

EXPERTS WORKSHOP ON THE STUDY AND CONSERVATION OF EARTHEN ARCHITECTURE IN THE MEDITERRANEAN REGION

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Abstract:

The study and conservation of earthen architecture has developed significantly throughout the last two decades in the Mediterranean region. To initiate greater cooperation among Mediterranean countries, a group of professionals with expertise in the subject from eleven representative countries convened for a series of structured discussions - within the framework of an Experts Workshop - on the challenges facing the field. The ultimate objective of the workshop, which occurred in March of 2009 on Sardinia in Italy, was to develop an action plan for coordinating the advancement of the discipline within the Mediterranean region. The participants identified training and research needs, priorities, available resources, and potential strategies for two themes: the conservation and management of earthen sites and earthen architecture for sustainable development.

The recent development of the study and conservation of earthen architecture in the Mediterranean region has been accomplished through a series of international conferences, training initiatives, formation of national and international committees and the resulting network of practitioners, scientists and academics. Seeking to facilitate the development the field within the Mediterranean region, Project TERRA - a collaborative initiative of the School of Architecture of Grenoble (CRATerre-EAG), the Getty Conservation Institute (GCI), and the International Centre for the Study of the Preservation and the Restoration of Cultural Property (ICCROM) - initiated the TERRAMed project in 2004 to collect and analyze information on past and present activities in Mediterranean countries. In 2005, the Diparch- Università di Cagliari (UNICA), the Escola Superior Gallaecia (ESGallaecia) and CRATerre-École Nationale Supérieure d'Architecture de Grenoble (CRATerre-ENSAG) organized the first Mediterranean

Conference on Earthen Architecture (MEDITERRA 2009). GCI joined the group to co-organize an experts workshop as part of the MEDITERRA 2009 general program. This paper presents the planning process, identified objectives, action plan development methodology, and general discussion of results from the Experts Workshop.

1. BACKGROUND

Earthen architectural heritage is of remarkable significance as a testimony to human development and adaptation to environment. There is a wealth of earthen architectural heritage worldwide—from historic city centers and vernacular cultural landscapes to some of the world's largest archaeological sites. Conserving this legacy is a formidable task that requires sustained commitment, interdisciplinary effort, and international cooperation. The late 1980s and 1990s witnessed considerable advancement in the field of earthen conservation through a series of international conferences, training initiatives, and the formation of national and international committees devoted to the cause. Through these opportunities for exchange, a network of practitioners, scientists, and academics was established. Institutional commitment has lagged behind, however, along with support for larger scale initiatives and collaboration. Institutional involvement and cooperation are key to developing the broad-based support needed for the conservation of earthen architecture. In November 1997, following their collaboration on PAT96 (the first Pan-American Course on the Conservation and Management of Earthen Architectural and Archaeological Heritage), the International Centre for Earth Construction - School of Architecture of Grenoble (CRATerre-EAG), the Getty Conservation Institute (GCI), and the International Centre for the Study of the Preservation and the Restoration of Cultural Property (ICCROM) established a joint program called Project TERRA to further study the conservation of earthen architecture. Aware that the study and preservation of earthen architecture has been a priority for different national and international organizations in the Mediterranean region, Project TERRA took a first step towards an assessment of current practices and the state of the field in each country. In 2004, the TERRAMed (1) project was initiated to collect and analyze information of past and present activities organized in different Mediterranean countries. The ultimate objectives of this study were to identify key players in the region and to organize an expert's workshop to facilitate the discussion of needs and the development of short- and long-term strategies for the region. In 2005, Project TERRA ended its official partnership, but the institutions involved continue to collaborate closely in various activities.

In the same year, the Diparch-Università di Cagliari (UNICA), the Escola Superior Gallaecia (ESGallaecia) and CRATerre-École Nationale Supérieure d'Architecture de Grenoble (CRATerre-ENSAG) formally became European partners for the UNESCO Chair of Earthen Architecture. This collaborative agreement has provided the framework for ongoing partnership in activities such as research projects within the European Union Cultura 2000 program, book publications, student and professor exchanges, and collaboration in scientific events. In order to strategically place these activities within a regional framework, UNICA, ESGallaecia and CRATerre-ENSAG decided to organize the first Mediterranean Conference on Earthen Architecture (MEDITERRA 2009) and to propose an action plan based on the TERRAMed project. As a contributing member to the original TERRAMed project, the GCI was very pleased to receive an invitation from UNICA, ESGallaecia and CRATerre-ENSAG to co-organize an expert's workshop as part of the MEDITERRA 2009 general program.

2. THE EXPERTS WORKSHOP

The Experts Workshop brought together a select group of professionals from Mediterranean countries with expertise in the study and teaching of earthen architecture, materials science, construction, and conservation (2). It provided a forum to discuss two major issues: first, the challenges for the conservation and management

of earthen sites—broadly interpreted to include earthen archaeological sites, vernacular and monumental architecture as well as cultural landscapes where earth is a predominant feature—and second, earthen architecture for sustainable development. Workshop participants were selected according to 1) Representation of each macro-area: Northern Mediterranean, Maghreb, Near East and the Balkans; 2) Significance of overall knowledge of earthen architecture and conservation, as well as expertise on research, implementation of projects, and/or training concerning the subject areas addressed; 3) Institutional support (governmental or non-governmental organizations); and 4) Language (English and/or French).

3. METHODOLOGY

The first day of the workshop program, comprised mostly of working group sessions, was designed to maximize the opportunity for exchanges of information and informal discussion. Formal presentations made by selected speakers (10 minutes each) addressed the “state of the art” of each area of study. Participants then identified priorities, strategies, and resources needed for both of the selected themes based on the questions described below and delivered to participants prior to the event. The second day (to be attended only by workshop organizers) was dedicated to summarizing the previous day’s points of discussion. Workshop organizers since then have compiled the present summary with input from workshop participants defining current trends for the selected themes in research and training as well as an action plan including short- and long-term activities.

4. WORKSHOP THEMES

4.1 Management and Conservation of Earthen Sites

The management and conservation of earthen sites is undoubtedly a field of increasing interest throughout the world. The tenth international conferences organized in the subject, many published proceedings and numerous international projects and conferences are evidence of the transformation of the field into a discipline. This evolution is illustrated by the titles of the international conferences, which have evolved from “Conservation of mud-brick architecture” at the first meeting in 1972, to the most recent title “Study and conservation of earthen architecture”. Earthen sites are now broadly interpreted to include archaeological sites, vernacular and monumental architecture as well as cultural landscapes where earth is a predominant feature. The discipline embraces the study and research of topics such as material and construction techniques, conservation treatments, seismic protection and performance, management planning and preservation of earthen building traditions, among many others.

The Mediterranean countries have greatly contributed to the evolution of the discipline over the last 50 years. However, although many activities, programs, training courses and projects have been implemented in the field, Mediterranean countries have not yet developed a common action plan for the region. The following questions were intended to help the workshop participants to identify priorities in research and training for the Management and Conservation of Earthen Sites in the Mediterranean region.

A questionnaire has been previously distributed in order to identify research needs in the region, with the following questions:

- Do we need more research into the behavior of **earthen materials**? If so, could you mention at least three topics needing further research to improve the conservation of earthen sites at the material level?
- Do we know enough about how different **construction techniques** performed and evolved through time? Would a better understanding of the **history** of Mediterranean earthen construction techniques help to promote and preserve earthen sites?

- Do we know how earthen constructions perform when affected by disasters? Do we need research into **disaster management**, preparedness and response? If so, do we need to perform risk assessments of earthen sites? Do we need guidelines or techniques for seismic retrofitting?
- Is there a good understanding of the term “**management**” of earthen sites? Does the region need more research to improve the implementation and development of **planning methodologies**? Do we have any management plans for sites in the region which can serve as models?
- Do we need to work on **standards or best practices guidelines** for the implementation of earthen conservation projects?
- What other **research topics** will advance the conservation and management of earthen sites in the Mediterranean region?

Questions to identify training needs in the region:

- Do we have enough training courses on the **management and conservation** of earthen sites? Do we have **model courses** already in place? If not, what should **curricula** for the management and conservation of earthen sites include?
- Does the region need **didactic materials**? Can one set of didactic materials cover the needs of the whole region? Do we need to standardize training at the **regional level**?
- How can we make training courses available to students from other disciplines, such as architecture, engineering, planning, etc.? Since it is well-established that we should educate a wide range of **audiences**: technical, undergraduate, graduate, mid-career professionals or the general public (with outreach and advocacy), which target group is most in need of training?

4.2 Earthen architecture for sustainable development

Worldwide interest in sustainable development has grown dramatically in the last decade as the global environmental crisis has deepened. In response, the discipline of sustainable development has gained attention in the public consciousness and an increasing number of projects are being undertaken in the field. Although earthen architecture has always been a model of sustainability, there is still a disconnection between the study of earthen architecture and the field of sustainable development. This is a loss for both fields, as the benefits of earthen structures are often not used in the sustainability field and the study of earthen architecture is not consistently included in research, training or projects for sustainable development. As momentum toward establishing a more environmentally, socially and economically sustainable society grows, it will become increasingly important for earthen architecture to be a part of that movement. Research and training are two viable ways to strengthen the relationship between the two fields at a fundamental level. The working sessions that follow are intended to identify the challenges facing the study of earthen architecture for sustainable development and list possible strategies for addressing these challenges.

In some Mediterranean countries architects are designing new architectural projects using earth as a building material. However, these cases are more isolated initiatives than an extended movement. Projects seem to become lost between trying to use traditional constructions techniques or simply expressing a new tendency. Furthermore, there is not a real understanding of what earthen architecture can offer to society and how it could become a strong component for sustainable development. From the management of the material, to the territory, through different scales of research, experimentation and application, how can we define what sustainable earthen architecture should be?

The following questions were intended to help the workshop participants to identify what are the priorities in research and training for the study and promotion of Earthen Architecture for Sustainable Development in the Mediterranean region.

Also for this second topic, a questionnaire has been previously distributed in order to identify research needs in the region. The questions distributed were:

- What are the key contributions that earthen architecture can make to the field of sustainable development?
- Since sustainable development focuses on social, economic and environmental factors, how can we introduce cultural considerations into sustainable development research and project implementation? For example, how can we establish the study and implementation of earthen traditional construction techniques as viable methods for contemporary design?
- How can we improve research into the relationships between Mediterranean building traditions and techniques, their adaptation to the regional ecosystem and the consequential built environment? Do we need more research into the **economic benefits** to communities which currently build or have built with earth?
- Do we need to research the **efficiency** of earthen buildings (for example, operating energy and energy use during construction) to be able to compare it with other building materials? What type of data do we already have available? What data has not been identified yet and how can that data can be collected? Do we need to specifically research lesser-known earthen construction techniques such as cob, straw-clay or daub?
- Do we know enough about Mediterranean **contemporary** earthen building **techniques and architecture**? Do we need mathematical models for structural calculations specific to earthen construction techniques (including contribution to a **specific Eurocode**)? Do we need to include earthen standards in **national building codes**?
- What other research topics will advance the use of earthen architecture for sustainable development in the Mediterranean region?

Some precise questions to identify training needs in the region have been also posed:

- How do we build a relationship between earthen heritage conservation and sustainable earthen architecture within our educational activities?
- What should the curricula of teaching earthen architecture for sustainable development include? Should the teaching of earthen architecture be part of wider curricula (i.e. sustainable materials for new construction) or should it stand on its own?
- Do we have to develop common educational methodologies and **didactic materials**?
- How can we address the connection of **theory to practice** during training?
- Since it is well-established that we should educate a wide range of **audiences**: technical, undergraduate, graduate, mid-career professionals and the general public (with outreach and advocacy), which target group is most in need of training?

5. SUMMARY OF WORKING SESSIONS AND ACTION PLAN

The last day of the workshop was attended only by the workshop organizers and was devoted to summarizing the groups' discussions and developing an action plan including short- and long-term activities. In the sections that follow, the action plan is presented based on the discussion sessions which occurred during the workshop as well as input and reviews by the workshop participants via e-mail. The role of the organizers has been to synthesize and structure the information provided by the participants. Where possible, results have been grouped conceptually, with a summary given first and specific examples following. The occasional discord or random notations fed the groups' creativity and contributed to open and productive working sessions. While these results may not be cohesive, they represent the participants' dedication to the discussions and eagerness for collaboration throughout the Mediterranean region.

The action plan (3) took into consideration a set of conceptual definitions, which created the framework foundation for the development of the work and consists of four main sections: overall aims, specific objectives, priorities and strategies. In this case,

priorities were based on research and training needs recognized by both the French and English speaking groups. Strategies for the region were defined based on input from the participants, which allowed for the workshop organizers to design a series of activities, based on resources needed to put this plan into action. A second phase will allow organizers to establish a time-line, as well as responsibilities for the implementation of the defined actions. An evaluation of this plan should also be addressed after preliminary actions are implemented. The action plan is based in the following scheme:

5.1. Overall aim

The overall aim of the Mediterra action plan is to formulate a set of strategies in order to encourage institutions and individuals to advocate locally, undertaking jointly planned research and training activities, to advance the field of management and conservation of earthen sites, and earthen architecture for sustainable development in the Mediterranean region.

5.2. Specific objectives

The objectives of the Mediterra action plan are to:

- Contribute to a Mediterranean vision to advance the management and conservation of earthen sites and earthen architecture for sustainable development in the Mediterranean region.
- Develop a coordinated program among Mediterranean countries working in the fields of management and conservation of earthen sites and earthen architecture for sustainable development.
- Define a framework for the advocacy of a participatory and interdisciplinary approach to the conservation of earthen sites and earthen architecture for sustainable development.

6. ACTION PLAN: MANAGEMENT AND CONSERVATION OF EARTHEN SITES

6.1. Research needs

The following ideas emerged during the groups' discussions on the research needs for the management and conservation of earthen sites.

- There is a need for more coordinated **interdisciplinary research activities** — including input coming from practitioners working on project implementation— within a common vision among Mediterranean countries. The participants mentioned the need to develop a Mediterranean research project with common goals, objectives, target audiences, activities and resources.
- Although **scientific research** has been developed in recent years regarding material characterization and behavior, additional research at the material level is needed on topics such as thermal behavior, decay processes, water vapor transmission rates, acoustic qualities, compatibility with other materials, durability to environmental exposure, the effect of climate change, and long-term loading behavior. **The building cultures** in the Mediterranean region need greater exploration, particularly of how they were transferred and adapted from one country to another and the evolution of their relationship to the environment. Comparisons should be made between different building techniques and building cultures, including the study of the relationships between social systems, living traditions and cultural landscapes. It is necessary to adapt **existing building codes and standards** for best practices for earthen conservation, encouraging the use of results already developed by other institutions. Likewise, standardized terminology is needed at the regional level to foster understanding among disciplines and countries.
- There is a need to conduct research on the effectiveness of conservation for the **sustainability** of the built environment in the Mediterranean region.

- Greater research on **site management** is needed, especially the development of indicators for evaluating the positive and negative impacts of tourism, inhabitation and abandonment of sites.
- **Disaster management** needs more research on topics such as damage assessments, risk assessments, monitoring, and inventories, including the creation of scientific data to allow structural analysis for earthen buildings and sites. Assessment of the impact of natural disasters such as flooding, heavy rains, fires or earthquakes, building decay processes was particularly mentioned. Lessons could be learned from the way disasters have been managed in the past. Conservation interventions to improve seismic performance of existing earthen buildings were specifically mentioned.
- There is a need to improve **government involvement** through the development of national and regional legislation, adaptive reuse of heritage sites, and the inclusion of earthen architecture in agricultural and land-use planning.

6.2. Training Needs

The following topics were identified as needs for training addressing the management and conservation of earthen sites.

- There is a need for coordinated **training activities** within an interdisciplinary vision among Mediterranean countries while maintaining a focus on earthen architecture. Mediterranean countries should exchange their experience and knowledge through existing networks in order to develop training programs with the ultimate objective of increasing recognition of earthen heritage and strengthening the profile of earthen architecture.
- There is a need for training at a **variety of levels** - including universities, national programs, and Mediterranean-wide programs - and targeting a wide range of audiences -including academics, practitioners, artisans, technicians, future trainers and primary school students- throughout the Mediterranean. In order to reach decision makers, participants identified the need to increase public awareness by targeting politicians. In order to make training available and accessible to a wide-range of students, there is a need to vary the time-span of training programs and to deliver courses in the local languages.
- There is a need to develop **curricula** at all levels of education, incorporating hands-on training, from primary school to universities, certification programs for professionals and lectures for the general public.
- Specific calls were made for the **translation of existing didactic materials** into other languages and for their adaptation to local needs by using local teaching and dissemination techniques to better educate the audience. In addition, educational material on the management and conservation of earthen architecture should be included in schoolbooks for general and architectural education.
- **Methods and guidelines for disaster management, conservation, and site management** were specifically mentioned as needs for additional training.

7. ACTION PLAN - EARTHEN ARCHITECTURE FOR SUSTAINABLE DEVELOPMENT

7.1 Research Needs

The following research needs were identified for earthen architecture for sustainable development.

- There is a need to assess the current level of **knowledge** on the subject.
- There is a need for more knowledge on the **economic impact and/or benefits** of building with earth in comparison to “modern” construction and how earthen buildings can benefit local communities due to its increased sustainability and income from tourism or other related activities.
- There is need for more research and dissemination of the **social benefits** of earthen building regarding construction costs for sustainable large-scale housing projects, or the positive impact of the earthen built environment on human health. In the latter case,

comparisons with modern materials are needed on topics such as toxicity or thermal comfort.

- There is a need for further research on the effectiveness of earthen architecture as a natural **environmentally-conscious solution** and on the advantages of the adaptability of earthen buildings to their environment. More studies on energy efficiency evaluations, life-cycle assessments, analysis of performance based on “the three R’s” (Reduce, Reuse, Recycle), adaptability to climate change, the environmental impact of soil extraction and the seismic performance of traditional earthen buildings were mentioned in particular by workshop participants.
- There is a need to develop **building codes and standards**, including numerical models for structural, thermal and acoustic analysis; design principles; prototypes and models; simple testing methodologies, and production processes. The practical needs of construction should also be considered when designing research for codes or standards. There is a need to improve and disseminate existing building codes for seismic regions as well as guidelines for structural assessments. Tools developed for quality control for other disciplines should be employed. Testing methodologies should be established so they can be applied throughout the Mediterranean region.
- Cultural sustainability and common-sense solutions should be considered, such as the relationship between **high-and low-tech innovations** (for example, passive solar architecture), and the cultural relationship between earthen architecture, the landscape and the environment.

7.2 Training Needs

The following needs were identified for training addressing the use of earthen architecture for sustainable development.

- There is the need for **training programs, didactic materials and curricula** adapted to the local culture. For example, there is a great difference between regions with a continuous tradition of building with earth versus areas where the tradition has been lost and is now being recovered.
- It is necessary for education in the field of earthen architecture for sustainable development to be collaborative with **other institutions and disciplines**. Educational programs need to be formed cooperatively with universities, training institutions, museums, artisans’ organizations and non-governmental organizations. There is a need for educators to approach programs teaching sustainable architecture, environmentally-conscious construction, and energy efficiency, with the goal of gaining inclusion in their curricula.
- In order to train professionals prepared to work in many aspects of earthen architecture for sustainable development it is necessary to **develop a curricula** that includes:
 - a) Design principles for new buildings, such as life-cycle assessment, passive solar architecture concepts, and levels of construction regulations and economic evaluations of construction projects.
 - b) The health benefits of living in an earthen building.
 - c) Material targeting a diverse set of audiences, including artisans, architects, trainers, teachers, non-governmental organizations, decision makers, children and the general public.
- In order to train professionals with field experience there is a need to develop **pilot projects for on-site and hands-on training courses** with community involvement.
- In order to reach the general public, there is a need to **develop didactic materials** to easily disseminate using the media (printed, oral, games, Internet, TV, etc.).

8. CONCLUSIONS

The Mediterra expert meeting represents the beginning of an international cooperation that will expectantly allow a fruitful coordination of research groups working presently on earthen architecture. It will help identify common strategies for the conservation and

the future development of earth construction in the countries of the Mediterranean basin. It also poses the basis for the compilation of a common protocol that will guide future generations of all concerned countries, in target actions for the preservation of such important built heritage.

Notes

(1) The TERRA project (ICCROM, CRATerre and GCI) developed a preliminary assessment of different activities related to the study and conservation of earthen architecture in the Mediterranean region. For the purpose of this document, the report was called TERRAMed document.

(2) The meeting participants represented countries from the Mediterranean Basin, associated with the Declaration of Barcelona (1995). Mauro Bertagnin (Italy), Mohamed Boussalh (Morocco), Claire-Anne de Chazelles (France), Valentina Cristini (for Fernando Vegas and Camilla Mileto, Spain), Maria Fernandes (Portugal), Juana Font (Spain), Bilge Isik (Turkey), Borut Juvanec (Slovenia), Said Kamel (Morocco), Georgia Poursoulis (Greece/France), Ahmed Rashed (Egypt), Vjekoslava Sankovic (Bosnia and Herzegovina), Antonia Theodosiou (Cyprus), Humberto Varum (Portugal) and Leïla el-Wakil (Egypt)

(3) Action Plan was defined as "Steps that must be taken, or activities that must be performed well, for a strategy to succeed. An action plan has three major elements: (1) Specific tasks: what will be done and by whom; (2) Time horizon: when will it be done; (3) Resource allocation: what specific funds are available for specific activities."

(Website: <http://www.businessdictionary.com/definition/action-plan.html>)

Priorities were considered as conditions deserving specified attention and related to the identified needs.

Strategy within this framework was considered as the creation of an action plan for achieving important aims, dealing with "an uncontrolled environment" (as opposed to planning which is approached in a controlled environment) (Website: <http://www.easy-strategy.com/strategy-definition.html>).

Curriculum

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