



EU-India Partnership for Cultural Heritage Conservation

in collaboration with
**The National Museum Institute of
History of Art, Conservation
and Museology**



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Tomasz Kozłowski

Ambassador of the European Union to India



India and Europe are natural partners and our relationship is far-reaching, covering a wide spectrum from trade and investment to foreign policy and security, research and innovation, climate change and environmental protection. Most importantly, it is built on mutual understanding, commonly shared values, strong people-to-people ties, and admiration for our rich and diverse cultural heritage.

At the EU-India Summit in October 2017 in New Delhi, our leaders developed a long-term vision to strengthen the EU-India strategic partnership. Intensified exchanges between cultural stakeholders, educational institutions, and creative industries are part of this vision. This has also been reflected in the *EU Strategy on India*, declared in November 2018. The Strategy envisages a rich intercultural dialogue and vibrant *people-to-people contacts*, building upon diversity and multilingualism, and the protection and promotion of the world's cultural heritage. The conference on cultural heritage conference held last year in association with the National Museum Institute was a step towards the implementation of this ambitious vision.

The year 2018 was designated by the European Parliament and the Member States of the European Union as the *European Year of Cultural Heritage*. Its main purpose was to underline and promote the importance of our shared cultural heritage, and promote the value of culture as an instrument for furthering people-to-people. Cultural heritage is a collective as well as individual responsibility; it deserves to be recognized and preserved for future generations. It has a universal value which brings communities together, while at the same time representing the heart and soul of a society.

In this spirit, the Delegation of the European Union has been organising and partnering for a large number of cultural events all across India, covering literature, film, photography, music, and art.

This conference provided a platform for eminent experts from the European Union and India to explore the tremendous economic and social potential cultural heritage possesses, and share knowledge on the latest technologies such as Copernicus Satellite imagery employed for conservation and documentation of cultural heritage, and the digital archive *Europeana* featuring more than 58 million cultural items, offering free of charge access to European cultural heritage. It also offered information on the many European mobility opportunities, research grants, and scholarship facilities available to Indian students, researchers and higher education staff, such as *Erasmus+*, *Research and Innovation Staff Exchange Action* and *Global Fellowships* under the *Horizon 2020* and *Marie Skłodowska-Curie Actions*.

Let's not forget about the social and economic importance of cultural tourism. Sustainable tourism which helps to conserve cultural heritage is an increasingly important industry; it employs directly or indirectly millions of citizens, both in India and the European Union. As culture transcends borders, it brings also wealth to other countries. Attracted by India's rich cultural heritage, the number of European visitors to India has increased in a significant way over the last few years. In 2018 alone, over 2 million Europeans visited India. At the same time, in the European Union we welcomed nearly 3 million Indian tourists; we hope this number will increase further, as people-to-people exchanges intensify. These numbers give an idea about our strong mutual interest in each other's cultural legacies.

Cultural heritage is our common gift, which we have to protect, preserve and hand over to the next generations. It is my hope that this conference is only the start towards the realization of this ambition.



Dr Mahesh Sharma

Minister of State (Independent Charge) for Culture and Tourism



India and the European Union are long-standing partners with well-established friendly ties stretching over decades. Together they represent close to 2 billion people sharing thriving democracies, and rich regional and cultural diversity. This relationship encompasses a broad spectrum of exchanges, from trade and investment to security and research and innovation. Significantly, in recent times, great impetus has been added to this partnership through increasing inter-cultural dialogue, people-to-people exchanges, and ever-expanding tourism. This conference, which brought together leading experts from India and Europe from the field of cultural heritage, is another example of our close ties, and testament to how much we can learn from each other. At the Ministry, we are committed to conserving India's rich cultural heritage and promoting its unique art and traditions. In addition to the promotion and development of heritage, we manage several knowledge resource centres, are custodians of major museums, libraries, and cultural institutions, and provide capacity building programmes for those who wish to excel in the arts.

The Conference addressed issues that are crucial to the work of the Ministry – the preservation of tangible and intangible cultural heritage, solutions to mitigate the impact of climate change and urbanization on heritage sites, and new technologies adapted for conservation both in India and Europe. This exchange of best practices between conservationists and professionals is of great significance as it provides a unique platform for knowledge-sharing that can be adapted for practical purposes at heritage sites across the country. Already, we have 37 UNESCO World Heritage Sites in India, stretching the length and breadth of the country from the Kalka-Shimla Railway and the Ajanta and Ellora Caves, to the Sundarbans National Park and the Great Living Chola Temples in Tamil Nadu.

In addition to this, the conference also shone a spotlight on the heritage sites dotted across the country that have a European legacy, and which are now being restored and preserved under the auspices of European Union Member States in close collaboration with local and state authorities, and individual organizations working in the field of heritage conservation. The list of these monuments is impressive, and includes such renowned sites like the Chaunsath Khamba in New Delhi, the historic centre of Serampore, the Zangla Palace in Jammu and Kashmir, or the Indo-French Heritage Lab in West Bengal, among others. Together they represent the very significant work being undertaken by Member States and their contribution to conserving historic cultural sites that are of great value to India.

The unique cooperation being undertaken in this field by Indian and European counterparts is crucial towards strengthening our cultural exchanges and will only gain momentum in the coming years, as both sides appreciate the mutually beneficial partnership and continue to share new technologies and established methodologies to preserve our rich and diverse cultural legacy. I am convinced that India and the European Union have tremendous knowledge and skills in conserving their cultural heritage and much can be gained by bringing these together.

Dr B.R. Mani

*Vice Chancellor
National Museum Institute of History of Art, Conservation
and Museology*



India has a rich, diverse and dynamic cultural legacy, both in terms of tangible and intangible cultural heritage. Tangible and intangible heritage in the form of monuments, paintings, cultural heritage sites, material artefacts, linguistic diversity, and arts and crafts, are spread all across the country.

These elements of our cultural legacy are of universal value for individuals, communities, and societies which bring people together. It is imperative that we strive towards enhancing and celebrating this substantial cultural inheritance.

At the National Museum, we continually work towards preserving and showcasing India's cultural heritage through innumerable ways, including by hosting exhibitions, seminars, conferences, and art shows that highlight what the country has to offer.

We are delighted to partner with the Delegation of the European Union to India by hosting this unique Conference that has brought together a range of experts from India and Europe working in the field of cultural heritage conservation. Our Indian and European partners are covering a broad range of themes at this Conference, and their expertise will highlight how culture can be used as an instrument for social and economic development, as also how technology and new advancements can be deployed for the mitigation of risks to the conservation of cultural heritage.

India and the European Union already share very close and friendly ties and I believe that through the partnership displayed at this Conference, we will be able to strengthen and deepen our relationship even further.

I am convinced that this Conference will provide a unique opportunity to present creative solutions to the problems currently being faced in the field of cultural heritage conservation, particularly to the challenges posed by climate change, rapid urbanization, and industrialization.



Tuesday, 4 December 2018

10:00 – 10:40	<p>Opening Session</p> <p>Welcome Address by Dr B.R. Mani, Director General, National Museum and Vice-Chancellor, National Museum Institute</p> <p>Keynote Address by H.E. Tomasz Kozlowski, Ambassador of the European Union to India</p> <p>Address by Guest of Honour Shri Hardeep Singh Puri, Hon'ble Union Minister of State (Independent Charge), Ministry of Housing and Urban Affairs, Government of India</p>
11:00 – 11:15	<p><i>Special Address by Ms Nirupama Kotru, Joint Secretary, Ministry of Culture, Government of India</i></p>
11:15 – 13:00	<p>Session I: Cultural Heritage as a Catalyst for Socio-Economic Development</p> <p>Objective: <i>Through case studies, this panel will explore the potentially catalytic role of cultural heritage conservation for economic and social development in India. It will further provide an opportunity to EU Member States and their Indian partner organizations to highlight jointly implemented flagship projects and analyse their impact on local communities.</i></p> <p>Chair and Moderator: Mr Éric Falt, Director and UNESCO Representative, UNESCO New Delhi Cluster Office for Bangladesh, Bhutan, India, Nepal, the Maldives, and Sri Lanka</p> <p>Panellists:</p> <p>Ms Cecilia Costa, Cooperation Manager, International Cooperation and Development (DEVCO), Delegation of the European Union to India</p> <p>Mr Juan-Manuel Guimeráns, Director General for Culture and Tourism, Valladolid City Council and</p> <p>Dr Debashish Nayak, Secretary of the Heritage Conservation Committee, Ahmedabad Municipal Corporation</p> <p>Dr Balázs Irimiás, Initiator, Chairman of the Board of Trustees, Csoma's Room Foundation</p> <p>Mr Nishant Upadhyay, Doctoral Researcher, Raymond Lemaire International Centre for Conservation, KU Leuven</p>



<p>14:00 – 15:30</p>	<p>Session II: Mitigating the Risks of Climate Change on Cultural Heritage</p> <p>Objective: <i>This panel will chart the biggest current challenges stemming from climate change in the Indian context. Innovative concepts and technical solutions will be discussed on the basis of case studies.</i></p> <p>Chair and Moderator: Dr Tatjana Bayerová, Head of the Chemical Laboratory and Senior Lecturer, Institute of Conservation, University of Applied Arts Vienna</p> <p>Panellists:</p> <p>Dr Johanna Leissner, Scientific Representative of Fraunhofer Institutes IAP, IBP, ICT, IGB, IMW and ISC; Cultural Heritage and Sustainability Network</p> <p>Dr František Peterka, Chairman of Project, National Centre for Nanosurfaces Engineering; Deputy Chairman, Czech Association of Applied Photocatalysis; CEO of Nanotec System for Applied Photocatalysis</p> <p>Dr Satish C. Pandey, Associate Professor, Department of Conservation, National Museum Institute, Ministry of Culture, Government of India</p> <p>Dr Manish Kumar Shrivastava, Assistant Professor, Department of Energy and Environment, TERI School of Advanced Studies</p>
<p>15:30 – 17:00</p>	<p>Session III: Sustainable Solutions to Curb the Effects of Urbanization on Cultural Heritage</p> <p>Objective: <i>The panel will outline the current urbanization policy framework and the role of cultural heritage within it. The panellists will discuss the impacts of urban sprawl on architectural heritage in Indian cities and ponder how to turn these challenges into opportunities for sustainable growth.</i></p> <p>Chair and Moderator: Dr Shikha Jain, Director, DRONAH (Development and Research Organisation for Nature, Arts and Heritage) and Chairperson, DRONAH Foundation</p> <p>Panellists:</p> <p>Dr A.G.K. Menon, Architect, Urban Planner and Conservation Consultant, Convener of INTACH (Delhi)</p> <p>Mr Raphaël Gastebois, Architect and Technical Expert in Urban Development, Adviser to the Government of Puducherry in Pondicherry Smart City Project</p> <p>Ms Aishwarya Tipnis, Principal Architect and Conservation Planner, Aishwarya Tipnis Architects</p> <p>Mr Geert Robberechts, Convener and President, Indian National Trust for Art and Cultural Heritage (Belgium)</p> <p>Dr Bente Wolff, Curator, Project Head, The Serampore Initiative, National Museum of Denmark</p>



Wednesday, 5 December 2018

10:00 – 10:15	<p>Keynote Address</p> <p>Ms Oriana Grasso, Copernicus Unit, Directorate-General for Internal Market, Industry, Entrepreneurship and SMEs, European Commission</p>
10:15 – 11:45	<p>Session IV: Advancements and New Technologies Adapted for Identifying, Surveying and Mapping of Cultural Heritage Sites</p> <p>Objective: <i>This panel seeks to manifest advancements, cutting-edge technologies, and innovative solutions employed for cultural heritage. Earth observation techniques via satellite technology (Copernicus Earth Observation and Monitoring Programme) or remote sensing, diverse non-invasive technologies, which enable mapping of historical sites, or the employment of Unmanned Aerial Vehicles (UAV) in mapping and monitoring of cultural heritage sites (photogrammetry, airborne imagery, photointerpretation technologies), will be discussed.</i></p> <p>Chair and Moderator: Ms Oriana Grasso, Copernicus Unit, Directorate-General for Internal Market, Industry, Entrepreneurship and SMEs, European Commission</p> <p>Panellists:</p> <p>Dr Tobias Matusch, Research Associate (Secretary General) of the UNESCO Chair on World Heritage and Biosphere Reserve Observation and Education, Heidelberg University of Education, Germany</p> <p>Dr Rosa Lasaponara, Scientific Director, ARGON Laboratory (Earth Observation for ARchaeology and EnvirONment), Institute of Methodologies for Environmental Analysis, Italian National Research Council and</p> <p>Prof. Nicola Masini, Senior Researcher, Institute for Archaeological and Monumental Heritage, Italian National Research Council</p> <p>Dr M.B. Rajani, Assistant Professor, National Institute of Advanced Studies, Bengaluru</p>



<p>12:00 – 13:30</p>	<p>Session V: Digital Transformation of Cultural Heritage: Toward Greater Inclusion and Accessibility</p> <p>Objective: <i>Digital technologies offer new opportunities to popularize cultural heritage, facilitate international research, and safeguard cultural heritage artefacts against illicit trade.</i></p> <p>Chair and Moderator: Dr Shantanu Ganguly, Fellow, Knowledge Management Division, The Energy and Resources Institute (TERI)</p> <p>Panellists:</p> <p>Mr Benoît Sauveroche, First Counsellor - Communications Networks, Content and Technology, Delegation of the European Union to India</p> <p>Dr Ramesh C. Gaur, Director (Library and Information) and Head, Kalanidhi Division, Indira Gandhi National Centre for Arts (IGNCA)</p> <p>Dr Irene Seco Serra, Heritage Service Head, Spanish Agency for International Cooperation and Development (AECID)</p> <p>Prof. Sumant Rao, Associate Professor, Industrial Design Centre, Indian Institute of Technology, Mumbai</p>
<p>15:00 – 16:30</p>	<p>Session VI: European Union-financed Mobility Schemes for Students and Researchers in the Field of Cultural Heritage Conservation</p> <p>Objective: <i>This session will inform on EU-financed mobility schemes for undergraduates, and young and established researchers in fields related to cultural heritage conservation, who are interested in studying/conducting research in the EU.</i></p> <p>Chair and Moderator: Mr Sanjeev Roy, Key Higher Education Expert, European Union Public Diplomacy in India</p> <p>Panellists:</p> <p>Mr Sanjeev Roy, Key Higher Education Expert, European Union Public Diplomacy in India</p> <p>Dr Vidya Vencatesan, I/c Director, Centre for European Studies, University of Mumbai</p> <p>Dr Samrat S. Kumar, Country Representative, EURAXESS India – Researchers in Motion</p> <p>Prof. Vijay S. Khare, Director, International Centre, Savitribai Phule Pune University</p>



Cultural Heritage as a Catalyst for Socio-Economic Development

Through case studies, this panel will explore the potentially catalytic role of cultural heritage conservation for economic and social development in India. It will provide an opportunity to European Union Member States and their Indian partner organizations to highlight jointly implemented flagship projects and analyse their impact on local communities.

In recent times, the role of cultural heritage in promoting the socio-economic development of communities has increasingly become an important topic among policymakers. It has been found that cultural heritage can serve as a catalyst for the development of tourism and other ancillary sectors, which can provide a significant opportunity for the development of national economies.

The speakers in this panel will discuss means by which international, national, regional and local authorities can harness synergies of their cultural heritage to promote sustainable economic development to the communities which are the guardians of these works.



Chair and Moderator: **Éric Falt**

Director and UNESCO Representative, UNESCO New Delhi Cluster Office for Bangladesh, Bhutan, India, Nepal, the Maldives, and Sri Lanka



Since May 2018, Mr. Éric Falt has served as the Director and UNESCO Representative for the UNESCO New Delhi Cluster.

Mr. Falt has previously served as Assistant Director-General for External Relations and Public Information at the Paris headquarters of UNESCO with the rank of Assistant Secretary-General of the UN. He also guided UNESCO's communications and public information efforts.

Prior to this, he served as Director of the Outreach Division at the United Nations Department of Public Information in New York. Mr. Falt has also served as the Director of Communications for the United Nations Environment Programme (UNEP), based at its headquarters in Nairobi.

Cecilia Costa

Team leader – Cooperation Manager EU Delegation to India and Bhutan



Cecilia Costa is currently Cooperation Manager at the European Union Delegation to India in charge of coordination and implementation of EU external actions in India and Bhutan. She is involved in development cooperation since 1989, first working with a network of European Universities, promoting university exchanges with Latin America and the Mediterranean countries; and later, since 1998, working for the European Union engaged in the promotion of institutional capacity building and capacity development including through higher education and cultural cooperation and exchanges.

Since 2002 she has been working in the Asian region with a particular focus on India and Afghanistan. She is currently working in India for the second time since February 2017, and is in charge of the coordination of the implementation of EU development cooperation activities in India and Bhutan. Her specific areas of interest include governance, aid effectiveness and innovative financing for development; strengthening capacities to unlock economic growth, and peace and stability.



Juan-Manuel Guimeráns

Director General for Culture and Tourism, Valladolid City Council



Since 2004, Mr. Juan-Manuel Guimeráns has served as the Director General for Culture and Tourism of the Valladolid City Council. He is a permanent member of the Spanish Civil Service, occupying different directive positions in several Ministries (Public Works, Presidency, Economic Development and Culture and Tourism) of the Castile and Leon Region.

A regular lecturer at several universities and the civil service institutes in Spain, he has specialized in Public Management, Organizations Change, Smart Heritage Management, and Sustainable Tourism, and has been invited to lecture at various international programmes initiated by the European Union.

Mr. Guimeráns is passionate about cinema, and as vice-president of the Spain Film Commission (SFC) since 2015, he has actively been engaged in the preservation and conservation of works of audiovisual heritage. He is also in charge of international collaboration projects with regard to cinematography in countries such as China and India.

Prof. Debashish Nayak

Secretary of the Heritage Conservation Committee, Ahmedabad Municipal Corporation



Prof. Debashish Nayak is an architect with more than two decades of experience in managing urban conservation issues of historic cities in India and abroad.

He is the Founder-Director, Centre for Heritage Management of Ahmedabad University. He has also served as an advisor to Heritage Programmes in the Municipal Corporations of various cities including Ahmedabad (since 1996), Jaipur, Amritsar, Old Delhi, Lucknow, and Pondicherry, as well as to the Indian Heritage Cities Network launched by UNESCO, India.

In addition to receiving the Ashoka Fellowship (1990 – 1993) and the Salzburg Fellowship (1990), he has also been awarded the Ten Outstanding Young Indians Award (1994); the Friends of the United Nations Citizen's Award (1995); and the Anubhai Chimanlal-AMA Nagrikta Puraskar – citizenship award for his contribution to the city of Ahmedabad. In 2015, he was awarded the Lifetime Achievement Award by the Governor of West Bengal.



Dr Balázs Irimiás

Initiator, Chairman of the Board of Trustees, Csoma's Room Foundation



Balázs Irimiás is the founder and project leader of Csoma Szobás Alapítvány, and head of the reconstruction of the Zangla palace, Jammu and Kashmir.

After having studied at Budapest University, Dr Irimiás earned his doctorate in the field of monument restoration from Vasa University, Tokyo.

During his years in Japan, he was able to take part in the restoration work of the Cambodian Angkor ruins. Between 2000 and 2001, he was a member of the Graphisoft Architectural Software Development Team.

In 2007, he traveled to Zangla, where he visited the palace where Kőrösi Csoma Sándor spent three months in Tibet. Since this time, Dr Irimiás has been engaged in the restoration of the palace.

In 2010, he founded Csoma's Room Public Benefit Foundation, an organization established with the aim of this restoration project.

Nishant Upadhyay

Doctoral Researcher, Raymond Lemaire
International Centre for Conservation, KU Leuven



Mr Nishant Upadhyay trained as an architect at the Government College of Architecture, Lucknow. He obtained an Advanced Master's Degree in the Conservation of Monuments and Sites from the Raymond Lemaire International Centre for Conservation, University of Leuven as a recipient of the Erasmus Mundus EXPERT scholarship.

Mr Upadhyay designed and executed architectural projects in Bangalore, India, with a focus on ecological mud architecture, before getting into heritage conservation. He has worked with several international and national organizations, such as the Indian National Trust for Art and Cultural Heritage - INTACH, UNESCO, and ICOMOS, among others.

At present he works for UNESCO as program officer for the culture sector and is a PhD candidate at KU Leuven, with a focus on the role of historical landscape conservation with the case of the Royal Gardens of Rajnagar in Bundelkhand, India.



Mitigating the Risks of Climate Change on Cultural Heritage

This panel will chart the biggest current challenges stemming from climate change in the Indian context. Innovative concepts and technical solutions will be discussed on the basis of case studies.

Climate change represents a grave and serious threat to humanity.

Studies suggest that climate change will have severe and irreversible consequences for humanity, agricultural practices, varied industries, as well as the preservation of our shared cultural heritage.

While significant work has already been undertaken in the fields of assessing the impact of climate change on future generations, and efforts are being made to reduce the use of harmful fossil fuels and promote alternate renewable sources of energy, the same degree of importance has not been placed on the conservation of cultural heritage, and the threats it faces from climate change.

Our combined global, national and regional cultural patrimonies serve as a well-spring for the shaping of our identities. It is, therefore, crucial that significant resources and study should be devoted to the issue of preserving our cultural heritage in the face of climate change.

This panel will utilise case studies and the latest research in developing clear and practical methodologies for the adoption of ways to preserving our combined cultural heritage.



Chair and Moderator: Dr Tatjana Bayerová

Head of the Chemical Laboratory and Senior Lecturer, Institute of Conservation, University of Applied Arts Vienna



Dr Tatjana Bayerová presently serves as the Head of Chemical Laboratory and as a senior lecturer at the Institute of Conservation, University of Applied Arts in Vienna.

She has previously served as an external lecturer and project co-worker at the Faculty of Restoration, University of Pardubice, Czech Republic, as well as at the Department of Chemical Technology of Monument Conservation at the Institute of Chemical Technology in Prague.

Dr Bayerová has trained at the International Academic Projects course, “New Methods of Cleaning Painted Surfaces” in England and at the Institute Royal Patrimoine Artistique, Brussels.

She has participated in numerous projects, such as the *Scientific Study of Artwork in Nako, India*, in which she was the principal researcher, as well as in the *Study of Organic Coatings on Metal Based Museum Objects*.

Dr Johanna Leissner

Scientific Representative of Fraunhofer Institutes IAP, IBP, ICT, IGB, IMW and ISC; Cultural Heritage and Sustainability Network



Dr Johanna Leissner trained as a chemist in Germany and the United States. She has been working in cultural heritage research for over 20 years with a focus on climate change, environmental pollution, sensor development and sustainability.

Dr Leissner has served as the Coordinator of the large-scale EU project *Climate for Culture*. She participated as the German delegate at the Council of Europe Strategy “European Cultural Heritage in the 21st century”.

Since 2005, she had been the scientific representative for Fraunhofer-Gesellschaft at the European Union in Brussels. She is the co-founder of the German Research Alliance for the Protection of Cultural Heritage (2008) and of the Fraunhofer Sustainability Network.



Dr František Peterka

**Chairman of Project, National Centre for Nanosurfaces Engineering;
Deputy Chairman, Czech Association of Applied Photocatalysis; CEO
of Nanotec System for Applied Photocatalysis**



Dr Peterka graduated from the Institute of Chemical Technology in Prague in 1972, following which he started research work at the Nuclear Research Institute (NRI) in Řež. He was granted a Fellowship by the International Atomic Energy Agency (IAEA) in 1976, but changed his professional field to applied photocatalysis soon after. Since then he has coordinated several national and European RandD projects. In 2006-2009, he chaired a European COST 540 PHONASUM project to solve important problems in applied photocatalysis.

He is strongly interested in culture heritage protection by novel photocatalytic applications. Between 2005 and 2011, he coordinated a project for the Czech National Centre for Nanosurface Engineering that resulted in 168 papers in international scientific journals and 11 patents.

He represents the Czech Republic in international ISO and CEN standardization bodies dealing with photocatalytic applications. In 2013, he co-founded and was the first chairman of the Czech Society for Applied Photocatalysis (ČSAF). He also acts as a board member of the European Federation for Photocatalysis and serves as Chief Executive Officer of the Nanotec System Company.

Dr Satish C. Pandey

**Associate Professor, Department of Conservation, National
Museum Institute, Ministry of Culture, Government of India**



Dr Satish Pandey is a conservation scientist, currently working as Associate Professor of Art Conservation at the National Museum Institute, New Delhi. His teaching and research focus on conservation of stone and wall paintings; research and development of conservation materials and technical art history.

Dr Pandey obtained his M.Sc. and D.Phil. in Archaeological Sciences from the University of Oxford. He has been an AHRC Science and Heritage Programme Fellow at the Courtauld Institute of Art, London. He has also been a visiting researcher at the National Centre for Preservation Technology and Training (NCPTT), USA and at the School of Geography and the Environment, University of Oxford.

He is a fellow of the International Institute of Conservation (IIC), London and Coordinator of ICOM-CC Education and Training Group.



Dr Manish Kumar Shrivastava

Assistant Professor, Department of Energy and Environment,
TERI School of Advanced Studies



Dr Manish Kumar Shrivastava is an inter-disciplinary researcher by training. His research interests include theories and practices of justice with a particular reference to the interaction of energy, technology, and environmental policy in multi-level governance and fragmented society contexts.

Prior to joining TERI SAS, he was associated with The Energy and Resources Institute, New Delhi for 10 years where he coordinated many research projects like preparedness of the Indian Oil and Gas sector to face challenges posed by climate change, implementing Nationally Appropriate Mitigation Actions; key issues in climate change negotiations, and many international projects such as ADAM, CLIPORE, and Global Climate Network.

His current research focuses on the implementation of India's NDC and technology cooperation needs, as well as the role of sub-national and non-state actors in scaling up climate action in developing countries. He holds Ph.D. and M.Phil. Degrees in Science Policy and a Masters Degree in Economics from Jawaharlal Nehru University, New Delhi.

Sustainable Solutions to Curb the Effects of Urbanization on Cultural Heritage

The panel will outline current urbanization policy framework and the role of cultural heritage within it. Panellists will discuss the impacts of urban sprawl on architectural heritage in Indian cities and ponder how to turn these challenges into opportunities for sustainable growth.

As countries in developing areas such as Africa and Asia continually see a shift towards industrialization, more and more people from rural areas are migrating to major metropolitan areas and cities.

Often, it is these very areas of urban conglomeration that are home to major cultural heritage sites. Continued migration to urban areas will inevitably pose a significant strain on existing urban resources, as well as on the cultural heritage extant in these locations.

The role of cultural monuments, artefacts and heritage on the development of an urban ethos and psyche, is already well established. It is therefore vital to identify, develop and put into practice new methods by which communities can ensure that the development of urban areas works hand-in-hand with the preservation of works of cultural heritage that will be available for future generations.

This panel will explore work that has already been undertaken in this area, wherein urban communities and the cultural heritage they are a part of, are allowed to exist in harmony.



Chair and Moderator: Dr Shikha Jain

Director, DRONAH (Development and Research Organisation for Nature, Arts and Heritage) and Chairperson, DRONAH Foundation



Dr Shikha Jain received her doctorate in architectural history from PRASADA, De Montfort University, United Kingdom.

She has represented India as Member Secretary, Advisory Committee on World Heritage to the Ministry of Culture during India's term in the UNESCO World Heritage Committee from 2011-2015 and has worked on various UNESCO missions.

As an international expert, she has advised the National Heritage Board, Singapore on the World Heritage Site of Singapore Botanic Gardens inscribed in 2015 and is currently involved as an expert with the nomination of MraukU for the Government of Myanmar.

As Director, DRONAH, she has steered more than 50 conservation, urban heritage and museum planning projects across India including projects with international organizations such as the Getty Foundation, World Monuments Fund and various state and central government ministries in India.

Dr A.G. Krishna Menon

Architect, Urban Planner and Conservation Consultant,
Convener of INTACH (Delhi)



Dr A.G. Krishna Menon is an architect, urban planner and conservation consultant practicing in Delhi for over 40 years.

He co-founded what is today the University School of Architecture and Planning, Guru Gobind Singh Indraprastha University, Delhi.

He has been actively involved in urban conservation and in 2004 drafted the INTACH Charter for the Conservation of Unprotected Architectural Heritage and Sites in India. In the past he has been associated with the formulation of The Delhi Master Plan-2021.

In addition to his professional consultancy work, he was until recently the Convener of INTACH's Delhi Chapter.



Raphaël Gastebois

Architect and Technical Expert in Urban Development, Adviser to the Government of Puducherry, India



An architect and urban planner, and born in 1976 in Normandy, France, Raphaël Gastebois is currently an international technical expert in urban development and advises the government of Puducherry in its approach of Smart City and on the development of its heritage.

He previously worked for twelve years as a government architect, head of the architecture and heritage department, in several French regions in Normandy, Champagne-Ardenne and then in the Indian Ocean in Reunion and Mayotte Islands, where he was also the Regional Curator of Historic Monuments.

He trained at the National Architecture School of Normandy, the Ecole de Chaillot and the Ecole des Ponts et Chaussées in Paris. He was the collaborator of Bruno Decaris, then Pierre-Yves Caillault, Chief Architect of Historic Monuments.

In parallel with his duties, he has taught at the Institute of Territorial Planning and Urban Planning of the University of Reims (IATEUR) and at the National Architecture Schools of Nancy and Montpellier (Reunion Island).

Aishwarya Tipnis

Principal Architect and Conservation Planner, Aishwarya Tipnis Architects



Aishwarya Tipnis is the principal architect of an eponymous architectural and urban heritage conservation practice based in New Delhi, India.

In 2018, she was the recipient of the prestigious Chevalier des Arts et des Lettres by the Government of France in recognition for her work in conserving French monuments in India.

Ms Tipnis is also the recipient of numerous other awards, including the 2016 UNESCO Award for Heritage Conservation in the Asia-Pacific Region; the 2011 Commonwealth Professional Fellowship, and the 2006 Scottish International Scholarship. She was also selected as a participant for the first edition of the European Union Cultural Diplomacy Platform's flagship Global Cultural Leadership Programme in 2016.

She has worked as a consultant for UNESCO, Asian Development Bank, World Monuments Fund New York as well as Vieilles Maisons Françaises, Paris, the Embassy of France in India, and the Embassy of the Kingdom of Netherlands in India.



Geert Robberechts

Convener and President, Indian National Trust for Art and Cultural Heritage, Belgium



Mr Robberechts graduated as an Art Historian in 1984 from KU Leuven. He was thereafter involved in conservation works in Flanders, mostly with reference to the revival of historical gardens and landscapes (e.g. Kortrijk Beguinage, Drongen Old Abbaye, and Sint-Amansberg Beguinage, among others).

In 2003, he founded the Belgian Chapter of the Indian National Trust for Art and Cultural Heritage (INTACH Belgium). He was consultant on numerous projects in India including in Orchha (Rai Praveen Palace and Gardens – Phool Bagh), Srinagar (Mughal Gardens), Aurangabad and Region (incl. Khuldabad and Daulatabad – Mughal Gardens), Cochin (Ayurvedic Botanical Garden), and Kodaikanal (Belgian Convent). The main project he has been involved in, however, is the restoration of the 18th century royal gardens in Khajuraho/Rajnaragar (2003 till date).

Geert Robberechts is also the Director of the India House Leuven, in which capacity he has been able to negotiate MoUs between the city of Leuven and New Delhi Municipal Council (NDMC), and Gwalior MC, on smart technology transfers under the Smart Cities Mission.

For ASCI (Agricultural Skill Council of India), he initiated the development of the training module “Heritage Gardener”.

Dr Bente Wolff

Curator, Project Head, The Serampore Initiative, National Museum of Denmark



Dr Bente Wolff is curator and senior researcher at the National Museum of Denmark, Department of Modern History and World Cultures. She has been the project head of the Serampore Initiative since it was founded in 2008.

Her role is to lead the Danish project team and to secure collaboration and coordination with Indian partners and associates, in order to integrate the Museum’s restoration projects with other projects of urban upgrading and heritage conservation, which are being planned and executed in Serampore by the Government of West Bengal. Under the Serampore Initiative she is also engaged in social surveying, academic and publication work and she takes active part in the creative process of producing museum exhibitions and documentary films.

She holds a PhD in Cultural Anthropology from the University of Copenhagen. Previously she has done research on tourism and social economy in Southeast Asia and Oceania. She has also held courses on practical inter-cultural skills for Danish business leaders and government officials working in Asia.



Advancements and New Technologies Adapted for Identifying, Surveying and Mapping of Cultural Heritage Sites

This panel seeks to present advancements, cutting-edge technologies, and innovative solutions employed for the preservation of cultural heritage. Earth observation techniques via satellite technology (Copernicus Earth Observation and Monitoring Programme) or remote sensing, diverse non-invasive technologies, which enable mapping of historical sites, and the employment of Unmanned Aerial Vehicles (UAV) in mapping and monitoring of cultural heritage sites (photogrammetry, airborne imagery, photointerpretation technologies), will be discussed.

This panel will explore the different facets by which modern technologies can contribute to the preservation, conservation, and indeed, rediscovery of our cultural heritage, so as not only to re-explore our combined cultural patrimony, but to preserve it for future generations.



Chair and Moderator: Oriana Grasso

Copernicus Unit, Directorate-General for Internal Market, Industry, Entrepreneurship and SMEs, European Commission



Oriana Grasso currently serves as policy officer at DG GROW, Copernicus Unit I2, European Commission and is in charge of horizontal issues and cultural heritage since November 2014.

She is an anthropologist and sinologist by education and has worked in the fields communication and European advocacy since 1980. She was a policy adviser in the European Parliament for Copernicus and other space, energy, research and environment programmes from 2004 to 2014. She also served as policy officer in the Forward studies Unit of STOA (Scientific and Technical Options Assessment) from July to October 2014.

Dr Tobias Matusch

Research Associate (Secretary General) of the UNESCO Chair on World Heritage and Biosphere Reserve Observation and Education, Heidelberg University of Education, Germany



Dr Tobias Matusch is a research associate at the Research Group for Earth Observation, Heidelberg University of Education and executive manager of the UNESCO Chair on World Heritage and Biosphere Reserves Observation and Education.

As executive manager of the UNESCO Chair, Dr Matusch is responsible for designing and developing various events and activities on an international scale as well as bringing together all UNESCO Chair actions within the Heidelberg University of Education.

Dr Matusch studied geography in Greifswald (Germany) and Utrecht (Netherlands). In his doctoral thesis, he focused on satellite image-based monitoring of protected areas.

Dr Rosa Lasaponara

Scientific Director, ARGON Laboratory (Earth Observation for ARchaeoloGy and EnvirONment), Institute of Methodologies for Environmental Analysis, Italian National Research Council; Director, Digital Belt and Road International Centre of Excellence (ICoE Potenza) at CAS-CNR



Dr Lasaponara has over twenty years of experience in the field of EO technologies, both spaceborne and airborne. Her research deals with optical data and radar data processing for archaeological and cultural heritage sites, and risk estimation and mitigation for sites of high cultural value. She has authored or co-authored more than 300 peer-reviewed works.



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She is editor of NHESS and has been associate editor of Sensor. She is a member of the editorial board of several international journals and has also coordinated for several of them (Journal of Archaeological Science, Archaeological Prospection, among others). She currently serves as scientific coordinator of several research projects funded by the EU, by ASI, CNR, ESA, and the DPC.

She is an adjunct professor for MicroWave teaching at the University of Basilicata and holds several international positions including: chair of EARSeL SIG RS for archaeology, visiting professor at the Institute of Remote Sensing and Digital Earth, Chinese Academy of Sciences, Beijing, among others.

Prof. Nicola Masini

Senior Researcher, Institute for Archaeological and Monumental Heritage, Italian National Research Council



Nicola Masini is a senior researcher responsible for the Potenza seat at the Institute of Archaeological and Monumental Heritage of National Research Council (IBAM-CNR). He is also Professor of Architectural Restoration at the School of Architecture in Matera, and Director of the Italian Archaeogeophysics Mission in Peru.

His scientific activity has been developing along two main lines of research: earth observation sciences for archaeological research, and non-invasive sensing technologies for architectural and archaeological heritage conservation and management.

Currently he is responsible for two Horizon 2020 projects: ATHENA (H2020-TWINN-2015) aimed at creating a Remote Sensing Science Centre for Cultural Heritage in Cyprus, and GeoMOP (H2020-MSCA-IF-2016).

Dr M.B. Rajani

Assistant Professor, National Institute of Advanced Studies, Bengaluru

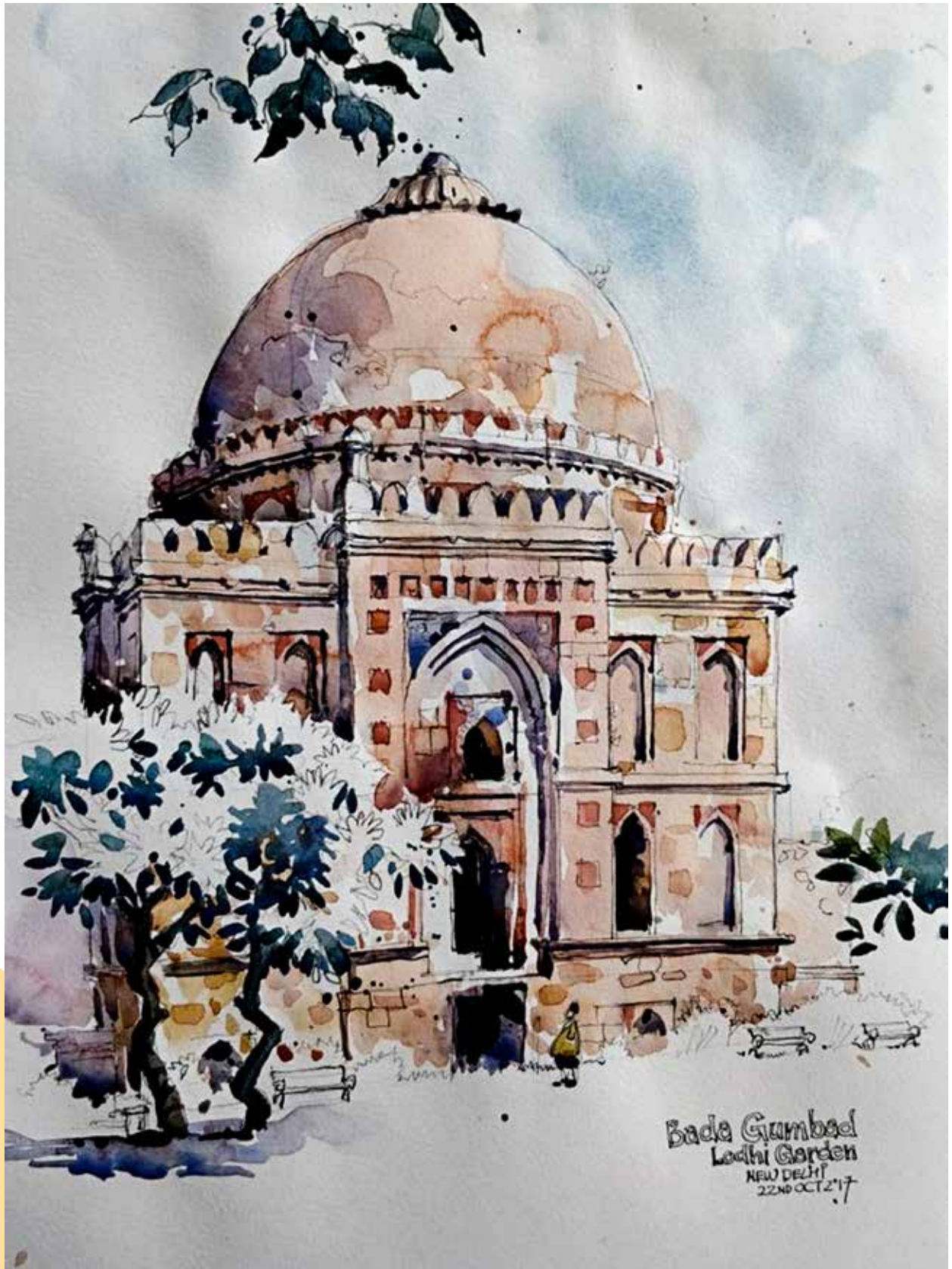


Dr M.B. Rajani's research has two inter-related facets: analyzing cultural landscapes using geospatial data to identify new features of archaeological interest, and advancing the use of such analysis for preserving built heritage in the face of rapid urbanization.

Her doctoral research at NIAS, Bangalore (2005-10), was awarded PhD by University of Mysore (2011). Her recent publications include, "Archaeological exploration in Srirangapatna and its environ through remote sensing analysis" (2018); "Archaeological remains at Nalanda: a spatial comparison of 19th century observations and the protected World Heritage Sites" (ISEAS, 2018); and three articles in the Current Science Special Section on "Geospatial Techniques in Archaeology" (2017).

She is an elected member of the Indian National Young Academy of Science (2018-22).





Digital Transformation of Cultural Heritage: Toward Greater Inclusion and Accessibility

Digital technologies offer new opportunities to popularize cultural heritage, facilitate international research, and safeguard cultural heritage artefacts against illicit trade.

Recent advancements in technology, particularly in the field of digitization, can revolutionize the entire process of preserving and conserving our cultural heritage and can act as an impetus to the development of regional tourism, ancillary industries and scholarship.

These new technologies also provide an exciting opportunity for the advancement of the promotion of artefacts, relics and manuscripts to a wider audience, which would not otherwise have been able to access them.

This panel will discuss the latest methods in use for the digitization of cultural artefacts of high value, and the impacts of these processes on greater accessibility of our cultural heritage.



Chair and Moderator: Dr Shantanu Ganguly

Fellow, Knowledge Management Division, The Energy and Resources Institute (TERI)



Dr Shantanu Ganguly holds a doctorate in the Marketing of Special Library Services, as well as three master's degrees in Marketing Management, Library and information Science and Ecology and Environmental Sciences.

During his 27 years of experience, Dr Ganguly has worked at some of India's premier academic institutions and organizations, including, the University of Delhi, the Indian Institute of Management in Lucknow, the National Productivity Council of the Ministry of Commerce and Industry of the Government of India, the Institute of Integrated Learning and Management, as well as at The Energy and Resources Institute (TERI).

In recognition of his years of expertise in the area of knowledge management, Dr Ganguly has been awarded the Bonnie Hilditch International Librarian Award for Science and Technology by the Special Library Association of the United States, as well as the roll of honour conferred for outstanding achievements by TERI.

Benoît Sauveroche

First Counsellor - Communications Networks, Content and Technology, Delegation of the European Union to India



Benoît Sauveroche works at the Delegation of the European Union to India, where he is responsible for issues related to communication networks, related content and technology.

His professional life brought him to live and work on four continents, and explore a wide variety of activities.

Dr Ramesh C. Gaur

Director (Library and Information) and Head, Kalanidhi Division, Indira Gandhi National Centre for Arts (IGNCA)



Dr Ramesh C. Gaur is presently Director (Library and Information) and Head, Kalanidhi Division at Indira Gandhi National Centre for the Arts (IGNCA), New Delhi.

Between October 2011 and January 2018 he served as the University Librarian, Jawaharlal Nehru University (JNU), New Delhi, and was a Fulbright Scholar (VT, USA).

Dr Gaur is a member of the Expert Consultation Committee for setting up of the International Centre on Documentary Heritage (ICDH) in South Korea. He is the National Coordinator, Experts' Group on Memory of the World (MoW) Programme in India, and a member of a Think Tank on Library and Information Services formed by the Ministry of Culture, Government of India.

He also serves as a member of the Library Advisory Board/Committee of various universities across India.



Dr Irene Seco Serra

Heritage Service Head, Spanish Agency for International Cooperation and Development (AECID)



Dr Irene Seco Serra studied Archaeology in Madrid, Oxford and Rome, obtaining her Ph.D. in 2003. She combined her Mediterranean Archaeology research with Eastern studies.

She is fluent in English, Italian, Arabic and Japanese and has published more than sixty articles and several books on archaeological, historical and ethnographic topics.

She worked as Museum Curator for more than a decade before starting her career in cultural cooperation at the Spanish Agency for International Cooperation and Development (AECID), where she is Head of the Heritage Programme at the Department of Cultural Cooperation and Promotion.

Prof. Sumant Rao

Associate Professor, Industrial Design Centre, Indian Institute of Technology, Mumbai



With 26 years professional experience in animation, special effects and communication design, Sumant Rao's work spans commercials; short and feature films; book design and illustration; besides training, conducting workshops and teaching animation and special effects.

An aerospace engineer, a communications designer and Founder Director of Animagic Special Effects, he is currently a Professor in IDC, Indian Institute of Technology, Mumbai. One of his many areas of interest is making information on India's rich cultural heritage more widely available. 'Revisiting Ajanta' is one such project where he has explored appropriate design interventions for the Ajanta Caves.

He is currently working on the creation of a Virtual Experiential Museum on Ajanta in collaboration with the National Council for Science Museums, Kolkata and the National Museum, Delhi.

Some other notable projects include short and feature films like *Raju* and *I* (National Award for Best Animation Film), *Hey Ram* (National Award for Best Special Effects) and *Eklavya* for which he created the VFX for India's entries for the Oscars.



European Union-Financed Mobility Schemes for Students and Researchers in the Field of Cultural Heritage Conservation

This session will provide information about EU-financed mobility schemes for undergraduates, and young and established researchers in fields related to cultural heritage conservation, who are interested in studying and conducting research in the European Union.

As academic and technological developments take place across universities, specialist institutions and academies across Europe, and indeed the world, it is vital for the knowledge and advances gained within these institutions to be transmitted and applied across the globe, in order to preserve our global cultural heritage.

While significant developments have already been undertaken in this field, the European Union-financed mobility schemes for students and researchers in the field of cultural heritage conservation will seek to enhance the promotion and application of best-practices in the field of cultural conservation, while allowing for the transfer of cutting-edge technologies and know-how to allow local conservators to use their applications in preserving the cultural heritage extant within their own countries.

This panel will hear from practitioners in the field of cross-institutional academic exchange programmes and will discuss some of the most pressing concerns within this field.



Chair and Moderator: Sanjeev Roy

Key Higher Education Expert, European Union Public Diplomacy in India



A UNESCO Fellow and Erasmus Mundus Scholar, Sanjeev Roy is an education management professional with more than two decades of experience in a wide-ranging background within the field of education and training in India and Europe.

For the last four years he is the Key Expert Higher Education for the European Union Public Diplomacy Project in India through Policy and Outreach Partnership. Prior to this, he worked with UNESCO, Hamburg; the Ministry of Human Resource Development, Government of India; the World Bank, the Ministry of Education (iEBC Consultant) in Copenhagen, Denmark; British Council Division, British High Commission in New Delhi; and Boston Consulting Group, London, United Kingdom.

His publications include several articles and book chapters on higher education, quality, ICT in learning and lifelong learning. An English literature graduate from Delhi University, he went on to do his MBA from the University of Derby. He is also an alumni of the World Bank Institute and the Indian Institute of Management, Ahmedabad.

Dr Vidya Vencatesan

I/c Director, Centre for European Studies, University of Mumbai



Prof. Vidya Vencatesan is Director of the Centre for European Studies, University of Mumbai and teaches Masters and PhD programmes in French and francophone literature at the Department of French which she headed between 2009 and 2018. She received her doctorate from Paris-3 la Sorbonne Nouvelle; she has since worked extensively on a comparative study of French and Indian epics and the tradition of storytelling in India and francophone literature from the Indian Ocean.

She has lectured extensively in India and abroad, has won many prestigious fellowships from the French, Canadian and Indian government, and the Maison des Sciences de l'Homme, and has been invited as a visiting professor to teach the Erasmus Mundus Masters programme in Strasbourg, Mulhouse and Bologna. She has been awarded the prestigious Chevalier de l'Ordre des Palmes académiques, le Chevalier des Arts et des Lettres by the Republic of France and La Cavaliere dell'ordine della Stella d'Italia by the Republic of Italy. She is the editor in chief of India's only francophone research journal *Synergies Inde* published by Gerflint. She was the Hon. Secretary of the Asiatic Society of Mumbai from 2007-2009.



Dr Samrat S. Kumar

Country Representative, EURAXESS India – Researchers in Motion



Dr Samrat S. Kumar is the Country Representative of EURAXESS in India, a European Commission initiative, which supports researcher mobility and career development, while enhancing scientific collaboration between Europe and the world.

Dr Kumar holds a PhD in South Asia Studies from the University of Oslo. He is a visiting faculty at the Malaviya Centre for Peace Research (MCPR) at Banaras Hindu University and lecturer at Oslo Metropolitan University's undergraduate course in Peace and Conflict Studies in Nepal. Dr Kumar has published articles, monographs and contributed to edited volumes in the field of peace studies and on cultural heritage.

His forthcoming book "*Vrindavan's Encounter with Modernity: Changing Environment and Life-worlds in an Indian Temple Town*" (2019) is on the impact of modernisation processes and socio-environmental challenges in Indian temple towns.

Dr Kumar has been involved in a number of collaborative research and educational projects between European and Indian institutions.

Prof. Vijay S. Khare

Director, International Centre, Savitribai Phule Pune University



Prof. (Dr) Vijay Khare is Dean, Faculty of Humanities; Director, International Centre; Professor and Head, Department of Defence and Strategic Studies, Yashwantrao Chavan National Centre of International Security and Defence Analysis (YC-NISDA), Savitribai Phule Pune University.

He is a recipient of the prestigious Fulbright Fellowship, USA, awarded in 2017, as well as an Erasmus Fellow. Dr Khare's areas of expertise are international relations, national security, non-traditional security, terrorism and counter-terrorism, peace and conflict resolution, human rights and internationalization of higher education.

Presently, Prof. Khare is coordinating two capacity building higher education projects funded by the European Union namely, Social Innovation for Local Indian and Israeli Communities and Graduate Entrepreneurs (SILICE) in coordination with 5 Israeli universities, four European partners and four Indian partners; and the Tuning India project, coordinated by the University of Duesto, Spain and other Indian institutions.

Earlier, he successfully completed European Union projects such as Erasmus Mundus (EXPERTS4ASIA, Experts Sustain, EMINTE, EUPHRATES, Euro Culture, among others) and Erasmus + projects.

He has also been instrumental in setting up a Joint Centre for Collaborative Engagements at SPPU with Pennsylvania State University, USA.



**CONTRIBUTIONS FROM
PARTICIPANTS**



Preserving Cultural Heritage Drives Socio-Economic Development

Eric Falt

Over the last two decades, there has been a growing recognition of the links between sustainable development and the conservation of cultural heritage. Indeed, culture is intrinsic to development, drives development, and is impacted by broader development processes.

Today, UNESCO's World Heritage sites number 1,092 around the world. They represent monuments and natural sites of 'outstanding universal value' and are recognized as beacons of cultural heritage for the whole of humanity. Every year they receive millions of visitors, resulting in substantial economic gains for the communities where they are located. Typically, the presence of cultural sites and related ancillary services tends to catalyse tourism, attract investment, and sustain livelihoods.

India currently has 37 magnificent World Heritage Sites – a number that we are certain will grow in the years ahead. Additionally, another 44 Indian sites presently feature on UNESCO's Tentative List of World Heritage. Each of these sites is a potential hub for economic activity. While tourism offers the most obvious source of revenue, the development of urban infrastructure and the revitalization of art forms around these heritage zones helps build thriving local economies.

Mahesh Sharma, the Indian Minister of Culture had drawn attention to this trend when Mumbai's Victorian Gothic and Art Deco Ensembles were inscribed as a UNESCO World Heritage Site in June 2018. As he had said at the time, international recognition would 'boost the local economy', 'give a tremendous fillip to domestic and international tourism', and lead to 'increased employment generation, creation of world-class infrastructure, and augmentation of the sale of local handicrafts'.

Across India, efforts are being made to leverage heritage sites in order to promote tourism. For instance, in 2018 the State Government of Uttar Pradesh announced its plans to develop Fatehpur Sikri into a premier tourist destination, and revealed some of the financial allotments made and the groundwork that had already been done. Difficult as it is to believe however, in spite of these initiatives India attracted only 15 million international tourists in 2018. This was about the same number of tourists that visited Singapore, and was far below the mark of 87 million tourists to France, the world's most visited country last year. Clearly, much more can be done to harness the enormous potential of tourism in India, and to better market the country's countless cultural attractions.

The promotion of tourism and associated economic activity, however, must be sensitively undertaken. Heritage sites and their surroundings should not be damaged by excessive tourist traffic, the uncontrolled mushrooming of local enterprises, and the effects of pollution, as is reportedly happening to monuments like the Taj Mahal. As Target 12.b of the Sustainable Development Goals points out, we must 'develop and implement tools to monitor sustainable development impacts for sustainable tourism that creates jobs and promotes local culture and products'.

A large number of Indian towns and cities are prosperous economic centres today partly because they are endowed with a wealth of cultural assets that include not just historical sites and living built heritage, but also an abundance



of intangible cultural heritage such as art forms, crafts, festivals, and musical and culinary traditions. This vibrant cultural mix usually derives from the identities and livelihoods of local communities, and breathes vitality into urban locales.

UNESCO's Creative Cities Network is an initiative that helps cities place intangible heritage at the heart of their development plans. In India, thus far Jaipur, Varanasi and Chennai have been designated as Creative Cities by UNESCO because of the central role played by art, crafts and music in local development. Jaipur's centuries-old legacy of crafts and folk art currently employs over 175,000 people, and has generated a dynamic ecosystem of heritage festivals and tourism. In Varanasi and Chennai, historic musical traditions have given birth to flourishing music industries and networks of music festivals and academies.

Strategic efforts to promote intangible cultural heritage could directly empower women and other disadvantaged groups. For instance, UNESCO's state-level partnership with the Government of West Bengal and the NGO Banglanatak has had an outstanding socio-economic impact on the livelihoods of crafts workers, drawing women, youth and underprivileged communities to the sector in unprecedented numbers. The 'Arts for Life' project has established a competitive handicrafts sector in West Bengal by helping develop rural craft hubs, enhancing productivity and building sustainable market linkages. With average monthly incomes of craftspersons in the state almost trebling, and the emergence of a new class of rural entrepreneurs, 'Arts for Life' is a model of how economic returns from intangible heritage can be optimized.

UNESCO believes that helping preserve a sense of 'place' with a distinct social and cultural identity is fundamental to communities' well-being and growth. In the aftermath of the devastating Kerala floods of 2018, for example, UNESCO undertook a post-disaster needs assessment in the state and recommended to the State Government of Kerala the use of traditional building material for the reconstruction of indigenous housing. The integration of these building techniques into a post-disaster reconstruction strategy is likely to help preserve the uniqueness and authenticity of local heritage. Moreover, owing to the labour-intensive nature of these building methods, it is expected that larger numbers of community members will benefit from specialised longer-term livelihood opportunities. Finally, the potential contribution of the exercise to intangible factors such as local pride in upholding local traditions is too significant to be overlooked.

At UNESCO, we firmly believe that cultural heritage must be protected if local development is to be effectively achieved. We are delighted that this premise also underlies the EU-India Partnership for Cultural Heritage Conservation, and its interventions in the areas of cultural heritage management and the promotion of folk arts and culture.

Several excellent international conventions and frameworks are in place today to remind us of the value of cultural heritage, and to guide us as we undertake to preserve it. Stronger cooperation between individuals, institutions and Governments would go a long way towards ensuring that our collective efforts to promote development through cultural conservation bear fruit. As Goal 11 and Target 11.b of the Sustainable Development Goals urge us, let us work together to build 'sustainable cities and communities' and to 'protect and safeguard the world's natural and cultural heritage'.

Eric Falt is the Director and UNESCO Representative to Bhutan, India, Maldives and Sri Lanka





The next candidate for UNESCO World Heritage status is the Pink City of Jaipur, which has been spruced up considerably in the last few months in anticipation of the vote of the World Heritage Committee in June 2019. One can expect significant economic benefits if Jaipur is designated as a World Heritage Site. It is estimated that the number of visitors to any newly designated UNESCO site jumps by 40 per cent within one year, with a corresponding positive economic impact on local communities.



UNESCO's 'Arts for Life' project in West Bengal has drawn unprecedented numbers of women to the crafts sector, transforming them into rural entrepreneurs.



The Cultural Heritage and Management Venture Lab in Ahmedabad, India

Casa de la India Foundation with the Municipalities of Valladolid (Spain) and Ahmedabad (India), University of Valladolid and Ahmedabad University

Juan-Manuel Guimeráns

The Cultural Heritage and Management Venture Lab in Ahmedabad, India, is a project funded by the EuropeAid programme: 'Investing in People. Supporting culture as a vector of democracy and economic growth'.

Introduction: the European Background

Cultural heritage is, of course, culture, yet must be much more than tangible or intangible shared culture, and recent experience in many European countries has shown this to be true. Cultural heritage appeals to many more aspects than just architecture, restoration, preservation, archaeology. It appeals to people, to the environment, to public services, to quality of living, and, of course, to wealth - and when talking about wealth, management is the answer.

The project we have been working on for more than four years, in the City of Ahmedabad (Gujarat-India) with the participation of hundreds of experts, common people, artisans, university scholars, politicians and municipality civil service members, started further away, in Europe, after the experience of a very small (in Indian standards) Spanish City, called Valladolid, following the works pursued by a group of European based experts in heritage.

As European based experts, the framework has been obviously that of the European Union (EU), an international institution that makes cooperation possible among (the current) 28 countries with really diverse realities (in terms of language, religion, cultural background, even economic framework). In our opinion, one of the main drivers of EU policy success is the ability to establish a common legal framework applicable throughout the continent at the highest level; a legal framework based on several key principles (notoriously cooperation, but also balance, knowledge, relevance) rather than compulsory strict regulations (the field of national law) which explains why public policies, in this case in the sector of promoting common cultural heritage, have been implemented quite quickly and even in such different environments and traditions.

Culture has thus become a key sector in the Europe 2020 Strategy, the document that has set out the roadmap for EU development in recent years, particularly in the field of smart cities. The document highlights the valued socio-economic components of culture and cultural heritage-conscious communities that make this sector one of the most valued and profitable for any society, nation or local community:

- It promotes social cohesion by enhancing innovation and creativity at all social strata;
- It improves the average level of education;
- It affects the improvement of well-being and health standards;
- It backs up sustainable economic growth;
- It generates wider intra and extra community communication and interaction;
- It leads to better social behaviour.



Yet, European experience has also shown that positioning culture and cultural heritage in the centre of public priorities is by no means an easy goal, and is a long and complex path. In line with recent historical developments, there are four stages which any place in the world that aims to tread this path must follow, and which are probably applicable the world over:

- 1945. By the end of WW II, everything had to be done in almost every field, especially in cultural heritage;
- 1950s-60s. Straightforward economic approach to the value of culture/cultural heritage;
- 1980-90s. Awareness of real value and of mistakes made;
- Early 21st century. Cultural heritage as a driver for innovation.

The path might be impossible to avoid, but the main value of taking this way is always to learn from every step taken, and in this sense, the lessons learnt after this process (and its mistakes) have been:

- Working fast should not mean low quality or loss of value;
- Democracy is not only a theoretical political system, and should be applied to the development of public policies, especially in the field of culture. Without people, it is not possible;
- Finance is important, but money can be the origin of disasters (the pressure of EU funding policy impacts on the proper development of large scale projects);
- Partnerships and understanding people's reality is everything.

Following the previously presented brief analysis, cities all over Europe have been involved in a process of applying networking answers to the new challenges that have arisen in the field of cultural management. Among them, the city where this project was initially born, Valladolid, has taken on an active role in the networking answer to the global challenge (aware that its own cultural development depends also on the balanced development of people thousands of miles away) with a special view in India.

Casa de la India (The House of India) Foundation, an institution created in Valladolid back in the beginning of the 21st century, is a specialized actor in Indo-Spanish cultural relations, project design, management, and implementation, specifically created for this purpose in 2003 by the University of Valladolid, the City Council of Valladolid and the Government of India through its Embassy in Spain and Indian Council for Cultural Relations.

Casa de la India lies at the heart of this Culture Heritage and Management Venture Lab Project. And it is a perfect example of the awareness of the importance for a medium size city in Spain of being active in a globalised world. Valladolid is convinced that networking among different and distant communities who face the same challenges is the only way to safeguard the preservation of what makes us special, our cultural heritage, raising awareness among the local population of its value with every visit we receive, with every project we become involved in with our partners all over Europe and around the world. There are many other examples of this policy and approach, the most important being the CreArt network of cities for artistic creation that has given young local creators the chance to stay in our city without losing the connection with the best and most vibrant cultural centres in Europe.

We put all this experience and passion in developing a project in India, and we were so lucky to find Ahmedabad, where we have learnt far more than anyone else in this adventure.



The Cultural Heritage and Management Venture Lab in Ahmedabad Project in Brief

The project we have been developing with our friends in Ahmedabad for more than four years till now is an international cultural cooperation project funded by the EuropeAid programme “*Investing in People. Supporting culture as a vector of democracy and economic growth*’. It has been coordinated by Casa de la India Foundation (Spain), acting as main partners the Municipalities of Valladolid (Spain) and Ahmedabad (India), and both local Universities.

The project aims to detect, raise awareness of, promote and support the local heritage based ecosystem to make culture the driver for social and economic development, and has been part of the wave of local strength driving Ahmedabad to achieve the first all Indian recognition as UNESCO World Heritage List city.

The project is being one of its kind in this cultural sector - acting as a vector for economic change and aiming at influencing the policy-making process by facilitating necessary legislations to enable innovative ways of sustaining cultural practices and of “selling” them in the competitive market. The project has helped bringing a broader appreciation of heritage related resources that are already present within the city and the state, and thus triggered the active participation in heritage management from the Municipal and State authorities, policy makers, local leaders, NGOs, community groups, educational institutions as well as businesses.

To achieve its general goal, two tools have been developed with the help of experts from Valladolid and the rest of Spain, and the effort of Ahmedabad people and institutions. First, the *Ahmedabad Venture Lab*, an innovative programme hosted by the University of Ahmedabad and implemented with its project partners, which combines training and master class sessions with business consulting advice for new and talented business ideas in the cultural sector. The aim of the Venture Lab is to help new heritage based companies to start and grow. It was implemented during 2015-2016. Nowadays it continues its duty of forming new entrepreneurs and creating new cultural companies.

Second, the *Ahmedabad Cultural Heritage Cluster*, a professional platform for the promotion and development of culture Industries and heritage related business. It is formed by 50 local entities among public administration, professional companies, research and Universities, NGOs working together with common objectives:

- Development of new projects, products and services around Heritage and Culture;
- Provision of technical advice on common areas of interest (marketing and promotion strategies, quality, technology, logistics, etc.);
- Facilitating access to professional markets worldwide;
- Influencing specific policies or policymakers around key aspects related to cultural and heritage activities;
- Attracting new companies, investors and talented people to cultural business sector.



Why Ahmedabad

The soul of India lies in its ancient culture and heritage. It is the responsibility of every generation to ensure that the ingenuity and spirit of human skills, art and creativity are not lost to future generations. Culture and heritage includes a rich legacy with an astonishingly diverse range of monuments and buildings, community spaces, arts and crafts, traditional dance and music, folklore, cuisine, textiles, lifestyles, etc.

Ahmedabad city, besides economic predominance, possesses enormous built up heritage resources. There are 57 protected monuments in the city as per the Central as well as State Government list and a large number of traditional wooden pol houses, of which about 10,000 survive even now. Combining its economic strength with its wealth of cultural heritage, Ahmedabad has an enormous potential to offer. We were (and still are) convinced that great opportunities may arise if we strengthen the capacities of its cultural actors for the development of a dynamic cultural and architectural sector contributing to preserve heritage and earn profit by creation of job opportunities and adding economic value to heritage and cultural assets.

Training Programmes and Platform

The project “Cultural Heritage and Management Venture Lab in Ahmedabad, India” has been working along these lines over a period of 33 months. This joint project involves the following institutions and entities: Casa de la India as project coordinator, the University of Valladolid; Valladolid City Council; Ahmedabad University and Ahmedabad Municipal Corporation as project partners, and the EVoCH Platform and ARandPA Biennale-Fair; Urban Management Centre; City Heritage Centre and CEARCAL – Regional Handicraft Centre, as associate partners.

During these programmes, leading Spanish and Indian experts, scholars and professionals have presented relevant case studies on how cultural heritage, nurtured by citizens over hundreds of years, can successfully become a resource for economic growth by creating new models for culture and heritage-related businesses applying innovative technologies coupled with effective and sustainable management practices that are sensitive to the traditions and history of their respective cities whilst at the same time playing a pivotal role in the context of modern smart cities development. Ahmedabad Cultural Heritage Cluster (ACHC), a registered public trust or society, has become a professional platform for the mentoring, promotion and development of cultural and heritage industries in the city of Ahmedabad supported by active stakeholders, institutions and businesses. Local talent, students, graduates and young entrepreneurs will find a useful platform in the Ahmedabad Heritage Venture Lab (AHVL), which was inaugurated as part of the project at Ahmedabad University as an innovative space to foster and mentor innovative and economically sustainable ventures in the heritage sector and to serve as a model to continue disseminating and replicating this proposal in other states and cities of India.

Among the key innovative strategies to emerge in this pioneering project is the need to elaborate on the concept of smart heritage as an important vector for economic and tourism growth, and the added value of creating networks of smart heritage cities to boost multiple collaborations and share best practices as a proven methodology to implement new initiatives in a sustainable manner and benefit from past experiences.



Conclusions

After being involved in cultural cooperation projects with India, and specially with Ahmedabad, we feel that we always get much more than we give. This is the magic of collaborating, the fact that the final figure is always bigger than the simple addition of the factors involved.

The Cultural Heritage and Management Venture Lab in Ahmedabad, is a perfect example of this feeling. Not only has it had an impact on the life of hundreds of people in Ahmedabad, future drivers of a radical change in the approach to the management of cultural heritage and its value as a driver for social and economic development in India, but it has also meant a complete change in the life of the European experts involved in it, whether working on site in Ahmedabad hand in hand with our Indian colleagues, or from thousands of miles away, preparing materials and sharing experiences through the internet or in the several events that have arisen along the project.

There is no experience like getting into the soul of India, and the soul of India is in its people and heritage. We have been lucky enough to have been invited to taste it, and will be grateful forever.



Lost Gardens of Khajuraho

Nishant Upadhyay

“The attempt to derive meaning from landscapes possesses overwhelming virtue. It keeps us constantly alert to the world around us, demanding that we pay attention not just to some of the things around us but to all of them—the whole visible world in all of its rich, glorious, messy, confusing, ugly, and beautiful complexity.”

- Pierce Fee Lewis in *Common Landscapes as Historic Documents*, 1993



Ranibagh (Queen's Garden), Rajnagar. Photo: Nishant Upadhyay

India presently faces the onset of rapid development and change in every part of the country. Although the current GDP of 7.9% (Trading Economics 2016) shows positive trends, it's often based on standards and indicators which focus very heavily on only the economic output of the country as per the neo-classical model of Economics (Czech 2010). The indicators tend to ignore the significance of the cultural, social and natural capital in the development of the country. This article brings out the role of the conservation of cultural landscape in sustainable development following the standard definition by UNESCO where culture should be regarded as the *set of distinctive spiritual, material, intellectual and emotional features of society or a social group, and that it encompasses, in addition to art and literature, lifestyles, ways of living together, value systems, traditions and beliefs* (UNESCO 2001) via a case study of royal produce gardens of Rajnagar. Historically as well at present with 68.84% of the total population of the country being rural (Census of India 2011), the idea of culture in India draws heavily from rural agriculture. These agricultural related activities are major factors in the transformation of Indian landscapes, blurring the boundaries between agriculture, culture and sustainable development.

Since the early settlements, India had innumerable and regionally very diverse agricultural and farming traditions, many of them already lost to time (Shiva 2000). All these traditions and techniques very organically deal with region-specific needs in terms of climate and environment. But in the current rapid urbanization and population pressure, government and industry policies alike tend to overlook and even endanger this traditional wisdom, sorting to extreme and technology based agriculture which comes with a heavy price on environment (Shiva and Holla Bhar 2001). A possible strategy to counter this scenario is to exploit this inherent community wisdom and resilience to pave the way for long term sustainable development. This article presents how the conservation project of the historical royal produce gardens found all across the region of Bundelkhand attempted to tap into local agricultural practices and wisdom to create centres of organic agriculture and biodiversity excellence.

A recent study by Europa Nostra brings out the role of heritage in sustainable development using a unique 'Upstream Four Pillar' approach for looking at heritage's role in development. In this model, instead of breaking down heritage into various components, the four pillars of sustainability, namely Environmental, Social, Cultural and Economic, combine to form the aspects of cultural heritage (CHCFE Consortium; Europa Nostra 2015). This



approach provided a framework for critically appreciating the conservation process of the royal Bundeli garden in Central India. The fourth pillar, namely economy, was dealt with on the principles of Ecological Economics which defines the role of natural capital in the 'demand-supply' approach of neo-classical economics and lays stress on integrated resource management and planning (Czech 2010). Both architectural and social research were made for the heritage sites. Pattern of transformation of the heritage site was analyzed by mapping built and open spaces, vegetation, infrastructure and sacred spaces at garden level. Also social structure of the settlements and the religious rituals and festivities involving the garden complexes were spatially recorded. This data was recorded through drawings and photographs and was consequently related to socio-economic variables. This article includes the comparison of the past state of gardens and the present state, with reflections upon future development. This comparison was based upon oral interviews with key stakeholders in Rajnagar, on site documentation and the analysis of literature published by the conservation agency over the course of the project.

For this article, sustainable development is understood as development that meets the needs of the present without compromising the ability of future generations to meet their own needs (Brundtland 1987; Ward 1973). Thus, sustainable landscape development would refer to a positive change or improvement of a relatively larger region with similar stakeholders or characteristics, meeting their needs while still retaining the abilities to cater to future generations' needs.

Indian Landscape History and the Case Study: Royal Bundeli Gardens

India has a long tradition of nature appreciation and landscaping (Shiva 2000). The *vedic* traditions since 1000 BC followed a bipartite system to ascribe rules and treaties namely *Vastu* (material thing) and *Agama* (spirit) which are complementary and at times even overlap each other to maintain and upkeep landscapes and buildings. These texts also emphasize the cyclic nature of being and material temporality, which is very well ingrained within the Indian context and society. The text of *Mayamatam* mentions incorporating gardens in town planning at various levels. It clearly tells the importance of having open green spaces full of plants and trees where one can have either meditative or leisure purposes (Mayamuni 11th CE).

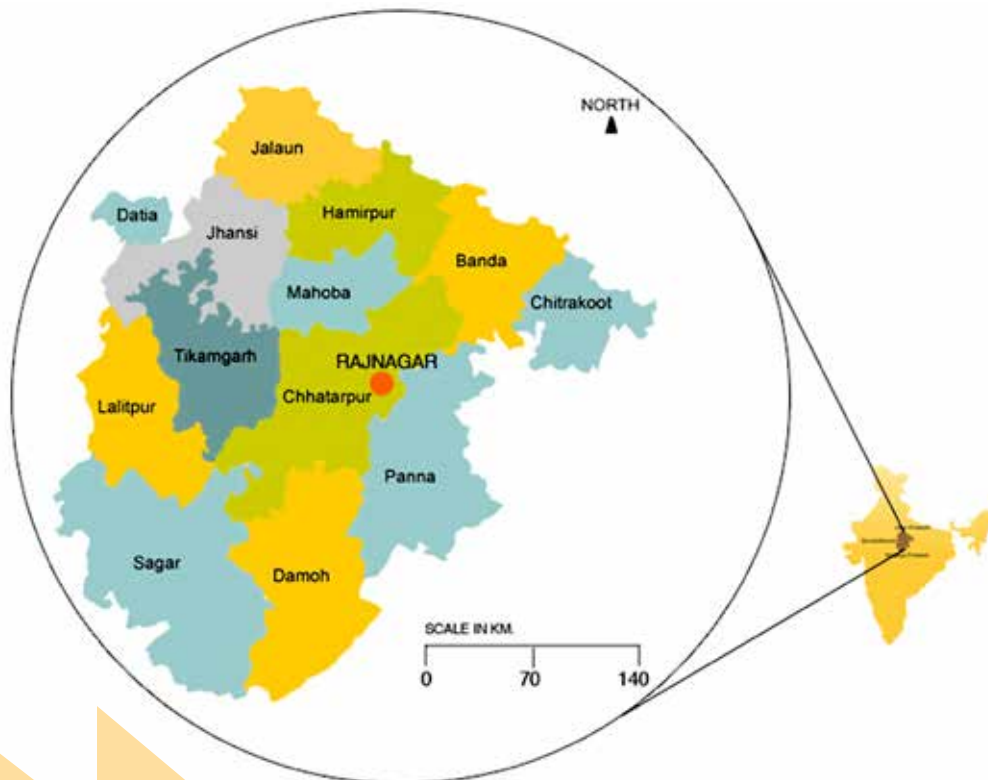
Apart from the ancient and medieval Hindu texts like *ArthaShastra*, *Mayamatam* and *Manasara*, garden architecture in India has been well portrayed in the miniature paintings done under Rajput and Mughal patronages. The Persian garden traditions from Mughal and Rajput garden architecture evolved to new heights in India from the 15th to the 17th centuries. The miniature paintings and Mughal memoirs depict how many activities were happening in the garden and the pavilions within them. Owing to long summers in most parts of India, garden spaces were primary places for social interactions, official meetings, leisure activities, music, celebrations and even important ceremonies like marriages and coronation of kings (Bhagwat 1993).

With the idea of having open spaces came the idea of having pavilions, temples, mausoleums and outhouses (*kothi*) to enjoy those open spaces. Gardens often served as a retreat from the indoor spaces to connect with nature. These enclosed and well-designed green spaces allowed privacy, which was much prized by the royal families in those times; more over, the walled setting also ensured safety from enemies and animals in contrast to



the experience in the open woods around the region. These gardens often served as centres of bio diversity and agricultural excellence.

In the region of Bundelkhand a series of walled gardens of a similar type can be seen all across the region. The historical region of Bundelkhand lies in the centre of India. Present Bundelkhand region comprises 14 districts from two states of India (seven districts of southern Uttar Pradesh and six districts of northern Madhya Pradesh). The Bundelkhand region within these boundaries has an area of around 70,000 sq km with a population of 15.5 million (Census Organization of India 2015). Within the Chhatarpur District of Bundelkhand in Central India lies the town of Rajnagar, the administrative centre of that part of the District, and a twin town to Khajuraho, famous for its UNESCO World Heritage listed medieval stone temples (UNESCO 2016). In 1998 a report was compiled by the government of Madhya Pradesh as a Conservation and sustainable development strategy for Khajuraho region which outlined a geographical region. This special region also includes the town of Rajnagar which houses these remarkable produce gardens (the Khajuraho Planning Team 1998).



Location of Bundelkhand in India and location of Rajnagar along with the districts of Bundelkhand. Based on the data from www.bundelkhandinfo.org.in

Rajnagar town is now governed under the Chhatarpur District as a *Nagar Panchayat* (subdivision of district). The population of the Rajnagar Nagar Panchayat is 14,253 (Census Organization of India 2015). These royal gardens in Rajnagar all share the same features: they are walled, with a small Shiva temple, an outhouse (*kothi*), cremation platforms (*samadhi*), several wells (some are stepwells), irrigation channels and areas ranging within 3 to 6 acres. In Bundelkhand similar gardens can be seen all across the region.



In the year 1998, the gardens at Rajnagar were listed in the 'Inventory of Cultural Components of the World Heritage Zone Khajuraho' (The Khajuraho Planning Team 1998), that was compiled by INTACH for Directorate of Archaeology, Archives and Museums, Government of Madhya Pradesh, as part of the research for the 1998 report (Sikka 1998). Eleven gardens from the 18th century are listed in this report. Other than the listing, four more gardens could be identified, eg. the garden complex of Radha Madhav temple also has similar features as that of the listed gardens. Thus the extended list of gardens indicate the existence of at least 15 gardens in Rajnagar.

The history of these gardens is largely unknown, as is the reason for such an incredible concentration around the historical urban centres in Bundelkhand, for example there are 15 such gardens just within Rajnagar. These gardens were created by the royal family of Chhatarpur in the second half of the 18th century / beginning of the 19th century as produce gardens for vegetables, flowers and fruit. The hypothesis for Rajnagar is that every garden is connected with an heir prince, who would – after having reigned as king – have been cremated in his garden, as might have been the case with his close relatives (Babbar and Robberechts 2007).



3D model based on documentation of Ranibagh. Photo: V. Acsinte and Nishant Upadhyay

These gardens were no permanent living quarters, but the king and his family would stay in tents pitched in the gardens whenever they travelled through the region or came to assist the religious festivals in Khajuraho. The outhouse (*kothi*) would have been the storage room for the tents and other household gear. In other words, the gardens were a kind of royal caravanserai. The region's water needs were met with artificial lakes and ponds. It is often around these ponds that the royal gardens were constructed. The gardens of Bundelkhand not only provided a place for leisure but also were centres for agriculture and irrigation. The built heritage which remains in these gardens, and includes stepwells and irrigations channels, shows the rich legacy of the evolved methods for agriculture in the otherwise drought prone area. Allegedly, after Indian independence (1947), the larger number of gardens came into private hands, as gifts from the royal family (Upadhyay and Sharma, 2017).





Tiwari ka Bagh. Photo: Nishant Upadhyay

These gardens along with their irrigation and agricultural methods formed a unique micro self-sustainable ecosystem in the region which now face the rapid process of urbanization as a threat to their existence. It was not till the release of the 1998 report about Khajuraho region that the gardens were acknowledged as historical landscapes and not just another farmer's field in the region. Bundelkhand, being a region covered with forests, was initially governed by agriculture which evolved into a form of agroforestry. With the initiation of state into the industrialization era during colonial times, many trees were cut down without any planned replacements. This depletion of trees and increasing population pressure lead to changes in traditional farming techniques in the drought prone region. This change in farming techniques and over-exploitation of wells led to the depletion of the water table in the surrounding area.

Conservation and Management

The Belgian Chapter of the Indian National Trust for Art and Cultural Heritage (INTACH Belgium) has been actively doing work in restoring the royal gardens in Rajnagar/Khajuraho of the Bundelkhand region in India under the project name of 'The Lost Gardens of Khajuraho'. The work so far has been executed on the basis of historical information found via channels like local agencies, interviews with the royal families, users of the gardens, available archival resources and on site surveys.

The conservation project started in 2003 when a Belgian art historian, Mr. Geert Robberechts went to visit Khajuraho, famous for its medieval temples. Realizing the immense potential and yet the lack of tourist



infrastructure and management for the royal Bundeli gardens, he contacted the local authorities to work on a proposal for a tourism management plan. An overseas chapter of the Indian National Trust for Art and Cultural Heritage (INTACH) was set up in Belgium to fund the conservation project of these gardens. INTACH was registered in 1984 as a society with the support of the Government of India. The Trust soon gained national importance acting as consultant to government bodies in the protection of heritage and culture of India. INTACH has pioneered the conservation and protection of India's natural and cultural heritage and is today the largest membership organization in the country dedicated to conservation with local chapters all over the country (mostly in urban settings). INTACH endeavors to contribute to restoration of monuments and their management; advocate for heritage property conservation; raise public awareness through heritage walks; establish heritage clubs in schools; and hold awareness workshops for teachers of schools and colleges and heritage walks to various unprotected sites (Menon 2009).

The main challenges faced by INTACH Belgium chapter at the start of the project were to form a sustainable tourism management plan which includes these gardens as part of the route proposed for tourists coming to see the world heritage temples in Khajuraho. The lack of archival data and published material on the gardens made the conservation more difficult. But the major challenge faced by the organization was the lack of awareness about these heritage structures and the significance of organic farming (Robberechts 2016). The lack of information about the gardens and their history is still a challenge and being investigated. The prime reason for the lack of archival information is the intentional destruction of royal records as part of the Indian independence movement when both the colonial British power and the Indian monarchy were overthrown in 1947. Allegedly volumes of royal records from Chhatarpur and Rajnagar were burnt after India attained independence as a statement to mark the end of monarchy and beginning of democracy in a free nation (Natiraja 2016). Thus, results from oral interviews and discussions with the royal family were used with a micro history approach to recreate the cultural landscape and then address conservation issues. For example, only on repetitive information about the mango trees and agroforestry in oral surveys, an attempt was made to replant local variety of mango (eg. *mangifera indica*) trees along with local vegetables in the gardens undertaken.

One of the key objectives of the conservation project is to reintroduce traditional agriculture methods and organic farming via these gardens. The gardens were foreseen as training centres for sustainable farming practices. For this purpose, a collaboration for expertise was setup with Navdanya. Navdanya is an organization for Indian organic farming movement active in 18 states of the country (Navdanya 2015). Since the gardens were privately owned, a formal agreement was signed with the owners of two of these gardens, namely Ranibagh and Pateriya ka Bagh, which allowed INTACH to monitor and direct the development of the two gardens. These two gardens were intended to be test cases. It was expected that they will become an example for the rest in due course of time and will encourage other owners of the royal gardens to ratify the agreement with INTACH. This awareness campaign for organic farming and local capacity building was carried out by establishing a local chapter of INTACH which coordinated various training programs for the farmers in the town of Rajnagar within these historical gardens in collaboration with Navdanya. The local chapter helped build faith in capacity building and encourage community participation in the project. INTACH in collaboration with Navdanya started regular training programs for the local



farmers in organic farming. Currently, organic farming and training is being furthered by Gandhi Ashram, Chhatarpur who hold discussion sessions for local seed variety conservation with local farmers. Till date, a crop rotation schedule is planned for the two gardens undertaken with a dynamic conservation approach. A community seed bank was setup where farmers would deposit and loan seeds of local varieties when needed.



Heritage Education in Rani Bagh. Photo: Tanja Willekens

On the social front, educational tours for children from local schools and awareness campaigns about the historical and agricultural values of these gardens are organized regularly in town. Cultural rehabilitation was also undertaken by doing a series of repair works for the gardens which included soft cleaning, removal of plant growth, to full scale renovation of the *kothi* in Ranibagh. The Shiva statue was reinstated in Ranibagh which brought back a lot of people to the garden for their morning and evening prayers. Bundeli music concerts are organized regularly in the gardens to engage the community and to support local music traditions as it must have been organized in the 18th century during the royal stay in these gardens. These concerts are followed by dinner of local Bundeli food made from the harvest of these gardens for culinary practice protection. On the economic front, the gardens undertaken by the project produced organic harvest which was used by the farmers and their families. The long term project also provided food and livelihood security to six families of the workers who are constantly engaged in the project.



Challenges Ahead and Conclusions

The project overall has yielded very optimistic results on various fronts. But still the immediate economic profit gained by building over these gardens and no level of protection from the heritage authorities, has led three of the gardens to be irreversibly changed. To counter the urbanization process which includes private owners building shops, gas stations, marriage halls etc. within the gardens, and to provide long term sustainability to these landscapes, the project envisages to make these historical gardens a part of sustainable rural tourism. This tourism track is foreseen as an extension of the existing popular tourist trail of local, national and international tourists coming for the UNESCO listed temples in Khajuraho. The pertinent lack of rains has also affected the project negatively, thus, the drip irrigation methods and their efficiencies are being explored into. The impact of the project on society is obvious though the lack of awareness about the long terms benefits of organic farming and traditions poses a big challenge to justify the project outputs especially since the output has not been evaluated on the basis of pure monetary gains. The project incubates a huge potential and if implemented on a large scale on the series of such gardens all across Bundelkhand can be foreseen to yield remarkable results and understanding among the local population and pave way towards sustainable development of the regions.

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Glossary

Baoli/ Bowree – Stepwell.

Kothi – The outhouse or the pavilion in the garden used for storing agricultural tools and storing tents for camping, historically.

Samadhi – Memorial platform made for deceased member of the royal family.

Nagar Panchayat- Subdivision of district.

Abbreviations used

ICOMOS – International Council for Monuments and Sites.

INTACH- Indian National trust for Art and Cultural Heritage.

MP- Madhya Pradesh.

UNESCO – United Nations Educational, Scientific and Cultural Organization.



Together for Cultural Heritage: Indo-Austrian Cooperation

Dr Tatjana Bayerová

Over the last decade, the Institute of Conservation at the University of Applied Arts Vienna has established a vivid cooperation with several Indian institutions dealing with the preservation, conservation and restoration of cultural heritage. 2019 marks ten years of collaboration between the Institute of Conservation and its 'eldest' Indian partner – the National Museum Institute of History of Art, Conservation and Museology in New Delhi. On this occasion it is time to recapitulate what was achieved over the past ten years and what can be improved for the future.

The Institute of Conservation at the University of Applied Arts Vienna (hereafter 'the Institute') led by Prof. Dr Gabriela Krist is a highly-regarded institution for education of conservators-restorers in the preservation of cultural heritage. The training programme takes the form of a five-years' diploma study with the possibility of a subsequent PhD study. The training is offered in four fields of specialisation: conservation and restoration of stone, panel paintings, objects or textiles. The Institute works in close cooperation with various local and international organisations focusing on the care and preservation of cultural heritage, and maintains close contact with many national and international institutes and universities offering education in the same field as well as with a large number of research centres, conservation science laboratories, galleries and museums. In addition, the Institute has also undertaken a number of conservation projects worldwide, e.g. in India, Mongolia, Nepal. In December 2018 the Institute was awarded a 'UNESCO Chair on Conservation and Preservation of Tangible Cultural Heritage'.

The National Museum Institute of the History of Art, Conservation and Museology (hereafter 'NMIHACM') in New Delhi is one of the leading centres in the country for training and research in the field of art and cultural heritage and is the only one in India that offers a full two years MA programme and subsequent PhD in conservation of cultural heritage. The course is theoretically sound, but quite limited in respect of practical conservation training and state-of-art conservation research. This is due to the unavailability of necessary facilities and relatively short history of conservation practice in comparison to Europe. Thus, the collaboration between the Institute and NMIHACM has been beneficial in bridging this gap.

The cooperation between the Institute and Prof. Dr M. Veludhyan Nair, the former head of the Conservation Department of NMIHACM, started during the research and conservation project of the Institute at Nako in Western Himalayas, North India in 2004. It became intensified in 2009 and formally legalized by the signature of a Memorandum of Understanding (hereafter MoU) between both institutions. Moreover, in 2016 an MoU on governmental level in the field of art and preservation and conservation of cultural heritage was signed between the Austrian and Indian governments.

During the last ten years, several workshops at NMIHACM and Summer Schools in Vienna were organised and many Indian PhD students have had the possibility to perform research in Vienna. The Institute's first workshop in NMIHACM was held in 2009 on the topic, 'How to care for textile collections: methods and practical



approaches'. The event was enthusiastically joined by students, researchers and practising conservators from across India. The practical knowledge imparted in the workshop was unique, since this was one of the rare opportunities that theoretical knowledge obtained from books could be learnt by hands-on training. Similarly successful and enthusiastically attended were the five following conservation training workshops (2010-2016) on 'Preventive care of metals in collections', 'Investigation and analysis of paintings', 'Painting materials – theory and practise', 'Historic textiles in museums' and 'Structural conservation of canvas paintings'. The workshops are an important tool for training on specific topics in the form of intensive courses. They consist of individual lessons divided into theoretical parts and practical exercises, and, if possible, the study of original art objects is also integrated into the programme. The workshops are supervised by members of the Institute and supported by external lecturers from different Indian Institutions. The Austrian Cultural Forum, the Austrian Embassy in India, and Eurasia-Pacific Uninet¹ (EPU) provided financial support to these training programmes.

From 2014 to 2017, four International Summer Schools took place at the Institute in Vienna. The programme aimed at fostering knowledge transfer and mutual learning in the field of conservation and focused on hands-on conservation in a full-time intensive course. Each year a group of students and teaching staff from different international partner institutions came to Vienna to participate. The duration varied throughout the years from two to four weeks in summer. During these events, the Institute hosted altogether five staff members and 39 students from all three NMIHACM departments (Conservation, Museology, History of Art). The Summer Schools were funded at first by EPU and the University of Applied Arts Vienna, and later by the resources of the IMPULSE programme of the Austrian Agency for International Cooperation, Education and Research.

Since 2011, there have been eight PhD internships for NMIHACM students facilitated with the financial support of EPU, the OEAD Austrian Agency for International Cooperation, Education and Research and Ernst Mach Grant by means of this collaboration. The theoretical methodology of practice linked with investigative studies is first introduced to each intern, then, depending upon the area of interest, they develop the understanding of the Austrian approach to conservation and learn practical skills twice a week. Other days are devoted to carrying out the research work on their PhD topic. As all of the Institutes' laboratories are technically equipped with the essential facilities, it is possible to accomplish a wide variety of experiments under one roof. In the case that the student requires a particular device or technique not available at the Institute, the Institute is linked to a wide network of other scientific bodies that can get involved. Additionally, interns take part in a Project Week, they can attend all lectures at the university, they are always made part of all ongoing activities in/off the Institute, and staff members also help them to improve their effective and systematic scientific writing.

In the future, more workshops at NMIHACM are planned, and staff members and students of both institutions will continue to learn from each other. The International Summer Schools are also going to be expanded. They will not take place only in Vienna but also in partner countries in China, Mongolia and India. The next Summer School in July 2019 will take place at the School of Cultural Heritage, Northwest University, Xi'an, China. The collaboration between the Institute and the Napier Museum in Thiruvananthapuram was another milestone in the Institute's

1 Eurasia-Pacific Uninet is a network which aims at establishing contacts and scientific partnerships between Austrian universities and universities of applied sciences, other research and member institutions in East Asia, Central Asia, South Asia and the Pacific region. The goal of the Eurasia-Pacific Uninet is to internationally align and position the Austrian educational system and to create synergies to support partner institutions in various forms of bilateral cooperation. More info at: <https://www.eurasiapacific.info/>



activities in India. In order to improve conditions of museums in the state, the Government of Kerala constituted an Experts' Committee and chose to begin with the Napier Museum. The Napier Museum, founded in 1855, houses a rare and unusual collection of historical and archaeological artefacts, ancient ornaments, bronze objects and ivory carvings and offers a glimpse of Kerala's rich cultural history. The Institute was invited in February 2016 to prepare a roadmap to identify and overcome the areas of concern. Subsequently, four specialised work missions by the Institute members had taken place in the Napier Museum from 2016 to 2018, while more are being planned for the next years. The main aim of these workshops was to research the needs of the collection in the tropical climate and to formulate a tailored plan for its upkeep. The solutions working successfully in Austria need to be researched for their effectiveness in India due to the contrast between the two climates. Thus this project enables Austrian and Indian partners to learn from the expertise of one another and develop innovative ideas by combining experiences of working in two different climatic zones. The project also aims to integrate the traditional practices and materials with a scientific attitude to the collection care. The whole programme has been supported by EPU (grant number EPU 12/2016 and EPU 20/2017), Napier Museum Thiruvananthapuram and the Government of Kerala.



The first workshop at the National Museum Institute New Delhi in 2009, 'How to care for textile collections: methods and practical approaches'. Photo: Institute of Conservation, University of Applied Arts Vienna

Since 2018 the Institute has collaborated with two new partners – the Indian National Trust for Art and Cultural Heritage and the Indira Gandhi National Centre for the Arts, both in New Delhi.

The Indian National Trust for Art and Cultural Heritage (INTACH), founded in 1984, has pioneered the conservation and protection of India's natural and cultural heritage and is today the largest membership organisation in the



country dedicated to conservation with over 190 chapters across the country, with chapters in Belgium and the United Kingdom as well. Over the years, INTACH has taken up restoration and protection of hundreds of monuments that fall outside the coverage of the Archaeological Survey of India and other government agencies. The director of the INTACH Conservation Institute Delhi (ICI) initiated the setting up of a small laboratory that should support and facilitate the conservation activities of ICI. Since there are no experiences in conservation science at INTACH at all, the Institute was requested to help with the basic training in conservation science. Therefore, after signing the MoU between both institutions in 2018, it was possible to start with planning of training workshops. The first one took part in February 2019; the next one is planned for February 2020.



Participants of the international Summer School 2014 working in the laboratory. Photo: Institute of Conservation, University of Applied Arts Vienna

Since 1985, the Indira Gandhi National Centre for the Arts (IGNCA) has been a premier government-funded arts organization in India. IGNCA specializes in the areas of preventive conservation, conservation training and research. It joined EPU at the end of 2018 and besides the collection care workshops it has planned to establish a postgraduate diploma course in preventive conservation in collaboration with the Institute.



In addition to on-site training workshops, the Institute also coordinated and /or organised international conferences to strengthen and promote the needs of conservation of cultural heritage. The first of these events took place on the occasion of the 60th anniversary of the establishment of diplomatic relations between the Republic of Austria and the Republic of India at the National Museum Institute New Delhi in August 2009. The conference 'Cultural Heritage Counts – Research, Conservation and Management' initiated by the Austrian Cultural Forum New Delhi and the Institute and fully supported by EPU, gathered Indian and Austrian experts of different backgrounds active in the field of heritage research and preservation^[2]. The second conference entitled 'Crossing Borders – Recent Developments in Research and Conservation in India', organised by the Institute, was held in Vienna in December 2016 (the conference proceedings are under preparation). In April 2018, the Embassy of India in Vienna and the Institute organised the conference/workshop 'Conservation of Cultural Heritage – Materials and Equipment in Conservation Today' in Vienna. The main aim was to share information on tools, technology and advancements in conservation methods with practicing conservators from India. This event uniquely connected European conservation companies with the Indian market and hence it is hoped that facilities introduced in Vienna will soon make their way to India.

At the end it might be summarised that the main idea of all the above mentioned activities stays the same: it is the responsibility of all of us to take care of the cultural heritage beyond national borders, as it is stated in the UNESCO Convention concerning the Protection of the World Cultural and Natural Heritage: "...it is incumbent on the international community as a whole to participate in the protection of the cultural and natural heritage of outstanding universal value, by the granting of collective assistance..."

All of our efforts and training programmes are dedicated to this idea.

2 The conference papers were published in: G. Krist and T. Bayerová, eds. *Heritage Conservation and Research in India. 60 Years of Indo-Austrian Collaboration*. Konservierungswissenschaft. Restaurierung. Technologie. Band 6. 2010. Wien: Böhlau.



How to use Climate Models and Building Simulation to Assess the Impact of Climate Change on Historic Buildings and Art Collections

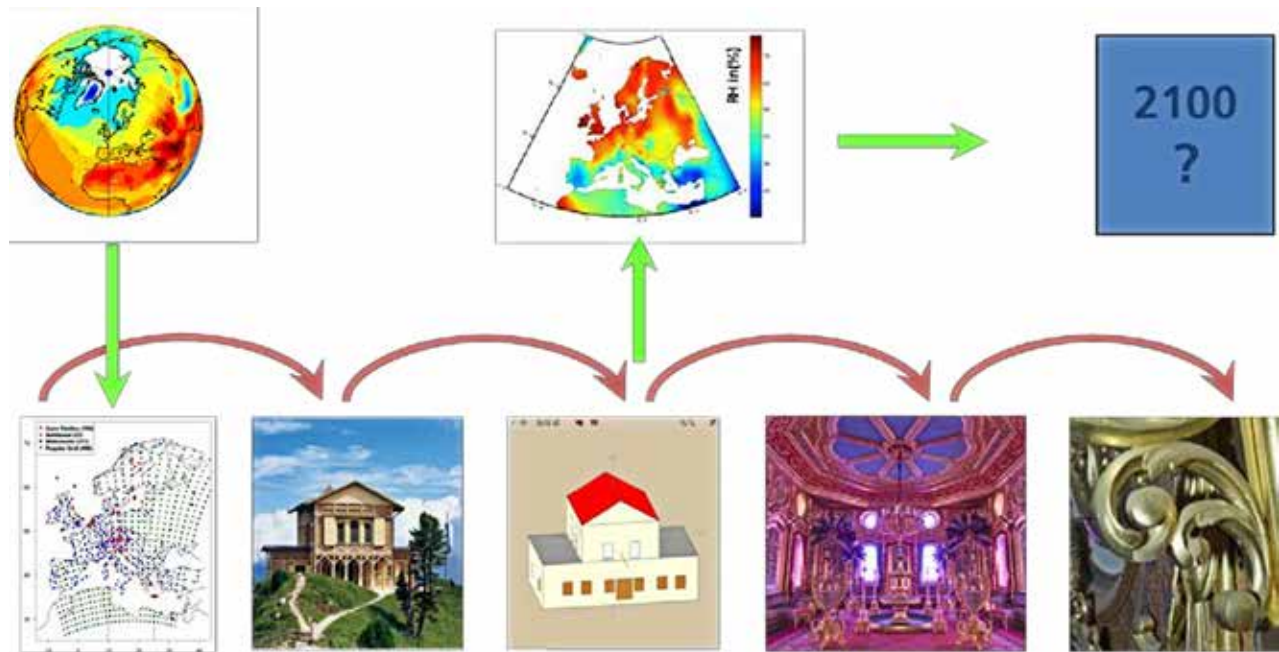
Dr Johanna Leissner

Climate change is one of the most critical global challenges of our time. For many decades numerous scientists from all over the world have been researching this topic and complex climate models suitable for making future climate projections have been developed. Climate change in itself is not the main concern; more important is its impact on the planet. But there is not so much information available on how the changing climate affects mankind and its environment. Although many studies have been conducted to explore the impact of climate change on economy, biodiversity and agriculture or on fresh water availability, only a little is known, to whether, and how, climate change influences our cultural heritage. Within the European funded project *Climate for Culture* running from 2009 until 2014, a multidisciplinary research team consisting of 27 partners from the EU and Egypt, has conducted research in order to estimate the impact of climate change on the indoor environments of historic buildings in Europe and the Mediterranean region and on the vast collections they contain.

For this purpose, the *Climate for Culture* project has coupled for the first time ever climate modelling with whole building simulation tools: the high-resolution climate change evolution scenarios provide the necessary climate indices for different periods in the past (1961-1990), near (2021-2050) and far (2071-2100) future. Here the regional climate model REMO with the high spatial resolution of approx. 10x10 km has been further developed over the whole of Europe and the Mediterranean. This set of climate indices is used in whole building simulation tools to assess future projections of outdoor climate changes on the indoor environments in historic buildings and its impact on cultural heritage items in Europe and Egypt. In addition, predictions for sea level rise up to 2100 produced from the climate models identifies the sites most at risk in Europe. By coupling climate modelling with building simulation, future indoor climates and energy demands can be calculated and thus suitable mitigation strategies developed and tested. Valuable collections in historic buildings from different climate zones have been included in in-situ investigations of current and past problems and in making projections of future issues.



The Climate for Culture methodology



The Climate for Culture project short cut

From the global climate model → to high resolution regional climate simulation → to case study historic buildings → to whole building simulation → to indoor environments and → to individual cultural heritage items.

For the high resolution climate simulations within the Climate for Culture project two scenarios are investigated, the A1B scenario and the very recent RCP4.5 scenario of the IPCC assessment report 5 (AR5). The mid-line A1B scenario assumes a greater CO₂ emission increase until 2050 and a decrease afterwards. In the recent past the global circulation model community launched climate runs driven by the new AR5 IPCC emission scenarios which served for the second phase. RCP 4.5 stands for Representative Concentration Pathway and is a scenario based on long-term, global emissions of greenhouse gases, short-lived species, and land-use-land-cover which stabilizes radiative forcing at 4.5 watts per square meter (W m⁻², approximately 650 ppm CO₂ equivalent) in the year 2100 without ever exceeding that value.

For the development of the whole building simulation tools, sets of climate indices were defined (see Table 1 below). The test datasets were prepared for the period of 1950 to 2100. The calculations made for the period of 2001 to 2010 are based on the A1B IPCC scenario. Modelle climate data needed to be verified and processed to be suitable for building simulation. New methods and modules for simulation tools had to be developed, implemented, tested and used. The successful application of suitable simulation tools allows computational testing

of active and passive adaptation and preservation strategies. Several building simulation tools were tested and two - Hambase and WUFI Plus - proved to be suitable to model temperature and the change in relative humidity fluctuations due to moisture buffering. Software models for some case study buildings already exist, for instance in Germany, Linderhof Castle, the Kings House on the Schachen, the church of Roggersdorf and in the Netherlands, Amerongen Castle. Those case study building models were used to produce the first results, derive suggestions for software development and improvement as well as to apply different active and passive measures in the model.

The development of the building simulation tool is also based on real data from historic buildings collected as case studies. For this purpose a survey with a specially designed, questionnaire was performed to set up a range of case studies from all over Europe and Egypt. The survey now covers up to over 120 case studies in eleven countries. Parameters like type of building, specific site-related factors, available indoor and outdoor climate data, observed damages and suitability for other work packages are reviewed and are transferred into a *Climate for Culture* database which has several layers of information. The list of case study buildings will be continuously updated and extended further.

Based on the climate data received from the high-resolution regional climate model, a climate classification map over all of Europe and Northern Africa was produced. The climate map is derived from an overlay of temperature and humidity for the baseline climate 1960-1990 since temperature and humidity changes have a great influence on most degradation processes of materials. The climate zones were established to organize the collection of crucial data from various historic buildings: for each climate zone, a zone leader was appointed to be responsible for harmonized data collection.

The case study buildings were used for the development of the whole building simulation tool including a generic building model and for assessing the effects of climate change. Therefore, in situ investigations of existing problems have been carried out to be used for the projection of future challenging issues using whole building simulation and different in situ monitoring technologies. The in situ measurements have been performed by laser speckle interferometry which was developed in a previous European project (Laseract) and by 3D microscopy. The two methods have already been successfully applied at the test site at Fraunhofer Institute for Buildings Physics in Holzkirchen (Germany) and at several case study sites in Croatia and Crete and show good complementarity. Further investigations by glass sensors from the previous European project AMECP (Assessment and Monitoring the Environment of Cultural Property) to assess the corrosivity impact of indoor and outdoor conditions at cultural heritage sites throughout Europe have also been carried out at case study sites in Crete and Croatia and Germany. These examinations allow a much more precise and integrated assessment of the real damage impact of climate change on cultural heritage at regional scale. In terms of climate control in historic buildings, a survey of the state of the art has been finalized and used to develop appropriate mitigation/adaptation strategies. This means that active and passive measures were discussed and defined which resulted in the implementation of humidistat heating and equal sorption control as well as an absolute humidity control algorithm in the whole building simulation tool WUFI®Plus. In addition different existing and new microclimate control approaches are considered in the tools Hambase and MATLAB/Simulink.



The main innovation in the whole project is the first ever use of a combination of climate modelling and building simulation tools to predict in a better way the influence of the changing outdoor climate on the indoor environment in historic buildings up to 2100 and to calculate future energy demand for environmental control in historic buildings. By using an automated procedure an assessment of the damage potential in various climate zones has been performed. The project focuses on gradual climate change and has not taken into account extreme events; this was explicitly excluded by the European Commission`s 2008 call for proposals. Since temperature and humidity are still recorded with analogue thermo-hygrographs in many museums, a software algorithm has been developed to convert analogue into digitised data. The software DigiChart can be downloaded for free at the *Climate for Culture* website. The project also examines a broad range of mitigation and adaptation measures: how to control indoor and microclimates energy efficiently and how revitalisation and enhancement of historical climate control (climatisation) systems can lead to sustainable solutions for historical buildings. The climate for culture methodology is integrated into a decision support software which provides building owners information on how to adapt buildings to climate change. For the first time, a comprehensive and in-depth analysis of the economic benefits associated with reducing climate change damage to built heritage interiors in Europe was undertaken. This also included a study of the attitudes, preferences and ethical views held by the general public on the need to protect cultural assets from the impact of climate change. A questionnaire for the visitor surveys in the United Kingdom, Sweden, Germany and Italy was developed and is available in English, German and Italian.

The research described above was performed within the EU project “Climate for Culture”.

Damage risk assessment, economic impact and mitigation strategies for sustainable preservation of cultural heritage in times of climate change.

Grant agreement No. 22 6973 (2009 - 2014)



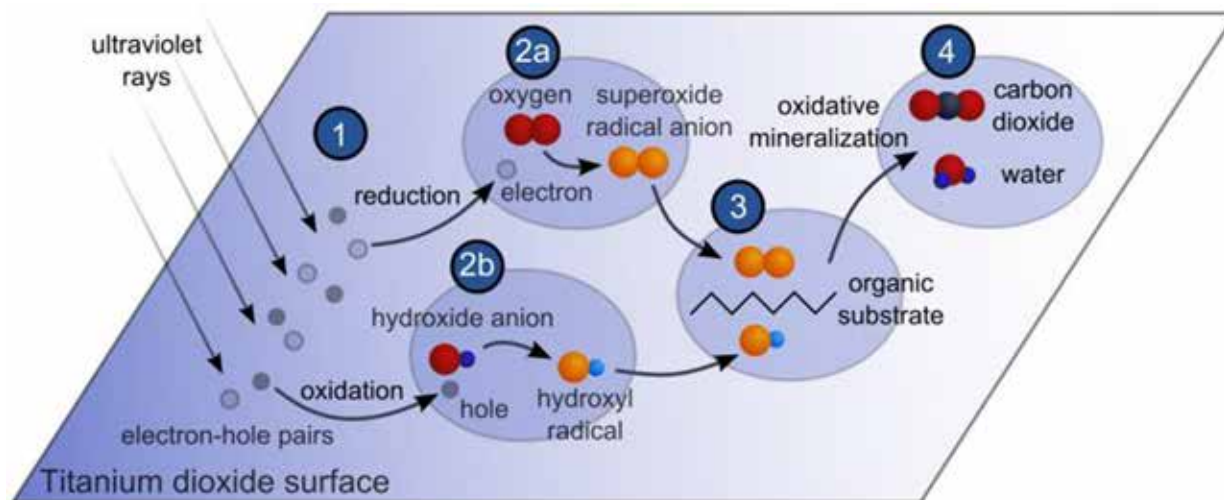
Novel Photoactive Nanomaterials and Technologies for Environmental Cleaning: a New Solution for Culture Heritage Protection

Motto: Sunlight is Helping to Protect our Culture Heritage

Dr František Peterka



The world is rich in cultural monuments, which shall be kept for the next generations. It would be only possible if corresponding technical and economical solutions are introduced. Photocatalytic treatment represents a very promising non-invasive solution that keeps clean any surface just utilizing sunlight. It is based on thin photocatalytic coating activated by solar UV radiation, on which any organic substances, including microorganisms, are continuously decomposed up to simple inorganic products such as carbon dioxide and water.



In the Czech Republic, there are thousands of historical buildings and monuments undergoing accelerated surface damage due to air pollution, especially in large cities. A special transparent nanocomposite coating system with solar photocatalytic self-cleaning and disinfection function, developed and patented in the Czech Republic, proved to be an effective tool to prevent the growth of algae on living houses as well as historical monuments.

In cooperation with the Prague City Gallery, a pilot project of photocatalytic surface protection of selected historical objects already started in 2017. This *in-situ* application was preceded by a number of laboratory tests with identical materials used in historical constructions such as sandstone, masonry, marble etc. Active participation of Czech experts in European projects of Cooperation in Science and Technology (COST G8, 540, COSCH) enabled a valuable experience exchange. Fulfilling of necessary legislation was also the rule including certified tests proving no damage of historical material by photocatalytic coating in a long-term period. Based



on a successful evaluation of the pilot experiments, hundreds of other objects could undergo the photocatalytic treatment to protect monuments, not only in the capital city of Prague but also the other world culture heritage sites, including the famous Indian national monument, the Taj Mahal.



Statue of Angel in Trebon, after photocatalytic treatment; the applied photoactive nanocomposite transparent coating provides continuous solar self-cleaning and permanent prevention of algae growth. Photo: www.nanotecsistem.cz



Making Heritage Relevant to the Local Community: A Case of Erstwhile Colonial Settlements of Chandernagore and Chinsurah in Suburban Calcutta*

Aishwarya Tipnis

Abstract

In a scenario where cultural value is embodied in layered histories and narratives while the built heritage is defined by non monumental buildings, the challenges of urban conservation become far more complex. A unique cultural landscape of the Hooghly river where European colonial powers first set up their trading stations in the 17th century, are a living example of this contradiction. Now part of suburban Calcutta, the once important trading towns of the Danish (Srerampore), Dutch (Chinsurah), French (Chandernagore) and Portuguese (Bandel) are grappling with issues of urban development, infrastructure and socio-economic development. While experts at conferences and seminars romanticise about the glory of the past, citizens deal with the everyday issues of health, sanitation, property disputes and economics, making heritage conservation an elitist dream. The fundamental question that one needs to answer is whose heritage is it anyway? At a time where there is a paradigm shift from expert driven to community led, the methodologies for urban heritage conservation demand to be re-written and re-interpreted to make heritage relevant to the local community. There is a far greater chance of the survival of this heritage with the community as its custodian, in the current scenario where there is negligible legislation to protect these heritage buildings. The urban conservation and community engagement strategies for Chinsurah and Chandernagore have been built on these premises and although a step in the right direction, there still remains a lot to be achieved.

Introduction

The cultural landscape of the Hooghly river has a layered history that is inextricably linked to the history of India. It has been a witness to the rise and fall of colonial ambitions. It has been the cradle of maritime trade in the region dating back to the medieval port of Saptagram, it was here that the seeds of industrialisation were sown, where the first jute mills were built. The banks of the Hooghly became home to the various European trading powers who came to Mughal India in the 16th century; records indicate that during the 17th-19th centuries, this stretch of the river housed the trading posts of the British (Calcutta), French (Chandernagore), Portuguese (Bandel), Dutch (Chinsurah), Danish (Srerampore). Fondly known as “Europe on the Ganges”, this region is a testimony to the confluence of cultures and a starting point of the “Contemporary Bengali Culture” manifested in the form of architecture, town planning, literature and art.

These erstwhile colonial settlements are now small towns which form a part of metropolitan Calcutta, while the community comprises of educated citizens mostly engaged in service who travel daily on the suburban trains to Calcutta for their jobs. These towns are now lucrative as they offer affordable housing for these daily commuters and thus find themselves at the centre of incremental developer-led urban development. The cultural landscape once dotted by palm trees and ground plus one storied spacious mansion or town houses, is rapidly being replaced by piecemeal developments of multi-storied housing. The layered history of these towns



and their urban fabric seem to be inconsequential to this new wave of urban development that threatens to make these suburban towns generic clones of each other and rob them of their individual identity and sense of place.

This region has been recognised as a unique cultural landscape embodying immense cultural value and having the potential of being nominated as a world heritage site. The Government of West Bengal has been keen to develop this region as a tourist zone and efforts are being made by multiple agencies in this regard. Of the many individual efforts being made in this direction, we have been commissioned as architectural heritage consultants in the preparation of the urban area appraisals for the French settlement of Chandernagore (2011) and the Dutch settlement at Chinsurah (2014) by the Embassy of France in India and the Embassy of the Kingdom of the Netherlands in India, respectively. The project at Chandernagore undertaken during 2010-11 had drawn up a list of 99 buildings of heritage value, identified the architectural and urban character and included recommendations for the integrated development of the town. The study was shared with the local and state government and it was proposed to inscribe these buildings on the official heritage list in the hope of protecting them from destruction. However in reality, while there were no conclusive outcomes, one by one, heritage buildings continued to be destroyed. We found ourselves as activists on the ground in trying to protect these buildings from demolition. With growing interest in the transformation of this zone into an active tourist hub by the Government of West Bengal, as part of the shared cultural heritage programme of the Kingdom of the Netherlands, in 2014 we were commissioned to prepare a comprehensive listing and mapping of the heritage of the Dutch remains in Chinsurah.

A constant question that we were asking ourselves through the course of this project was how was this research going to be relevant to the community who lived in Chinsurah, whose heritage was this anyway? Was this going to be one more research project that became a coffee table book or was there another way. Having learnt from our previous experience at Chandernagore, we developed an inclusive methodology with the community at the core of the project.

The Chinsurah Experience

We believe that heritage isn't just about the past, or dead old buildings. It is about the people who lived then and who live now. The Dutch in Chinsurah project is an initiative for people to have an opportunity to explore the past, to understand it and what it means for them in the future.

An important trading town and port in the 17th century, Dutch ships often stopped at Chinsurah on their way from Amsterdam to Batavia (modern day Jakarta). It was a prosperous town, built around the Fort Gustavus, where merchants, both European and native, built their mansions and pleasure palaces along the banks of the river Hooghly. In 1825, it changed hands to the British in exchange for some islands near Indonesia in the Malay peninsula. The British demolished Fort Gustavus and built a cantonment in its place, the vast vegetable gardens of the Dutch were transformed into the Esplanade around the Fort. The growth of the British in India and with the growing prominence of Calcutta, Chinsurah was relegated into a sleepy suburban town.

Our initial interactions with the residents and citizens of Chinsurah showcased some interesting revelations: most of the people were not even aware that their town was an erstwhile Dutch settlement, they had absolutely no clue



of the rich history of their town. The general perception of heritage was limited to grand monuments, more often than not we were told that there was nothing in Chinsurah - we should go to nearby Chandernagore and Calcutta if we were looking for “heritage”. The lack of awareness and appreciation of the history and heritage of the town was the single most important reason for the neglect, apathy and haphazard development of the town.

Our primary research revealed that there wasn't much written about the town - a substantial time was spent by the historian on our team to reconstruct the historical timeline and narrative of Chinsurah. Our research highlighted that although the town seemed like a 19th century British town, it still retained its original Dutch spatial planning and morphology. We were able to extrapolate the same by using map-regression and geo-referencing to map the hidden layers of the history of the town. Our primary task was to prepare a list of buildings of heritage value in Chinsurah, but we didn't have a base map to begin with. Our teams walked through the streets of Chinsurah to prepare an accurate map based on the satellite image of Google. We were conscious of the fact that for the survival of the urban heritage of this town, a two-pronged approach that was a combination of an academic approach to identification based on value and significance as well as robust research and the community's perspective on what they valued and their own associations with this heritage had to be developed. In a scenario where there is negligible legislative protection for this kind of urban heritage which comprised of non-monumental everyday buildings, streets and spaces coupled with immense pressure for redevelopment, the onus for the survival of this heritage lies on the community.

As part of this project, we developed a community engagement strategy that would empower the people to identify key values in their urban areas, articulate their aspirations and vision for the town. The strategy aimed at two simultaneous approaches to map, understand and interpret the heritage of Chinsurah; the first approach, **“Chinsurah looking at itself and the world”**, was aimed at engaging the local community to define what it considers valuable, what it wants to pass on to the next generation and thereby instilling a sense of pride within the community. The second approach towards community engagement was **“World Looking at Chinsurah”**; the objective was to identify the global values associated with Chinsurah.

Workshops, symposiums, social media and the website were envisaged as a way of bringing together not only experts and enthusiasts but also people in the Netherlands with genealogical interest in Chinsurah. With an aim to make Chinsurah accessible to both Indian and international tourists, we built a user-friendly and attractive website that provides a one-stop solution to anyone who wants to know about Chinsurah.

The principal strategy was to involve the local community in the mapping process from the very onset. We were keen to establish what was the “sense of place” of this town, what was it that made it special and hence one of tasks we undertook was to prepare an experiential map of the town, of how this town was perceived by users. The aim was to build awareness around the significance of their heritage and assist them to play responsible stakeholders of their heritage. A group of community volunteers was formed that would assist the project team on the field survey, this core group was called the “Rangers”. This had two advantages: firstly, that it built trust amongst the locals and allowed access and deeper penetration into the community who welcomed the survey team into their houses, shared their stories and views on the heritage of Chinsurah; and secondly, it became a word of mouth medium of dissemination of the information collected during the survey to the others in the community. Local enthusiasts and historians, as well as school teachers came forward and shared their



insights into the history of the town. Interviews were conducted with local residents, students, rickshaw pullers, teachers, doctors, and people on the street to gauge the sense of place of Chinsurah; this was captured on video and has been composed into snippets that craft the identities and realities of those who live in and share the town.

A number of engagement activities spanning from a couple of hours to a fortnight were planned and executed with the community.

Community Mental Mapping of Chinsurah

The first workshop for community engagement was conducted for school children in the age group of five to twenty in the form of a painting competition on the theme of “Heritage of Chinsurah”. To have a wider audience reach this was organised as part of the local “Durga Puja” festival which is one of the most important festivals of Chinsurah and attended by almost everyone in the community. This was envisaged as a mental mapping project, where the children drew what they defined as the most important landmarks within the town. Forty three children participated in the competition held on the 29th and 30th September 2014 as a part of the ‘Tola Phatak Sarvajanic Durga Puja Committee’ and ‘Upasana’ - Antarbagan Chuchura Durga Puja respectively. The outcome of the painting competition has been made available on the website.

The community survey had indicated that most children were unaware of the history of the Dutch in Chinsurah and thus a brief was prepared which was given out to the children giving them a narrative of the history of the town. Based on the brief, the children were asked to use their imagination to draw and illustrate the themes from the history of Chinsurah. Out of forty three children who participated in this competition the best illustrations were selected and have been compiled in the form of a children’s story book of the Dutch in Chinsurah; this bilingual book in English and Bengali is available for download from the website.



Comic Book Workshop

The second workshop was conducted on 15th October 2014, it was led by Payal Wadhwa, the graphic designer and illustration artist. The content of the workshop included the definition of what the power of comics can be, the many ways one may draw one, what the various ingredients of a comic are. Further the idea was to engage students with creative ways of interpreting historical values in the contemporary setup. The workshop was attended by twenty seven children in the age group of eleven to twenty. The children were asked to imagine a short story that had themselves, Chinsurah and the Dutch and illustrate it in the form of a comic book and their responses were drawn over a period of a fortnight in elaborate comic pages. The objective of the workshop was to encourage the children to understand the multiple layers of the town and its relevance in contemporary life. The workshop was successful in raising awareness about the history of the Dutch in Chinsurah, making the children conscious of the history and heritage in their contemporary setup as well as valorising what is important for them as a community.

The comic books created as part of the workshop are available for download from the website.

Heritage Walk Workshop for Chinsurah

Creating heritage awareness was done not only through heritage trails but also by inviting the community to contribute to the storyline, identifying not only architectural landmarks but also community specific points, training local residents as volunteer guides and bringing cultural change. With this aim, the third workshop held on 16th October 2014 was centred around developing a narrative and heritage trail for Chinsurah informed by the local history, stories and assimilation of the archival research which was conducted with local historians and enthusiasts. A heritage trail, map and script was thus prepared by the project team based on the output from the workshop and consultation with other experts such as Bauke van der Pol, who has recently published a book on the 'The Dutch East India Company in India'. Two local history enthusiasts, Rangan Dutta and Saptarishi Banerjee, were trained to lead the walk.

Conducting The Heritage Walk

As part of the "world heritage week" in November, free heritage walks on the themes of "In the footsteps of the Dutch" and "Dutch in Bengal" were conducted in Chinsurah on 23rd November 2014 led by local historians. A total of twenty people including students, teachers, residents, enthusiasts and architects from Calcutta participated in the walk.

It has been designed as a sustainable model that can be run independently by local historians and the brochures of the walk are available for download from the website. This created a ripple effect and many enthusiasts came forward and independently began arranging these walks for European visitors, history enthusiasts from Calcutta and other students. The walk was one of the most popular engagement events in Chinsurah that helped many citizens discover the hidden aspects of their town's past.



The project also created a social media page on Facebook and blog for the Dutch in Chinsurah project, that helped connect more than 1000 people within the community and in the Netherlands and generated much interest in the findings of the Dutch in Chinsurah project. People from the community came forward to share their own stories, histories and heirlooms regarding the town.

Lessons from Chinsurah

Community engagement and interpretation strategies have to be bespoke and constantly adapted; engaging with a semi-urban community in Chinsurah on a shoe-string budget was challenging by itself. Many strategies that worked brilliantly for urban and metropolitan areas such as the photography workshop and competitions, didn't find many takers in Chinsurah. By design, we wanted to keep the whole experience intimate and thereby didn't seek any professional help or sponsorship for any of the events, which in hindsight might have been more effective with better planning. People were more enthusiastic to participate in competitions rather than workshops as they simply believed there would be no benefit in spending a couple of hours attending a workshop. The citizens were not internet and social media savvy and it was an interesting experience to hand hold them to hashtagging and Instagram, something which we took for granted.

The lessons and impact of the Dutch in Chinsurah encouraged us to re-examine our previous project at Chandernagore and self-initiate another community engagement and interpretation project with the aim of making this shared cultural heritage relevant to the local community that lives and works there.

Experiments at Chandernagore

We already had at hand a list of 99 buildings of heritage value in Chandernagore that we had prepared in 2011; we began with the premise that heritage isn't just about the buildings, it's about the people and the stories that they associate with it. Thus we set off on another journey in finding the hidden meanings and stories behind the heritage of Chandernagore. This project began in March 2015 and we intend to have the website up by March 2016.

To engage the community in the project, a call for applications inviting enthusiastic youth which was passionate about their heritage to join us in the project was announced. The main objective was to encourage and give a platform to the local youth, students of history and other enthusiasts to get involved in building the story bank of the town. A total of 15 people signed up as citizen historians who worked through the summer in collecting the history of the place. The volunteers went from home to home speaking to the older people to capture their memories on audio and video of what they remember about Chandernagore. These citizen historians were then supervised to curate a heritage walk for the town based on the information collected by them including local stories and research at the libraries. They were trained to lead this walk primarily to develop this as a sustainable revenue generating model for the youth of Chandernagore and this would help their heritage become relevant to them today. On the occasion of the Indian Independence day, a heritage walk was conducted on the theme of the nationalist movement, collating all the stories they had collected over the summer. A map and brochure was designed, which was handed out to the participants and would be available for download from the website.



One of the main objectives of the project has been to empower the youth of Chandernagore and build pride in their town's heritage. The key aim of the competition is to inspire people of all ages to discover more about their recent past through active engagement with their heritage. It will help raise awareness of the settlement and encourage participants to visit and appreciate their local sites. Further learning from our experience in Chinsurah, we designed a community engagement strategy that was built upon a broad base to reach out to maximum people in the community. We partnered with the local Institut de Chandernagore to anchor our projects, and it became the venue for most of our workshops and competitions. Further, local schools were invited to participate in the competitions - we received an overwhelming response and we hoped that this exercise would inspire these students to be proud of their heritage and gain new skills to appreciate and care for their local environment.

We have worked with volunteers from the town and have publicised most of the competitions through social media/ word of mouth. The strategy was designed to first engage children in activities they were comfortable with and accustomed to such as painting, creative writing, and quizzes and then engage them in new out of the box pursuits such as the Lego Brick by Brick competition, Franco-Bangla food contest, Photography Workshops, Comic Book Workshops, which would give them new mediums to express themselves. Furthermore, a community engagement workshop was conducted at the Strand where younger kids were to play a game, older people were engaging in conversations about the changes they wished for their town.



The Community Engagement Workshop at the Strand was able to bring to the surface multiple insights in a short span of time through interesting out of ordinary game-based interactions. Through a one-on one interaction, it was possible to extract issues and aspirations about what the towns' citizens envisaged for their town. The method of hands on manner of capturing key ideas and issues in a colourful and concise manner allowed curious and knowledgeable passersby to inquire and also involve themselves in the event. The success of the workshops was demonstrated by the number of people who learnt about heritage, developed skills, changed their attitudes towards heritage of the town and had an enjoyable experience.



Conclusion

Heritage has the power to connect people, history helps root individual and collective identity of any town or city. The experiments at Chandernagore and Chinsurah have been a successful demonstration of multi-disciplinary work where history, urban geography, interpretation, technology and conservation architecture complement each other. This project has demonstrated how the urban fabric itself can become a museum housing many stories and meanings that is accessible to all, that can actively involve the youth and inculcate a sense of pride in their environment. The websites and social media provided a platform not just for the residents but also for others who lived elsewhere and have roots in Chinsurah and Chandernagore, to showcase their talent, to understand how the place has grown and changed over time as well as what the problems are that it faces and how can they be solved collectively. The enthusiasm and awareness generated on this project is just the beginning, there is still a long way to go before heritage becomes the starting point of the urban development process.

*First published in Context magazine



Pizza and Heritage

History, Conservation and Urban Development in Former Danish Serampore, West Bengal

Dr Bente Wolff

Serampore in West Bengal has become a model case for heritage-led development in a modern, expanding city environment. The town has served continuously for more than 250 years as an administrative and court centre, through the subsequent Danish, British and independent Indian governments. Today it is an expanding suburb to Kolkata with around 200,000 residents and seat of the sub-divisional court and administration for 1,5 million citizens of the surrounding urban and rural areas.

With rapid urban development, residents in Serampore had lost hope of saving heritage buildings and surrounding public spaces dating from the 18th and 19th centuries. But several conservation projects have triggered a process of upgrading and revitalization of the area, demonstrating that it was not too late to retain the historic qualities of the area as a dignified administrative centre and inviting public space.

The story here is one of reversing the normal order of planning and execution, beginning with action on ground; ending with a masterplan. Visible results create energy, hope and a common goal. The main lesson is that creating a shared vision is just as important as money, technical skills, bricks and mortar.

Apart from being a modern city in the greater Kolkata conurbation, Serampore has a particular history which deserves to be known. It is part of the wider Hooghly-Kolkata region, a hub for early-colonial trade and mutual cultural inspiration between India and Europe. So, before discussing the recent heritage work, let us begin with outlining some of this history.

Europe on the Ganges (Hooghly River)

Nowhere else in the world than this stretch of the Ganges, which the Europeans called the Hooghly River, is a more concentrated zone of built heritage witnessing about the commercial and cultural interaction between East and West from the time of early European trade colonialism in Asia. In Murshidabad we find European-style palaces of Bengal's Mughal rulers; further south in Hooghly District and Kolkata are European luxury mansions and government buildings, as well as sumptuous palaces and grand houses of the Bengal trading dynasties, who grew rich on the textile export to Europe as business partners, investors and moneylenders. Ranging from vernacular to European architectural styles, with all degrees of mutual inspiration in between, these buildings tell a story about the time of inter-continental business and collaboration, that went before British dominance on the subcontinent.

Serampore is one of the European trading towns along Hooghly River. The others are former Portuguese Bandel, Dutch Hooghly-Chinsurah and French Chandernagore. Across the river from Serampore is Barrackpore, where the spark of the great revolt ignited in 1857. Further south is the *megapolis* Kolkata or Calcutta, capital of British India until 1911 and the Empire's second city after London.



The point here is not to glorify the early period of Indian-European trade relations. There were complex power struggles, armed clashes and piracy, as well as extraction and suppression of those without wealth and power, including slavery. But this period has often been forgotten in light of later European global hegemony. It is worth remembering and preserving some physical remnants from the time when Europeans operated on terms defined by Indian political and economic elites.

The Best Built and Best Kept Town



Serampore in 1810. Painting by Hammer. Photo: The Maritime Museum, Elsinore

Serampore with the Danish name Frederiksnagore came under Danish administration in 1755 when the Mughal Governor Ali Vardi Khan granted the Danes rights to trade, exercise law and collect taxes at Serampore. Despite their formal governance rights, the Danes had to balance their acts between the power of local business magnates and other Europeans, especially the British.

As the other European towns, Serampore traded in luxury goods, especially fine cotton and silk products, which could not be produced in Europe. Gradually Serampore also became a manufacturing centre for these textiles.

In the early years the Danish station was called the poorest and least significant of the European settlements, but the town grew and developed. A British writer, visiting around 1830, called Serampore the best built and best kept European town in India with its river front lined by European luxury villas, lush gardens, and palatial houses of wealthy Indian traders. She could not imagine a more beautiful sight than evening time with European ladies and gentlemen promenading in full attire on the river esplanade, and groups of conversing Indian *babus*, clad in the purest white muslin.

Smugglers, Debtors and High Caste Weavers

Much of Serampore's beauty was built on illegitimate money. First, Danish traders earned much of their wealth smuggling goods to Europe for British clients. Secondly, European criminal suspects and bankrupts from other parts of India sought refuge in Serampore, escaping legal persecution and their (often Indian) creditors. Protected by Danish jurisdiction they brought their liquid wealth to the growing town, building their luxury mansions here. Known as a safe-haven for criminals, there was considerable stigma attached to Europeans living in Serampore.

The town offered new income opportunities for Indians and many weavers and other textile artisans settled here, including Brahmins and others of high caste who could not have taken up this work within the strict caste regulations in their home villages.



Goluk Dham, the grand house of the Roys, one of Serampore's oldest trading dynasties who were commercially collaborating with the Danes from the mid-18th century. Modern apartment blocks now overlook the central courtyard

Mass Communication, Modern Education and Social Reforms

Serampore's greatest claim to fame owes to the British Baptist mission, led by William Carey who arrived in 1799. Fearing it would disturb trade, the British had banned Christian missions in their areas of control. But Serampore's Danish head wanted fresh, dynamic people in his new town, and allowed the missionaries to settle and work.

The Baptist mission founded the Serampore Press, which pioneered a communication revolution by printing books in over 40 Indian and other Asian languages, most of which had never been typeset before. Bibles in vernacular languages were printed along with school books, classical epics and religious texts in Sanskrit, modern Bengali literature, and the earliest newspapers in Indian languages.

The missionaries and their local associates also started many schools, including girls' schools. In 1818 they established Serampore College which today has more than 3000 students. In 1827 the Danish king authorized the College to convey university degrees on par with Denmark's two universities in Copenhagen and Kiel. Serampore College may therefore be reckoned as Asia's first modern university.



The main building of Serampore College. The College was established in 1818 as one of Asia's very first institutions for modern higher education, and a node in the early development of the cultural and social reform movement known as the Bengal Renaissance. Today the College has more than 3000 students, most of them affiliated to the University of Calcutta. Photo: Britt Lindemann, 2018

Accepting students from all castes and faiths, the mission was not always popular among the more conservative Indians, but the new ways resonated with the Bengal reform movement, which had its earliest beginning at this time. The missionaries collaborated with the Bengal reformers, especially the famous Ram Mohan Roy, in their common struggle for widow remarriage, abolition of *sati* and other issues of social reforms and human rights. At times a critical dialogue on religious matters went on between the Christian missionaries and Roy who reread the classical Hindu texts according to modern humanistic principles. The intellectual debates between Indians and their counterparts from Europe and other parts of the world formed into the Bengal Renaissance (also known as the Indian Renaissance) of religious reform, social critique, modern literature, science and art.

Serampore and the wider Hooghly-Kolkata region remained a centre for modern education and social reform long after the Danes sold their possessions to the British and left India in 1845. The local reform movement further developed into a struggle for Indian independence, and the Hooghly area became an early stronghold for organized resistance against British rule.

Losing Memories, History and Space

In today's Serampore there are still many remnants from previous historic periods and people, even if the last four-five decades have seen most historic buildings being replaced by concrete buildings. The different faiths are represented by Hindu temple structures, some from before the Europeans settled, as well as mosques, churches and cemeteries. Indian and European grand houses still bear witness to those who grew rich on colonial trade. Serampore's continued status as an administrative and court centre appears from the public buildings dating from the Danish, British and early independent Indian governments. Serampore College's campus is a prominent exponent for the modern education tradition together with several fine school complexes, while 19th century jute and cotton factories are important examples of industrial heritage.

These remaining historic buildings are either still in use or have been so until recently. But many are in a dilapidated state or even in complete ruins, only waiting to be demolished and replaced by a new or administration or residential block.

Our initial survey in 2013 of citizens' relations to the historic town core showed that people from all social layers experience a sense of loss with the rapid changes of the town: a loss of personal childhood memories of buildings and places, a loss for younger generations growing up without the physical remnants of Serampore's history, and a loss of public, outdoor space, which is shrinking with every new construction project.

A follow-up survey is yet to be executed, but judging from citizens' comments during and after the restoration projects, there is now increased hope that the town core may retain its qualities. Statements are now frequently made that "the heritage work has reversed Serampore's development" or "we never thought a haunted ruin like the Denmark Tavern could become a beautiful café and restaurant."



Heritage-led Urban Development

The expressions of optimism from citizens reflect that the heritage work has catalysed a general upgrading of Serampore's historic core. The main lines of the streetscape had become blurred by traffic congestion, unplanned development and decaying 'cornerstone' buildings. With the buildings restored, it became possible to "read" the main axes of the original town plan. Revival from ruin of a few prominent buildings thereby established a common vision among different stakeholders, which was needed to trigger further supplementary actions from local government agents.

For the NMD it started with the Church. St Olav's had been in continuous use from 1805 till 2010 when the roof began to collapse and the church was closed. When in 2016 it reopened in its original stateliness it served to re-establish the town core's main east-west axes of which it is a focal point.

The intersecting north-south axis runs from the river to the administrative compound, culminating in the former Danish government house from the 1770s. From the NMD we initiated restoration of the Denmark Tavern at the river front, and the two gateways to the administrative compound; all buildings that are defining for this axis. The Government House itself was restored by the state government and reopens in 2019 as a culture and information centre with government offices, seminar halls and a historic exhibition.



The restored main gate to Serampore's Administrative and Court Compound. The gate is a key point on the axis that runs from Hooghly River (the Ganga) to the former Danish Government House (1770s), which can be seen through the gate

Different branches of Government of West Bengal have each contributed their own part, but all supporting the same main vision of recreating the area as it was originally intended: a dignified administrative centre with open, public spaces between the buildings. The streets and public river front area have been upgraded; a new bus terminus has been built outside the historic centre to remove heavy bus traffic from the old town square; two modern storage buildings disfiguring the administrative compound have been demolished, and an alternative location has been found for a planned four-story government office building.

Pizza and Heritage: the Power of a Shared Vision

Critical local voices were raised in 2018 when, in the real estate section of a major newspaper, a Serampore-based entrepreneur was quoted for saying that his town now offers both pizza outlets and restored heritage buildings within easy reach of each other. The critical response reflected a common view that the real estate business and other commercial interests are responsible for the massive high-rise developments and the demolition of heritage buildings. But, seen in a more positive light, the entrepreneur's remark shows that even commercial stakeholders have begun to subscribe to the vision maintaining a lively historic downtown with prominent old buildings surrounded by public, green areas, and free from new constructions.

The great challenge then, is to further upgrade the area in ways that not only consider tourists and the middleclass residents of the concrete blocks outside the centre, who visit during evenings and weekends. Also to be respected are the needs of the area's long-term residents, many of whom are from small, low-income households who highly depend on public outdoor spaces, as well as the many clients of the court and government offices, who often come from rural villages.

A Liveable and Sustainable Town Core

The need has now arisen for a coherent masterplan for organising the town core. Our Kolkata-based architect partners have prepared a detailed landscaping plan which we have submitted to the state government who will be responsible for funding and implementation of the project, with professional advice from our Indian-Danish team.

Had we started our engagement in Serampore with making this masterplan, rather than with restoring the buildings, precious time would have been lost: new incompatible development projects would have been realised, while projects supporting the vision might not have happened. Even more importantly, the recent improvements on ground have ensured wide agreement to the plan proposal from local stakeholders who wish to take part in realising the project. In other words, 'selling' the plan to stakeholders and qualifying the dialogue between planner and user is easier when the users have already experienced an improved environment.

The plan aims at adding new value to the town core while maintaining its existing qualities. In practical terms this means to preserve the vibrant, informal nature of the public spaces and create synergy rather than competition between the restored buildings and the existing environment. This point is illustrated by the two new restaurants that have opened in restored heritage buildings; both are government owned and run by private operators: one is the heritage lodge Denmark Tavern on the river front which runs an up-market café and multi-cuisine restaurant; the second is a Bengal restaurant in a former office building which serves a full meal for just under one American dollar. The price level of both restaurants is adapted to the local market and they are commercially viable from local and regional customers alone, gaining only supplementary income from tourists. They do not compete with the many outdoor stalls and low-cost eateries selling food, fruit and tea to residents of the area, court-goers, government office staff and everyone else. Our upgrading plan has been made with a clear objective of letting these popular informal stalls and eateries operate on an unchanged level.



Creating Public Attention

Throughout our engagement in Serampore our work has been covered by local newspapers and electronic media. Together with our local partner INTACH we have arranged architect competitions, with the combined purpose of getting the best technical quality in the projects and staging events to generate public attention. UNESCO's Asia-Pacific Award of Distinction 2016 to the restoration of St. Olav's had the same double effect of promoting high quality and creating awareness.

Along with the progress of the conservation projects, Indian national media also began to cover the work, and with the opening of the Denmark Tavern in 2018, international publications like National Geographic and Lonely Planet have followed suit.

Social media is probably the most important factor for creating sustained attention to Serampore: during the restoration work, and especially after the two restaurants have opened, a steady stream of private travel guides, videos, food blogs, selfies and similar material are being posted on social media, most of them by people from the Kolkata-Hooghly region itself.

Half the History May Soon be Missing

The future for Serampore's Indian buildings seems less optimistic. The Bengal palatial houses are owned by private families who struggle to maintain their homes, but have little chance of getting support from government sources or foreign donors like ours.

The most significant Indian buildings still bear witness to the immense wealth created by the old trading dynasties, but most of them are crumbling. Modern apartment blocks are constantly moving closer, often overlooking the inner palace courtyards, as the owners' maintenance costs have been met by selling off neighbouring land to developers.

Selling or donating a palace to a larger religious trust has been a strategy for some house owners to see their ancestral house survive. But if no further solution is found the loss will be immense, in terms of keeping Serampore's combined Indian and European ambience and the remnants of its multi-cultural history.

Safeguarding private buildings is out of our financial and organisational means, but we have facilitated several schemes to study and record the history through research and on-site documentation. Archival research is being carried out in two historic PhD projects, one in Denmark and one in India; mapping of whole areas and detailed recording of individual buildings have been carried out by staff and students from IEST in Shibpur, CEPT University in Ahmedabad and the Royal Academy of Architecture in Copenhagen. If the Indian side of Serampore's Indian-European heritage is lost, at least the knowledge about it will be kept for the future.





Denmark Tavern inauguration. Photo: Britt Lindemann, 2018



Government House. Photo: Britt Lindemann, 2018



The Serampore Initiative of the National Museum of Denmark

In Cooperation with

Government of West Bengal, Hooghly District Administration, Serampore Municipality, West Bengal Heritage Commission, West Bengal State Archive

Indian partner of the Serampore Initiative

Indian National Trust for Art and Cultural Heritage (INTACH), Kolkata Chapter

Conservation Architects and Architect Planners

Manish Chakraborti, M/s Continuity, Kolkata: St. Olav's Church, The Denmark Tavern, The Main Gate and South Gate, Serampore College Gate

Gopa Sen, The Designers, Kolkata: The Government House (a project of the Government of West Bengal), the old Land Registration Building

Ashish Acharjee, Sujoy Das and Associates: Masterplan for upgrading and Landscaping of Serampore Town Square and Sub-divisional and Court Compound

Surveys and Documentation

Partha Banerjee, the Researcher, Kolkata,

Souvanic Roy, Subrata Kumar Paul, Indian Institute of Engineering Science and Technology, Shibpur (IEST)

Jigna Desai, Kushi Shah, CEPT University, Ahmedabad

Lars Sigersted, Jonathan Pihl Petersen, the Royal Danish Academy of Fine Arts; Schools of Architecture, Design and Conservation

NMD's Project Team

Flemming Aalund (architect), Simon Rastén (historian), Kristina Djurhuus Christiansen (anthropologist, surveyor), Bente Wolff (anthropologist, project head)

Funding Partner: Realdania (Denmark)

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Copernicus Contribution to Cultural Heritage Protection

Oriana Grasso

Abstract

The synergy between space technologies and cultural heritage heralds a societal transformation. Copernicus, the European Union programme for Earth observation, was originally intended as a tool to look from space at our planet changes, in order to help tackle environmental challenges. Thanks to its achievements, it is nowadays a complex, yet flexible, geo intelligence system, supplying huge amounts of data and information for applications in many domains. From the description of the Copernicus services it is easy to deduce the role that the programme already plays in monitoring and protecting cultural heritage. Further actions are being considered to enhance such a role, through the compilation of a products portfolio dedicated to the cultural heritage user community.

Why Space?

Interaction with space has shaped human culture since the dawn of civilisation. First it was the need to know the geographical features around a tribe encampment, to feel safe in a hostile or dangerous environment. Later it was the need to know what was beyond the usual lands and mountains, in search of riches, that brought us to travel and map our planet. Then we looked at the sky and outer space, knowing that by observing Earth from a distance we could better protect our planet. Man's first walk on the moon was also the first step into a new dimension, one with far larger horizons: with the production and transmission of data the new digital era had been launched. Fifty years later, space born data applications are transforming the management of several activities, from agriculture to transport, from emergencies to energy, from adaptation to climate change to cultural heritage protection, and in so doing they are heralding a new societal transformation, a new way for people and nature to interact. Space technology is actually enabling a digital society, a new culture. In a few decades time, in fact, the heritage to protect and preserve might be the human race... it all began with Earth observation.

20 Years of Earth Observation in the EU: from GMES to Copernicus

The European Union began the space adventure roughly twenty years ago, in Italy, Baveno (Lake Maggiore), where various national space agencies and scientists gathered to define and launch a programme, GMES (Global Monitoring for Environmental Security), whose objective was to help monitoring and protecting the environment. The programme changed name in 2014 to become the actual Copernicus. Thanks to its satellites, the Sentinels, Copernicus is producing huge amounts of data. Data (and related clouds) are the bricks for the society 4.0 to come, for smart towns, smart travels, smart energy, and the implementation of the internet of things. Space is enabling a new culture!



What is Copernicus and how is it Structured?



The initial Earth observation programme, Copernicus, has become one of the most advanced geo-intelligence systems. It is based on the needs of the users and on a full, open and free data policy. Data from its satellites, called Sentinels, from other satellites (called contributing missions) and from local land, sea and air sensors (in-situ) are processed and transformed in added value products by the six Copernicus Services: Land monitoring, Atmosphere monitoring, Marine environment monitoring, Emergency management, Security, and Climate Change. The Copernicus Services are implemented thanks to the operation by various agencies or bodies (like the European Environmental Agency, the Joint Research Centre, the European Maritime Safety Agency and others). Access to the products offered by the Services is supplied by various platforms, some of them managed by private consortia.

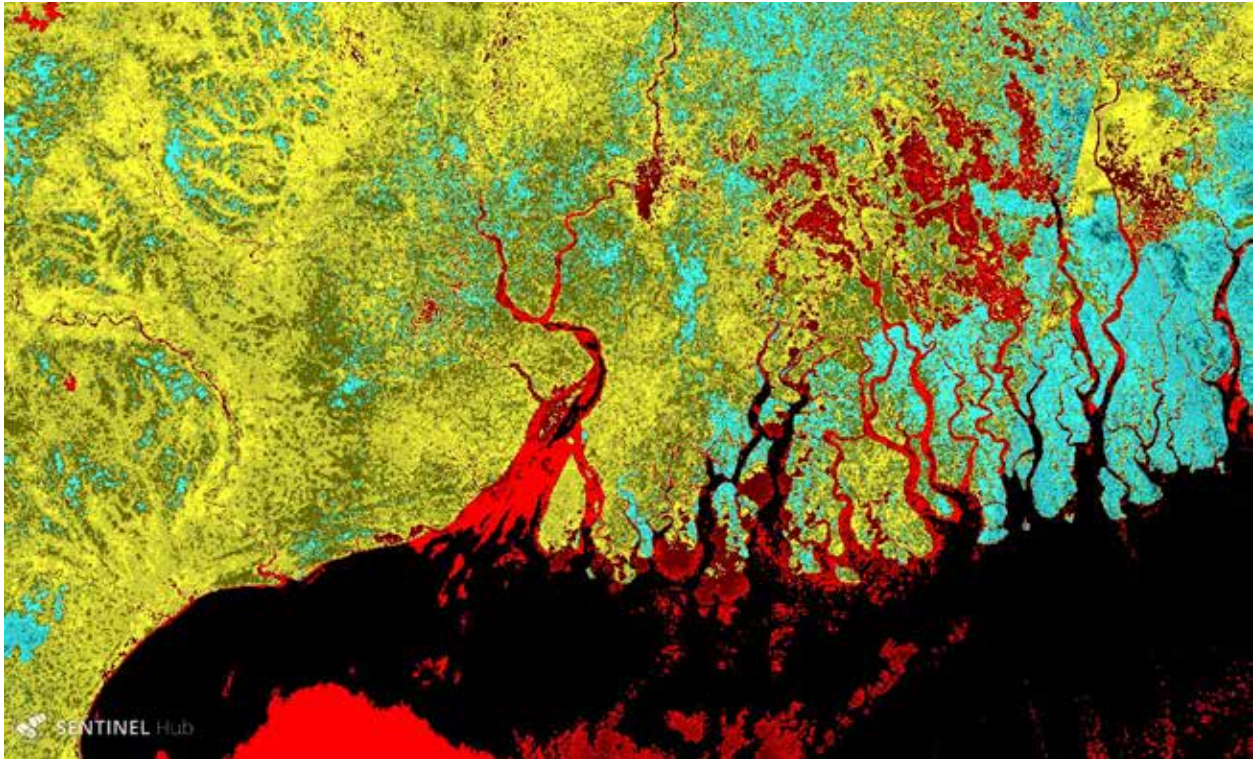
What can Copernicus do for Cultural Heritage?

Cultural heritage, we all know, includes natural heritage too: a landscape is a cultural signpost. Its changes are proof of the interaction between man and nature. Copernicus already helps protect European and UNESCO protected sites by monitoring for ex. moisture, vegetation index, salinity, aerosols concentrations. Copernicus' usefulness has been assessed in landscape and assets monitoring and conservation; geo-mapping; vulnerability and environmental risk assessment; support to emergency intervention in historical and protected areas. One example is the Sundarbans National Park, listed as a World Heritage site since 1987, seen on the next page in a Sentinel image, followed by a rendering of the area's vegetation index:



(Sentinel Hub by Sinergise)





Sometimes a very high resolution capacity is required for monitoring sites and buildings and Sentinels do not always allow for a very high resolution. However, what made Copernicus a success is its nature of a complex system, composed of many elements: satellites, sensors, other satellites products, data processing. All this results in living maps of our surroundings, useful to decide when and how intervention is required to better protect and restore.

Copernicus 101

Thanks to the general cooperation agreement signed in March 2018 with Copernicus, Indian institutions, researchers, and start-ups will soon be able to partake of the programme's initiatives, some of which are dedicated to support skills, education and business promotion. Dedicated space research project funds are already open to Indian participation in the framework of the Horizon 2020 programme. Further information is also available on the www.copernicus.eu website.

The synergy between space technology and culture is the perfect example of how knowledge and care for the past can validate our present and propel us to the future. The EU-India partnership, thanks to culture, encompasses all these time and space dimensions.



Modern E-Learning and Blended Learning Strategies in an Interdisciplinary Environment – How to Empower UNESCO Stakeholders to use Earth Observation

Dr Tobias Matusch, Lisa Dannwolf, Prof. Dr Alexander Siegmund

The United Nations Educational, Scientific and Cultural Organization (UNESCO) provides an agenda to the global community to build and preserve peace, foster education, science, and culture. UNESCO designated sites fall into three categories, including World Heritage Sites, Global Geoparks, and Biosphere Reserves. Currently, 140 Global Geoparks in 38 countries and 686 Biosphere Reserves are distributed over 122 countries. Furthermore, since the adoption of the World Heritage Convention in 1972, UNESCO compiled a list of 1,073 World Heritage Sites, based on cultural, natural and mixed properties, respectively. Designated sites of UNESCO are distinguished by their outstanding universal value for mankind. However, an increasing number of these sites are labeled as “In Danger”, with the possibility of those values being lost. Currently, 54 UNESCO World Heritage Sites, especially in Africa and the Arab States, are considered endangered, often caused by armed conflicts, natural disasters, and urban sprawl. Regardless of the underlying causes, this considerable degradation can be monitored on a number of different Cultural and Natural Heritage sites, Biosphere Reserves etc. (UNESCO, 2009). Many of these affected sites can be found in the global south, suffering from conflicts, poor economic, social or political conditions. However, they play a decisive role within the UNESCO sites network. In India, so far 37 sites are designated as world heritage sites and further 42 sites are on the tentative list, which the state party intends to consider for nomination. Accordingly, there is a dynamic process and a huge demand for appropriate documentation, management, and monitoring of these sites.

In recent years, new techniques and applications in the field of remote sensing and satellite systems has emerged. Those systems including GPS satellites, meteorological and communication satellites, as well as Earth observation satellites, which constantly increase their socio-economic benefit for societies (Price Waterhouse Coopers International, 2016). Geoinformatics and Earth observation applications are more and more part of our everyday life. Applications such as maps or navigation systems are, often unconsciously, even used by the youngest generation. Benefits from Earth observation can be found in almost all areas of society and professions, including sectors such as agriculture, forestry, insurance, renewable energies, and air quality. In addition, UNESCO stakeholders already benefit from the current development. The magnitude of such a benefit, however, considerably depends on the expertise, abilities, and received training on satellite image assessment of each individual. Despite the current fleet of available Earth observation satellites, their data is hardly used for operational assessments of endangered UNESCO sites. This is due to knowledge gaps by the user, limited technical and financial facilities or the lack of ready-to-use data, which result in insufficient exploitation of these opportunities by heritage site managers and other relevant stakeholders. To encourage and support stakeholders to process satellite images, derive valuable information and incorporate them into their daily working routines, the Department of Geography, Research Group for Earth Observation (rgeo (<http://www.rgeo.de/de/start/>)) at Heidelberg University of Education developed the e-learning training environment “Space2Place”. The e-learning module was specifically created to empower UNESCO sites managers and planning authorities to incorporate Sentinel data from the European Copernicus programme to improve documentation, monitoring, planning, and management of respective sites.



Earth observation tools have been identified as useful means for various issues such as documentation, monitoring, planning, management, and evaluation of UNESCO sites and their surroundings. Main benefits are time and cost savings, provision of near-real time information, quality improvements by increased accuracy of information, qualified decision-making and planning as well as enhanced control of processes and measures. Earth observation techniques are evolving on a fast track. Implemented by the European Commission, the Copernicus programme produces vast amounts of digital data in order to support service providers, public authorities and the international community with valuable information. This information can be openly accessed free of charge. The core of the Copernicus programme is a fleet of Sentinel satellites. This fleet consists, for example, of radar satellites (Sentinel 1) and high-resolution optical satellites (Sentinel 2) up to planned missions for atmospheric composition monitoring (Sentinel 5) and global sea surface height measurements (Sentinel 6).

These Earth observation techniques offer a wide range of possibilities, but are yet rarely used by UNESCO sites managers or related planning authorities. The deficient implementation is often justified with the complexity of satellite image analysis as well as high costs in terms of time and organization efforts. However, the increasing number of UNESCO World Heritage sites, Biosphere Reserves and other UNESCO related sites show high potentials to use remote sensing data for monitoring, evaluating, and visualizing environmental changes.

The Space2Place Module

The major aim of the learning module Space2Place is to empower UNESCO site managers and planning authorities to incorporate data from the Copernicus programme into their daily working routines. Besides regularly used very high resolution optical satellite images, current research also shows the potential of high to medium resolution images such as from Sentinel-2 for the monitoring of cultural and archaeological sites. By using practical examples and exercises, the capacities of stakeholders at UNESCO sites in the field of Earth observation should be enhanced. In addition to the general objective of integrating Earth observation applications into the daily working routines of UNESCO stakeholders, numerous intermediate objectives such as strengthening the general knowledge and enhancing the ability to communicate about Earth observation issues are useful. This promotes the capacity to formulate needs and to stress their demands. The module was published online as an introductory course in Earth observation at the beginning of 2018 (www.geospektiv.de). The methods and tools included in the module are linked with the easy-to-use online remote sensing application “BLIF”. The connected application comprises a large set of valuable satellite data processing functions, including image enhancement, measurement, analysis and digital image processing tools, which are explained step by step and linked to practical exercises.

The module consists of 21 learning units, including four intermediate tests and one final examination. The Figures 1 and 2 give an impression of the usability of the GUI while Figures 3 and 4 show the usage and evaluation of Geospektiv and BLIF by students. Additionally, four links to the online remote sensing application BLIF are implemented in Space2Place. The module is designed for a duration of 120 minutes and registered users receive a graduation certificate at the end. The learning units are kept very broad to provide a general but wide overview.




1

Introduction

Remote sensing **technologies** are increasingly used to explore, document, monitor, and report about UNESCO sites. In recent years, many practical applications were developed for both **cultural and natural sites**. However, **involved stakeholders** need a basic understanding of what remote sensing is **and how they can gain** the maximum benefit from these evolving technologies

In this module you will learn:

- main benefits of remote sensing for UNESCO sites
- basics about remote sensing
- applications of remote sensing



The new Sentinel-2A in operation, which was launched in 2015. The satellite was developed by ESA as part of the Copernicus Programme. (Source: ESA)

NEXT

Front end of Space2Place and the introduction unit, presenting the learning module and a description of the learning objectives

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BLIF - Change Detection

Hidden for centuries in the tropical jungle, **Angkor** is nowadays one of the globally most important archaeological sites. The Angkor complex, as a former capital, is an outstanding representation of the power and skills/ architecture of the **Khmer Empire**. The whole area stretches over 400 km², including forests, lakes, and an old canal system. The famous temples of **Angkor Wat**, Angkor Thom or Bayon are just a few examples why Angkor and the nearby town Siem Reap are **tourist magnets** for globetrotters. But their fame also led to considerable land cover changes during the past years.



The Temple of Angkor Wat in Cambodia (Credit: T. Matsuzaki)

START BLIF

NEXT

Graphical user interface of a learning module in Space2Place, offering an introduction to the change detection topic with an example of Angkor Wat in Cambodia. At the bottom of the screen, the start button for BLIF is visible. In BLIF practical exercises related to the learning units can be performed





Space2Place was tested intensively by students at the premises of the GIS-Station, a competence centre for digital geo-media at Heidelberg University of Education. Guided by an instructor, the various processing steps and tasks were evaluated from a didactical point of view and with regards to the content



Students using the remote sensing application BLIF with the instructions of a lecturer. BLIF is integrated in all learning modules of Geospektiv and provides the basic functions to analyze and use remote sensing data

With regard to the manifold applications and the availability of data, a specific focus was placed on the Copernicus Program. Based on the different purposes of the satellites, various applications are possible, reflected by the Copernicus Services: Atmosphere, Marine, Land, Climate, Emergency, and Security. However, other data sources are also available within the module, providing the user with a wider spectrum of usable sensors such as Landsat and RapidEye. As a result, the integrated application examples are also kept without great detail, but will be specified for a deeper understanding by additional future learning modules.

The module itself is designed as a blended-learning approach. It provides key features such as optimized presentation of the learning units on different end user devices, introduction to various Earth observation applications, e.g. deforestation, forest fire mapping, drought mapping, integration of various optical satellite images like Sentinel-2, Landsat 8, and RapidEye. The handling is based on interactive approaches, and integration of different media, as well as interim and final quizzes to check learning success. One of the main features is the personalization of the learning modules content depending on the abilities or interests of the user. The platform offers information with different levels of difficulty and adaptable learning paths.

Various factors support the use of the e-learning modules and the remote sensing application BLIF:

1. Personalization of learning paths based on the adaptive design of the website is probably the most important factor for the application of Geospektiv and Space2Place. By providing an appropriate content and challenges for both, fast learning and slow learning users, more efficient learning outcomes can be realized.
2. A crucial point is the award in terms of a graduation certificate by the end of each learning module. In various countries, such certificates are part of the necessary prerequisites for job promotions or financial compensations. Regardless of the content, the expected final certificate additionally stimulates the brain's reward system, increases motivation and reduces the rate of termination during the modules.
3. Another important factor is the security of the website, especially if it is used in an educational context in Germany. To control the access to forbidden websites or undesired changes in the system, considerable restrictions on computers and networks are often set by administrators. Accordingly, the website needs to be secured by https to be accessed, which is in the case of Geospektiv and BLIF automatically provided by Candy. However, this also requires that only secure content is implemented in the learning modules, otherwise no https security can be provided by the system.
4. The language barrier is another crucial factor, often resulting in a reduced understanding of the learning units. Space2Place is currently offered in English to meet the standard in the global education system. New courses will also initially be offered in English upon introduction. The online remote sensing application BLIF is additionally available in German, French and Italian as well as in Spanish soon. The e-learning platform Geospektiv will be soon available in Spanish as well, next to the default languages of German and English.



These datasets and information can be used for customized monitoring of ongoing environmental, economic and social processes according to the Sustainable Development Goals (SDGs) and related indicators. Additionally, UNESCO site stakeholders can stimulate communication about Earth observation satellites, methods, related data and tools as well as actively promote Earth observation in a broader context as useful contributions to preserve the wide range of UNESCO designated sites.

By offering an e-learning platform, we can not only foster the use of Earth observation in general and impart knowledge to different stakeholders, but also address various SDGs and contribute to the 2030 Agenda. One important aspect is the existing gender gap and under-representation of women in STEM (science, technology, engineering and mathematics). This aspect is closely related to the quality of education (SDG 4), gender equality (SDG 5) and the reduction of inequalities (SDG 10) as important objectives of the United Nations. Several studies show that distant learning approaches can minimize the existing gender gap and provide useful education opportunities for women.

The e-learning environment, including Geospektiv and BLIF, is constantly under development and expansion. New language packages will be added in the medium-term future. This includes the platform itself, but also the translation of learning modules into other languages. The focus is on translations into English, but courses with content in Spanish and French will follow. Accompanying scientific research and evaluations set the focus in two areas. The first one concentrates on the difference between pupils and adults, the second focus is on the mentioned gender gap and varying learning approaches between male and female. New learning content in line with state-of-the-art didactical research will be added and a practical introduction with didactic preparation will be made available. By using different cooperation, further contact persons can be introduced to refer the UNESCO site stakeholders accordingly. This will extend the network of stakeholders and lead to valuable linkages with Earth observation experts.



Earth Observation for the Study of Human Past and Cultural Heritage Management. Overview and New Perspectives

Prof. Nicola Masini, Dr Rosa Lasaponara

Introduction

Remote sensing is the applied science discipline with diagnostic-investigative purposes that allows obtaining qualitative and quantitative information on the environment, climate, and urban landscape through measurements of electromagnetic radiation that interacts with the physical surfaces of interest, performed by sensors onboard of satellite or aerial platforms without any physical contacts with targets to be investigated. Remotely sensed measurements can be acquired using passive or active sensors; the first one exploits and acquires spontaneously emitted or reflected radiation in diverse ranges of electromagnetic spectrum (solar reflected energy, thermal or microwave radiation), the second one launches energy (in selected ranges of electromagnetic spectrum) and acquires the returned signal backscattered by targets.

In the last two decades, the improvement of devices and sensors as well as the increasing availability of user-friendly software for data analysis and processing have led to growing interest in the use of Earth Observation (EO) sciences and technologies in the cultural heritage (CH) domain. This paper deals with a short discussion on the possible applications of EO for the study of human past and cultural heritage management.

Remote Sensing for the Study of Human Past

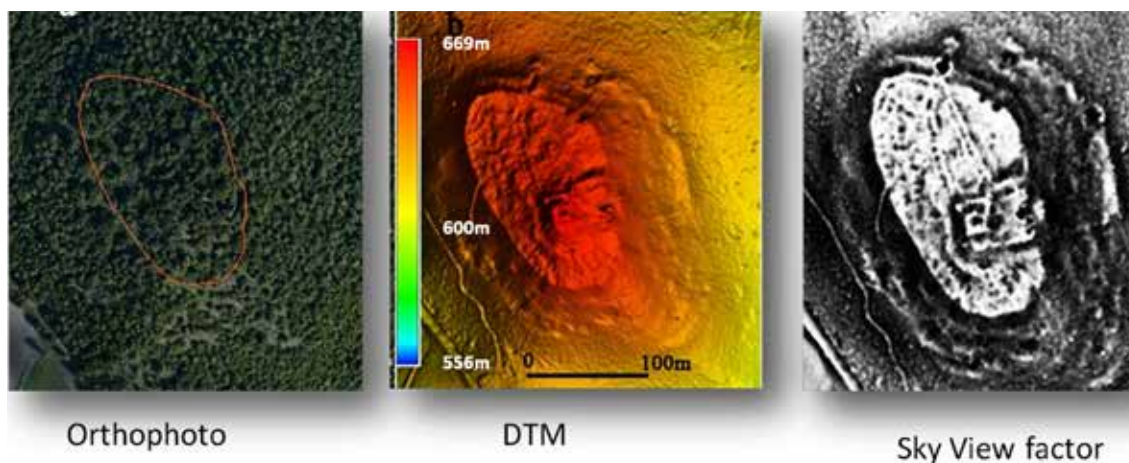
Historically, aerial photography [1] has been the first passive remote sensing data source extensively used in archaeology for surveying emerging archaeological remains as well as for detecting proxy indicators on the presence of buried archaeological remains which are the result of physical and micro-topographical interaction between the same archaeological remains and their surroundings. The potential of passive remote sensing has grown enormously thanks to the development of multispectral and hyperspectral sensors, on board airplanes or satellites, which allow, by analyzing the spectral response in the various bands acquired, to extract information at different scales and produce accurate thematic maps with the use of classifiers. In particular, landscape archaeology can benefit from satellite images because such data can reduce time of investigations, especially for large areas.

The archaeological proxy indicators [2], fundamental for the study of human past, are detectable not only from passive remote sensing imagery but also from active data, including SAR and LiDAR data with diverse visibility depending on environmental setting, the expected archaeological features, remote sensing data resolution and acquisition.

LiDAR provides direct range measurements mapped into 3D point clouds between a laser scanner and the earth's topography. The high detail of the digital terrain models allows us a precise characterization of geomorphological features and the identification of relief linked to human activity [3]. LiDAR sensors are also powerful tools for investigating and surveying archaeological heritage in wooded areas. They can penetrate



vegetation canopies and model accurately underlying terrain elevation [4]. The interpretation of LiDAR products aimed at identifying potential traces of cultural interest is based on the visual criteria and the degree to which the features appeared anthropogenic versus non-anthropogenic: shape, pattern. To this aim, it is crucial: 1) to process the point clouds and classify terrain and off-terrain objects by applying adequate filtering methods, in order to obtain very accurate DTM; 2) to ‘manipulate’ the DTMs with appropriate techniques of visualization aimed at emphasizing changes of morphology, discontinuities of the landscape, platforms and any kind of earthworks attributable to the human work. As an example, see Figure 1 which shows the added value of LiDAR and derived models based on the use of visualization technique such as hill shading, Sky View Factor and Local relief Model to image a medieval castle [5] under a wood in Basilicata, in Southern Italy (for additional detail on LiDAR derived models based see [6,7])



LiDAR based detection of a medieval castle under canopy in Basilicata (Southern Italy). The figures show the added value of Sky View factor for the archaeological study.

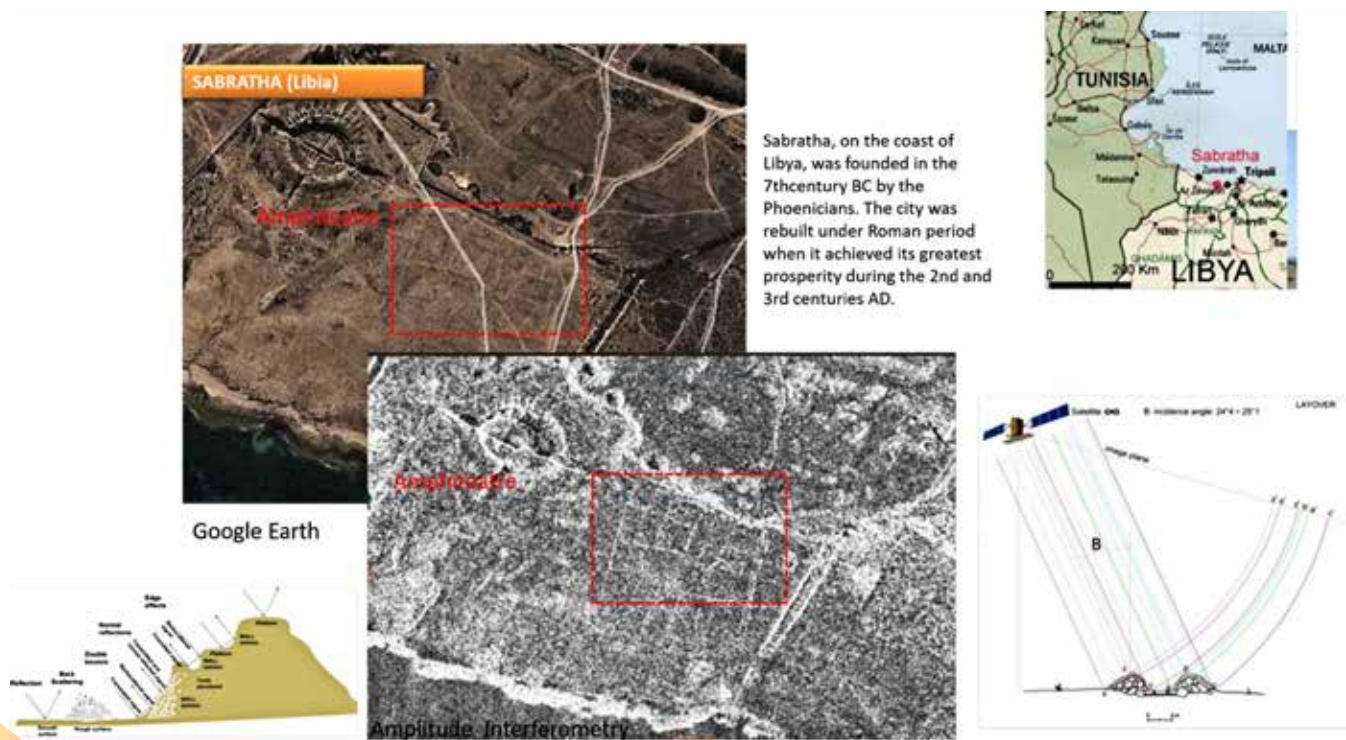
With the development of Synthetic Aperture Radar (SAR) in terms of multi-band, multi-polarization and high-resolution data, space radar remote sensing for archaeology has opened new research fields. Actually, the use of satellite radar data in archaeological investigations can offer great potential for site detection and the study of ancient landscapes in desert areas where optical data generally are strongly limited by their inability to penetrate soil, coupled with the absence of typical archaeological marks [8]. However, the extraction of archaeological features from SAR data is a tough challenge. One of the main issues is the low signal/noise ratio, especially considering the complexity of the target and the fact that modern landscapes may mask them. Although several achievements have been made in recent years, the exploitation of SAR remote sensing to detect archaeological marks is still in its infancy, especially for X-band data, such as COSMO-SkyMed. The reconnaissance of typical archaeological marks by using radar is more complex with respect to optical imaging due to a greater number of parameters that characterize SAR data [9, 10], including the:

- Characteristics of the radar system as, operating frequency, polarization;
- Angles, viewing geometry (ascending or descending), etc.;
- Characteristics of the surface;
- Archaeological features in terms of buried or emerging remains, their geometric structure, orientation, building material, etc.



The methodological approaches usually adopted are based on two different feature-enhancement procedures [9]: (i) multi-temporal analysis performed to reduce noise and highlight archaeological marks; (ii) single-date analysis to assess the ability of the single SAR scene to detect archaeological features (as usual using optical remote sensing).

The results are encouraging, but there is still much to be done to make the SAR an operational practice in the field of archaeological prospection. The most important obstacles are the difficulty of interpretation and the absence of predictive models or indicators as in the case of optical remote sensing data. In order to overcome these gaps, it is necessary to integrate SAR with other remote sensing techniques (see Figure 2), including geophysics, in order to validate methodological approaches and facilitate the interpretation for archaeological purposes (as an example, see some applications based on the integration of SAR and geophysical prospecting in China and Syria [11, 12]).



Optical and SAR integration for the detection of archaeological features in Sabratha (Libya)

Remote Sensing for Cultural Heritage Risk Analysis and Conservation

Recent improvements in earth observation techniques (including both active and passive sensors) today offer advanced technical characteristics and higher spatial resolutions (up to 30 cm) that enable new applications specifically for the preservation of cultural heritage. Moreover, the current availability of long-term satellite time series provides an excellent tool to observe and monitor changes from a global view down to a local scale. National



(DLR, CNES, ASI, JAXA) and international space agencies, such as NASA, ESA, etc, provide valuable satellite data which are very useful for capturing regional environmental changes along with impacts induced by human activities at a site level. In particular, data from NASA website satellite time series (as AVHRR, SPOT-VEGETATION, MODIS, Landsat TM, etc.) are freely available. More recently, ESA deliveries Sentinel products and open source software tools specifically set up for processing active and passive data. Moreover, the availability since 2000 of Very High Resolution (VHR) data with spatial resolution less than 1 meter up to pixel at 30 cm (WorldView-3, today) enables the creation of accurate and updated maps. <http://whc.unesco.org/en/factors/>). In this context, UNESCO, in partnership with some space agencies in the world (NASA, ESA, DLR, ASI, CNES, CNSA), over the years has strongly promoted the use of space technologies to assess the state of conservation of world cultural and natural heritage sites.

In recent years, the importance of applying space technology to cultural heritage management has been paid great attention to worldwide, being that the capability of satellite imagery can enable overcoming typical problems arising from traditional field investigations and monitoring [13]. The main advantages of using satellite remote sensing can be summarized as follows:

- Timeliness in updating the status of cultural heritage sites and landscapes;
- Objectivity knowledge base;
- Simplicity of “reading” the state of cultural heritage and landscapes;
- Availability of extensive historical archives;
- Contained costs of systematic monitoring programs;
- Immediate detection of anthropogenic and natural changes;
- Easy and friendly activation of interaction with citizens (as recommended by UNESCO) also following the open collaborative approach (Citizen or Crowd science) today recognized as a very useful “tool”.

In addition, it is also important to remember that SAR sensors are able to sense areas at any time of day or night, to ‘penetrate’ clouds, making possible the mapping and study also of those regions, tropical and subtropical, where cloud cover is one of the major limitations of optical imaging. The ‘penetration capability’ depends on sensor bands, surface characteristics (ice, desert sand, close canopy, etc) and conditions (moisture content). In particular, Very High Resolution (VHR) Synthetic Aperture SAR (SAR) data, such as TerraSAR-X, Cosmo SkyMed and quadpol PALSAR-2 opened a new era in the space-borne SAR applications including those related to archaeology. SAR is able to provide data and useful information about the contemporary and past landscape, enabling the discovery of unknown sites, infer changes in the current and former environment and support risk monitoring exploiting radar interferometry. The latter combines two or more radar images over the same area to detect changes occurring between acquisitions and to monitor even slight ground movement – down to a few millimetres – across wide areas.

In the last decade, growing interest has been addressed towards the exploitation of remote sensing for monitoring cultural heritage using in particular Differential Interferometric SAR (DInSAR) as a relevant tool for deformation monitoring and preventive diagnosis of monuments and surrounding environments.



For sake of brevity, we cite the applications on some World Heritage sites such as Rome, Pompeii, Angkor [13, 14, 15]. Today, as also highlighted by UNESCO, cultural heritage is “increasingly threatened with destruction not only by the traditional causes of decay, but also by changing social and economic conditions which aggravate the situation with even more formidable phenomena of damage or destruction”. At present it is particularly important to improve risk estimation, mitigation and management, also using information and data from Remote Sensing in order to set up operational approaches and methods for the diverse applications and risks, as well as protocols and quantitative evaluations of their accuracy and reliability.

These needs and gaps have been also recently highlighted by ICOMOS [12]. In particular, the most critical and urgent needs to preserve CH are:

- Environmental assessment and monitoring (pollution, climate change, seismic risk);
- Anthropic pressure evaluation and management;
- Tele-survey and Geographic Information System for protection and management of tangible cultural heritage;
- Pre-normative studies for the guaranteed protection and management of tangible cultural heritage;
- Study of environmental changes over time (fig. 4);
- Preventive approach against extreme natural events (seismic events, flooding, storms, landslides, fire), and measures of “first aid” requires the assessment of;
- Changes in hydro-geological conditions in the ground: technologies for stabilizing the historic structures;
- Best conservation practices against specific attacks (physical, chemical, biological) to prevent damage on specific materials;
- Intelligent multi-sensor systems for early warning (modelling, local network for monitoring systems), including tele-diagnosis;
- Techniques for inventory, cataloguing and traceability of cultural heritage objects.

In this context, remote sensing plays an important role in increasing the ability of a community, a society, a territory, to resist, absorb, mitigate, and recover from the effects of a hazard in an efficient and timely manner, including the risk mitigation and preservation of cultural heritage.



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Site Protection Boundaries: a Double-Edged Sword

Dr M.B. Rajani

Abstract

In developing countries such as India, it is increasingly necessary to protect cultural heritage sites from potential damage as cities, towns, villages, industries and transportation networks rapidly expand. Site protection boundaries must be selected with utmost care because they can trigger fresh development activities up to the permitted edges – poorly chosen boundaries can cause irretrievable harm to unprotected cultural heritage near such sites. A host of technological tools (remote sensing imagery, GIS and other image processing software) are available to delineate protected zones accurately according to suitable protocols (e.g., using topographical and cadastral maps). We argue that these protocols must include a thorough geospatial analysis of the larger archaeological landscape around a site, considering all references to cultural remains in the vicinity. For illustration, we consider three sites in India that vary in the type and duration of protection accorded to them: Sarnath (part of the World Heritage Sites Tentative List since 1998), Bodhgaya and Nalanda (inscribed as World Heritage sites in 2002 and 2016 respectively). At each site, we identify nearby cultural remains that have been destroyed or face increased threats from development activities.

Introduction

The Archaeological Survey of India (ASI) was created in 1861 and tasked with undertaking “a complete search over the whole country, and a systematic record and description of all architectural and other remains that are either remarkable for their antiquity, or their beauty or their historical interest”. Today, ASI looks after over 3,600 sites, and the departments of archaeology of each State typically takes care of a few hundred sites. Since 1977, India has been one of the active States Parties adhering to the World Heritage Convention. Thus far, 37 properties in India have been listed as World Heritage Sites (29 cultural, 7 natural and 1 mixed)¹ and 42 further sites appear in the tentative list.² It is concerning that UNESCO’s website lists no maps for five of these properties. Further, the core zone boundaries for most of the remaining properties are identical to the area currently protected by ASI.

Given India’s vast size and rich cultural heritage, many cultural remains are undocumented or fall outside the set of “official” sites managed by state and national governments. Some of these remains lie inconspicuously at the periphery of official sites, camouflaged by modern landcover. The popularity of an official site (particularly if it attains UNESCO’s World Heritage tag) can spur development activities that can increase the risk of damage to nearby cultural remains that lie outside these protected regions. The present World Heritage operational guidelines (2017) for drawing cultural property boundaries state that “boundaries should be drawn to include all those areas and attributes which are a direct tangible expression of the Outstanding Universal Value of the property, as well as those areas which in the light of future research possibilities offer potential to contribute to and enhance such understanding.”

We present examples of cultural remains that qualify for protection according to these guidelines, yet they lie in the unprotected vicinity of three official sites. One of these sites (Sarnath) is on the tentative list, and the other two



are World Heritage sites (Bodhgaya and Nalanda). These important Buddhist sites are in rural areas (well away from big cities), where land is generally used for agriculture. However, satellite images confirm that development activity has significantly changed the land use near all these sites over the past 15 years or so, endangering unprotected cultural remains in their vicinity. Thus, these examples highlight the need for greater care in identifying nearby cultural heritage and including these (where feasible) within the protected boundaries.

Geospatial analysis techniques are suitable for the twin tasks of identifying nearby cultural remains and delineating appropriate boundaries for buffer zones in cost-effective and systematic ways. In this study, we used remote sensing images obtained from satellite/aerial platforms to identify cultural remains. These images provide synoptic, multispectral views that can reveal tell-tale signs of archaeologically interesting features which may be invisible to observers at ground level. Further, we use Geographic Information System (GIS) software to geo-reference 19th century maps to help recognise features that were more readily visible at the time the maps were made. With these inputs, we suggest boundaries that better adhere to the UNESCO guidelines.

Sarnath, Varanasi, Uttar Pradesh (part of the World Heritage Sites Tentative List since 1998): Buddha is believed to have first preached in Varanasi, making it one of the four holiest Buddhist sites (alongside Lumbini in Nepal where he was born, Bodhgaya in Bihar, and Kushinagar in Uttar Pradesh where he attained Nirvana). The site is located near the confluence of the rivers Ganga and Varuna. A geospatial analysis of the region surrounding the protected area using satellite images has identified crop marks indicating an ancient 3.7 km² settlement.³ The layout is rectangular, flanked by waterbodies that are now dry, with sides oriented to the cardinal directions (Figure 1).

Alexander Cunningham, the founding Director of ASI, visited the site in 1835-36 and reported on the initial excavations⁴. Subsequent excavations have been carried out, including some as recently as 2014. These excavations have uncovered monasteries, stupas (Dhamekh, Dharamrajika and Chaukhandi) and antiquities dating from the 3rd century BCE to the 12th century CE⁵. Cunningham's report of 1871 includes a map showing the larger archaeological landscape that contained three large interconnected tanks and many mounds of anthropogenic shape.⁶ By geo-referencing this map⁷, we find that the 1.4 km² area Cunningham surveyed in 1871 lies within the northern half of the 3.7 km² rectangular settlement. This archaeological landscape has been fragmented by a major road (which has developed over time from a small path in Cunningham's sketch) and a railway line from Varanasi to Gorakhpur. Further exploration within this rectangular area using non-destructive geophysical techniques has high potential for identifying buried features of architectural interest, some of which could be worth excavating and conserving. However, Figure 1 makes it clear that several buildings have cropped up between 2002 and 2018 at multiple locations within this rectangle and near the waterbodies, potentially destroying such remains. It is therefore imperative that Sarnath receives protection status. Ideally, the entire rectangular region and the waterbodies should be included for protection when the State party prepares a nomination file.

Mahabodhi Temple Complex at Bodhgaya (inscribed as a World Heritage Site in 2002): the main shrine at Bodhgaya marks the location where the Buddha is said to have attained enlightenment. It is therefore the most important of the four main sites connected to Buddha's life, and it has been a major pilgrimage destination for Buddhists for well over two thousand years. The main shrine was constructed in the 5th/6th century CE. It is made of brick



covered with stucco, tapering from a square base to a height of about 55m, with four smaller shrines at each corner. Within the temple complex, the main shrine is surrounded by many smaller stupa-like structures made of brick and stone. The larger settlement had a square monastery to the north that was visible in the 19th century. Several other remains had formed into mounds and were surveyed and mapped by Cunningham in 1892.⁸ This map has been geo-referenced and all its features have been identified on satellite imagery (Figure 2), although the clarity of their contours has diminished from 2003 and 2018 as several modern buildings have been constructed (even within the region marked Buffer-1 in the map for Bodhgaya on UNESCO's website⁹).

When we conducted a field survey in 2018, accessibility and mobility in the larger landscape was very restricted, especially during the run-up to festivals and during vacations. When the site was inscribed as a World Heritage site in 2002, only the temple complex and the tank to its south were included in the core zone. Ideally, the core zone should have been expanded to include all the mounds, tanks, canal and monasteries marked in Figure 2, to protect them from the development that has subsequently taken place. It may still be worth extending the protected boundary to include the larger landscape in the interest of avoiding further damage to these remains.

Nalanda Mahavihara at Nalanda (inscribed as a World Heritage Site in 2016): Nalanda was a Buddhist residential monastery that was functional from the 4th/5th century CE until at least the end of the 12th century CE. Although it was not associated with the life of Buddha, Nalanda attracted monks from as far away as China (e.g., Xuanzang spent about twelve years there in the 7th century CE) and received patronage not only from within India but from distant lands (e.g., the king of Sumatra funded a monastic dwelling at Nalanda).¹⁰ ASI has excavated and protected six temples or chaitya¹¹ at this site: a row of four temples (T3, T12, T13 and T14) to the west, T2 to the east, and Sarai temple further east. Figure 3 illustrates the core and buffer zones of this property, which was inscribed as a World Heritage site in 2016. The core zone is restricted only to the property owned by ASI, even though several nearby archaeological remains have been identified in the past.

Francis Buchanan visited Nalanda in 1812 and left a detailed description¹² of these ruins, including a hand drawn sketch¹³ of their spread. Cunningham explored and excavated the site (1861-1864) and made detailed reports, including a site plan¹⁴. Alexander Broadley, a District Magistrate of Patna and Gaya, also conducted excavations and made a diagram of the scattered ruins¹⁵. Recent remote sensing analyses have revealed traces of the ruins mentioned in these reports, set within the larger landscape of the site¹⁶. By geo-referencing these maps and integrating them into a GIS platform (together with textual information from the accompanying reports), it is possible to identify the locations of every feature noted by Buchanan, Cunningham and Broadley.

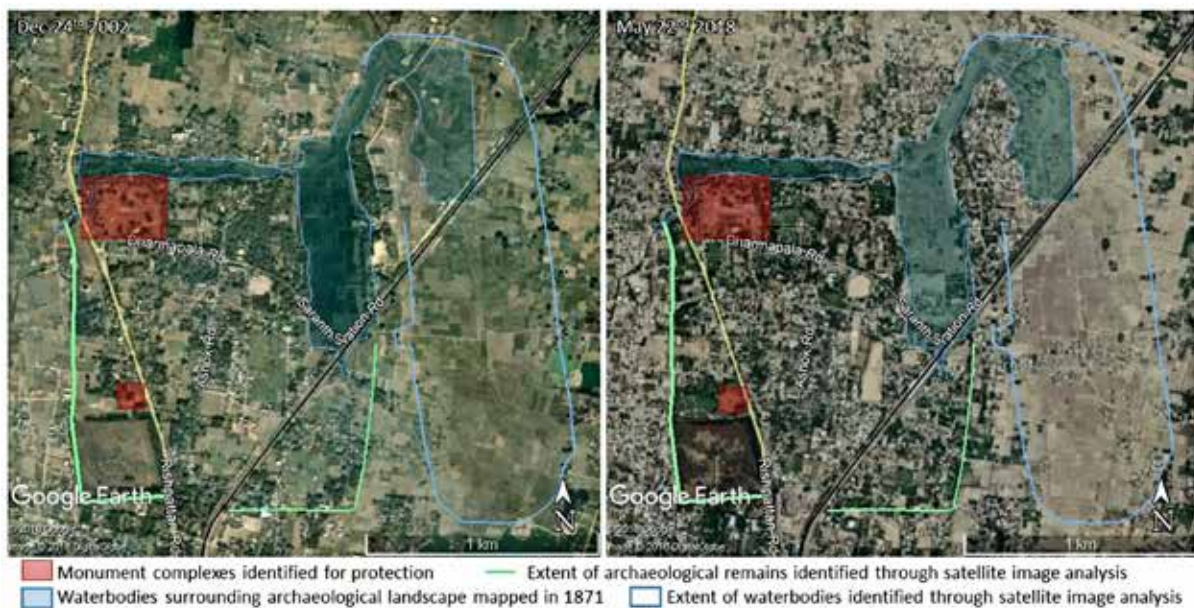
Site visits were made to verify each identified feature, and to note the extent of the spread of ruins that remain in the environs of the site. Figure 4 illustrates that this extent spans approximately 7.25 km². (Normalising this to align with land parcel boundaries yields an area of 9.8 km² that is recommended for protection). In contrast, the currently protected area inscribed as World Heritage¹⁷ includes a 0.23 km² core zone and a 0.58 km² buffer zone (Figure 4).



Concluding Remarks

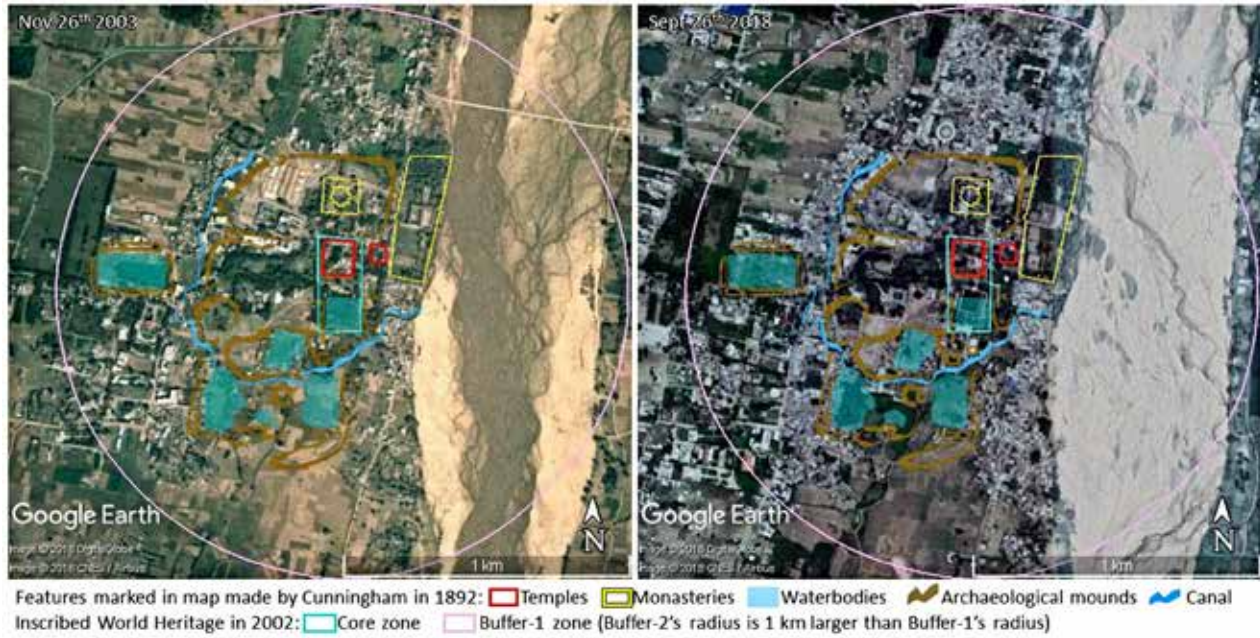
Geospatial analysis using aerial and satellite-based imaging has proved to be a very useful tool in identifying features of cultural heritage at many sites around the world. The associated technology of GIS allows multiple layers of information to be integrated, including spatial information from old maps and reports. A geospatial analysis of a heritage site can immensely and uniquely contribute to the scholarship regarding its history by identifying its original components and extent. Apart from the academic nature of such an analysis, it provides a more comprehensive set of features for protection and conservation. Resource constraints may eventually limit protection and conservation efforts, but these decisions should be made with the best information available. Further, the techniques and tools involved in such an analysis are better than traditional methods to create maps and delineate boundaries for conservation plans, to critique existing plans (as exemplified in this article), and to monitor land use changes over time within protected areas.

Site protection boundaries enable the preservation of cultural heritage by limiting development within them, but they also define the line beyond which such restrictions do not apply. A site with a World Heritage tag naturally attracts greater footfall from visitors, and real estate developers recognize the enhanced value of land immediately outside the protective boundary. This effect is clearly seen in Figure 1 (Sarnath, which is still on the tentative list), and it is even more pronounced in Figure 2 (Bodhgaya, a World Heritage site). Now that Nalanda has been inscribed as a World Heritage site, we can expect similar development to the edge of the protective boundaries. Any unexcavated or unexplored remains of cultural heritage outside these boundaries therefore face elevated risks of destruction. By arguing for a more careful approach to drawing site protection boundaries, we hope to raise awareness so that timely action can be taken to protect the priceless remnants of our cultural heritage from irreversible harm.



The area identified for protection at Sarnath in context of the archaeological landscape identifiable through geospatial analysis. Note the increased number of concrete structures from 2002 (left) to 2018 (right)



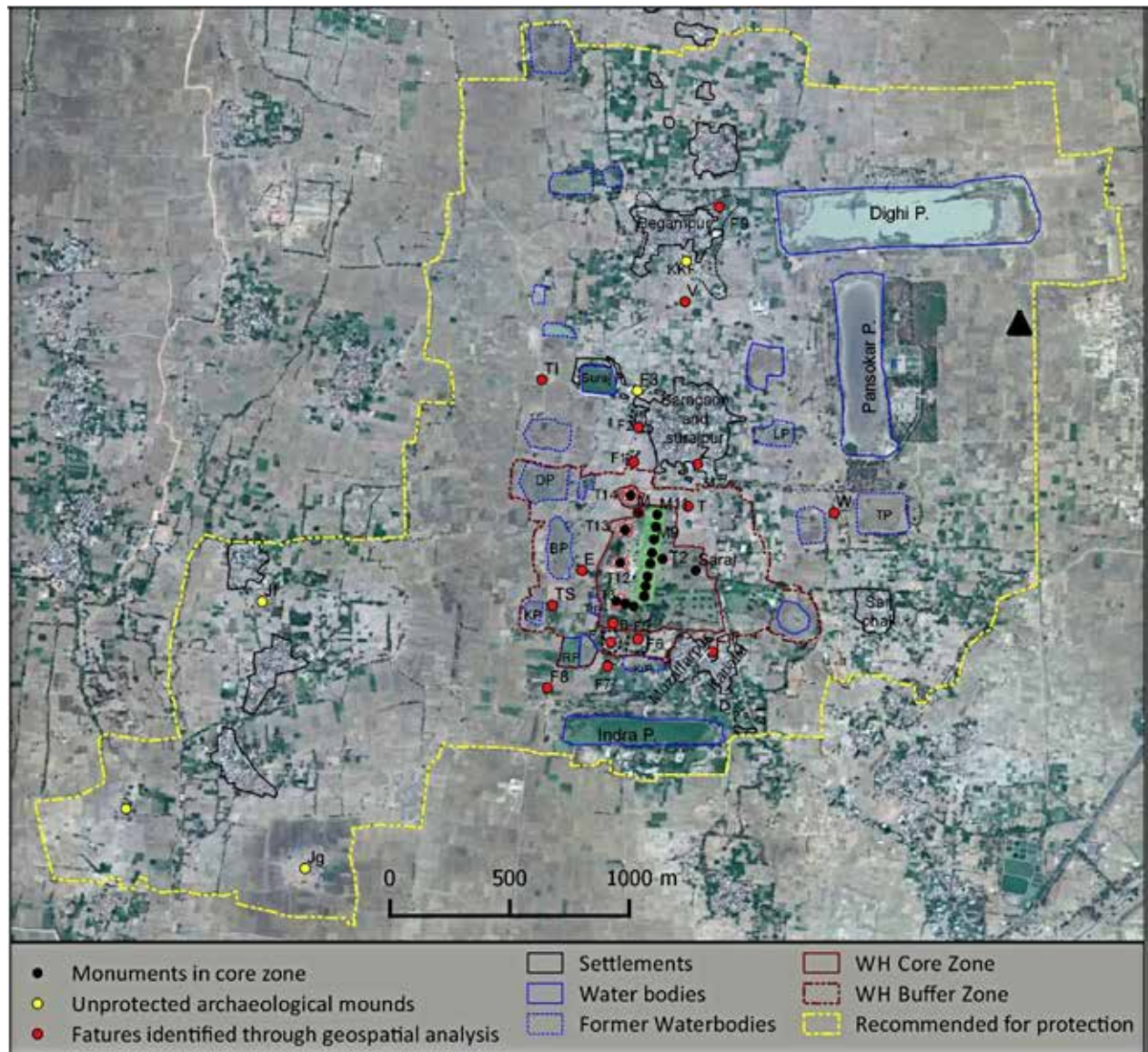


The property of Bodhgaya inscribed as a World Heritage site in 2002 in the context of the archaeological landscape identifiable through geospatial analysis. Note the increased number of concrete structures from 2003 (left) to 2018 (right)



Nalanda: Property inscribed as World Heritage in 2016





The archaeological landscape around the inscribed property of Nalanda showing the boundary of region that can be recommended for protection



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Working with New Technologies at Heritage Sites

A Brief Survey of the Activities of the Heritage for Development Programme of the Spanish Agency for International Cooperation and Development (AECID)

Dr Irene Seco Serra

New technologies provide us with powerful instruments which are being progressively applied to projects of culture and development. But working with new technologies at heritage sites is not an easy task, as there are several extra elements to be taken into account.

We present here some of the projects currently being carried out by the Heritage for Development programme of AECID detailing the processes we use, so that our shared experience may be applied to Indian sites.

The Heritage for Development Programme

AECID is the main actor of Spanish cooperation for development. Oriented towards sustainable human development and combating poverty, it focuses on the gender perspective, environmental quality, respect for cultural diversity and respect for human rights.

AECID works in culture and development through several instruments, the leading one being the *Heritage for Development Programme*. The main goal of the *Heritage for Development Programme* is contributing to the development of local communities through the promotion of their own heritage. In 2014, AECID commemorated the 25th anniversary of the Programme. This longstanding experience highlights the importance that Spain has given to working in heritage and culture with a development perspective, a sector in which our country has a solid track record.

We believe that cultural heritage not only plays a role in development cooperation, but it is also an important cross-cutting tool for achieving inclusive, peaceful, and participatory societies.

Two Technology-Oriented Projects Currently Run by the Heritage for Development Programme

Preservation, Enhancement and Digitization of the Manuscripts at the Family Libraries of Chinguetti (Mauritania)

Starting in 2016, the general objective of this project is supporting the preservation and enhancement of the manuscripts at the family libraries of Chinguetti (Mauritania).

These are family-acquired and transmitted libraries, originally linked to 18th century trans-Saharan trade routes. We intend to make this heritage available to the Mauritanian people, a heritage which is deeply related to their diversity and identity.



In the background, diverse threats to cultural heritage lurk. To begin with, we have to confront climate-related difficulties in preservation, mainly biological threats, sand and extreme dryness. The depopulation of the area is another potential threat to the safety of the manuscripts, as is the lack of knowledge and awareness of the richness of this heritage. To top it all, as in many other places, heritage may become a target of violence.

Our activities in Chinguetti began with a preparatory study of the manuscripts at the family libraries, which led to the digitization of the most relevant items.

A second phase has included the restoration of the libraries themselves. We have also organized several meetings with our Mauritanian associates, including a visit to Spain during which members of different Mauritanian institutions, such as the National Museum or the National Research Institute, as well as the leaders of the family libraries, have visited relevant Spanish research centres and libraries and have established personal contact with their Spanish counterparts.

Architectural Assessment and Installation of a Solar-Powered Electrical System at the Great Mosque of Djenné (Mali)

This project, which started in 2017, began with the assessment of the state of the mud structure of the Great Mosque of Djenné. The assessment allowed a subsequent restoration and also paved the way for the installation of solar panels. The use of solar power intends to lift off the community the electricity expenses, which are becoming too onerous for a local community already hard-hit by economic crisis.

The Mosque of Djenné is the largest mud building in the world, being listed by UNESCO among its Heritage Sites; it is also a powerful symbol of identity as well as a focal meeting point for all who live in the area.



Unfortunately, the country is immersed in a deep economic recession and tourism, once a welcome income source, has virtually disappeared in the city. The crisis has also resulted in the interruption of the cyclic mud plastering of the building or *crépissage*.



This plastering is traditionally done on a yearly basis in order to preserve the integrity of the walls; however, the lack of resources has prevented it from taking place for some time - it was only resumed last year and its much needed annual continuity is difficult to foresee.

There are also climate-related difficulties for the preservation of the building, which worsen in the absence or intermittence of the yearly plastering.

Our activities in Djenné started with the architectural assessment of the Mosque; this was followed by the installation of a UNESCO norms-friendly solar-powered system in order to provide electricity for the building and the adjacent public square. Further assessments are planned in order to extend our actions to other historic buildings of the city in the near future.



Working with New Technologies at Heritage Sites: the case of Djenné

Working with new technologies at heritage sites requires a careful diagnosis and planning as well as a risk assessment and a well-designed activities schedule and a detailed technical justification. A management and sustainability estimate is also advisable. We will now examine the case of Djenné and provide details of the matrix we created in the hope that it may be useful for other sites with similar problems.

Diagnosis: in the case of Djenné, the project required both an architectural assessment and a technical assessment focused on solar power.

Planning: our planning schedules include general objectives and several specific objectives which are directly linked to the proposed activities. In Djenné, there was a general objective, five specific objectives and seven main activities.

DJENNE	Activities indicators	Starting point	Final goals
General Objective: Protection and enhancement of World Heritage: - Social cohesion and peace - Human rights: Access to electricity - Environmental protection, sustainable energies	Architectural and technical assessment: completed. Solar panels and lamps: installed.	Ancient building with structure problems. Absence of renewable energy source: scarce or non-existent lighting.	Architectural assessment which will enable subsequent interventions. Re-appropriation of public space: meeting point for the community. Proposed results achieved: architectural assessment completed, restoration initiated, solar panels working, heritage criteria fulfilled, tourism recovered.
Specific Objective 1: Assessment	Assessment completed	No previous assessments in the last 5 years	Enabling future architectural interventions
Specific Objective 2: Diagnosis	Diagnosis completed	No previous diagnosis	Enabling the integration of solar equipment
Specific Objective 3: Planning and installation of solar panels and lamps	Installation completed	Number of solar panels: 0	Building and public space provided with solar panels and lamps in working order.
Specific Objective 4: Remarkable cut down on costs	Electricity costs reduced	Extremely high electricity costs	Acceptable electricity costs
Specific Objective 5: Sustainable management of the building as part of the "Old Cities of Djenne" category.	The building is still listed as World Heritage	No global management; danger of getting out of the list	Building managed locally as Heritage Site
Specific Objective 6: Integration of local actors	Actors consulted	No previous consultation	Local actors are part of the project



Risk assessment: in Djenné, apart from the usual natural and anthropic risk assessment, a specific heritage-oriented assessment was performed in order to achieve a suitable fit of new technologies and UNESCO norms.

Activities schedule: they are interconnected with the technical justification. The detailed checklist of Djenné included fourteen items conveniently linked to indicators and assessment sources.

	Month 1	Month 2	Month 3	Month 4	Month 5	Month 6	Month 7	Month 8	Month 9
Product									
Result 1. Architectural assessment									
Evaluation and actor consulting	x								
Works in progress		x	x						
Diagnosis of urban and architectural design; viability study.		x	x	x					
Result 2. Rehabilitation initiated				x	x				
Result 3. Electricity provided									
Solar panels installed				x	x				
Inauguration						x			
Result 4. UNESCO criteria observed			x	x	x	x			
Result 5. Turistic value improved, heritage value increased						x			
Monitoring and coordination	x	x	x	x	x	x			
Activities report (including social, economical and cultural impact).								x	x

Management and sustainability: new technologies require an extra effort on management and sustainability in order to be successful once the project is ended. The characteristics of the solar panels and other elements in Djenné were therefore exhaustively analysed and assessed so that local management and repair could be guaranteed.





Photo: Jakub Zaczek



Cultural Heritage Conservation Projects

EXAMPLES OF EUROPEAN UNION
MEMBER STATE PROJECTS REALIZED IN
COLLABORATION WITH INDIAN PARTNERS



Preservation of Tibetan Cultural Heritage in Nako Village, Himachal Pradesh

Institute of Conservation, University of Applied Arts Vienna

From 2004 to 2010 an interdisciplinary team of Austrian conservators and researchers under the leadership of Prof. Dr Gabriela Krist (Institute of Conservation, University of Applied Arts Vienna) undertook the scientific research, development and implementation of long-term preservation strategies to preserve the interiors of two temples within the Tibetan Buddhist temple complex at Nako, Upper Kinnaur, North India. The conservation activities followed the emergency architectural interventions conducted by the Indian architect Romi Khosla.

The four historically significant temples can be dated back to 11th/early 12th century. Their proximity and strong cultural connection to Western Tibet make them a valuable living record of the social and cultural history of the region. Also due to the artistic qualities – the temples preserve the earliest artistic heritage of Tibetan Buddhism in the form of mural paintings, polychrome clay sculptures and decorated wooden architectural elements – the complex is one of the most important and unique art works of its kind in the world.

This architectural legacy in the Western Himalayas has recently started showing alarming signs of deterioration. The historic earth structures designed for an arid climate now receive rainfall during the whole summer. Changing climatic patterns, rising ground water, frequently occurring earthquakes and constant human interventions have posed a serious threat to the existence of this living cultural heritage that resulted in an urgent need for a comprehensive conservation programme and further preservation.

For this purpose, the understanding of construction and artistic techniques and the decay mechanisms were studied and formed the base for the development of conservation measures, taking sensitive consideration of local needs, and guidelines for future maintenance.

To meet the goals of the project an interdisciplinary approach was undertaken. It comprised of a complete on-site survey including graphic documentation of the historic structure, and damage assessment and conservation measures documentation. A detailed technical research on local traditional materials and techniques was required to provide an essential base for appropriate conservation intervention. Additionally, a three-year climate monitoring of the exterior and interior climate was carried out.

These efforts resulted in the complete stabilisation and conservation of the interior decoration of the two main temples and urgent securing measures in one smaller temple, so that the temples can continue to be a focal point of pilgrimage and worship. Comprehensive material and technological research was completed, and a digital graphic documentation database of all four temples accompanied by a coherent visual glossary was created.

The project partner was the National Research Laboratory for Conservation of Cultural Property Lucknow. Support was also received from the Nako Buddhist Society, Nako Youth Club and Hangrang Organisation, as well as from the Austrian Cultural Forum New Delhi.





Apse of the Main temple – before restoration in 2007 (left) and after restoration in 2010 (right).
Photo: Institute of Conservation, University of Applied Arts Vienna



View of the Buddhist temple complex at Nako from the south-west side. Photo: Institute of Conservation, University of Applied Arts Vienna

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Restoration of the Royal Gardens in Khajuraho, Madhya Pradesh

INTACH Belgium Chapter

The Belgian Chapter of the Indian National Trust for Art and Cultural Heritage (INTACH Belgium) has been actively restoring the royal gardens in Rajnagar/Khajuraho of the Bundelkhand region in India under the project name of 'The Lost Gardens of Khajuraho'.

Khajuraho is a small city of some 20,000 inhabitants in the Chhattarpur District of Madhya Pradesh, India. The name is derived from the Hindi word khajur, which means date palm.

From a historical viewpoint, Khajuraho is part of Bundelkhand. It lies in the middle of an agricultural region, but the most important source of income is tourism.

With shared interests from both Belgium and India, the project started in 2003 and an overseas chapter of Indian National Trust for Art and Cultural Heritage (INTACH) was set up in Belgium to fund the conservation project of these gardens.

The aim of the conservation project is to reintroduce traditional agriculture methods and organic farming via these gardens acting as the training centres for sustainable farming practices and to revitalize these "lost gardens" in an adapted, sustainable way, in accordance with the INTACH philosophy: with the help of and for the benefit of the local population.

The main features of the Lost Gardens Project are:

- Historically informed reconstruction of the royal gardens of Khajuraho with the help of local craftsmen and local knowhow;
- Creation of a community seedbank with local varieties of vegetables and fruits, and the cultivation of these varieties;
- Sustainable development through sustainable cultivation techniques such as "conservation agriculture";
- Sustainable tourism.

The project is also part of a renovation strategy for the development of Khajuraho and the broader region.

The government of Madhya Pradesh supports the plan to develop Rajnagar, the administrative centre of some 20,000 inhabitants, as a "heritage village" in the strategy for regional development.





Photos: INTACH Belgium; Nishant Upadhyay

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Examples of Czech Efforts Towards the Preservation of Cultural Heritage in India

Since the establishment of the Czech Republic in 1993, cultural heritage has been one of the priorities of the Czech Government.

In terms of the Czech contribution to conservation efforts in India, the primary focus from the very beginning has been on the intangible cultural heritage of India. For example, in 2018 the Czech Republic actively cooperated with the Indian NGO "Psychological Community and Health Organisation - PSYCHO TRUST", on a project geared towards the improvement of traditional crafts of tailoring and embroidery among rural girls from 25 villages in the Karur District in Tamil Nadu. The idea was to help spread the unique skills of older women among the younger generation so that traditional tailoring and embroidery would continue to flourish.

Another similar project funded by the Czech Republic in 2018 took place in Imphal, Manipur where a new community centre was built for 150 women from the local minority community. These women were trained by the local NGO "Institute of Social Research and Development" (ISRD) in traditional silk weaving and embroidery techniques.

Since 2010, the Czech NGO Brontosaurus has been working to preserve the unique local cultural heritage of Mulbekh village, Kargil district, Jammu and Kashmir. The main aim of the efforts of many Czech volunteers is to protect traditional local culture by improving living conditions and increasing qualifications and skills of the local community, by combining traditional local techniques with modern technologies.

In a similar vein, the Czechs helped build a new building of Spring Dales Public School, Mulbekh. Similarly, another building to accommodate 40 students was also built. New buildings were designed and built using solar and rammed-earth technologies, the latter of which is an adaptation of the traditional Ladakhi mud-building technique. When designing and building these structures, traditional Ladakhi techniques and features were employed, such as typical Ladakhi window decoration, clay roofs, channel irrigation systems or composting toilets, for example.

Another project involved the exploration of local languages which still exist but are quickly disappearing in the remote villages of Little Tibet, Jammu and Kashmir, where Czechs are helping in the mapping and documentation of the vocabulary and grammar of these local languages.

In the Czech Republic itself, there are thousands of historical buildings and monuments undergoing accelerated surface damage due to air pollution, especially in large cities. A special transparent nanocomposite coating system with solar photocatalytic self-cleaning and disinfection function, developed and patented in the Czech Republic, has proven to be an effective tool to prevent the growth of algae on living houses as well as historical monuments.

Czech experts are keen to cooperate with their Indian counterparts to apply these modern nanotechnologies to Indian heritage monuments in the near future.

In addition, many Czech Indologists are currently working towards creating and implementing different projects of cooperation between the Czech Republic and India in the field of the cultural heritage conservation.





Photos: Embassy of the Czech Republic in India

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Denmark-India: Restoration of Historic Town Core of Serampore, West Bengal

The National Museum of Denmark in Collaboration with Government of West Bengal

10 years ago Serampore was about to lose its historic core; an administrative centre and recreational area in West Bengal. As Serampore has become increasingly integrated in larger Kolkata, grand old houses have fallen in ruin, while multi-story buildings have mushroomed and traffic problems increased. This process of rapid urbanization is still happening today, but the town core's historic streetscape and important heritage buildings have now been saved. Through conservation driven development, the area has been revived as an attractive public space.

The conservation projects of the National Museum of Denmark have been of vital importance, but they are only a part of the area's positive transformation. Co-funding and supplementing projects from the Government of West Bengal have been equally crucial, and other associates from India and Denmark have also contributed in realizing the shared vision.

Serampore was a Danish trading town from 1755 to 1845. In the 1830s it was known as India's best-built and best-kept European town and praised for its combination of luxurious European houses and Indian palaces. It is part of the area known as Europe on the Ganges (Hooghly River).

The Serampore Initiative of the National Museum of Denmark was founded to document and preserve the physical cultural heritage from the Danish period in Serampore from 1755 to 1845. Apart from conservation and urban upgrading the Museum also works to create new knowledge and promote awareness of Serampore through researching joint Indian-Danish history.

The funding partner is the philanthropic association Realdania whose mission is to improve the quality of living through improving the built environment. In association with INTACH and Indian conservation architects, the National Museum of Denmark has initiated the restoration of several larger and smaller heritage buildings in Serampore, and organized architect competitions. It has offered expert advice to local conservation and urban upgrading projects funded by the Government of West Bengal.

The Museum collaborates with private Kolkata-based architects, CEPT University Ahmedabad, the Indian Institute of Engineering Science and Technology Shibpur, and the Copenhagen School of Architecture on restoring, documenting and planning for Serampore's historic buildings and streetscape. The work involves thesis students from both countries. The comprehensive restoration of St. Olav's Church received UNESCO's Award of Distinction 2016. In 2018 the Museum concluded the restoration of two buildings owned by the Government of West Bengal and leased to private operators who run them as popular local cafés and restaurants. One is the Denmark Tavern of 1786, which the Park Group also runs as a lodge, labelled as the oldest hotel in India. The Museum cooperates with an Indian architect consultant on a detailed landscaping plan for the former Danish administrative compound and town square. The plan proposal has been submitted to the State Government for expected implementation in 2019.





(Top): The ruined Denmark Tavern before restoration (2013), Photo: Flemming Aalund
Below: The Denmark Tavern after restoration (2018). Photo: Britt Lindemann

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Indo-French Heritage Lab

The Chandernagore Initiative, Kolkata

The Indo-French Heritage Lab is an open, flexible and participative platform dedicated to heritage. This initiative aims to promote the exchange of expertise and training programmes and bring together all public and private stakeholders around a positive vision of heritage that accompanies the development of modern, smart and sustainable Indian cities. This ambitious platform shall apply out-of-the-box methodologies such as artistic mediation, cultural actions, innovative workshops and hackathons.

The pilot project of the Indo-French Heritage Lab is located in Chandernagore, the erstwhile French settlement in suburban Kolkata. A town with a unique history of its own lies in neglect, threatened with disappearance by the pressures of modern development. A physical manifestation of the dichotomy of dwelling in the past or moving on to the future, the town - dotted with crumbling mansions - is a testimony to the grandeur of Bengali merchants rapidly being replaced by insensitive modern development. As architects and historians romanticize about its glory, architecture and historic milieu, people want smaller efficient houses with modern amenities.

The community comprises of educated citizens mostly engaged in service who travel daily on the suburban trains to Kolkata for their jobs. These towns are now lucrative as they offer affordable housing for these daily commuters and thus find themselves at the centre of incremental developer led urban development. The cultural landscape once dotted by palm trees and one-storied spacious mansions or town houses is rapidly being replaced by developments of multi-storied housing. While the community wants to preserve their historic environment, the lack of funds and resources and little support from the government in the form of soft loans, tax breaks and grants, means the goal of preservation becomes far idealist.

The Indo-French Heritage Lab sets out to develop a new methodology pivoted on citizens' engagement to find new and innovative sustainable solutions to the restoration and reuse of everyday heritage buildings. The House of the Moon Project is an initiative which was launched for the restoration of one of the most prominent buildings on the promenade of the Registry Building to be restored and reused for the community. Through a series of academic workshops and pop-up art installations, students were able to articulate the aspirations of the community to the decision makers. The project also marked the beginning of a dialogue with the Government of West Bengal and the Government of France to collaborate on an innovative PPP to restore and re-appropriate the building as a cultural space for citizens. This project is representative of how through the merging of resources and the employment of digital technologies for community engagement, we can develop a bottoms-up approach for heritage conservation of everyday heritage spaces and places.

In this way, the model and the tools developed in Chandernagore, a pilot project of the Indo-French Heritage Lab, should be implemented in other Indian cities which have heritage sites to preserve. The objective is to create a comprehensive platform to bring together innovative and participatory projects around heritage conservation and provide tools for the implementation of these initiatives on site.





Old Residence in the Strand. Photo: Institut Français en Inde / French Embassy



Jora Ghat, Chandernagore. Photo: Institut Français en Inde / French Embassy

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Restoration of Chaunsath Khambha, New Delhi

Embassy of The Federal Republic of Germany in Cooperation
with The Aga Khan Trust for Culture

The restoration of Chaunsath Khambha, a Mughal mausoleum dating back to the early 17th century, was carried out between 2010 and 2014. The project was part of the Urban Renewal project run by the Aga Khan Trust for Culture in the historic Nizamuddin quarter in New Delhi, where Humayun's Tomb – a World Heritage site – is also to be found. For this unique project, the 25 marble domes in the tomb were removed and put back together by hand to replace centuries-old damaged iron dowels.

Chaunsath Khambha was built in 1623-4 to serve as a tomb for Mirza Aziz Koka, foster brother of the great Mughal Emperor Akbar. The name reflects the tomb's architecture: chaunsath (64) stands for the tomb's 64 marble pillars (khambha). The mausoleum is unique on account of it being built entirely out of marble, with 25 marble domes supporting the flat roof of the structure.

The marble blocks of the 25 domes are linked to one another and embedded in the brick masonry above the domes with iron dowels. The rain water that had collected on the roof over the centuries had severely corroded the iron dowels. This led to them bursting through the masonry in all parts of the mausoleum - domes, arches, façade and even the columns. The mausoleum's entire structure was thus in jeopardy.

A high definition survey, using 3D laser scanning technology, was carried out on the structure as a precursor to conservation work. This survey revealed that over 80% of the marble blocks had severe cracks and that these cracks had merely been filled with white cement during past repair work by way of a makeshift solution. This masked the damage but allowed the deterioration to accelerate.

In view of the unique architectural design and construction of Chaunsath Khambha as well as the fact that each stone was unique in shape and size, it was agreed that all original stones would be retained. To this end, each of the 25 domes had to be dismantled in order to remove the damaged iron dowels. Such an effort had never before been undertaken anywhere in the world.

Once each stone was numbered and catalogued, the individual marble blocks were dismantled and reassembled on the floor. The iron dowels were removed and cracks were filled using precisely-fitting stones. It took the stonecutters eight months to successfully repair the first dome using traditional building techniques – thus establishing the methodology for repairing the rest of the mausoleum. This allowed urgently needed repairs to the roof to be taken in hand.

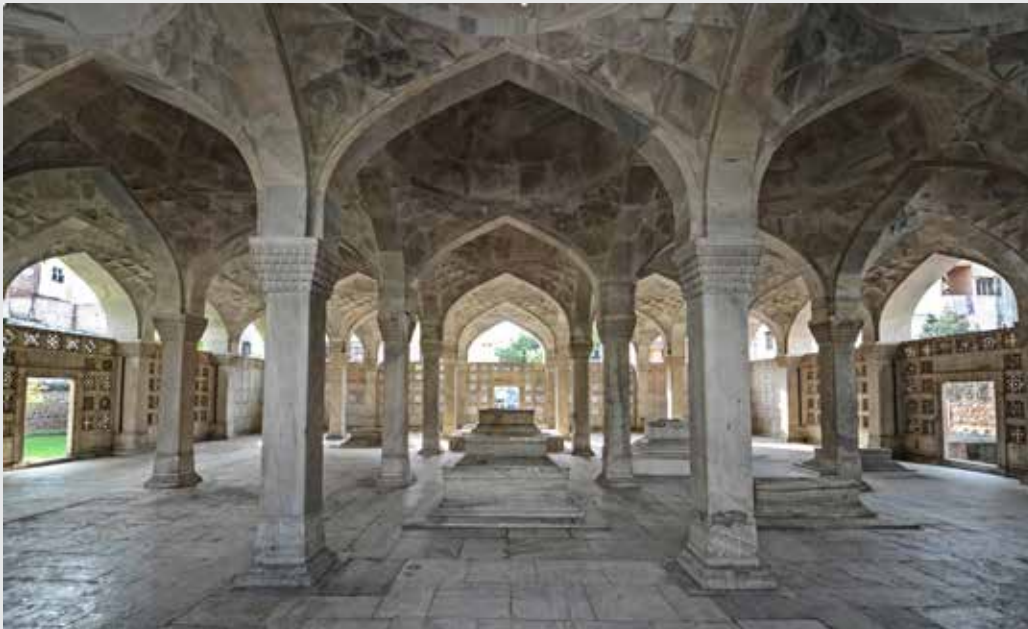
The repairs to the domes were coupled with repairs to the 35cm thick arch stones and the severely damaged diamond-shaped pendentives which support the marble domes. All in all, the repair of the 25 domes has taken almost four years, which amounted to more than 25,000 days of work for the stone craftsmen.

Ratish Nanda
CEO, Aga Khan Trust for Culture





Chaunsath Khamba shines in old glory. Photo: Aga Khan Trust for Culture



The pillars and domes of Chaunsath Khamba: every individual stone in the 25 domes was restored by hand. Photo: Aga Khan Trust for Culture

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Restoration Of Oont Kadal, Srinagar

Embassy of The Federal Republic of Germany in Cooperation with the Indian National Trust for Art and Cultural Heritage (INTACH)

The cultural heritage of a country, both tangible and intangible, is a key factor in defining the identity of its people. Historical monuments do not only represent architectural skills of the past, but they also provide a deep insight into the history of their creation. Unfortunately, the combined impact of climate conditions, pollution, negligence, urbanization and natural decay often results in damage to cultural heritage sites, sometimes including the complete disappearance of such cultural heritage.

Therefore, protecting, preserving and maintaining cultural property are key aspects for present and future generations. Already in 1981, the German Government made this one of its priorities of its cultural work abroad. Since then, more than 2,860 projects in 144 countries have received support through the Federal Foreign Office's Cultural Preservation Program amounting to a total of around 80 million euro. The focus is on supporting projects in countries where cultural property and heritage sites are threatened, and where funding is insufficient to preserve them.

India has an incredible history, resulting in numerous treasurable cultural heritage sites. It is a huge task to keep track of the condition of each of these sites and to find resources to take conservation measures in due time. Thus, it is only natural that Germany has been engaged in a number of cultural preservation projects in India. This includes amongst others the restoration of the Queen's Palace of the Mehrangarh Fort in Jodhpur and the Heritage Path in Wanla, Ladakh.

A recently completed project is the restoration of Oont Kadal ("Camel Bridge"), situated on Dal Lake in Srinagar, Jammu and Kashmir. The Indian National Trust for Art and Cultural Heritage (INTACH) had approached the German Embassy and proposed to restore this well-known 17th century structure. It is believed that at that time, Oont Kadal facilitated access to a religious site situated in the close by village of Ishber. When it became inaccessible in later years, it still remained in use, although as a place for pictures than as a passage for pilgrims - the cover of "Vogue Magazine" from 1956 likely being the most famous of them!

Soon after the project proposal was made, funding through the Federal Foreign Office's Cultural Preservation Program was secured and the conservation process was initiated. The challenging works conducted in the middle of Dal Lake included the cleaning of the site and reversing several previous interventions that had been inappropriately done. After this, the actual condition of Oont Kadal could be analyzed. Even samples of lime from the site were examined in a laboratory so the new lime would match the original as closely as possible. The structure was first relieved of plants and trees growing through it that were compromising its strength, before being treated with herbicide to avoid any future growth of trees from the masonry.

Apart from the frequent sub-zero temperatures at the site, the logistics of material proved to be a challenging aspect of restoring Oont Kadal. A boat, called "khoch", traditionally used to ferry sand from rivers, was used to carry stone, sand and lime from the shore to the site within Dal Lake. This made the process very labor-intensive and time-consuming.



However, thanks to the great efforts and dedication of the workers on site, the conservation process could be completed in due time, leaving a marvelous and eye-catching structure in the middle of Dal Lake, which would otherwise likely have disappeared. And with it, the stories it has to tell.



The structure was approached with boats, called “khoch”, that were traditionally used to ferry sand from rivers.
Photo: Indian National Trust for Art and Cultural Heritage (INTACH), Jammu and Kashmir Chapter



Difficult weather conditions did not keep the workers on site from fulfilling this challenging task.
Photo: Indian National Trust for Art and Cultural Heritage (INTACH), Jammu and Kashmir Chapter

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Restoration of the Zangla Palace, Jammu and Kashmir

Csoma's Room Foundation

Nestled in the foothills of the Himalayas, the Zangla Palace served as the residence of the renowned Hungarian explorer and orientalist, Sándor Csoma de Kőrös, in the early 19th century - the compiler of the first Anglo-Tibetan dictionary and considered the founder of Tibetology.

After a long period of decay, in 2008, the Hungarian NGO, Csoma's Room Foundation began the process of restoring the palace to its former glory, as well as undertaking conservation activities of the artefacts inside the palace.

Inspired by the Hungarian connection of Sándor Csoma de Kőrös, Dr Balázs Irimiás established Csoma's Room Foundation with the specific aim of using his academic knowledge and expertise in ensuring the preservation of this unique and beautiful monument.

In 2008, the Foundation began by undertaking a manual survey and a risk assessment of the main components of the building, as well as engaging in emergency interventions – ensuring the stability of the roof and filling in cracks in the exterior wall of the building.

During the following year, the Foundation engaged in a two-pronged plan: by fortifying and strengthening different elements of the building of the palace, while at the same time undertaking a survey of the now abandoned fortified village, which once surrounded the palace. This survey was undertaken by Julie Delmotte of EFEO.

In 2010 and 2011, the Foundation undertook major reconstruction activities, specifically with regard to the roof and exterior walls of the project. These activities continued into the following year, and were supplemented by an archaeological survey of the surrounding Zangla village, with surface collection and wall mapping.

Other activities that the members of the Foundation undertook up to 2016 included the replacement and strengthening of the main wall balcony of the palace, regular maintenance and painting of the exterior walls, as well as rebuilding the cracked structural walls of the room where Sándor Csoma de Kőrös originally resided, on the fourth floor of the palace.

By 2016, the conservation project had achieved its goal of ensuring the structural stability of the Zangla Palace.

Some of the main sponsors of this project from 2008-18 include: the Hungarian enterprises MARKET Építő Zrt, Quantis Holding and GeoX Ltd., as well as the Singapore-based company Sight to Sky.





Photo: Csoma's Room Foundation

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From Laboratory to Conservation Site

Research on performance of improved traditional materials and techniques and development of a technical database to support conservation and adaptive reuse of historic residential buildings in Shahjahanabad, Delhi

The CNR - Istituto di Geoscienze e Georisorse (Pisa - Italy) in collaboration with the Department of Architectural Conservation - School of Planning and Architecture Delhi (India)

The collaborative research project between CNR-IGG and SPA, Delhi (Institute of National Importance) is intended to ensure development of technical expertise and efficiencies for improved conservation interventions in historic buildings used for residential purposes in Shahjahanabad, Delhi.

The focus is on:

- a. Systematic scientific research to evaluate the efficacy of various traditional and historic building materials and the utility of specific, compatible, modern materials;
- b. Identification of improved materials and techniques that will be proved effective under tropical climatic conditions for improved conservation interventions on residential heritage buildings (havelis). In particular, consolidation and protective agents for mortars and stones, cleaning procedures for removal soluble salts and organic growth from historic buildings, improved mortars (from traditional receipt or new formulation) and grouts are tested in lab and onsite in order to evaluate and compare their performance;
- c. Enabling technology transfer and applications from laboratory to conservation sites;
- d. Creation of a reliable technical database on materials properties and development and demonstration of improved practices and appropriate techniques for grouting, sandstone consolidation, cleaning and protection, up-gradation and adaptive reuse of built heritage of historic buildings.

The collaborative project is envisaged as a research-cum-training and outreach initiative for practical application of scientific knowledge to common conservation problems linked with living historic 'haveli' residential buildings in Shahjahanabad. Scientific assessment of the efficacy of traditional formulations and modern treatments are also undertaken in order to devise innovative, effective, economical conservation treatments, methods and techniques, with a strong scientific foundation, for common material deterioration problems in the context of a walled city in India.

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IoT Framework for Modeling, Monitoring and Damage Detection of Natural and Historical Heritage Structures

The Università degli Studi Roma Tre of Rome - Dept. of Architecture (Italy) in collaboration with the Amrita University - Centre for Wireless Network Applications (Kerala - India)

With this project Roma Tre University and Amrita University started a research collaboration with the aim of developing new Low Cost Strategies for Natural and Historical Heritage Health Monitoring and Damage Detection.

In general Health Monitoring involves different research disciplines and expertise. From one side there's a need of design and optimize monitoring systems (MS). If, in particular, one refers to Structural Health Monitoring (SHM), then the MS can be designed to collect two different kinds of data: 1) static measurements; 2) dynamic measurements. The data collected from the MS could be hence used in different ways. Continuous or periodic monitoring of the Structural System can be used to detect significant statistical changes in the monitored response, with respect to a pre-defined reference state of the structure that needs to be initially selected. Significant changes means that something is occurring to the monitored structure. At that point engineering interpretations of possible causes of the measured changes in data need to be given.

There are again different ways of making such interpretations. One way is to analyze the data from a statistical model to calculate the probability of some events and assessing if they are going to occur. The other way is to implement a Model of the structure (e.g. a numerical Model such as Finite Element Model) and to use this Model to simulate possible scenarios that allow for an interpretation of what is really occurring to the structure.

The FE model used for this purpose needs a preliminary calibration (Model Updating). This means that if we know, from measurements, the response parameters of the structure at the reference state then the initial model (or reference model) is implemented a calibrated to give the same response parameters, within some fixed tolerances. The response parameters could have static meaning (as strain measures, settlements) or dynamic meaning (natural frequencies and mode shapes).

The two groups are therefore developing an IoT framework for monitoring natural and historical heritage structures. Modelling of the structures is the main activity of the Italian Research Unit while the Indian one is in charge of the design and implementation of the framework for large scale data collection, big data analysis and warnings.

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Conservation and Restoration of 26 Paintings Created by Stefan Norblin Decorating the Palace of Maharaja Lakhdhirji Waghji Bahadur

Stefan Norblin, a Polish painter, poster artist, illustrator and interior designer, decorated 26 interior paintings of the newly created modernist palace in Morvi in Gujarat around 1943. The vast majority of his works are thematically related to Hindu mythology, while maintaining elements of Art Deco style, thanks to which images were created referring in a direct way to the European - modernist - shape of the palace, as well as binding the European painting tradition with the art of the East.

This unique collection of works was created during the Second World War, using materials available on site, which resulted in technological heterogeneity and a different degree of sensitivity of individual images to the passage of time. After 70 years, the state of preservation of images was very diverse.

Conservation and restoration works on the works of Stefan Norblin were started by a team of Polish art conservationists in 2013. Funding was provided by the Polish Minister of Culture and National Heritage's programme "Protection of Cultural Heritage Abroad", as also from the Ministry of Foreign Affairs. The project was implemented in cooperation with the Polish Institute in New Delhi, with great involvement from the widow of the Maharaja. All conservation activities carried out until 2017 were organized by the Polish Heritage Academy Alumni Association and undertaken by a team of four specialists from Poland in two subsequent sessions each year.

The paintings by Stefan Norblin were characterized not only by technological heterogeneity and the associated variety of reactions of individual works to climatic storage conditions, but also by the diversity of the way they were displayed in palace interiors. Most of the paintings were painted on linen substrates; however, there were also works created on wood-based boards and - one - on a gypsum board. Some of the paintings on linen substrates were stretched on looms of a temporary nature, while other paintings were exhibited hanging in frames, and still others were permanently incorporated into the interior decoration. All the above-mentioned features of the Morvi collection set before the conservation team very interesting and often difficult challenges. All conservation activities carried out during the nine sessions were carried out on the spot without any facilities of a professional conservation workshop.

Despite these difficulties; through the help of the Maharaja's family and the palace workers in Morvi, the team of Polish restorers performed a full spectrum of conservation and restoration activities on the paintings of Stefan Norblin. Adhesive layers were stuck, paintings were cleaned of surface dirt, and necessary actions were carried out on the substrates of the paintings. The main activities included gluing the rags of linen canvas and complementing the loss of canvas; in some cases the layers were delaminated from the walls on which they were glued. Combinations of wood-based substrates and gypsum boards were repaired and their defects were supplemented. The loss of mortar paintings was supplemented and painting layers were retouched.

All of Stefan Norblin's works remain exhibited in accordance with his design and original artistic assumptions and today represent a fine example of European art in India.





Photos from the archives of the conservators

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Cultural Heritage and Management Venture Lab in Ahmedabad, India

Casa De La India Foundation with the Municipalities of Valladolid (Spain) and Ahmedabad (India), University of Valladolid and Ahmedabad University

This is an international cultural cooperation project funded by the EuropeAid programme “Investing in People. Supporting culture as a vector of democracy and economic growth”. It has been coordinated by Casa de la India Foundation (Spain), in collaboration with the universities and municipalities of Valladolid and Ahmedabad. The Casa de la India Foundation is a specialized actor in Indo-Spanish cultural relations, project design, management, and implementation, specifically created for this purpose in 2003 by the University of Valladolid, the City Council of Valladolid and the Government of India through its Embassy in Spain and Indian Council for Cultural Relations.

The project aims to detect and support the local heritage-based ecosystem to make culture the driver for social and economic development, in particular focusing on the Walled City of Ahmedabad, which achieved the first all Indian recognition on the UNESCO World Heritage List in 2017. To achieve its general goal, two tools were developed during this project with the help of experts from Valladolid, and the efforts of the people and institutions of Ahmedabad.

First was the Ahmedabad Venture Lab, an innovative programme hosted by Ahmedabad University and implemented with its project partners, which combines training and master class sessions with business consulting advice for new and talented business ideas in the cultural sector. The aim of the Venture Lab is to help new heritage based companies start and grow.

Second was the initiation of the Ahmedabad Cultural Heritage Cluster, a professional platform for the promotion and development of cultural industries and heritage related businesses. It consists of 50 local entities from the fields of public administration, research and education, and the non-governmental sector working together with the objectives of developing new projects, products and services around heritage and culture; providing technical advice on common areas of interest; facilitating access to professional markets worldwide; influencing specific policies or policymakers around key aspects related to cultural and heritage activities; and attracting new companies, investors and talented people to the cultural and business sector.

The project is one of its kind in this cultural sector - it acts as a vector for economic change and aims at influencing the policy-making process by facilitating necessary legislations to enable innovative ways of sustaining cultural practices and of “selling” them in the competitive market. The project has helped bring a broader appreciation of heritage related resources that are already present within the city and the state, and thus triggered the active participation in heritage management from the municipal and state authorities, policy makers, local leaders, NGOs, community groups, educational institutions as well as businesses.

Associate partners of the project include the Regional Government of Castile and León and the EVoCH Platform Network (Economic Value of Cultural Heritage), a network of public and private bodies financed under the Cultural Program of the European Union.



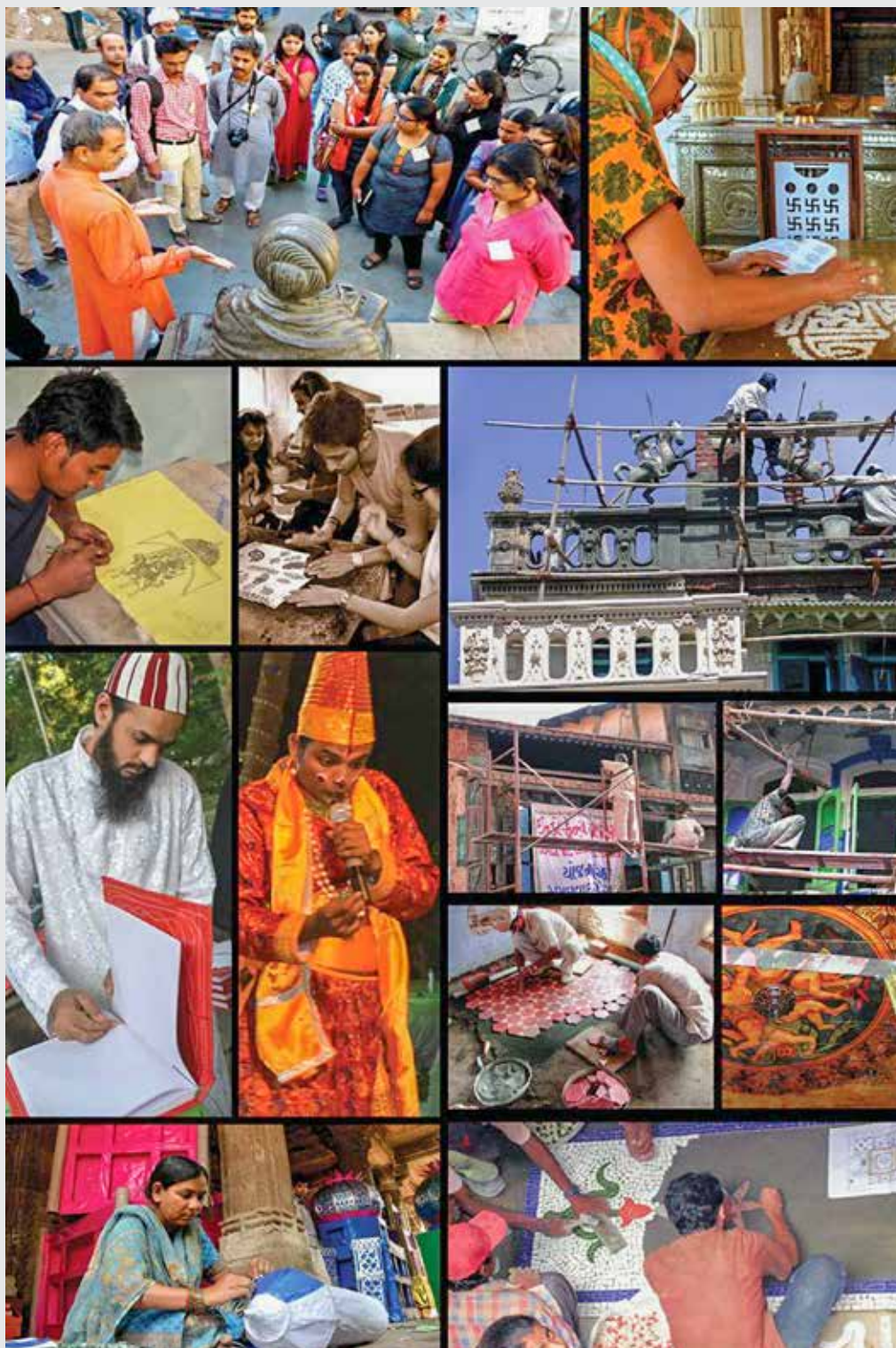


Photo: Fundación Casa de la India

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Ethno-Magic Going Global Through Exchange, Integration and Collaboration

A Banglanatak Project Financed by the European Union

Ethno-magic Going Global is a project undertaken by Banglanatak, a grassroots-based organization from Kolkata, working in the field of culture and development. Between 2009 and 2011 and with European Union financing, the project was implemented in six districts of West Bengal, namely Malda, Purulia, Bankura, Paschim (West) Medinipur, Purba (East) Medinipur and Nadia. The focus of this initiative was on the development of a unique folk art and culture-based creative industry benefiting poor and marginalised rural and tribal communities in this area.

The project was initiated with the aim of engaging folk artists living in these six districts who practised a variety of folk dance, song, drama and painting, such that these activities would prove lucrative for them and their communities. The artists were given technical know-how so they could own and manage rural micro enterprises and resource centres offering cultural products and services including heritage tourism services.

The direct beneficiaries of the action were 3200 folk artists including Chhau and Jhumur dancers, Jhumuriyas singers, Patuas, Bauls and Fakirs, and Gambhira and Domni performers living in one hundred and fifty villages in the aforementioned six districts. These folk artists formed 233 self-help groups (SHG) as part of ongoing interventions to revive art forms as a means of livelihood.

The overall objective of the project was to develop creative economies based on ethnic art and culture to preserve living heritage. The aims of the project were realized through several means. The organization of cultural events, folk festivals, workshops and residency programs for local artists and communities allowed for engagement with and popularization of local folk traditions. Local areas of interest were promoted through the development of ten folk heritage tourism trails. Local customs were preserved through the recording of songs, creation of digital content and books, dissemination through the internet, and textual and audio visual documentation. Additionally, artists and their families were able to sustain themselves through the provision of health insurance.

The project led to improved livelihood opportunities and income for artists; encouraged the preservation of folk heritage in these areas; provided a basis for revitalizing previously deprived indigenous communities, and helped forge partnerships for exchange between practitioners from the European Union and rural Indian communities.



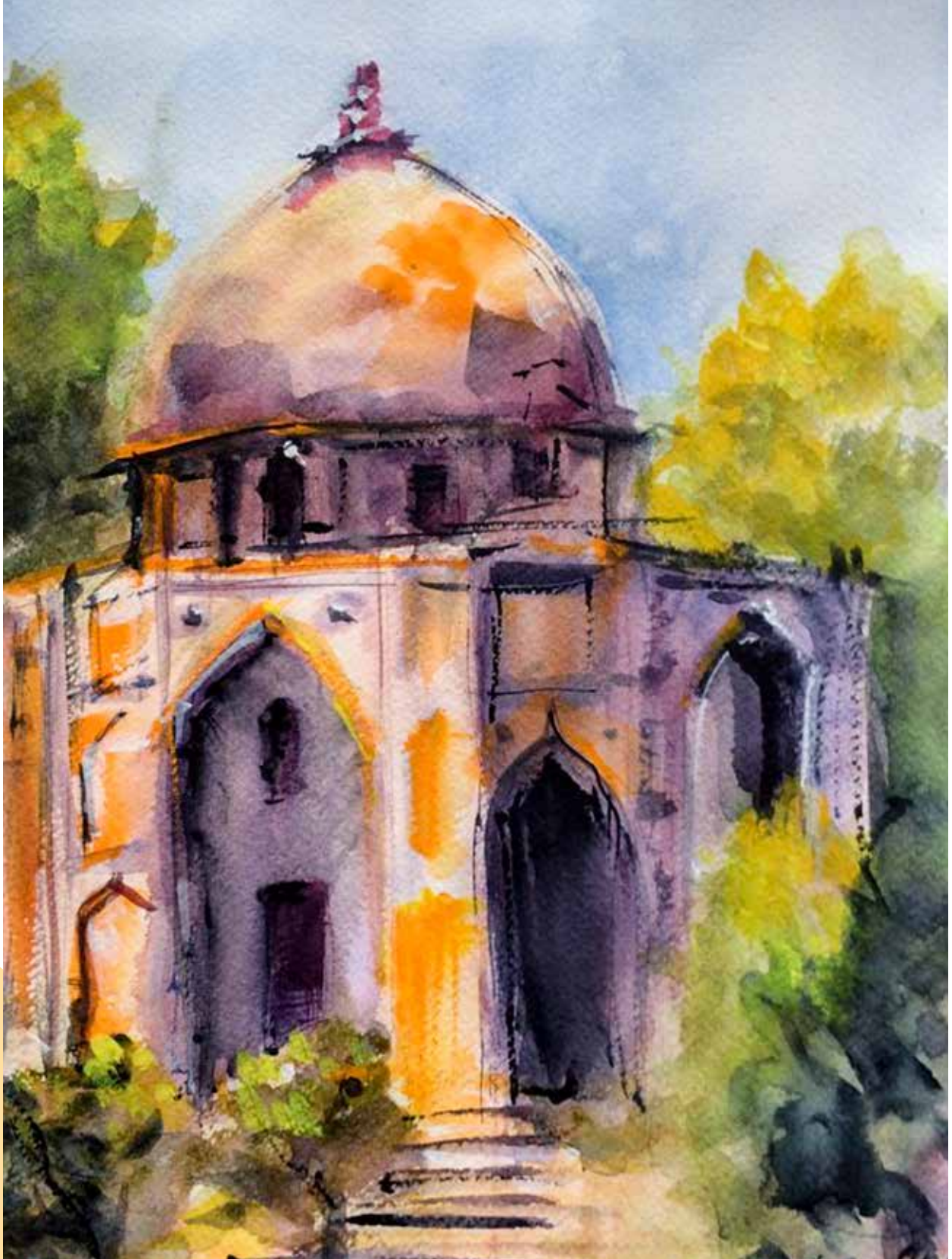


Photos: Banglanatak

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Artwork courtesy of Zuzana Mezencevová



**EUROPEAN UNION SCHEMES
FOR CULTURAL HERITAGE
CONSERVATION AND
EDUCATION**



Copernicus for Cultural Heritage: Satellites to Preserve the Legacy from our Past!

Cultural heritage, a shared source of remembrance, understanding, identity, dialogue, and creativity, represents an irreplaceable source of life and inspiration while contributing to social cohesion and economic growth.

The importance of cultural heritage preservation is globally recognized. The United Nations Educational, Scientific and Cultural Organization (UNESCO) has a World Heritage mission aimed at management and preservation of cultural heritage sites – to date, 1,073 sites are registered and monitored by UNESCO.

Today, tangible and natural cultural heritage is in danger, because of natural hazards and climate change, as well as man-made threats and criminal activities.

The data and information offered by the Copernicus programme can contribute to tangible and natural cultural heritage preservation and management. Earth Observation (EO) data is becoming increasingly instrumental, with numerous projects and applications aimed at providing products tailored to the needs of cultural heritage.

Examples of useful EO-based products include land-use change maps; natural subsidence, ground motion detection; risk assessment maps; archaeological sites monitoring and identification (e.g. buried sites); monitoring of the destruction or looting of sites; urban sprawl monitoring; climate change indicators; air pollution monitoring; coastline monitoring (erosion); and bathymetry.

Tools integrating EO data into daily cultural heritage-related activities are already in place – a good example of them is the online training environment “SpaceToPlace – EO to Empower UNESCO Site Managers” from Heidelberg University, winner of the 2016 Copernicus Masters University Challenge.

While Space2Place targets UNESCO users, other initiatives are focusing on EU national and regional stakeholders. The NEREUS Earth Observation Working Group brings a regional perspective on EO imagery and geo-information data for cultural heritage and landscapes. At the regional level the contribution of EO services and products such as those from Copernicus could be useful for the management of cultural heritage during emergencies, particularly in the case of geo-hazards and the mapping, monitoring and management of cultural heritage as a daily routine.

In addition, the HERACLES (HERitage Resilience Against CLimate Events on-Site) project aims at designing, validating and promoting responsive systems for the effective resilience of cultural heritage sites against the effects of climate change.

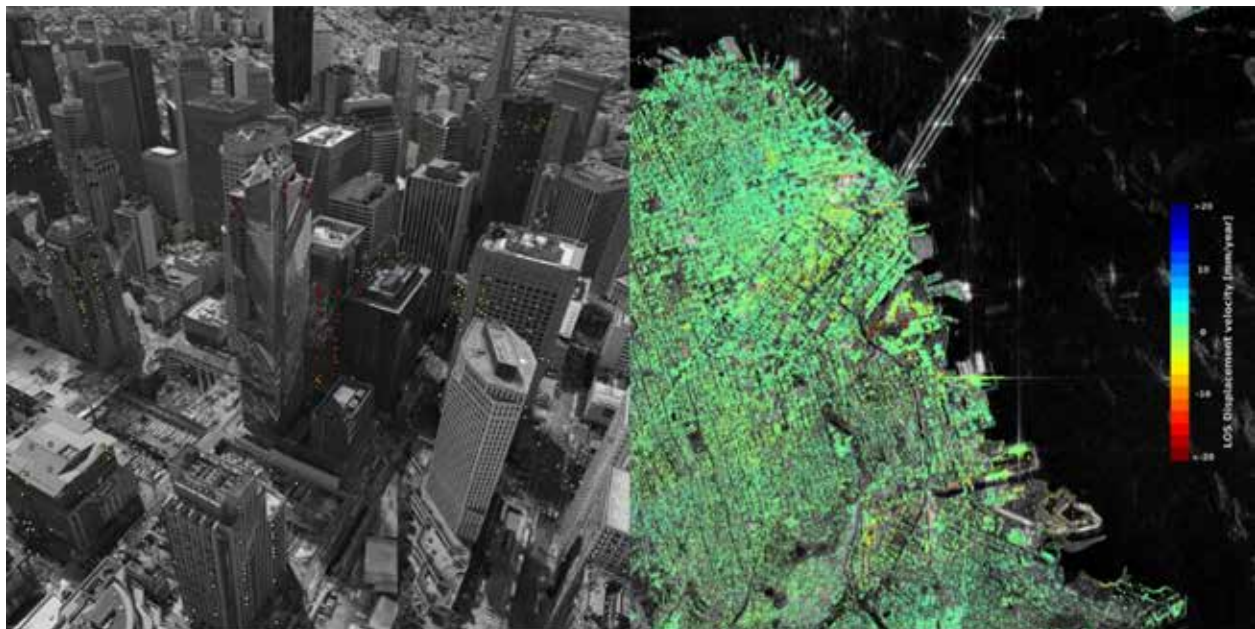
Within this framework, Copernicus could enable continuous monitoring of high-risk cultural heritage sites. Specific products such as change detection analysis (optical imagery) or deformation analysis (SAR imagery) have proven to be extremely beneficial for preventive action in these sites.



The PROtection of European Cultural HERitage from GeO-hazards (PROTHEGO) project aims to make an innovative contribution towards the analysis of geo-hazards across European cultural heritage areas by applying novel space technology based on radar interferometry (InSAR) to monitor monuments and sites at risk.

Lastly, the HERCULES (Sustainable Futures for Europe's Heritage in Cultural Landscapes) project focuses on the use of Copernicus data to support sustainable and cost-effective landscape monitoring.

The objective is to empower public and private actors to protect and sustainably manage cultural landscapes at a local, national and pan-European level. Copernicus is particularly useful thanks to its high-resolution (Sentinel-2) and Medium-Resolution (Sentinel-3) multi-spectral optical imagery.



Ground displacement of downtown San Francisco. While green indicates no detected movement, points in yellow, orange and red indicate where structures are subsiding, or sinking. (Source: ESA SEOM INSARAP study / PPO.labs / Norut / NGU)



Europeana – A European Cultural Heritage Platform for All

Launched in 2008 as the common, multilingual access point to digital resources of Europeana heritage, Europeana is an open data platform with many services giving access to almost 60 million items including image, text, sound, video and 3D material from the collections of over 3 700 libraries, archives, museums, galleries and audio-visual collections across Europe.

The materials can be used by teachers, artists, and professionals in cultural institutions and creative fields such as for making documentaries, tourism applications, games, animations and design tools. For example, 155 of the pieces of art chosen by Europe's museums, libraries and galleries to share through 'Europeana 280' have been made available under open licenses.

Europeana is also one of the key partners of the European Year of Cultural Heritage. It will, as part of the closing of the Year and the commemoration of the Great War, showcase the resources collected and digitized on the WWI and how its content has been used in pan-European Transcribathon events to crowdsource the transcription of large numbers of historical documents, with the help of a specially designed online tool. This specific initiative aims to create a fully accessible record of the unique unpublished stories found in letters and diaries in Europeana 1914-1918.

Europeana is a unique EU initiative and the only pan-European platform of its kind. It is the only aggregator in the world that brings together the largest digital collection from across 28 Member States ensuring broad and more democratic access to culture. It has also helped inspire a sense of shared history and identity among European citizens through its unique collections. At the same time, it has brought together European cultural institutions, enabling them to collaborate and share their material with European citizens.

This has led to sharing of best practices on common standards, and has also helped nurture a European network of data partners, aggregators and professionals in various fields who have stimulated capacity building and the exchange of expertise. Some of the major achievements are the progress towards a de facto standardisation in the cultural heritage sector through the Europeana Data Model, the Europeana Publishing Framework and the International Rights Statements.

Europeana also complements national strategies of Member States for the digitisation and online accessibility of cultural heritage, and reflects EU policy, such as the overall objectives of the Gothenburg communication of November 2017 on Strengthening European Identity through Education and Culture.

In addition, Europeana can be an important test-bed for new technologies and innovative ideas to enhance user experience. In fact, Europeana has received a 2017 Application Programming Interface (API) award for its REST API in the context of API World 2017. This recognition highlights the exciting work of Europeana at the interface of technology and cultural heritage.





A digitized version of an Indian portrait painting featuring Arabic text along the borders
 Photo: Wellcome Collection

Erasmus+ Opportunities for Eu-India Academic Cooperation

Erasmus+ is the European Union programme for education, training, youth and sport for the period 2014-2020. The programme builds on the brand name of the Erasmus programme, which, since 1987 has enabled almost 4 million European students to spend part of their studies in another higher education institution elsewhere in Europe. Erasmus+ offers much more than grants for students. There are four international actions of particular interest to India. Under the Horizon 2020 programme, the Marie Skłodowska-Curie actions offer as well opportunities for academic cooperation and mobility for India.

The EU has a long history of EU-India co-operation and high-level policy dialogue, especially on Science and Technology. Currently, India is very active under Erasmus+ International Credit Mobility (ICM). It also benefits from Erasmus Mundus. All these efforts enhanced the internationalisation of Indian HEIs, increased the visibility of the EU higher education system and finally increased employability among grantees.

Erasmus Mundus Joint Masters Degrees (EMJMDs) award full-degree scholarships to Master students from around the world covering tuition, travel and a living allowance. The programmes last from one to two years during which Erasmus Mundus students study in at least two different Programme Countries. Upon graduation, they are awarded a joint or double degree, or multiple degrees. Students apply directly to the programmes published in the EMJMD Catalogue.

As a partner country for Erasmus+, India has been allocated €6.8 million, for 2018 under Capacity Building in Higher Education.

Jean Monnet activities aim to develop EU studies worldwide. For over 25 years they have been supporting study modules, chairs and centres of excellence to promote excellence in teaching and research on the European integration process. Networks and projects under Jean Monnet foster cooperation and transfer of knowledge and good practice in this area. Under **Jean Monnet** this year, **12 professors** from eminent Indian universities have been granted funds to promote excellence in teaching and research in the field of European Union studies.

The **International Credit Mobility (ICM)** action extends the well-known Erasmus programme to non-EU Partner Countries around the world, funding short-term mobility of students, researchers and staff to and from Europe. Students come to the host institution for 3-12 months, obtaining 'credits' which are then recognised at the sending institution as part of their degree.

India is a very popular partner for higher education institutions (HEIs) in European Programme Countries to work with. European demand for projects with India is one of the highest in the region. So far under 4 calls, India has received 12% of the awarded grant for the whole of Asia so far (EUR 6.5 million), which will fund over 1,700 mobilities (of which over 1,000 are incoming to Europe) between 2015 and 2019. Each year, well over 500 new mobilities between Europe and India will be funded, of which approximately two-thirds are incoming to European Programme Countries.

For more information, visit
ec.europa.eu/programmes/erasmus-plus/about_en



Euraxess

Researchers in Motion

EURAXESS India, part of EURAXESS Worldwide, an initiative funded by the European Commission, is a networking and information tool for European researchers working in India and Indian ones wishing to collaborate and/or pursue a research career in Europe. It was launched in 2011 and provides information about research in Europe, European research policy, opportunities for research funding, international collaboration and for trans-national mobility. Membership is free.

The objective of EURAXESS India is to maintain the link of Europe with European and Indian researchers, scientists and scholars abroad. The multidisciplinary network involves researchers at all stages of their careers.

EURAXESS India focuses on three types of activity: networking researchers, disseminating information and helping researchers to collaborate with colleagues in Europe and to find rewarding careers in Europe or India. It organizes such events as the European Research Day, the EURAXESS Science Slam India; besides providing information sessions at Indian universities, research institutes and companies on the opportunities of cooperation and career with Europe.

EURAXESS Worldwide is a component of “EURAXESS - Researchers in Motion”, an initiative of the European Research Area (ERA) strategy that addresses barriers to the mobility of researchers and seeks to enhance scientific collaboration between Europe and the world.

It is funded by the European Commission and has the support of 40 European countries. In addition to EURAXESS Worldwide, it comprises EURAXESS Jobs and Funding, a comprehensive recruitment tool for researchers, entrepreneurs, research organisations and universities and business, EURAXESS Partnering, allowing to find host institutions and partners, and EURAXESS Information and Assistance, a network of more than 500 centres in 40 countries providing relocation assistance to ensure a smooth transition of Europe-bound international or expatriate European researchers.

EURAXESS Worldwide has been launched in ASEAN hub (encompassing Singapore, Thailand, Malaysia, Indonesia and Vietnam), Australia and New Zealand, China, India, Japan, Korea, Latin America and Caribbean States (LAC) and North-America (USA and Canada).

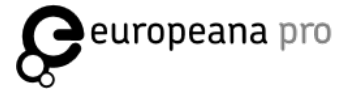
For more information, visit

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