A case of sustainable conservation

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Abstract

The preservation of architectural assets requires full training, updated knowledge and an interdisciplinary nature. Considering an architectural site's values and that many are no longer restorable once modified, the case is evident. It is legitimate that all taking part must operate in the full conscience of these values. However, there are cases in which it is not possible to make use of modern instruments and skilled labour – cases in which the context and the economic availability narrow down possible choices. Adding to this a condition of urgency, it turns out that the above mentioned is no longer linearly applicable. At Voskopojë (Albania), today a village, once a flourishing cultural centre, still visible are 5/25 post-Byzantine churches. The plan for cultural saving in course (n.g.o. Patrimoine sans Frontières, Paris/France), has been, with local institutions, a movement for conservation of these assets that represent such important testimonies of the village's history, whose memory has been compromised through destructive actions, also by the natural exposed risks (seismic risk M=6,9). Conserving these assets means conserving the historical memory of the place and people, giving them back a durable key of identity, an instrument for autonomy, and a coherent development with the past. Modernity in these cases is in developing the applicability of the above-mentioned competences, not only in hands-on terms but also in an awareness of the advisors' role. The case of the church of the Prophet Elias, one of above-mentioned five, has put forward a responsible reflection on these thematic ones, in that the conservation plan was to be elaborated with qualitative standards, and carried out through the involvement of local resources. This has been translated into an action of contextual acquaintance, in the appraisal of system's limits and in the consequent responsible action of specialized "external" technical support.
Keywords: Albany, Voskopojë, historic sites, church architecture, post Byzantine age, conservation, seismic vulnerability analysis, cooperation.

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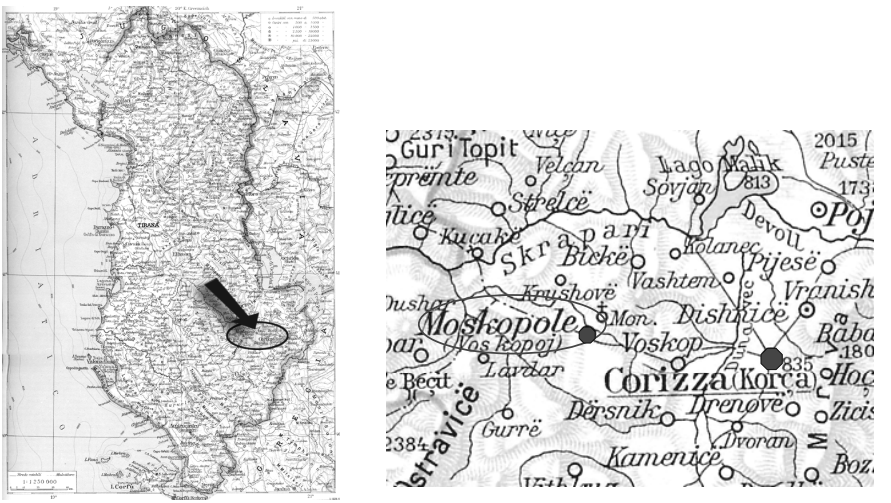
1 Introduction

The Voskopojë site (Korça, TO) is characterized by a concentrated presence of fine religious buildings from the post-Byzantine age, six of which are conserved to a large degree like the original structures. The others, vestiges of a past civilization [1], are in such a conditions to be currently object of archaeological research undergone by the competent Albanian institutions. Six years ago the site has re-entered in the safeguard plans of the o.n.g. Patrimoine sans frontières (PsF), which have got together the necessary resources not only for the material patrimony, but also for the development of the territory, based on a premise of cooperation. This understanding, follows the presentation of this historic site and of its context, understood as a system in which knowing the majority of factors, limits and correlated potential as to able to proceed, have been indispensable. On this basis, the elaborated labour methodology will subsequently come out into the light, mediating characteristics of the system and imperatives for the conservation.



(a) (b)

Figure 1: Cartography of the Office of the Italian touring club. Vallardi, Milan 1929. (a) Albania, the black ellipse circumscribes the district of Corizza, the arrow indicates the geographic position of Voskopojë. (b) 'Voskop' shown between Moskopole and Korça.

2 The context

The village of Voskopojë is found at an altitude of 1200 m (3.937,01 ft) above sea level, in a small valley encircled by a promontory. The safeguarded religious buildings are the churches of Sant'Atanasio (Shën Thanasit, 1724), Prophet Elia

(Profet Shën Ilia, 1759), Saint Maria (Fjetia and Shën Mërise, 1712), Saint Michele and Gabriel Archangels (Lagja e Shën Mëhillit, ?), Saint Nicola (Shën Kollit, 1726) and monastery of Saint Giovanni (Shën Prodhomit, 1632) [2]. Presumably, the very temporal vicinity of their construction, is one of the reasons for why the buildings have such similar characteristics, before between all the positioning: of all the external churches of the village, each one is found on the top of a projecting land mass; oriented with the apse to east and the inner floor area is found, on average, to be -1,5 m than the external one. The materials used, the supplying sources, the committee sponsors, let alone the work force that, if not the same for all the churches, it is reasonable to think that they were however in tight contact between themselves. They follow a probable common constructive archetype, in spite of the differences that characterize them. The rectangular plant of the body of the main building, its completion by two other additional functional units: an external gallery (the southern longitudinal side) and a narthex (west side). The inside is divided by two files of columns in three naves and a presbytery of the same width as the body of the church; the typology and the positioning of the openings, the position and dimensions of two accesses: one by the external gallery in arcades and one by the narthex. The wall of perimeter, with an average thickness of 1 ml, built in 2 facings of a squared hardcore in lime mortar, filled by a hardcore filling of stones and mortar, placed in no regular fashion. At the moment of the activation of the safeguard plan, for all the above-mentioned monuments, the intention to start an action of conservation was already present by part of the Albanian institutions in charge, in particular by the Institute of Monuments of Culture of Tirana (IMK), given the long period of abandonment and the improper use which they had been put into, coinciding with the communist regimen (1946-1990). Regarding this goodwill, PsF has put itself forward as a cooperating partner, offering support in the search for finance and in the recruitment of advisers to place side by side with the local experts, with the aim of construing a comparison and, in base of this, beginning a common objective path, having as a goal both conservation of monuments, and restoration of the local system of professionalism and competences. The experience gained in the area has immediately outlined, in an obvious way, the inopportunity for applying linearly the work modalities based on means of operativity, taken for granted in many European zones. Like for example, all concerning aspects of material operations: the availability of uninterrupted of electrical current, of material hardware and of up to date software, and of technological communications like an Internet connection. Also to be considered are the effects of the transition period, from before to after the communist regimen, on the organization of the institutions that have left their customary order in order to pursue a new one: the competences are still not reorganized and therefore they still do not manage to operate to the maximum of their potential. To this one can add the diversity in training carried out by local experts and external advisers - an imputable diversity in the period of forced closing of the village, that has determined the lack of cultural exchanges. If though, in the event of being able to do little through material operating resources, in the other fields all efforts have been put into finding a common

ground of agreement, between the various operating methods, where being able to characterize the mutual roles and the responsibilities, weighing up the local experience and knowledge. Returning to the cultural patrimony, in concrete terms, obvious reasons of resources have therefore imposed priorities, the first inspections have taken all the monuments into consideration, as did some preliminary studies, but it has not been as such for the intervention plans. The first two churches currently under consideration and that already have been object of urgent intervention are the church of Sant'Atanasio and the church of the Elia Prophet. This last one soon has become the case pilot for the development of the operational modalities and cooperation.

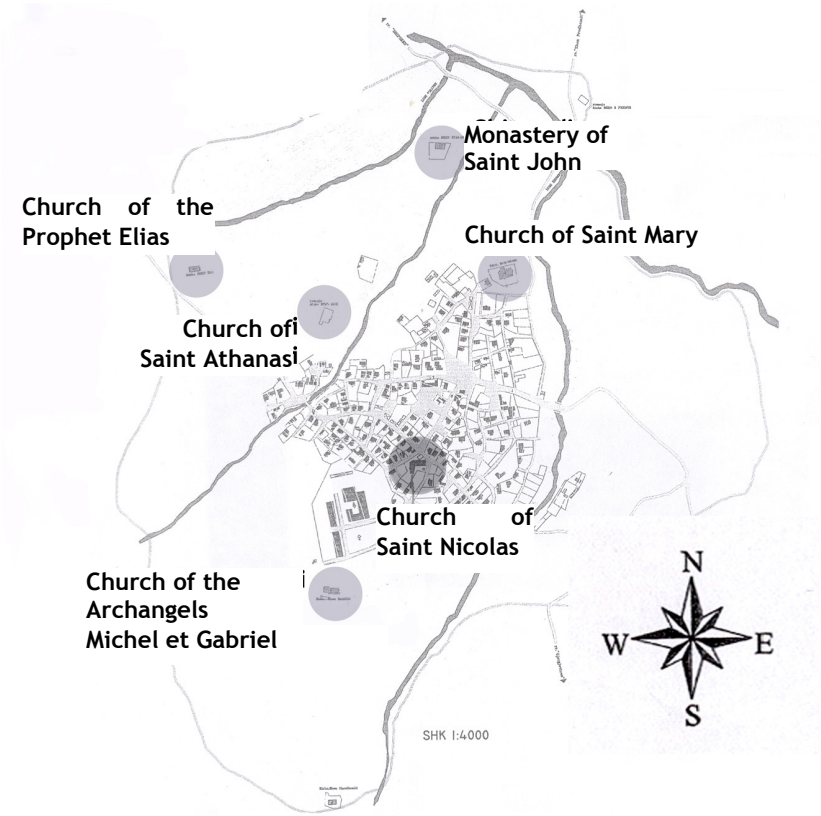


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Figure 2: Plan of Voskopoje, the positions of the six main religious monuments built in the post-Byzantine age and still visible today. Original base document: Master plan for *zonen me perparesi zhvillimin and turizmit* Voskopojë (original scale 1:4000), edited by the ISPU, *Instituti studimeve projektimeve urbanistike*, Albania 2001.

(a)

(b)

(c)

(d)

(e)

Figure 3: (a) Church of Sant'Atanasio, part of image, from the northeast. Around the church the cemetery is visible, today open to the village. (b) Church of the Elia Prophet, seen from the west. (c) Annexed church of the Monastero di San Giovanni, seen from the north-west. (d) Church of Saint Michele and San Gabriel Archangels, part of image, from the northeast. (e) Church of Saint Maria, seen from the south-west.

3 The church of the Elias Prophet at Voskopojë: the whole of the proceedings put into place for the conservation of the monument

3.1 The preliminary phase: historical, material and environmental knowledge

The beginning of the project saw the starting of several actions aimed at getting together the maximum of information available on the monument and its context.

Table 1: Actions started for the knowledge of the site and of the monument.

Actions of knowledge	
For the site:	For the monument:
A.1 Consultation of qualified institutions as regards geology, geotechnics and hydrogeology	B.1 Consultation of indirect sources [in progress]
A.2 Consultation of qualified institutions as regards seismology	B.2 direct Inspection, analysis and condition report
A.3 Study of general climatology For the monument:	B.3 Comparison with other similar architectures of the site

On these bases, we started, progressively and advancing research, the study of the monument. At the end of this first stage, with the completion of information acquired, considered necessary were: the execution of: land survey, architectural statement of the current state, study of acoustics of the church, archaeological rebuilding of the acoustic shape, characterization of the ground, geological investigation, of hydrogeology and the level of seismic activity of the environment, characterization of lytic materials employed in the construction industry, state of pollution water of the rivers. The main results of these preliminary study campaigns were as follows (while referring to the panel):

(a)

(b)

Figure 4: The church Profeta Elia, (a) in an image (not given) from the archive of IMK. (b) today's image.

3.1.1 Type of surroundings: geology, geotechnics and hydrogeology (A.1)

The church of the Elias Prophet, like the other churches of the site, was built in the middle of a little pronounced headland, where the deposit of vegetable

ground and the layer of unconsolidated or semi consolidated ground do not exceed the depth of approximately 1,50-1,70m. Under this thickness there is the consolidated and compact ground: base formation [3]. The obvious advantage of this configuration for the structure is the stability, as the foundations support on the base formation.

3.1.2 Type of surroundings: seismology (A.2)

The particular study of the environment confirmed, in terms of risk, information corresponding to the national data in regards to seismic potential: 6.9 M [4, 5]. The manifestation of the seismic events is visible on the structure of the church in the form of a framework of the cracks in the built part, as can be seen in the displacement of certain elements constituting the wooden carpentry of the roof.

3.1.3 Consultation of indirect sources (B.1)

This action was almost entirely taken in charge of by the professionals of the I.M.K of Tirana: In the photographic historical file of the I.M.K., in the technical file of the I.M.K., the bibliography, the cadastral documents.

3.1.4 Direct inspection, analyses and report of state: materials and techniques of construction (B.2)

As regards to the materials, one noted that the foundation and the structures are made out of lytic materials. The stone, in the roofing stones, is also employed as a last external layer of cover. All the types of stone and binders were identified by the study of characterization of the materials [6]. In regards to the architecture of the construction, the church of the Elias Prophet hardly distinguishes itself from that recognizable in the other churches of the site. The macroscopic difference compared to the other churches is the method of cover: three roofs, two with only one inclined slope on the lower side and one with four slopes in stemming on the central nave, of which the carrying structure is entirely in wood, organized in a rafter frame, complete for the central nave, with a half-rafter for the lower side. Originally, this system also included a wooden ceiling – now however almost totally collapsed. Whereas the cover of the other churches is composed of one articulated system of vaults in carrying masonry, on which the wooden carpentry is supported, surmounted by a layer of wooden boards, that form the structure of the four slopes visible from the outside. In this case the timber structure is not integral. On the final cover there is always a layer of the roofing stones. The factors which allow the renewing of the church in the common prototype are found in the global design of the church. The building techniques resemble those of the other churches, but are carried out here in a more meagre fashion- a probable echo of the beginning of the decline of Voskopojë. The perimeter wall, built in 2 filled facings, show a different quality between that of the outside and that of the interior. The filling between the two facings is an incoherent mixture that, in the visible parts, corresponding with the collapses, was put together with a not very hydraulic mortar.

3.1.5 Comparison with other similar architecture of the site: inheritance in the environment (B.3)

As has already been already mentioned, the site of Voskopojë includes 5 other post-Byzantine churches, all built between the first half of the XVII° century and second half of the XVIII° century. The presence of this thus concentrated ensemble has paved the way for a comparative study between the architecture and the varying techniques of construction. It would seem that all these churches are renewable in agreement with the mentioned architectural prototype.

3.2 The intermediate phase: understanding

The acquisition of information concerning the preliminary phase has made possible an understanding of the structure, of the techniques of construction, as well as the general study of the current state of the structure and analysis of the corresponding behaviour, the corresponding interaction dynamic with the environment and the evaluation of the risks to which the structure is exposed.

3.3 The final phase: the study of the actions necessary for conservation, according to the criterion of the least possible intervention, the definition of the priorities.

Knowledge and comprehension allowed the evaluation of the intervention, necessary for the conservation of the monument, of their classification according to the corresponding levels of emergency. Emergency interventions aiming to the documentation of the wooden ceiling (fallen to the ground) had been encouraged even in the preliminary phase. The safety from the roof and the parts built into such, turned out to be a priority. This process will be described hereafter in its essential parts.

3.3.1 First priority: static safety setting

Firstly in this particular case, the safety setting allows the follow-up of restoration without exposing the operators to danger. The choice of this intervention was stemmed from considerations according to: masonry presented collapses at the angles, the wooden ceiling had recently collapsed, the rafters of the frames no longer stemmed directly, but inclined in the direction of the apse, the roofing stones fell occasionally inside the church through the holes in the layer from the covering boards, regarding principal environmental risks (seismic, snow), ascertains that occasional and fortunate interventions had already been made of late, the fact that the church had been visited in spite of its condition and official warnings concerning the dangerous state. Although urgent, the intervention on this church could not disregard its value as a historic building.

3.1.1.1 The study of the roof The wooden roof is made up of three roofs: the pavilion roof of the central nave and two low roofs at the sides- symmetrical compared to the central longitudinal axis of the church, and with only one slope.

Table 2: Schema delle strutture lignee delle coperture.

	Typologie de structure			Typology	composition		
	composants	Total Number	Space Distance elements		éléments	N/ typology	Average section
Central Body Pavilion Roof	Rafters	19	83cm	Complete Rafters	Crossbow	2	15x15cm
					Lower entry	1	15x15cm
					Central post	1	10x10cm
					braces	2	10x10cm
				Partial Rafters	Crossbow	2	15x15cm
Low-Side	Semi-Rafters	2x31	51cm	Semi-Rafters	Crossbow	1	12x12cm
					Entry	1	12x12cm
					braces	1	10x10cm

In the central nave two typologies of rafters are laid out in an alternating fashion. With an under-surface of cross-beams, where there was a wooden ceiling before its collapse. All the rafters, central nave and the ones on the sides, hold on the face of the principal rafters by the wooden covers boards. The roofing stones are laid out on the face. Longitudinally there is no system from the ridge sheathing for connection of the rafters to the crossings of the principal rafters to the central nave. The current state of degradation of the roof of the central nave is renewable mainly due to the following factors: the deterioration of the materials (lack of maintaining and/or excessive support demand, as in the case of the boards), missing longitudinal connectors between the elements carrying the nave's transversals, lacking sufficient connections with subjacent masonry in the body of the church (through the time of violent seismic action that the structure underwent - in movements and the slopes of the rafters). In supposing the structure "healthy" (*previous status*, pre-alterations), the calculations carried out for the evaluation of its performance in service through the actions of wind and snow and through the action of the seismic movement (horizontal accelerations applied to the mass greater than 40% of that of gravity) highlighted the existence of two groups of timber structures according to their state of demand: The first group strongly demanded (rafters of the low sided dimensions, boards stemming from the central nave, the central nave's partial rafters); a second group with an average/low demand (the central nave's complete rafters, boards on the lower side).

3.1.1.4 The principal interventions under consideration For the roof of the central nave, to improve seismic action resistance, we have planned a summit connection (ridge sheathing) rafters from the central nave, to safe guard, during the execution, the connections of the frame with masonry by distributing the loads by interposition of a wooden belt. To get rid of the partial rafters pushed on the walls on which they press, we have planned a horizontal tie-beam with a connection at the lower ends of the principal rafters.

4 Conclusion

All the studies described here have been lead by private and public Albanian professionals, with the collaboration of the technicians recruited from PsF. The phase of plan, after a period of comparison between local and external professionalism, has been brought to term by external professionals, where as the organization of the execution of the jobs carried out by local workers was lead under the expert guide of technicians as well as by locals. We deem that the case of the church of the Elia Prophet as a pilot case concentrating on the very involvement that every phase of its process of conservation has produced in all the parts involved, with particular reference to professionalism and the local workforce.

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