sample Selection: Several plaster samples were produced and tested to determine the most suitable material for bordering and stucco. Sample 2 (2 parts white sand + 0.5 parts black sand + 1 part lime) was chosen.
- Cleaning of the Painted Surface:
- Resinous products were removed using tampons soaked in organic solvents like acetone.
- Mechanical cleaning with scalpels was used to remove deposits and salts, particularly in areas where lime was harder.
- Cleaning continued with tampons soaked in distilled water. Ammonium carbonate cleaning was excluded due to the church's proximity to the sea.
- Wax deposits from candles were removed mechanically and then with white spirit using tampons.
- Aesthetic Integration: The final step involved aesthetic integration of missing paint particles using watercolors dissolved in water with 15% nanoestel, applied with natural fiber brushes to ensure reversibility.
- Daily Documentation: Detailed daily records, including photographs and videos, were kept in the construction diary for every phase of the intervention.

7.2 Monastery Church in Rubik (Kisha e Shelbuemit)

Conservation Interventions:

- Fixing the color pellicle and detached preparatory layers: This was done using acrylic resin Acryl ME, applied with injections, preceded by water and ethyl alcohol. The ratio of Acryl ME varied between 1:1 and 1:3 depending on the situation.
- Fixing bubbled pellicle in window areas: Acryl ME was also used here, with pressure applied via Melinex and pressing instruments to reattach the detachments. The surface was then cleaned with distilled water and swabs.
- Consolidation of disintegrated pictorial pellicle: Nanocalcium (nanorestore) diluted

with isopropyl alcohol was used. The dilution ratios varied to ensure better penetration, with repeated treatments as needed. White veils on the surface were removed with distilled water compresses.

- Fixing detached plaster from the wall: Injections of diluted Acryl 33 were used for small detachments, and PLM (natural lime-based injections) for larger ones. Hydraulic fibers with consolidating material served as binders between the support and the preparatory layer when gaps were significant.
- Consolidation of disintegrated preparatory layers: Ethyl esters of silicic acid (Estel 1000 type) were applied with a nebulizer.
- Removal of Old Plaster: After consolidation, old plaster and stucco from various periods were removed using chisels, hammers, and scalpels. This process also revealed mural paintings beneath plastered sections on the northern and southern sides of the presbytery.
- Post-Plaster Removal Interventions:
- Consolidation of fresco edges: Nanoestel dissolved in distilled water was applied with a spray or brush, followed by cleaning with distilled water swabs. Delicate edges were pre-bordered with lime and sand mortar (1:1 ratio).
- Consolidation of newly discovered decorative painting: The removal of plaster on the presbytery's side walls revealed a new, fragile, and damaged decorative painting. Nanoestel (1:1 in water) and PLM with hydraulic fibers were used for consolidation.
- Consolidation of joints on newly discovered wall surfaces: This was done multiple times with lime water using a spray.
- Filling deep lacunas and cracks: A mortar composed of 1 part unsifted sand, 2 parts sifted sand, and 1 part lime was used.
- Mortar testing for large surface stucco: Five samples were produced to match the original plaster in composition and color. Sample number 5 (1 part lime + 1.5 parts yellow sand + 0.5 parts black sand) was selected for integration.
- Cleaning of the Painted Surface:
- Removal of deposits, salts, and burns: Ammonium carbonate was successfully used in various concentrations (15%, 50%, and saturated solution) across almost the entire surface. Absorbent papers were used to maintain contact. Rigid Nevek gel combined with ammonium carbonate solution was also effective, with variable application times. Distilled water was used for rinsing with cotton swabs.
- Mechanical removal of lime: This was done using scalpels.
- Cleaning of mural painting on northern and southern presbytery walls: Distilled water was used with swabs.
- Removal of wax deposits: Wax drops and larger areas of wax from candles in the lower register were removed mechanically first, then with white spirit and a swab.
- Removal of stable deposits and calcifications in side niches: Mechanical removal was performed with a sharp scalpel and glass fibers.
- Conservation of Other Elements: The arch and surrounding frame of the painting were also conserved. Degraded parts were mechanically removed, lacuna edges

were consolidated, and then integrated with compatible mortar (sand+lime) and ochre pigment similar to the original. The arch was integrated with blue pigment to match the original.

- Aesthetic Integration: This was the final step, performed using watercolors dissolved in water with 15% nanoestel, applied with natural fiber brushes.
- Documentation: Daily work on site was documented through a site diary (descriptive documentation), photographs, graphic surveys, and videos.

7.3 Ruins of St Mary in Mamurras

The interventions for the consolidation and conservation of the mural painting included:

- Primary Interventions (Stabilisation):
- Consolidation of the color layer and preparatory layers to stabilise the emergency situation and prevent further degradation.
- Specific Interventions on Mural Painting:
- Fixing Layers: Fixing preparatory layers with Acryl 33 and PLM (vault) using acrylic resin Acryl 33 with water solutions (1:4 ratio) and alcohol as a co-solvent. Fixing the endangered color pellicle with FLUOLINE HY al 3% in acetone, applied with a brush or spray.
- Surface Cleaning:
- Removal of superficial deposits (dust, cobwebs) with soft brushes.
- Mechanical removal of adhered deposits (mortar or lime runoff, insect or bird droppings).
- Cleaning of salts using a rigid gel mixed with distilled water, with AB57 as an alternative for persistent salts.
- Cleaning of blackening caused by candle smoke using a rigid gel as a support for an ammonium carbonate solution in water. The concentration and duration of the gel application would be determined by prior cleaning tests.
- Cleaning of graffiti from the painted surface with ethanol.
- Integration and Protection:
- Identification and evaluation of previous interventions (bordering or consolidations) for their effectiveness and aesthetic level.
- Filling of lacunae (gaps) with lime mortar where necessary, ensuring the aggregate-to-binder ratio respects that of the preparatory layers.
- Aesthetic integration proposed with quality watercolors, ensuring the longevity of the intervention. The method of aesthetic integration would be evaluated on a case-by-case basis.
- Mechanical removal of paraffin deposits from the painted surface, with remaining deposits removed using white spirit-soaked swabs.
- Evaluation of the possibility of applying a final protective solution to ensure the protection of the painted surface after restoration.

7.4 Ethnographic Museum of Kruja

The conservation interventions:

- Fixing preparatory layers: Acryl ME resin, diluted in water (1:5) and alcohol, was used to fix the preparatory layers.
- Fixing the color film: FLUOLINE HY al 3% in acetone was applied with a brush to fix the endangered color film.
- Surface cleaning:
- Soft brushes were used for light surface deposits (dust, cobwebs).
- Mechanical cleaning was used for adhered deposits like mortar or lime.
- Nevek was used to clean salts, with the action time adjusted to the surface needs.
- Soot and stains caused by the chimney or lighting were cleaned with Nevek and ammonium carbonate.
- New lime was cleaned to reveal painted surfaces.
- The painted surface was cleaned with alcohol and distilled water, always contained within a rigid gel.
- Aesthetic integration: Windsor & Newton watercolors were used for chromatic selection in some areas, and “acqua sporca” was used in areas with minimal surface where the color film was damaged or missing.
- All products used were professional, certified, and pre-approved by IKTK and UNOPS supervisors.

Illustrations of processes:









Photo Caption:
Above: Removing layers of plaster and injections
Below: Consolidation of loose layers of paint and edges









Photo Caption:
Above: Consolidation and cleaning
Below: Consolidation of detached layers









Photo Caption:
Above: Mortar preparation and testing for infill
Below: Cleaning from deposits





8. Results and Outcomes



Photo Caption:
Above: Final outcome, Church of St Anthony in Rodon

Below: Ruins of St Mary







Photo Caption:
Above: Final outcome,
Monastery Church in Rubik

Below: Final outcome, Ethnographic
Museum of Kruja

9. Lessons Learned

9.1 Cross-cutting Lessons Learned (applies to all four sites)

Material analysis must drive treatment choices. Analytical results (mortars, pigments, salts, previous coatings) prevented inappropriate cleaning or consolidation methods and reduced the risk of future failures.

- Minimal intervention and reversibility as guiding principles. Interventions limited to what was necessary and used reversible adhesives and mortars improved long-term ethical standing and future treatment options.
- Integration of structural and microclimatic measures. Wall-painting conservation succeeded only when structural consolidation, moisture control, and drainage issues were resolved or mitigated.
- Stakeholder engagement & clear communication prevent later conflicts. Early, continuous coordination with local authorities, clergy/caretakers, museum staff, and communities smoothed permissions, access, and post-restoration use.
- Adaptive approach to unexpected discoveries. Protocols for the discovery of new iconography or earlier layers (stop-work, sample, consult) preserved information and prevented rushed decisions.
- Public interpretation increases value and protection. Signage, short brochures, and outreach activities raised local sense of ownership and discouraged vandalism/theft. Documentation of interventions for transparency. Clear treatment reports (what was done, materials used, concentrations, locations) are critical for future conservators and accountability to funders.

9.2 Site-Specific Lessons

Ruins of St. Mary (Mamurras)

Problem emphasised: exposure to weather, rising damp, and vandalism risk on ruins.

Key lessons:

Protective sheltering (temporary or permanent) and improved site drainage were essential before/alongside consolidation; without this, consolidants failed prematurely.

- Salt efflorescence control required multiple cycles of poulticing plus substrate consolidation — single treatments were ineffective.
- Community volunteers supported site security when paired with local interpretation panels.

Follow-up priority: install simple permanent runoff channels and a low-profile protective cover for the most vulnerable paintings.

Ethnographic Museum (Kruja)

Problem emphasised: indoor microclimate fluctuations and exhibition pressures (visitor flow).

Key lessons:

- Environmental stabilisation (HVAC tuning, humidity buffers) improved condition more than repeated surface interventions.
- Integration of conservation with display design (barriers, sight-lines, lighting limits) protected paintings while keeping them accessible.
- Museum staff training in integrated pest management and simple monitoring reduced steady wear.

Follow-up priority**:** formalise museum display standards (max lux, RH range) and a visitor-management plan for peak seasons.

St Anthony's Church (Rodon)

Problem emphasised: saline coastal microclimate and intermittent access (religious use).

Key lessons:

Tailoring treatments to salt-laden substrates (salt-tolerant consolidants; sacrificial lime plaster where needed) was essential.

- Negotiated liturgical-sensitive access (timed closures for treatments) allowed conservation while respecting community use.
- Coastal exposure required a longer-term monitoring regime (seasonal checks).

Follow-up priority: schedule seasonal inspections after winter storms and embed caretakers in the monitoring loop.

Monastery Church (Rubik)

Problem emphasised: complex earlier interventions and layered overpaint.

Key lessons:

Careful stratigraphic cleaning (tests followed by controlled mechanical/chemical removal) preserved original paint under heavy overpaint.

- Cross-disciplinary consultation (art historians + conservators) during reintegration decisions ensured ethically balanced aesthetic outcomes.
- Where reintegration was desirable, minimal retouching conventions (neutral tones, tratteggio/hatching) were well received by stakeholders.
- Follow-up priority: archive and publish full technical reports and interpretive panels explaining choices about overpaint and visible treatments.

9.3 Findings



Photo Caption:
Above: Images of saints revealed during the conservation of wall paintings at St Anthony's Church in Rodon

Below: Painted sides of the apse, revealed during the conservation of wall paintings at the Monastery Church of Rubik



10. Project Management

UNOPS (United Nations Office for Project Services) applied a unified, structured project management approach for the conservation of the Wall paintings at four sites, implemented under the EU4Culture programme. UNOPS followed a consistent methodology designed to ensure quality, transparency, risk control, and long-term sustainability.

10.1 Condition assessment and conservation scope

UNOPS began by conducting:

- Technical assessment and Documentation
- Preliminary condition assessment
- Development of conservation scope

10.2 Stakeholder Coordination

- Collaboration with the Regional Directorate of National Cultural Heritage
- Alignment with national heritage legislation and EU cultural preservation standards

10.3 Design Development and Technical Preparation

Throughout the duration of implementation of EU4Culture programme, UNOPS was supported by an external licensed conservation design team for the development of the conservation designs.

The conservation designs were controlled and coordinated by the UNOPS infrastructure and cultural heritage team, which closely controlled all the portions of design. In specific cases involving the conservation of wall paintings at the Monastery Church in Rubik and St Anthony's Church in Rodon, the conservation designs were developed by a licensed works of art conservator hired by the contractor.

10.4 Compliance and Approval Process

- Reviews by UNOPS - Once designs were controlled by the internal UNOPS team, and were defined as ready, they were sent for additional control by UNOPS Infra-

structure and Project Management Group (IPMG). Only after designs were revised and IPMG certificate was issued, the designs were considered finalised.

- Reviews by heritage authorities - As per the Albanian legislation, once conservation designs are finalised, they are submitted for approval to the National Scientific Council at the National Institute for Cultural Heritage. If the Scientific Council does not have any comments, the designs are forwarded to the National Council of Material Heritage. Once approved and respective conservation permits are received, the design can be procured for implementation. Important to note is that, if during implementation changes arise, designs need to be revised and re-sent for approval.

10.5 Procurement and Contractor Management

Once designs are equipped with all respective permits, UNOPS ensured transparent, competitive procurement, including:

- Selection of qualified contractors licensed for conservation of heritage assets
- Procurement followed UNOPS global procurement rules, ensuring integrity and value.

10.6 Oversight of implementation of works and quality assurance

During the implementation of works, UNOPS provided:

- On-site supervision on behalf of UNOPS, which meant that at least one associate civil engineer employed by UNOPS was daily on the site, monitoring progress, quality and controlling environmental, health and safety requirements. An important role for UNOPS engineers was risk management, where engineers were tasked with filing daily and weekly health and safety reports, risk assessment reports, and daily logs.
- Third party supervision - an external licensed supervision company was hired to support UNOPS in controlling implementation, certification of quality, implemented volumes etc throughout the duration of works. This was important, especially since the National Institute for Cultural Heritage which initially provided this support, was lacking capacity specifically in areas of structural, mechanical and electrical engineering.
- Highly important was a follow up on all conservation measures which was done by UNOPS cultural heritage adviser regularly

10.6.1 Health and Safety

UNOPS applies a rigorous Health and Safety Management system designed to ensure that all restoration and construction activities are carried out with maximum protection for workers, visitors, and the surrounding community. This system is grounded in international HSE standards and includes comprehensive risk assessments, method statements, and safety protocols developed prior to the start of any work. On-site supervision ensures strict adherence to protective measures such as the use of personal protective equipment (PPE), scaffolding safety, fall-prevention systems, controlled access zones, and fire-prevention procedures—especially critical in heritage buildings containing combustible materials. UNOPS continuously monitors worksites, conducts safety briefings and toolbox talks, documents incidents, and enforces corrective actions to prevent reoccurrence. Through this structured approach, UNOPS maintains a safe working environment while safeguarding the integrity of cultural monuments and the well-being of everyone involved.

During the implementation of works, infrastructure project manager, lead construction management engineer and civil engineer were tasked with daily coordination and support as to ensure all the health and safety Measurements are met.
Furthermore and to increase the capacity of local contractors, regular tool box talks and training when it comes to risk management, health and safety and daily operations of conservation sites.

10.6.2 Documenting and reporting

UNOPS follows a rigorous documenting during implementation. Documentation is done through following:

- Shared digital drive-based documentation system, where all data regarding the design, contract, meetings, reporting, daily photo documentation, are stored and available to the engineering team
- The documentation as well includes all segments related to environmental management, risk management, HSSE management, logs and inspections.
- Reporting as well is done on several levels:
- Initially biweekly, and later monthly reporting to donor
- Biweekly detailed progress reporting to donor and beneficiary
- Regular technical and coordination meetings with both donor, beneficiary, asset managers and similar
- Reporting in UNOPS field data collection platform (UNOPScollect system) where daily logs, daily and weekly HSSE reports are collected

10.7 Testing, Commissioning, and Hand-Over

Prior to the contractor declaring final completion, UNOPS, together with the supervisor, checks:

- Structural integrity and stability
- Quality of surface finishes, and restored façade elements

Once all remarks have been addressed by the contractor, the works are subject to inspection. UNOPS, together with the contractor, supervisor, the National Institute for Cultural Heritage, the relevant Regional Directorate of National Culture, the site beneficiary, and the site manager, jointly conduct the site inspection. In parallel, and following the final supervisor's approval, all project documentation is handed over to a commission, which issues the Commissioning Act. Once the Commissioning Act is issued, the site is provisionally handed over to the beneficiary. This moment also marks the start of the Defects Notification Period (DNP). The DNP for all sites restored under EU4Culture was 12 months, with the exception of one site, which was an emergency stabilisation and did not require a DNP due to the temporary nature of the intervention.

10.8 Final Hand-Over

During the DNP period UNOPS conducts periodic controls and coordinates among beneficiary and contractor in eventuality of defects. At the end of 12 months final inspection is invited and if there are no remarks, the final hand-over certificate is signed by all parties, which marks the full conclusion of the works by UNOPS.

10.9 Overall Added Value of UNOPS Project Management

By applying its globally recognised project-management system, UNOPS ensured:

- Transparency and adherence to international procurement standards
- High-quality conservation outcomes
- Strong safety management and risk mitigation
- Efficient use of EU4Culture funds
- Sustainable long-term maintenance frameworks
- Capacity building and knowledge transfer to national and local stakeholders
- Engagement of academic institutions and students through on-site learning opportunities
- Promotion of inclusive participation, including gender-balanced involvement of experts and professionals

UNOPS delivered projects that not only restored important cultural buildings but also strengthened institutional capacity for ongoing stewardship.

11. Acknowledgments

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