Title of Project : Studies on the Documentation, Conservation and Utilization of Byzantine Architectural Heritage in the Middle East and North Africa

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Research Area : Turkey, Syria, Jordan, Egypt, Libya, Tunisia, Algeria, Greece

Keyword : Conservation; History of architecture

【Purpose and Background of the Research】

This research program is developed around the following five objectives relating to the significant Byzantine monuments in the Near-East and North-Africa during the period of its formation, particularly in the age of Justinian: "Fundamental Theoretical Study", "Archaeological Study", "Conservation and Restoration", "Engineering Study", and "Assessment Utilization". These are integrated into broader research of I) transitional aspects of Byzantine architecture between Late-antique to Medieval periods, II) re-interpretation of post-Roman strata of remains, III) conservation and restoration program for the monuments to be analyzed in this research, and finally, as a future objective, IV) construction of a multi-disciplinary framework by which conservation research could be effectively applied in other cases in developing countries.

【Research Methods】

"Fundamental Theoretical Study":

1) Measurement by 3-dimentional laser scanner; 2) Study of Byzantine architecture on the basis of survey; 3) Analysis of *Spolia* through excavation reports and relating visual documents; 4) Study of documents, such as world heritage nomination files or assessment reports of ICOMOS are analyzed; 5) Analysis of *Anastylosis* through survey

"Archaeological Study":

1) Excavation of Byzantine sites, particularly at "Fortress Church" of Ptolemais (Tolmeita), 2) Drawing out a plan of utilization on the sites studied in this program.

" Conservation and Restoration":

1) Documentation of the sites, materials and *Anastylosis.* 2) Material examination of properties of stones and bricks.

"Engineering Study":

1) Measurement of wind-direction, wind-speed, temperature, humidity, CO, NOx, SOx, rainfall, PH, sun-irradiation. 2) Planning of the site management. 3) Elasto-plastic FEM analysis by tetraedral and hexahedral solid elements.

"Assessment and Utilization":

Integration of above-mentioned studies and drawing out a management plan for each site.

【Expected Research Achievements and Scientific Significance】

1) This research aims at building up the basis of systematic descriptions about Byzantine architecture by highly accurate measurements in extensive areas along the Mediterranean Sea from north to south.

2) Certain disregard or over-restoration have damaged the architectural heritage. This research program, through careful application of latest advanced technology, assesses past intervention to produce effective guidelines of preservation, restoration, utilization and management which should be highly useful for relevant states and UNESCO. The results may stimulate or promote a mew reassessment of pre-Islamic cultural heritage in Islamic countries, and consequently have significance as a universal method of heritage conservation.

3) This research may contribute to constitute the foundation on the part of Japan for cultural support toward the heritage conservation in abroad, especially in those area where skill and human resources are not sufficient to maintain the heritage value.

【Publications Relevant to the Project】

Kenichiro Hidaka, Tatsuki Sato 2004, Deformation of the Main Dome" 67-91

Kenichiro Hidaka and Tatsuki Sato 2004 "Eastern Semi-dome" 111-114

in Kenichiro Hidaka Tatsuki Sato eds. 2004, *Academic Research Report of Hagia Sophia*, Chuo Koron Bijutsu Shuppan

【Term of Project】 FY2009-2013

【Budget Allocation】 141,500 Thousand Yen