31st May – 3rd June 2006, Prague, Czech Republic

Proceedings of the 7th European Conference "SAUVEUR"

SAFEGUARDED CULTURAL HERITAGE

Understanding & Viability for the Enlarged Europe

Volume 1 – Papers

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Volume 1 – Papers

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Editorial Note

International scientific projects in the field of cultural heritage have received European funding for more than twenty years. Though the financial support may not always have been as high as we would have liked, major results have been achieved with the help of researchers from many countries and a combination of national and European programmes.

The European Conferences on cultural heritage research have become regular milestones on the never-ending journey of discovery in the search for new knowledge. They also provide opportunities to make a brief review of the results, and to draw new inspiration. The programme prepared for this conference included 83 oral presentations and 134 poster and demonstration stands, reflecting the rich background and wide scope of our work. Nearly 300 delegates from 37 countries in the world attended the conference, which supported free participation of students presenting the outcomes of their research work.

This Conference was held just before the final negotiations in the European Parliament and the Council on the 7th Framework Programme of the European Community for research, technological development and demonstration activities in the next seven years. The programme therefore included themes aimed at enhancing and strengthening our common endeavour to create necessary and efficient conditions for future research on issues of cultural heritage.

The Conference sessions clearly showed the complexity of research into cultural heritage, where strong, well-planned collaboration among the natural, technical, economic and social sciences is needed in order to achieve reasonable and fruitful results. Nevertheless, our experience shows that a narrow approach dealing with a single task usually creates difficult problems that can lead to severe losses in the cultural heritage, or can damage our quality of life. Lack of support for interdisciplinary projects is a major deficiency of all grant systems and schemes. Bearing this in mind, we should support all ways of incorporating cultural heritage themes into as many priorities and calls of 7th Framework programme as possible.

An interdisciplinary approach should also be reflected in our cooperation with business and industry, namely with the wide range of small and medium-size enterprises working in the field of cultural heritage.

Safeguarding the cultural heritage is frequently interpreted as change management. Joint European research produces a scientific background and support for such management. We are living in a period characterised by rapid and remarkable changes in the environment in a general sense. Natural change and man-made changes, including climate change, as well as societal change, form an ever-changing and colourful stage not only for our research but also for the management of society. Close cooperation with policy makers is therefore a significant feature of cultural heritage research.

Cultural heritage issues and problems are essential elements of our everyday life, namely in relation to quality of life, social and economic welfare and stability. Therefore, it is very important that a wide public is involved in management of the cultural heritage, and it is very useful to inform European citizens about recent scientific achievements. For the first time in the history of these conferences, the 7th European Conference in Prague opened its poster exhibition and demonstration saloon to a public audience, a further step in opening up European science to the public.

A special session was devoted to cooperation in educational programmes and national research programmes. The need to promote the establishment of a network coordinating such cooperation was apparent, and this session was well supported. The same is true for cooperation

between research and industry, where an important development was the creation of the European Construction Technology Platform with a special targeted activity – the Cultural Heritage Focus Area. This has national parallels establishing national research agendas.

The final session invited selected representatives of international bodies and organizations, who presented persuasive contributions illustrating that European research into cultural heritage has a high international value beyond the borders of the European Union.

The papers presented during the conference sessions are gathered in the first volume of the proceedings, while the posters, accompanied with an extended summary, are published in the second volume. The two volumes thus provide rich material for study, inspiration and dissemination of knowledge.

The editors wish to thank everyone who contributed with deep enthusiasm and involvement to the organization of the conference, to the presentations, and to these proceedings for their valuable co-operation, without which the event could not have been successful.

SUMMARY

The 7th European conference on the Cultural Heritage: "Safeguard Cultural Heritage-Understanding Understanding & Viability for the Enlarged Europe"

The 7th European conference on Cultural Heritage research was held in Prague from 31st May – 3rd June 2006. The conference was supported under the 6th Research Framework Programme (Specific Support to Policy). It was organised in cooperation with the European Commission by the Institute of Theoretical and Applied Mechanics (ITAM) of the Academy of Sciences of the Czech Republic following the earlier conferences in Rome (1997), Aachen (1998), Santiago di Compostela (1999), Strasbourg (2000), Cracow (2002) and London (2004).
The overall aim of the conference was the consolidation and impact assessment of results achieved in EU research projects related to the movable, immovable and infrastructure applied to cultural heritage with a special focus on exploitation and spin-offs of cultural heritage research results and testing the acceptability of new technologies and sustainability approaches by the user community, SMEs, owners, managers, conservationists and restorers of the cultural heritage.

Its specific objectives were in particular to:

- Highlight the role of European cultural heritage research within international activities and co-operation.
- Assess the impact of EU policies on the conservation of European cultural heritage and evaluate the positive contribution of cultural heritage research for competitiveness and job creation.

- Disseminate the results of EU cultural heritage research acquired at large research facilities and discuss new development and innovations in research infrastructure.
- Discuss and consolidate co-ordination of national research and educational programmes for cultural heritage within the enlarged Europe.
- Refine ideas and visions of the European Technology Platforms opened to cultural heritage issues in the context of preparation of the 7th Framework Programme.

More than 280 participants from 37 countries representing a large number of research and end-user organisations from the public and private sector took part in 210 oral presentations and posters covering the plenary sessions on "The impact of EU policies on European cultural heritage", "Coordination of national research and education", and "Challenges of European cultural heritage" as well as the parallel sessions on the "movable heritage", the "immovable heritage", "Cities, landscapes and villages", and "Research infrastructure" applied to Cultural heritage. The poster exhibition gathered almost 100 posters related to the themes of the parallel sessions, and a "demonstration salon" was opened to innovative products and processes.

During the conference, attention was especially driven on the fact that there is a wide range of accumulated problems in historic settlements affecting the movable and immovable heritage and related to environmental changes, social impacts, economic issues, growing tourism and inadequate cultural heritage management as well as threats from natural hazards. All these issues require that cultural heritage research continues to develop advanced environmental technologies through the knowledge generated from basic research and the adaptation of scientific developments from other sectors. All stakeholders expressed a strong demand that the cultural heritage be mainstreamed into EU and national policies and research programmes.

In the final plenary session in the ceremonial Spanish Hall of Prague Castle, the Conference adopted the Prague concluding Message. This document presents the joint standpoint of representatives of major European and international bodies supporting cultural heritage research including the European Commission, UNESCO, Council of Europe, ICOMOS, ICCROM, ICOM, Europa Nostra, Organisation of World Heritage Cities, Getty Conservation Institute..; to summarise these conclusions, all stakeholders expressed a strong demand that the cultural heritage be mainstreamed into EU and national policies and research programmes. In this respect, the European Institutions should support the incorporation of cultural heritage themes into relevant priorities and tasks of 7th Framework programme, and mitigate unintentional negative effects on cultural heritage of other EU legislation in application of the article 151.4 of the EC Treaty; in addition, the value of cultural heritage research revised should be explicitly mentioned in the revised EU Sustainability Strategy, and the newly established European Research Council (ERC) should consider in its programmes the importance of basic research for cultural heritage.

Beyond the EU, National and Regional Governments and relevant authorities in Europe should integrate in their research programmes scope for cultural heritage research and support for related research infrastructure, and facilitate ways of overcoming the fragmentation of research for the cultural heritage research community. Finally,, public-private partnerships as specific European Technology Platforms (e.g. construction, chemistry) are expected to take into account the specific needs of cultural heritage in order to respond to new and complex challenges as mentioned above, and non governmental organizations should promote further public participation in cultural heritage research which favourably impacts on the environment, energy, sustainability and quality of life.

CONFERENCE SCIENTIFIC PROGRAMME

May 31, 2006 **Venue: Panorama Hall, Prague Congress Centre**

Opening Session

Chairperson: Miloš Drdácký (Czech Republic)

1	15.00-15.10	Václav Pačes	President of the Czech Academy of Sciences
2	15.10 -15.20	Alena Štěrbová	Vice-minister for European Integration and International Affairs, Ministry of Education, Youth and Sports, Czech Republic
3	15.20-15.30	Kateřina Kalistová	Vice-minister, Ministry of Culture, Czech Republic
4	15.30-15.40	Jan Slanina	Vice-minister, Ministry for Regional Development, Czech Republic
5	15.40-15.50	Michel Chapuis	European Commission, Directorate General 'Research'
6	15.50-16.00	Josef Štulc	President of ICOMOS Czech National Committee

Overview of poster presentations

7	16.00-16.30	Matija Strlič (SI)	Movable heritage
8	16.30-17.00	Cristina Sabbioni (IT)	Immovable heritage
9	17.00-17.30	Jacques Teller (BE)	Cities, villages and landscapes

Official opening of the Poster Exhibition (venue: poster exhibition)

10	17.45-17.55	Václav Jehlička	Chairperson of Committee on Education, Science, Culture, Human Rights and Petitions, Senate of the Parliament of the Czech Republic

June 1, 2006 **Venue: Panorama Hall, Prague Congress Centre**

Session I - Innovative Applications and New Ideas: Movable Heritage

Chairperson: Elin Dahlin (Norway)

Rapporteur: Jean-Marc Vallet (France)

1	9.00-9.15	Charlotte Björdal (SE)	Bacterial destruction of wooden cultural heritage
2	9.15-9.30	Rebecca Ippoliti (IT)	New restoration technique for waterlogged archaeological wood
3	9.30-9.45	Ilaria Degano (IT)	A multi-analytical approach to determine organic dyes in tapestries
4	9.45-10.00	Francesca Piqué (USA)	Methodology for the identification of organic materials in wall paintings
5	10.00-10.15	Terje Grøntoft (NOR)	An early warning system for organic materials in museums, historic buildings and archives
6	10.15-10.30	Joel Taylor (UK)	Dependency modelling for cultural heritage
7	11.00-11.15	Nigel Blades (UK)	Experience and application of the "IMPACT" air pollution software toll to cultural heritage
8	11.15-11.30	Pavel Zítek (CZ)	Impact of moisture sorption stabilization as a preventive conservation approach
9	11.30-11.45	Vasilike Argyropoulos (EL)	Sustainable conservation for metal objects from the Mediterranean Basin

10	11.45-12.00	Carl Johan Bergsten (SE)	Corrosion of lead and lead-tin alloys of organ pipes in Europe
11	12.00-12.15	Albert Canals (ES)	Radiofrequency identification for movable heritage management
12	12.15-12.30	William Wei (NL)	A new non-contact fingerprinting method for the identification and protection of objects of art and cultural heritage against theft and illegal trafficking
13	12.30-12.45	Isabel Rodriguez-Maribona (ES)	Development of a new anti-graffiti system, based on traditional concepts

Session III - Innovative Applications and New Ideas: Cities, Villages and Landscapes (incl. Archaeology)
Chairperson: Takayoshi Yamamura (Japan)
Rapporteur: André Loits (Belgium)

1	14.00-14.15	Paul Vandevelde (BE)	A risk-based approach to cultural heritage buildings
2	14.15-14.30	Paulo Lourenço (PT)	Reducing the seismic vulnerability of cultural heritage buildings
3	14.30-14.45	Federico M. Mazzolani (IT)	Earthquake protection of historical buildings by reversible mixed technologies
4	14.45-15.00	Maurizio Indirli (IT)	Evaluation of multiple risk and building vulnerability in the historic part of Valparaiso, Chile
5	15.00-15.15	Brian Clancy (UK)	Condemning and demolition of older residential property and the resulting break-up of long established communities.
6	15.15-15.30	Guido Carrai (IT)	Research-based municipal policy saves European cultural heritage: case study of Brandýs nad Labem - Stará Boleslav in the Czech Republic
7	16.00-16.15	Ina Macaione (IT)	From cultural heritage to sustainability: Architecture and Nature-City
8	16.15-16.30	Donovan Rypkema (USA)	Socio-economic impact of cultural heritage assets
9	16.30-16.45	Elisabeth Dumont (BE)	Pro-active management of the impact of cultural tourism upon urban resources and economies
10	16.45-17.00	Yosuke Fujiki (JAP)	A study on the method for extraction of tourism-impact on a historical townscape
11	17.00-17.15	Stephen Shaw (UK)	Tourism and multicultural heritage in the enlarged Europe: tools for participation by low-income residents
12	17.15-17.30	Maria Ruiz del Arbol (ES)	A meeting point for diversity: research and valorisation on cultural landscapes in the NW Iberian peninsula
13	17.30-17.45	Nigel Blades (UK)	Impacts of crushed rock quarries on historic villages and cultural landscapes
14	17.45-18.00	Jacques Teller (BE)	Urban and architectural integration of archaeological vestiges

June 1, 2006 **Venue: Room Club E, Prague Congress Centre**

Session II- Innovative Applications and New Ideas: Immovable Heritage

Chairperson: Linda Krage (Latvia)

Rapporteur: Roman Kozłowski (Poland)

1	9.00-9.15	Cristina Sabbioni (IT)	Mapping climate change and cultural heritage
2	9.15-9.30	Fulvio Zezza (IT)	Salt crystallization and damage to monuments
3	9.30-9.45	Barbara Lubelli (NL)	Hygric dilation behaviour of NaCl contaminated lime-cement mortar
4	9.45-10.00	Hamid Raad (AT)	Archeometry and the case study of the Nabatean Mortars
5	10.00-10.15	Yves Vanhellemont (BE)	A proposal for test procedures for injection products against rising damp
6	10.15-10.30	Antonella Grossi (IT)	Assessing compatibility in conservation of masonry structures in archaeological sites
7	11.00-11.15	Piero Tiano (IT)	Effects of weathering on stone materials: assessment of their mechanical durability
8	11.15-11.30	Claire Moreau (FR)	How to assess the efficiency of a stone consolidant - the example of the Bologna Cocktail
9	11.30-11-45	Wolfgang Krumbein (DE)	BIODAM - Practicability studies, application experience and success control of polyphasic approaches to inhibit subaerial biofilm growth and damage on buildings
10	11.45-12.00	Francesca Cappitelli (IT)	Biotechnologies and cultural heritage
11	12.00-12.15	Vladimír Kučera (SE)	Tools for assessment of corrosion and soiling in a multi-pollutant situation
12	12.15-12.30	Karl H. Becker (DE)	Atmospheric change and impact on monuments of cultural importance
13	12.30-12.45	Jim Williams (UK)	Foundation re-use as a mechanism for the preservation of buried cultural heritage in urban centres: how new engineering research helps limit archaeological damage.

Session IV - Research Infrastructure - Sustainable Scientific Impact of EC Research Projects on Movable and Immovable Heritage

Chairperson: Ioanna Papayianni (Greece)

Rapporteur: Paulo Lourenço (Portugal)

1	14.00-14.15	Jana Kolar (SI)	Infrastructures for cultural heritage
2	14.15-14.30	Loic Bertrand (FR)	Recent developments of cultural heritage interface at the SOLEIL synchrotron
3	14.30-14.45	Lucile Beck (FR)	Transnational access to the Louvre accelerator facility for ion beam analysis of the European culture heritage
4	14.45-15.00	Brunetto G. Brunetti (IT)	MOLAB (Mobile Laboratory): a transnational access service for in-situ non-invasive studies of the European cultural heritage
5	15.00-15.15	Stanislav Pospíšil (CZ)	Wind tunnel modelling in conservation
6	15.15-15.30	Vasco Fassina (IT)	CEN/TC 346 Conservation of Cultural Property

7	16.00-16.15	Ruven Pillay (FR)	Database management and innovative applications for imaging within museum laboratories
8	16.15-16.30	Mona Hess (DE)	Fragmentary mural paintings – possibilities of aesthetic presentation and exemplary communication
9	16.30-16.45	Wolfram Kloppmann (FR)	Isotope (sulphur, oxygen, boron) tracing of internal or external origin of sulphates involved in the degradation of French stone monuments
10	16.45-17.00	Fabian Käser (CH)	Life expectancy prediction of solid materials using chemiluminescence to characterize oxidative reactions and model-free simulation based on experimental data
11	17.00-17.15	Jaroslav Valach (CZ)	Enhanced optical methods for analysis of historical objects
12	17.15-17.30	Gabriel Maria Ingo (IT)	Large scale investigation of bronze archaeological artefacts from the Mediterranean basin
13	17.30-17.45	Annemie Adriaens (BE)	Monitoring the conservation of metal objects: evaluation of a new approach
14	17.45-18.00	Katarzyna Komar (PL)	Techniques for cultural heritage research in the Pomerania region

June 2, 2006 **Venue: Spanish Hall, Prague Castle**

Session V - Impact of EU policies and directives on European cultural heritage diversity and sustainable safeguarding; impact of cultural heritage research results on society and support for policy needs

Chairperson: Terje Nypan (Norway)

Rapporteur: Johanna Leissner (Germany)

1	9.00-9.15	Terje Nypan (NOR)	The challenge of EU policies for cultural heritage: Impact of EU Directives?
2	9.15-9.25	Jacques Akerboom (NL)	Impact of EU directives on small enterprises acting in cultural heritage field - Monumentenwacht experience
3	9.25-9.35	Chiara Nesti (IT)	Preservation of the cultural heritage of property through an analysis of European regulations. The example of natural bondings
4	9.35-9.45	Francesca Tolve (IT)	An analysis of research projects on conservation of paper and textile artefacts of historical, cultural and artistic value financed under EU Programmes *(Period 1995 – 2005)*
5	9.45-9.55	Ioanna Papayianni (EL)	Applying research results into practice in the field of repairing masonry monuments
6	9.55-10.05	May Cassar (UK)	Towards evidence for policy development in the area of climate change and world heritage
7	10.05-10.15	Monica Martelli-Castaldi (IT)	E.C.C.O - Legal issues of the Conservation-Restoration profession
8	10.15-10.25	Ingval Maxwell (UK)	Fire loss to historic buildings

Session VI- Coordination of National Research & Education

Chairperson: Claudio Modena (Italy)

Rapporteur: Cristina Sabbioni (Italy)

9	10.55-11.05	Piotr Świątek (BE)	Cultural heritage related research at COST
10	11.05-11.15	John Fidler (UK)	Towards an EU-wide strategy for research into the historic environment and its sustainable management
11	11.15-11.25	Sylvie Colinart (FR)	The French national research programme on sciences and conservation of the materials of the cultural heritage: results and future
12	11.25-11.35	Zuzana Bauerová (CZ)	The Czech national research programme on cultural heritage and European integration
13	11.35-11.45	Antonia Moropoulou (EL)	From national to European and international research and education programmes
14	11.45-11.55	Ling Chen (CHINA)	Research on the cultural heritage-based communication and creation models
15	11.55-12.05	Oscar Chiantore (IT)	Training and research at the Foundation Centro "La Venaria Reale"
16	12.05-12.15	Vivi Tornari (EL)	Integration of novel methodologies into teaching practices
17	12.15-12.25	René Larsen (DK)	European Network for Conservation-Restoration Education – ENCoRE: The role of conservation-restoration education in the implementation of European cultural heritage research

Session VII - Challenges of European Cultural Heritage Research

Chairperson: Andrea Tilche (EC DG Research, Head of the 'Environmental Technologies and Pollution Prevention' unit)

Rapporteur: Michel Chapuis (EC)

1	14.00-14.15	Zdeněk Bittnar (CZ) Member of ECTP HLG	Cultural heritage research and the European Construction Technology Platform
2	14.15-14.30	Pétronille Eynaud de Fay (FR), Roko Žarnić (SI) – ECTP FACH Coordinators	Focus area Cultural Heritage in the European Construction Technology Platform
3	14.30-14.45	Caterina Rehm-Berbenni (DE) – FACH HI6 Coordinator	Bridging the gap between research and industry
4	14.45-15.00	Pere Roca (ICOMOS ISCARSAH - ES) ISCARSAH Chairman	Prospects for international cultural heritage research cooperation – ICOMOS initiatives
5	15.00-15.15	Helmut Wenzel (I-SAMCO VCE - AT) Coordinator	International Collaboration on Natural Hazards expected for the 7th Framework Program of the European Commission
6	15.15-15.30	Denis Ricard (OWHC - Canada) Secretary General	Sustainable historical cities – worldwide challenge for interdisciplinary international research
7	15.30-15.45	Jean-Louis Luxen (CHEDI - Culture, Heritage & Development - International) President	Research for historic cities

8	15.45-15.55	Eléonore de Merode (Europa Nostrea) Heritage Awards Co-ordinator	Europa Nostra - message of the President of Europa Nostra, HRH the Prince Consort of Denmark
9	15.55-16.05	José Luis Pedersoli (ICCROM)	Future cooperation of ICCROM with the European Union
10	16.05-16.10	The Getty Conservation Institute	Letter of the director to be presented at the 7th European Conference

Closing Session - Challenges of European Cultural Heritage Research

Chairperson: Cristina Gutiérrez-Cortines (MEP)

Rapporteur : May Cassar (United Kingdom)

11	16.45-17.00	Andrea Tilche (EC DG Research, Head of Unit)	Orientations for cultural heritage research within the Environment Programme
12	17.00-17.35		Conclusion reports from sessions I – VII
13	17.35-18.15		Discussion and future recommendations, 7th FP
14	18.15-18.30		Closing ceremony (reading of conference message)

CONTENTS

From cultural heritage to sustainability: architecture and the nature-city

A. Sichenze, I. Macaione, M. R. A. Piro, M. Lavecchia, C. A. Fosci, M. I. Insetti

University of Basilicata, Italy

Key words: nature-city, safeguard, heritage, city-inn, urbstourism, ecosustainability

1 Introduction and contents (values, objectives and results of our research)

Firstly we would like to display the problem and our hypotheses, which contain the solutions to the problem on which we work as architects acting on the city.

Everyday in the world entire towns disappear from the sight of official economies together with their well-being measures, their houses, monuments, human values, scientific traditions, and they go in stand by. Some of them are completely destroyed, others simply stop in a sort of hibernation, and wait like messages in a bottle for a future economical-ecological science to understand them, heal them and bring them back to life.

Slowly nature covers everything with soil and vegetation, destroying some things and preserving others. Sometimes, with the help of archaeology, an alliance is created between science and nature, and this process can be governed by men ... but most of the times villages and small towns in southern Italy see their population grow older and older or leave; these places are abandoned to ruin and desertification. But if we look at them with the eyes of a tourist, tired of the big cities, they are a *Great Source of Future* and a cultural heritage consisting of several models of sustainable development.

This phenomenon of *stand by* of the city from a certain point of view looks like a paradoxical aporia, but from another helps us go nearer to the heart of architecture: *when things stop and stick to a beautiful order that goes beyond an ephemeral time, then there is Architecture* [1].

But, in an age in which everybody and everything runs gaspingly, there seem to be no time left for architecture, and so no time for a concrete cultural heritage.

Thus a city, lacking an appropriate programme for the surviving and developing of future generations, slows down until it stops and it is, strangely, the perfect scenario in which to find a life-rhythm more human, in which is possible to walk around and find the time to *feel* the air, the wind, the sun light or shade, in other words the physical and psychological relationship with nature.

While in thousands of areas in the world urban relationships atrophy or disappear, in other places, like China, for example, there are programs that will attempt to create, in the next twenty years, hundreds of new cities and a number of vast and small areas of urban retraining, and projects of ecological re-conversion of villages and countryside areas.

In this various and sometimes contradictory frame, urban environments characterized by old buildings, even if abandoned and rapidly falling apart, have a higher architectural and urban value than modern constructions, which are usually realised responding to excited formalisms or to the tastes of the single architect. There are, though, examples of a new attention to the relationship with nature, such as the new Malaysian cities, where principles of sustainable development are used.

In this situation we must study the ancient centres in order to understand their cultural heritage and use it for the new architecture.

In conclusion we can say that in between the old which is fading away, and the emerging new, we find the condition necessary for the cultural and environmental heritage which creates the sustainability of the development.

The truth is that this condition isn't new, nor old; it is just an idea of regenerability of the urban features which gives the nature time to adjust, regenerate itself and accomplish it's of absorbing the impact of changing.

But then we encounter another problem: the inadequacy of economical and managerial culture which has not yet learned to be ecological, cultural and tourist economy, other than projectual.

Our research started 10 years ago in response to the problem of the depopulation and the subsequent degradation of small centres and territories in the internal regions of Europe.

We have been fortunate to be based in the Basilicata region, which, because of its size and characteristics, we were able to use as an *open laboratory*.

So in a short period of time we carried out research on the nature-city and a number of other applications (urbstourism [2] and city-inn, ecological reconversion, sustainable construction, etc...).

Starting from the main objective to stop social and natural degradation in cities, villages and landscapes, we achieved a number of results.

Our first step, in order to save these beautiful villages and towns that, standing on top of hills, are also *territorial presidium*, was to *understand* that their chances of development lay in endogenous economical, social and cultural resources, already existing but still unused, and that it was necessary to study strategies to organize these resources in order to achieve social and economical sustainability.

The methodological result of our research, offered to the population of these areas, is a *paradigm* of ten *instruments* conceived as means to pass from the discovery of the single nature-city to appropriate projects for a sustainable development.

The first *results*, achieved through pilot project, were: deep understanding, development and recovery of the historical towns in internal rural areas trough appropriate tourism (urbstourism and city-inn [3]); creation of networks of villages and small towns; ecological conversion of the countryside and suburbs; creation of parks; saving of energy through the use of ecological buildings.

Thanks to these discoveries and to these projects an important change took place in Basilicata [4], a region where, till ten years ago, the importance of internal areas was ignored and the only investments for tourism were *fake farm holidays* and a savage tourist exploitation of the coast.

Even though a long period of time is necessary for such a change to take place, we can see that our research has not only a social-economical value, but also a cultural one.

2 The *discovery of the nature-city* as an unexpected originality and the formulae for innovation

The study concerning the process of recovery of urban depressed areas led to the partly unexpected discovery of the *nature-city*.

It would not be correct to use this synthetic definition referring only to small towns or villages as ecosystems with unused or wasted resources as their own powers of sustainability; we could use it wherever the conditions of existence of the nature-city are. Even in big unsustainable metropolis (where our study becomes even more interesting).

This is the most innovative aspect of our research: it is possible to say that the nature-city is called so because its relationship with nature, together with the complexity of adaptation to human civilization, is the basis of its very existence and richness. This is evident in its physical structure: in origin there can be a dominant natural entity (like a river, a lake, the sea, a forest, a mountain or a *gravina*). Together with one or more of these strong natural entities there is an inhabited centre.

Then both the entity and the centre will evolve themselves together.

We had, then, to *match* elements of ecological quality, such as the mutual dependence, the diversification, the complexity, the cyclic nature of processes and streams of information, the contextual conditions, etc., with human experience and cultural heritage (notions of knowledge, culture, value, richness genealogy, learning ability, etc.); thus we created a *paradigm* of ten categories (domesticity, centrality, naturalness, insularity, initiality, topicity / topicality, co-existentiality, time deepness, landscapeness, representativeness) [5] of communication for the most simple eco-cultural urban phenomena.

The answers to the problems of the future are in the complexity of the nature-city, and only architecture is able to synthesize this complexity; it is only through this consciousness that is possible to realize sustainable projects.

We have proves, gathered trough the study of over two hundred cities in the world and of our pilot projects, that the nature-city is able to regenerate itself at various degrees and that inside of it are the rules with which to interact with reality creating innovative projects and strategies.

3 The strategy for the regeneration of the Nature-City and problems people have to solve

Now that we presented the results we achieved and we are preparing for new collaborations with the nations of Eastern Europe on the sustainability issue, we have to consider carefully the difficulties that we had to face and that everyone has to face if he wants to try to solve the problem of the cultural heritage and the sustainability.

In almost all the areas with social and cultural difficulties – southern Italy is such a region – a cultural resistance emerges from the political sphere every time the concept of cultural heritage is introduced in the new frame of *unstainable development*.

This problem must not be underestimated since a *sustainable* development is achieved only when, a part from answering the needs of the present without spoiling the future and preserving the conditions for the regeneration of natural resources, we can also guarantee a *democratic participation* to the development.

This democratic participation has to be able to carry out a plan of cooperation of several urban centres to the sustainable development of an area.

The single local administrators, though (sometimes without specific knowledge), couldn't fully comprehend the necessity of participation in the sustainability paradigm and so opposed to the realization of the *agenda XXI* and the creation of a real network of different municipalities.

In other words, the language of the sustainability is still to specialist to be fully understood

In order to overcome these communication problems we had to carry on a hard work of cultural elaboration that we organized into three phases.

3.1 Phase 1: *key words*

We had to look for the *key words*, which had to be the less possible technical in order to help enlarging the accessibility to the complex phenomena linked to the sustainability.

We tried first of all to create a link between the language of cultural heritage and the one of the sustainability of development (figure 1).

3.2 Phase 2: *paradigm* of ten categories

We had, then, to *match* elements of ecological quality, such as the mutual dependence, the diversification, the complexity, the cyclic nature of processes and streams of information, the contextual conditions, etc., with human experience and cultural heritage (notions of knowledge, culture, value, richness genealogy, learning ability, etc..); thus we created a *paradigm* of ten categories (domesticity, centrality, naturalness, insularity, initiality, topicity / topicality, co-existentiality, time deepness, landscapeness, representativeness) of communication for the most simple eco-cultural urban phenomena. We selected ten words that everybody will be able to understand, even those who have no technical knowledge of the subject and so could be scared and make our progress slower. We also wanted to point out the ten features that make each city unique. These features correspond to this paradigm of ten categories.

3.2.1 Centrality

Centrality is the condition of *maximum crossing* of a multitude of beings and events through one or more centres.

It's where *multiplicative syntheses* are realized, where we pass from one to many. In Centrality's places, it seems that everything *leaves and comes back*. In Centrality we overcome *equivalence's limits* and we enter in the area where community's flow and meeting chances are at their peak.

For example a main street or a square can express this condition.

3.2.2 Domesticity

Domesticity is the repeated condition of *belonging to the house* (the cohabitation under the same roof that protects common things) of beings transferred from the fragmentary external world that tends to gather together forming *long-lasting and steady (*ständigkeit) *identities*. The culture of human domestic institutions is the explication of Domesticity. In Domesticity human

beings *re-construct* themselves and find again the *limits' immanence* of those things that, being soft, ductile, flexible, defenceless, can be nearer to them without intimidating them, as in a world that remains peaceful.

3.2.3 Naturalness

Naturalness is the extended condition of *being an ingredient* of life's regeneration in relation with nature, mainly referred to climate, geography, living creature's bodies and to the extent of the resources responding to the natural substratum, which tends to regenerate within a determinable period of time.

Naturalness finds expression in the *regeneration of the living* urban culture.

In Naturalness human beings try to overcome their regenerative isolation limits, becoming part of the complex relations of *the living*.

The connection with a big natural entity (wood, sea, river, lake, ravine, mountain etc...) can strongly mark a city's Naturalness.

3.2.4 Insularity

Insularity is the recurrent condition of spatial inclusiveness in collective *self-sufficiencies* that begins in ordering *parts* in space and shapes the geography of the rules and immanent laws of belonging to the world.

Thus self-sufficiency limits and needs of going beyond them take form.

The sea, the desert, the burnt lands, the deep woods, the starry sky, every fix big expanse wraps the city fertilizing or isolating it in self-sufficiency or letting it to be wrecked in external resources' apparent unlimitation.

3.2.5 *Initiality*

Initiality is the renewable condition of *re-production* or *re-starting* of the city, which can regenerate or simply grow: well or badly.

It is what is *before* and *in front* of the city. The event of the time and of culture and civilization's re-generation.

It is realized, often in combination with insularity, in various project types: *topica, atopica, utopica ed eterotopica*. Thus we always have a system of areas, or re- generation places, also into the city, where the city overcomes its destiny of *being limit*.

3.2.6 Topicity / Topicality

Topicity is the diffuse condition of reciprocity, of the mutual approaching of beings in small spaces.

This mutual approaching gives a communicative sense back to the visible structure of the space, which can be defined as *the language of the space* (before, after, left, right, up, down, through). There is something that magnetizes the language of approaching, that *gathers together and invites to stop, conveying comfort*.

Topicity, that is not a global qualitative aspect, is defined in *city's quantum* that, in their diffusion, determines a recurring topic feature.

3.2.7 Coexistentiality

Coexistentiality is the concurrent condition of richness of variety, of exchange and of receiving what, as a foreigner, is expected. Trough Coexistentiality not only we recompose world's diversity, we also *create world.*

Coexistentiality is the dimension of the staying together.

In a basic *Weltlichkeit* that acts as a substratum for difference and for market, Coexistentiality is the system of limits in which we overcome ethnic impoverishment and we realize a wide concept of biodiversity, of cultures as well.

3.2.8 Deepness

Time deepness is the condition, conferred to things, to have the time to fully exist. It is also what lies *under* the city (and the earth), and connects *before* and *after*.
Sometimes it's the origin and is the destiny.

In Deepness human beings attempt to go beyond the wild and inhuman condition of present time acceleration which leads them to *do just for doing*, in order to conquer, instead, a space-time expansion going beyond present time limits, into the past and into the future, looking for permanencies.

Archaeological sites, graveyards, museums and parks are some of the places in which the city offers the collective chance for such an overtaking.

3.2.9 Landscapeness

Landscapeness is the condition in which the look opens to overall values.

In the institutional places of sight, the view points, the city gazes to throw itself ahead, and looks at itself in order to go over the immediacy.

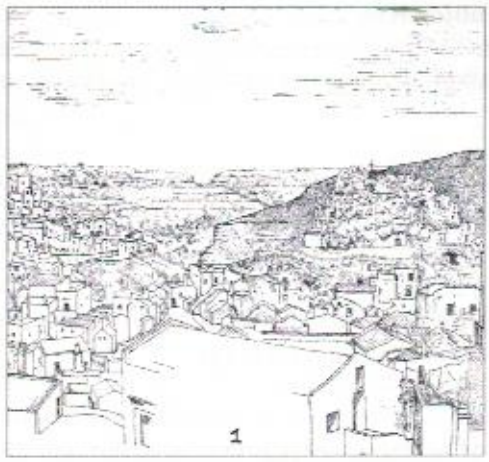
Thus the city's opening enters the landscape, here intended as that aesthetic frame in which the value of the whole (houses, nature, centres and streets) overcomes the sum of its parts.

This is the reason why some geographer speaks about a *perception* of the landscape as a *theatre*. We never have a direct relation with the world, but we always have it with a description of it.

3.2.10 Representativeness

Representativeness is the participation to a world's representation. It is a shared representation because it involves an object, the entity or person who is representing it and their reciprocal positions.

This, in the city, is a network of points of view and values (places and place's quality), a net of connections that starts from the monuments.

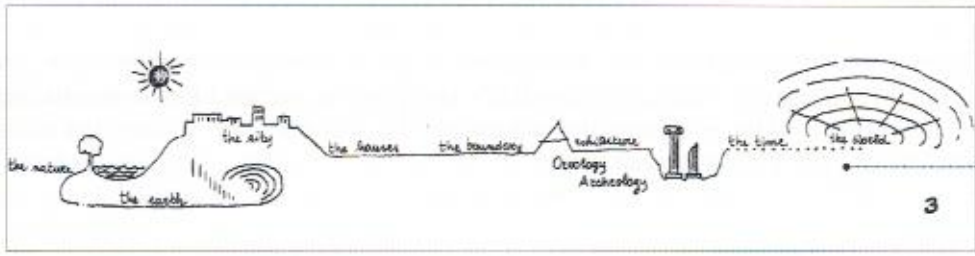


1. An ancient and paradigmatic nature-city: Matera (Italy)

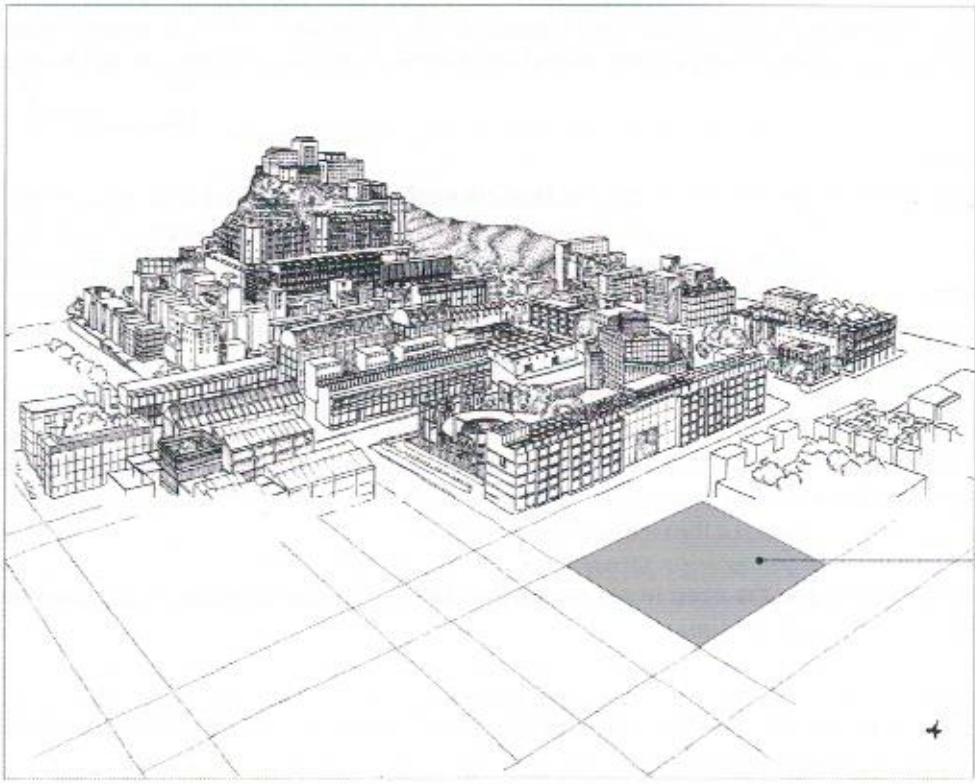
2. urbstourism as the "discovery" of nature-city resources

tourism in the nature-city world

3. The nature-city as combination of cultural heritage goods



from yesterday's small centre to today's nature-city world



In Eudossia every block has an own history and a set of architectures kept in a bank of architecture projects

4. A picture of Eudossia, the laboratory for the representation of nature-city scenaries

Figure 1: Products and projecting tools. Architecture is culture, environment, tourism and projects

3.3 Phase 3: the ten categories and their ecological objectives

In order to move on to the next step we started from I. Sachs's saying that a city should be considered as an ecosystem with its own potential of latent resources, poorly used or unused, or wasted.

So the application of our paradigm as a means for discovering latent resources in many cities, towns and small villages, lead us to develop a strategy that was at the same time cultural, ecological and economical that did not sever the *local* sphere from the *global* one.

The key aspects of this strategy are based on the correspondence between each of the ten categories and their *ecological objectives*, as we can explain in the next sections.

3.3.1 Centrality

Centrality is matched with the need to control the flux of substance-energy that goes through the centre, the quantity and intensity of the interactions between the parts of the whole and the elements.

3.3.2 Domesticity

Domesticity is matched with the need to ease the stability of *feeble strengths* (attention, love, for example), looking for a deeper re-balance of traveller's energies that we find in the *inhabiting*; improving the interactions and the exchange fluxes between the inside and the outside that make the *house-city* belonging self-reliant through time.

3.3.3 Naturalness

Naturalness is matched with the need to make the relation between the living creatures easier, with the need to re-generate and stimulate self-reliance (and the ability to recover from impacts and damage) of the eco-systems and of the natural *ingredients*: animals, vegetation and human beings.

3.3.4 Insularity

Insularity is matched with the need to mark the borders of the habitat, leaving the negativeness without.

3.3.5 Initiality

Initiality is matched the need to help the new re-conversions and re-starts of the different parts of the city, re-generating their natural and cultural resources.

3.3.6 Topicity

Topicity is matched to the need to multiply the *slow-spots*, and actions aimed to reduce the impacts on the ecosystems.

3.3.7 Coexistentiality

Coexistentiality is matched to the need to overcome the *difference* as an obstacle to coexistence, in order to improve the quality of life.

3.3.8 Deepness

Time-deepness is matched the need to discover the latent resources and the co-evolution of different life-times, even of slower ones.

3.3.9 Landscapeness

Landscapeness is matched the need to create a number of view-spots (but also points of view), all looking one to each other, creating a network able to convey a complete image of the view, which overcomes the sum of its parts.

3.3.10 Representativeness

Finally, *Representativeness* is matched to the need to comprehend the whole narrative frame by which each particular place described through its own cultural heritage and its own ability to show itself.

4 How transfer our discoveries to enlarged Europe

We had, in order to give the project a future, to develop the concept of *nature-city* [6] into a frame of high ecological and economical sensitivity, placing it between the heritage of the concepts of civilization and nature and the ecological conversion process.

From this point of view, all the different re-generation and safeguard techniques would become much more effective if all the single operations in which these techniques are used could find the chance to interact between each other. This can also lead to a mutual valorisation of all the cultural and natural entities of ecological system.

With the progressive enlargement of the European Community the innovative aspect of our research becomes more important; this power of innovation lies in the realization of the *nature-city cultural heritage*, which could be made easier to realize using the adequate instruments for the spread of knowledge.

The first two instruments we invented are an exploratory model of the polycentric nature-city in the geographical context and ecological network of resources, the *Polipolis*, and a new kind of cultural tourism, the *Urbstourism*.

Both consist in ways of discovery *of* nature and *in* nature. Both explore the dimension of the journey as the *discovery of a new world*: the world of the nature city.

This *new world* is made of people, places, events and products that *create world*.

Polipolis is referred to the poli-centric nature-city, it is the model (prototype) of a new multimedia way of connecting things and the technical-symbolical instruments to ecological issue. It allows us to travel in a network of nature-cities, discovering hidden phenomena, between real and virtual, through the deepest mental territories and epistemic stratifications, drowned and hidden in today's life.

We need it to draw the geography of cultural heritage, to discover areas, points of intevisibility, to study single organizing systems (joint to ten channels of ten categories paradigm), to find *discovery places*. These are knots of cities, of landscape, of ecological, archaeological, human, ecosystem places and of ecosystems of goods and activities. Urbstourism, the *nature-city* world tourism, could be seen as a particular type of rural tourism (*the countermelody of rural tourism*): as the latter is used to let people know the rural world's resources, urbstourism can be used to underline the nature-city's sources of well-being.

First of all, it could be used as a practice of direct, instinctive experience, which makes the nature-city accessible to everyone as a cultural and environmental heritage *capital*.

The original aspect of urbstourism is that it is able to connect the strong feeling of discovering a new world to the surprise of the discovery of the unknown potential of each human being that emerges when he comes in contact with this new world. Thus begins a whole process of discovery of latent potentials and abilities, the nature-city's *know-how*, which is the real resource of cultural heritage and which has the important ecological task of giving back a real *human time* to everyday's life. This is found by living for a while in the city-inn, through which

the recovery of the abandoned parts of the ancient nature-cities is carried on, re-converting them to a new, sustainable lifestyles that people can experience in their holydays and in their travels.

So the urbstourism becomes an *economic engine*, able to start the nature-city recovery process where the centre development had been abandoned due to the lack of an adequate economy.

From here comes also a new vision of local systems: they are now able to evolve the old economical activities (agriculture and building trade, both in deep crisis) into an ecological conversion of a nature-city in which urbstourism, now seen as an economy of tourism and of ecological buildings [5], connects the enjoying of the cultural and environmental goods to the recovery and the new, sustainable building of the city-inn.

A lot of these re-conversions, though, have been carried out by projectors and economists not ready for real sustainability. It is useful to keep in mind that the city-inn, in order to survive, must contain the knowledge resources and the latent potential know-how that give it the ability to protect and keep its own local resources, using them in an interactive, re-generative way and reconnecting them to the renewable sources. What is necessary, then, is a sort of *ecosystem* of the nature-city, able to save energy and reduce wastes, to recover from impacts and to learn to repair the damage they cause, to self-heal and to adapt to unpredicted errors, to grow and evolve, to regenerate time.

In this frame our work, following the *Lisbon Strategy*, has been using the nature-city concept in combining economic, social and environmental aspects in order to create social cohesion and to give back a prior important role to the elderly, women and children.

The nature-city requires in fact, because of its characteristics, the conception of time that comes from the regeneration of life, which is typical of women; it recovers the wisdom of the elderly, with their slow life rhythm and it helps the sensitivity towards nature that only children and young generations can truly express.

The last instrument we want to introduce in order to pursue this *sustainability strategy* is a *projectual laboratory for new nature-cities*, which works anticipating the urban ecosystem scenario.

This scenario can be seen by introducing in abandoned old villages or in large unsustainable cities, policentrical areas or complexes in order to regenerate conditions for the existence of the nature-city and to give these conditions, in a cultural and environmental heritage, to the next generations.

The laboratory accomplish this task through a variable model of urban scenario, named *Eudossia* [7], in which the architecture of buildings and of nature synthesize the nature-city characteristics in every single spot of the area, using the ten regenerative tools presented above.

We can conclude, closing a cycle of an evolutive spiral, that the task architecture has in projecting the new conditions for the nature-city, is to discover in which way every different time a specific cultural heritage can assume a regenerative function, combining with the guarantee of the environment's future.
The origin of all this is in the experience of the *archaeological parks*, of the *Ecomuseums* and of the *open museums*, but today we are trying to bring this experience forward, as we decided to try to explain through our participation to the 2003 Barcelona Biennial [8].

This group of new *products* and projecting tools created a number of integrated applications, above all in Basilicata, where architecture is culture, environment and tourism.

It is possible to use the same concepts, the same working categories and regeneration strategies in order to help the enlargement of Europe, wherever there are the conditions, even if partial conditions, for the existence of the nature-city, and wherever there is a will of regeneration.

5 Social and economical impact of our results and possible aftermaths

The results of our research created *impacts* both inside the Basilicata region (Matera Sassi, Acerenza-Forenza in Vulture AltoBradano, Potenza University with a number of new courses and masters etc.) and in other Italian regions (Liguria: Cinque Terre, the Puglia region: Gravina in Puglia, Sicily: Treno doc etc.).

We are furthermore projecting and realizing ecological architecture prototypes with no polluting emissions, using bio-construction techniques.

These projects, on which we are still working, are examples of new constructions, recovery of old buildings and renovation of modern ones, and represent a discrete variety of possible users of the nature-city.

We want to study a range of solutions for the different lifestyles that today's society creates. These solutions can range from miniapartments (only 24 square metres) to small ecological villages.

It is only by going back to projecting houses, though, that we can create a relationship with the inhabitants of a certain area, a relationship that is a central feature in the sustainability culture and that is difficult to find in other projects.

Even the issue of energy-saving, which is now the centre of all our efforts, linked to a new vision of cultural heritage, will only gain an incisive international importance when architects will focus their studies on solving the problems concerning the new demands of great masses of humanity.

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