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# **Considering Importance of Light in the Post-Byzantine Church in Central Albania**

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**Abstract:** The subject of this paper is application of coloring and lighting parameters as principals in well functioning of an important religious monument from the Byzantine and post byzantine periods in central Albania. The aim of the paper is to consider how the twelve-fifteen-century constructors of the Saint Mary church close to Lushnja city and Saint Mary of Leusa in Permet optically manipulated the visual space of the naves, through the particular use of light. The paper is discussing upon the points of the orientation of the main axis of the Saint Mary church that is correlated with astronomical paths and interaction between sunlight and church space itself. We try to discuss not only the fact of light as a symbolic role, but also its environmental implications in terms of surviving and existence. The survey will serve as an important example and approach to analyze other structures and architecture examples and contributing through integrated environmental approaches in conservation and revitalization.

**Keywords:** Saint Mary, Post byzantine architecture, light, integrated approach, analyze

## **I. INTRODUCTION**

The Byzantine and post Byzantine era in Albania has been marked by extensive church building. In many extensors the environmental and functional elements are integrated in both construction plan and orientation as well [1]. Archaeological explorations have brought to light a very large number of monuments dating from the early (or paleo-Christian) period that is from 4<sup>th</sup> to 15<sup>th</sup> centuries. The central and southern part of country is including the significant elements that were subject of our survey.

Various researchers in the context of general Byzantine studies are considering the windows and lighting constructions of a building as the principle source of illumination. Authors like [2] examined the orientation of the building and its fenestration in relation to astronomical research on the timekeeping system of the church and the movement of the sun during the year and each day of the year.

## **II. MATERIAL AND METHODS**

The methodology is based on principles of the orthodox religion that basically has created forms according to the need for meditation and concentration of the believers. The investigations of this paper are focused on compares of the relation between the spatial structure and the lighting in Byzantine churches. To that fact the deviation from the main East axis has been assessed (measurements with compass) and lighting (Luminance meter). Generally the study was exploring the meaning and role of light in different orthodox buildings performed followed by a research on the Byzantine and Ottoman religious architecture. The churches of Vithkuqi and other regions of Albania were considered, investigating the spatial structures and lighting in detail in order to define the relations and identify differences and similarities.

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**III. RESULTS AND DISCUSSIONS**

The majority of environmental problems in churches and other religion constructions are associated with lack of maintenance, chronic neglect and building defects leading to water ingress, condensation, etc. Deterioration of historical building materials such as in churches, monuments and buildings of historic and architectural interest are attributed to changes in the built environment. The main environmental parameters affecting the decay of materials are water, humidity, temperature, UV light and lack of ventilation.

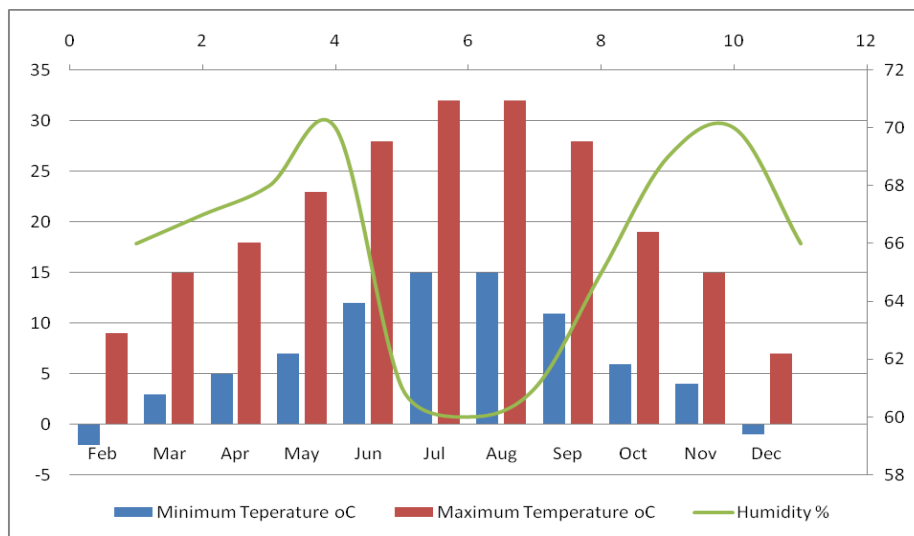


Fig. 1 Values of temperature (°C) and humidity (%) in surrounding area of Permet

Generally there are very few studies that are connecting the church design, plan of building, light penetration and elements of interior degradation. On the other hand there is no indoor space which is sterile and free from microbial contamination and the presence of biological contaminants in low concentrations can be treated as a „normal“ [3].

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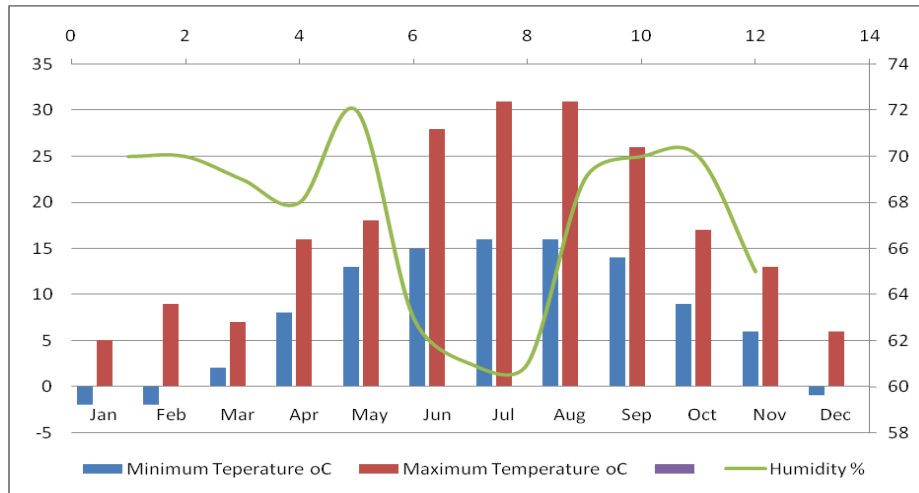


Fig. 2 Values of temperature (°C) and humidity (%) in surrounding area of Lushnja

Fungi are essential to survival of our global ecology but they may pose a significant threat to the health of occupants when they grow in our buildings. The problem of microbial contamination of indoor spaces connected with bio-deterioration of materials and buildings accompanies.

Conservation of ancient buildings is a major issue for modern societies, both from economical and cultural viewpoints. Information about the ancient built heritage is vital to plan adequate remedial measures. Monuments and buildings of historic and architectural interest works as spatial environmental ecosystems and provide ecological niches and pockets of microclimates in their built environment for the development of building pathology and must be understood as a whole.

Light levels in churches are mostly related to the creation of an environment where the worshipper can fulfill his religious needs and feel the essence of the religion, rather than to regular visual comfort objectives.



Fig. 3 General view of analyzed churches in Lushnja and Permet

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According to [4], because the majority of the windows in every church are permanently closed with shutters, it was not possible to conduct any direct observation of how the light enters the windows of the nave. We have faced with a similar problem and therefore a methodology needed to be devised which would overcome this problem. At the heart of the method is the cyclical nature of the yearly and daily patterns of the Earth’s movements around the sun and on its axis. In the Byzantine religious architecture, there seemed to be certain rules in the use of daylight. The sunlight penetration in the interior and the solemn impression on the worshippers seems to have arranged the plan of the buildings [5]. The movement of daylight during the liturgy defined the main axis of the building’s plan. The second vertical axis of guided light defined the position of the image representing the deity [3]. Based on our survey it should be noted that in the Byzantine churches light is engaged in order to motivate people activities. Byzantine church was based on that movement from the entrance through the narthex to the centre of the church. The transition takes place from the bright exterior to the well-lit first zone interior. From there, there is a reduction in the lighting levels until the light from the dome appears and leads people to the bright space underneath it [6, 7 and 8].

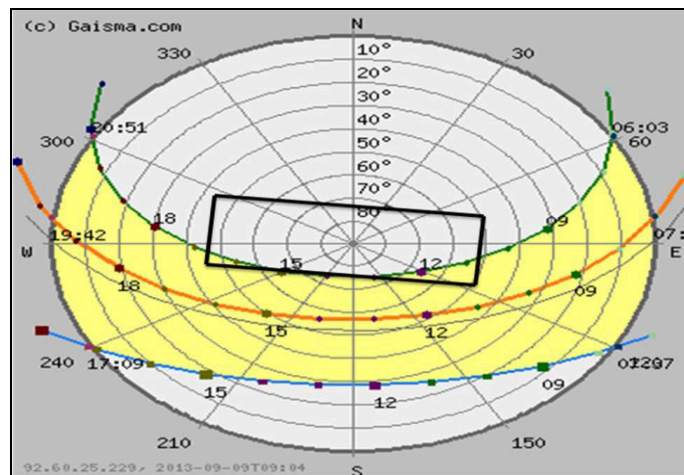


Fig. 4 The Church of the St. Mary of Lusa, Permet in the context of the relation between the orientation of its axis and the path of the sun throughout the year.

Based on data presented in Fig. 4 and 5, and the Table 1 the deviation plan from true east at the Church Saint Mary in Leusa, Permet is  $-3^\circ$ , while in the Saint Mary in Bishqethem Lushnja is  $-12^\circ$  (Fig.1 Fig.2). Looking to the interior of the both this spectacular examples of the post Byzantine era, which is directly reflected within the current state of lighting and windows positions.

Table 1 The compass measurements deviate from the true east orientation.

Church	Measurement (value $\pm 0.5^\circ$ )	Deviation from true East
St. Mary Leusa Permet	$102^\circ$	$-3^\circ$
St. Mary Lushnje, Bishqethem	$87^\circ$	$-12^\circ$

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In both examples surveyed and presented in the Table 1, an intriguing picture of the dynamics between the interior of Saint Mary of Leusa and other churches of the winder zone and the position of the sun during the summer and winter period. It is not difficult to point out that the sun is more or less aligned with the openings at or about the time of the canonical hours according to the Eastern Church tradition. This has also been observed in various churches sin Bulgaria [4]. The natural lighting of the interiors secures the maximum possible intensity of light at different parts of the interior and mainly where the concentrated of people is happen.

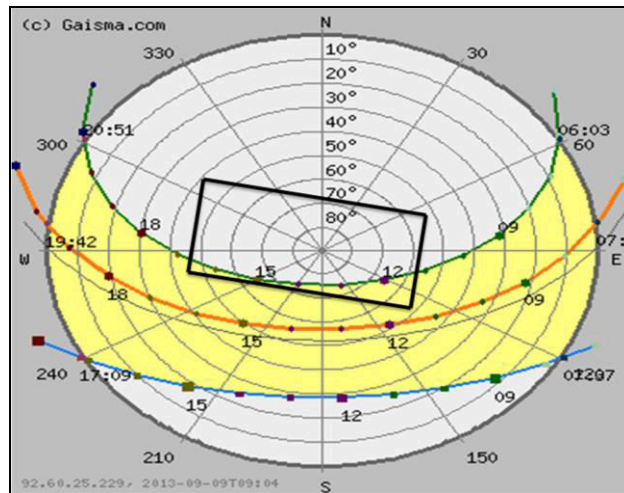


Fig. 5 The Church of the St. Mary of Bishqethem Lushnja in the context of the relation between the orientation of its axis and the path of the sun throughout the year.

**IV. CONCLUSIONS**

Management of the indoor areas of churches and other monuments is an issue of environmental control and management of bio-deterioration and health problems in buildings that are complex issues requiring multi-disciplinary investigations.

Based on our survey the orientation of the churches was done in accordance with astronomical principles, following the path of the sun on the horizon. Further to that the construction of the general plan and architectural solution was based on basic principles of the theological importance of the church. This has been a case with Churches St. Mary in Leusa Permet and Lushnja.

The windows position and lightings applied seem to have been selected taking in consideration the quality of the interior lighting and the ability of the human presence. The environmental situation and degradation has been also affected.

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