

PHOTOGRAMMETRY AND IMAGE INTERPRETATION ON THE STUDY OF ARCHITECTURAL AND NATURAL CULTURAL HERITAGE.

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ABSTRACT

This paper is the first stage (preliminary) for a study concerning an extensive mountainous region called Zagori, in North-Western Greece, that presents particular natural and cultural interest. In this mountainous area (covering 1053 square kilometers, with altitudes up to 2500m.) forty-five villages are settled at different altitudes (630-1340m.). An integrated study is planned for the natural and cultural environment. We use aerial photographs and satellite imagery-data.

1. INTRODUCTION

The Cultural Heritage of a country is undoubtedly a national asset. During the last decades, the efforts at national and international level for documenting, preserving and managing the Cultural Heritage have become more systematic. The Lab. of Photogrammetry-Remote Sensing of the Civil Engineering Faculty of A.U.Th. has dealt with the study of monuments and historical centers, emphasizing their wide surroundings and searching through the contribution of photogrammetry and remote sensing, their advances and trends in this issue (Patmios E., et al, 2001, 2002, 2004). The study of the form, the size, the ruining and the general “physiognomy” of the monument or the historical center is done in relation with its natural environment and the processes that take place in it. At present we turn our efforts to the study of extensive areas considered as a whole. Particularly, in this paper, we refer to such an extensive area that includes mountainous traditional settlements-villages, a typical example of architectural and natural Cultural Heritage. This paper concerns Zagori, in Epirus, North-Western Greece. The aim of the paper is to search through the potential of photogrammetric and remote sensing methods and resulting products on the study of natural and architectural Cultural Heritage in a development framework for the whole region. The following concern a preliminary report for the study area and our aspects, approaches and experiences.

2. THE STUDY AREA

Zagori is a very extensive mountainous region (altitudes ranging from 500m to 2500m), covering an area of 1053 square kilometers in NW Greece. It includes a “network” of forty-five village communities, built at different altitudes (630m-1340m), collectively known as “Zagorohoria” (Makris E., 1996).

The area, inhabited since antiquity, enjoyed great prosperity after 17th Century BC. The morphology is characterized by the high peaks of the Pindos mountain range and by a particularly interesting drainage network. The whole region (natural environment and settlements-villages) includes a variety of interesting features of natural beauty and architecture (relief, rivers, ravines, vegetation, traditional villages, bridges, monasteries, churches).

3. METHODOLOGY

The basic idea concerns an integrated study for all the area. This

integrated study will contribute to environmental development that will simultaneously facilitate the evaluation and management of settlements- villages. It should include fundamental subjects related to:

- . • Geomorphology,
- . • Geology,
- . • Hydrology,
- . • Transportation,
- . • Structures,
- . • Land uses.

With the above, various infrastructures works can be done. Qualitative and quantitative information is necessary. This results from bibliography, field study, existing maps (topographical, geological) and use of photogrammetric and remote sensing methods and “products” (qualitative and metric exploitation of imagery). The field study was determinatively important because it gave us a clear perception - understanding of the area and a valuable help for the organization of the study. The aerial photographs in different scales sufficiently inform about the natural environment (features, processes) and human settlements.

The processing of aerial photographs (graphical, digital, orthophotograph) can be used in many ways in the various phases of the study.

Satellite imagery allows multiple exploitation of the data provided, from visual interpretation to digital analysis.

We use the following satellite data:

Landsat 7

Orthorectified imagery – data
Multispectral, 30m resolution
Panchromatic, 15m resolution

Spot

Panchromatic imagery data,
level Raw (1A),
stereopair, and Panchromatic imagery data, ortho-
level
10m resolution.

We intend to use satellite data of very high resolution.

4. DISCUSSION

To summarize:

- a) We attempt the study, that this preliminary paper concerns, for the following reasons: It concerns an extensive region that collectively presents particular natural and cultural – architectural interest. An integrated study is aimed at. Combination of different photogrammetric and remote sensing methods and data is used.

- b) Our effort, for the time being is planned in the following two stages: Initial information that results from the preliminary paper. A pilot study concerning selected indicative cases.

REFERENCES

Makris E., 1996. Zagorohoria. 2nd Edition, Ioannina, Greece.

Patmios E., Lazaridou M., 2001. Progress on the Photointerpretation and Photogrammetric Study of Monuments

and Historic Centers. In: International Archives of Ph. And RS, Volume XXXIV-5/67, pp. 630-632, XVIIIth International Symposium of CIPA, Potsdam, Germany.

Patmios E., Lazaridou M., 2002. Satellite Image of Very High Resolution on the Study of Monuments and Historical Centers and their wide surroundings. In: International Archives of Ph. And RS, Volume XXXIV, Part 5, pp. 446-450. ISPRS Commission V Symposium, Corfu, Greece.

Patmios E., Lazaridou M., 2004. Remote Sensing on the Study of Cultural Landscapes. ASPRS Annual Conference, Denver, Colorado. In: Conference Proceedings pp. 184-187.