Restoration of Ancient Buildings and Sites: Advanced Technology, Green Materials and Best Practices

Prof. Mauro Salvemini

Culture2All NGO
President

2016

Mrauk U , Myanmar - copyright 2016 by Mauro Salvemini

…….. a common effort and a discourse of :

- Prof. Luca Marescotti , Milan Polytechnic
- Cluster design company and Arch. Federico De Giuli ;
- Group of ten Myanmar artists of Culture2All;
- Dr. Zar Chi Aye, Inst. of Earth Sciences, Lausanne Un.
- Dr. Romy Schloegel, EURAC, Bolzano (IT)
- Eng. Renzo Carlucci, land surveyor.
- ECOLINFA design company and Dr. Giacomo Cozzolino;
- Chamber of Commerce Italy-Myanmar
- AMFM GIS Italia association;
- team of Culture2All volunteers.

About Culture2All NGO www.culture2all.com

- established under Italian law of no-profit org. ;
- using art, culture and cultural heritage to bridge societies, economies, communities and solutions;
- already active in promoting Myanmar contemporary art and cultural heritage sustainable exploitation ;
- Myanmar Art Italy 2016
  - http://www.culture2all.com/catalogo-myanmar-art-italy-2016/
- Engaged in “Cultural Heritage and Villages” programme (see last few slides of presentation)

Aims and schema of presentation

- to give references to decision makers
- to create awareness about restoration
- to provide “good munitions” for actions
- to foster the participation of NGOs in projects
- Schema :
  - Basic principles
  - Restoration as infrastructure
  - Technical aspects
  - Best practices

semantic of the title and of the presentation :

- Ancient Buildings and Sites
- Restoration
- Advanced Technology
- Green Materials
- Best Practices

Archeological
Historical
Modern
.....

Type of restoration
Preservation
Maintenance
.....

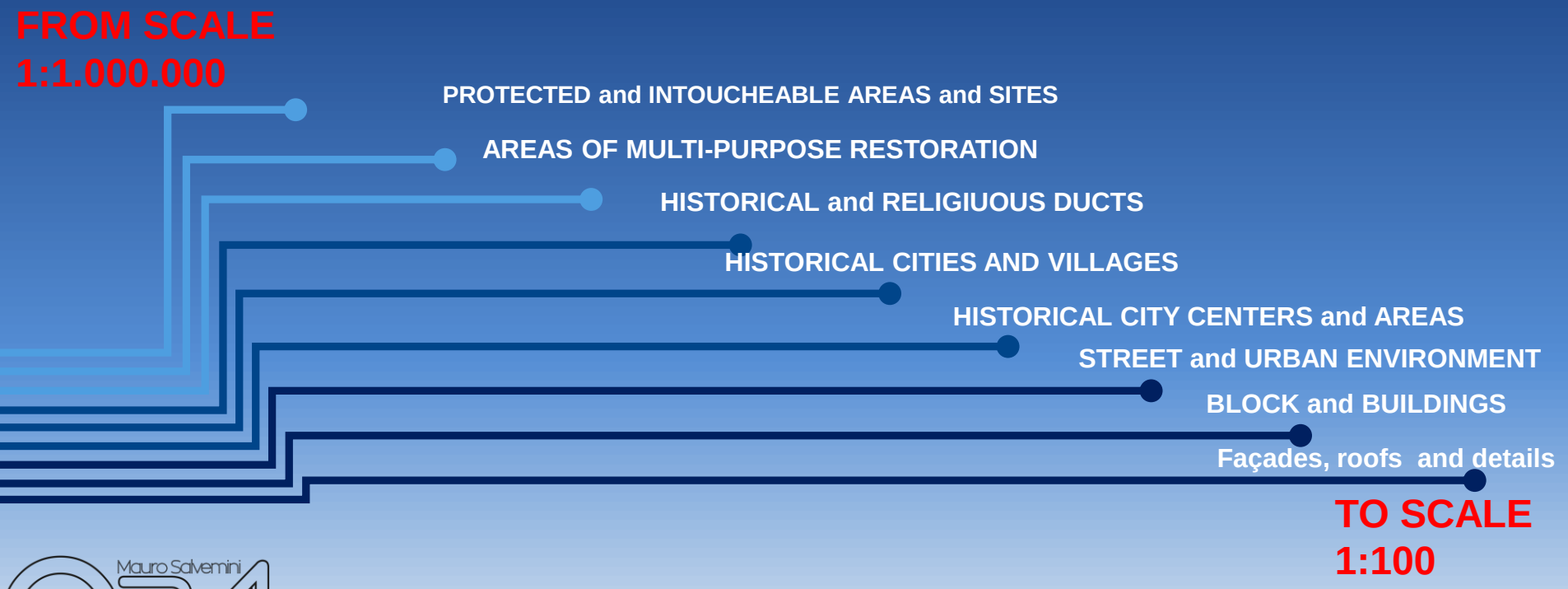
Cataloguing ,
monitoring
Surveying
Designing
Realisation , ...

Susteneable
Local
“green” .....
.....

CITY & COUNTRYSIDE

ULTURE ONLUS

What does restoration mean in terms of scale ?



Restoration need **DATA**

How and where to get DATA?

- From survey & monitoring
- From design
- From restoration/construction
- From maintenance and use

Mauro Salvemini
CULTURE 24 ONLUS

Multidisciplinary and infrastructural approach to restoration is needed specially in Myanmar where cultural heritage are complex and multilayered. How many tangible and no–mobile cultural heritage goods are in Myanmar ?

How to manage 5,000 cultural heritage goods in Myanmar?

Mauro Salvemini
President
CULTURE2ALL ONG

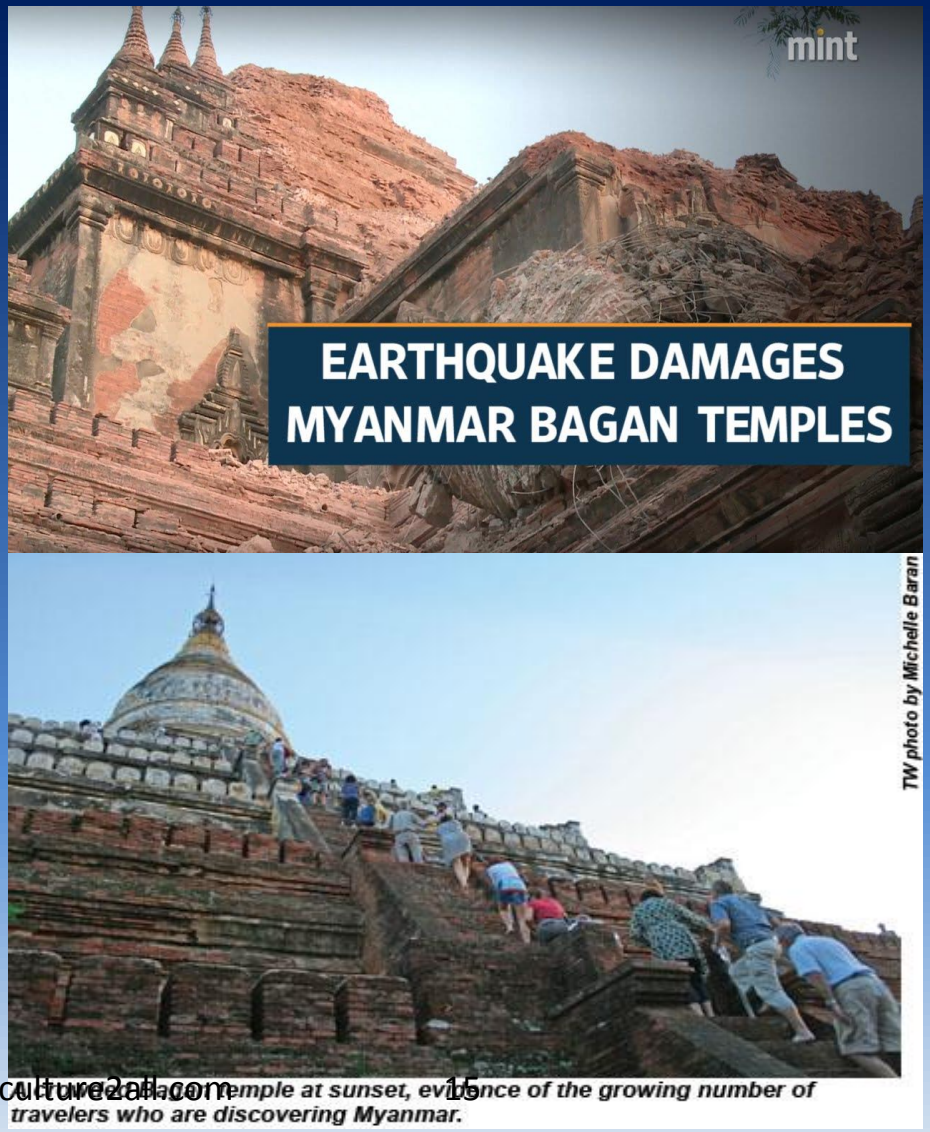
Picture shows statutes depicting Four Noble Truth in Thun Pagoda in Nyaungdon Town. PHOTO: YHT

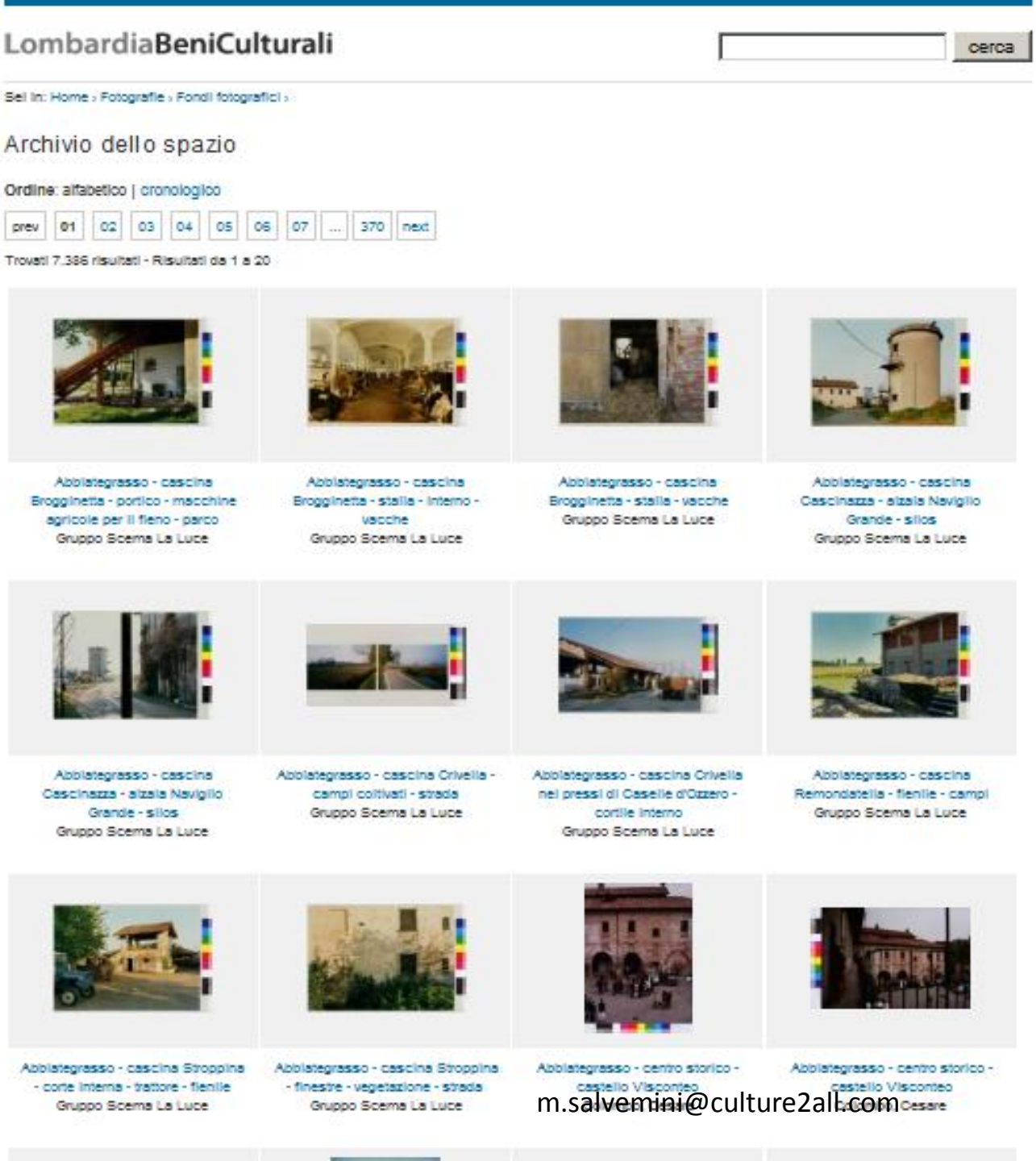
SINCE 2011, there have been interests and actions for cultural heritage in Myanmar. Among the others, a very recent initiative on intangible cultural heritage was overtaken by the new government with the UNESCO, in the near past among the others: the projects for the recognition (2014) of UNESCO Pyu's Ancient Cities supported by Italy, the ones in INLE lake area undertaken by Norway , and some others. As usual in situations like Myanmar, the projects have been focused on specific sites with specific tasks, aiming to protect the buildings and their artworks (paintings, etc.), to create awareness about the conservation and restoration issues and to build skills and competencies on specific technologies such as GIS (Geographic Information System), as the mentioned UNESCO project did (2012-2013). Based on the several decades of consulting experience for Italian Ministry of Culture and designing decision support information systems for public authorities based on geographic location, my prudent estimation of the entire Myanmar patrimony of fixed cultural heritage is about 5,000 goods. The patrimony amount of cultural fixed objects should be intended to enumerate goods from the archeological up to the colonial period so much present in Myanmar cities from Yangon to Sale. This huge patrimony may not be managed only by single projects even if modern technologies such as drones are going to be used.

During the recent meeting with Dr. Nanda Hmun, permanent secretary of Ministry of Culture, I have been very happy to hear that the attention is moving towards a more comprehensive view of the issue of cultural heritage in Myanmar. The good news is that the present information technology offers the SDI (Spatial Data Infrastructure) solution to manage the cultural heritage at a national level. This would enable the sharing of cultural heritage data, the efficient understanding and management of the shared cultural heritage resources for responsible authorities, partner institutions and public. This issue was also discussed with Ms. Zar Chi Aye, a doctoral candidate at University of Lausanne, who has been a part of the discussion developed on the workshop held at Free University of Bolzano (http://culturalheritagemyanmar.inf.unibz.it/). Based on the peculiar characteristics which every country has, it is a matter of fact that an already developed model cannot be imported and used for setting up an SDI or an information system while a specific national one has to be deployed. Therefore, as an initial step and as Dr. Nanda Hmun kindly agreed, it is opportune to do a specific workshop with relevant stakeholders for the discussion of how to build the SDI for cultural heritage in Myanmar. This would be benefit in maximizing the combined efforts and collaborations with all interested parties for the management of Myanmar cultural heritage.

Catalogue of cultural heritage

- A need for a comprehensive and accessible inventory (database) of cultural heritage sites
  - for protection against man-made and/or natural disasters
  - for sustainable development (in three dimensions)
    - economic development
    - socio-political development
    - environmental development





State / regional level

Catalogue

Risk assessment

- Natural and human-induced disasters caused enormous damages to communities
- Risk assessment is essential for preservation of heritage
- A need to assess/identify:
  - hazard events (floods, landslides, earthquakes, human impacts, …)
  - exposed (threatened) heritage sites
  - their vulnerability (degree of damage) to hazard events

PRESERVATION and RISK of Cultural Heritage

- **Individual Vulnerability (V) - namely a function that indicates the level of exposure of a given item to the aggression of territorial environmental factors;**
- **Territorial Danger (P) - namely a function that indicates the level of potential aggressiveness of a given territorial area, irrespective of the presence or otherwise of the items.**
  - **Environmental-Air domain, V1and P1**
  - **Static-Structural domain,V2 and P2**
  - **Anthropic domain, V3 and P3**

The model described above allows Risk (R) to be expressed as

$$Risk = R(V1,V2,....Vn, P1,P2,...Pn)$$

as a weighted funtion of the Vulnerability (V) and Danger (P) Indicators.

Sustainable tourism for cultural heritage exploitation

- Outcomes of seminar and workshop carried out at University of Bolzano .
- http://culturalheritagemyanmar.inf.unibz.it/wp-content/uploads/2016/02/Outcomes-CULRURALHERITAGE-Myanmar.pdf
- http://culturalheritagemyanmar.inf.unibz.it

Types of restoration :

conservative restoration
living restoration
functional restoration
archeological restoration
multipurpose restoration

ADVANCED TECHNIQUES

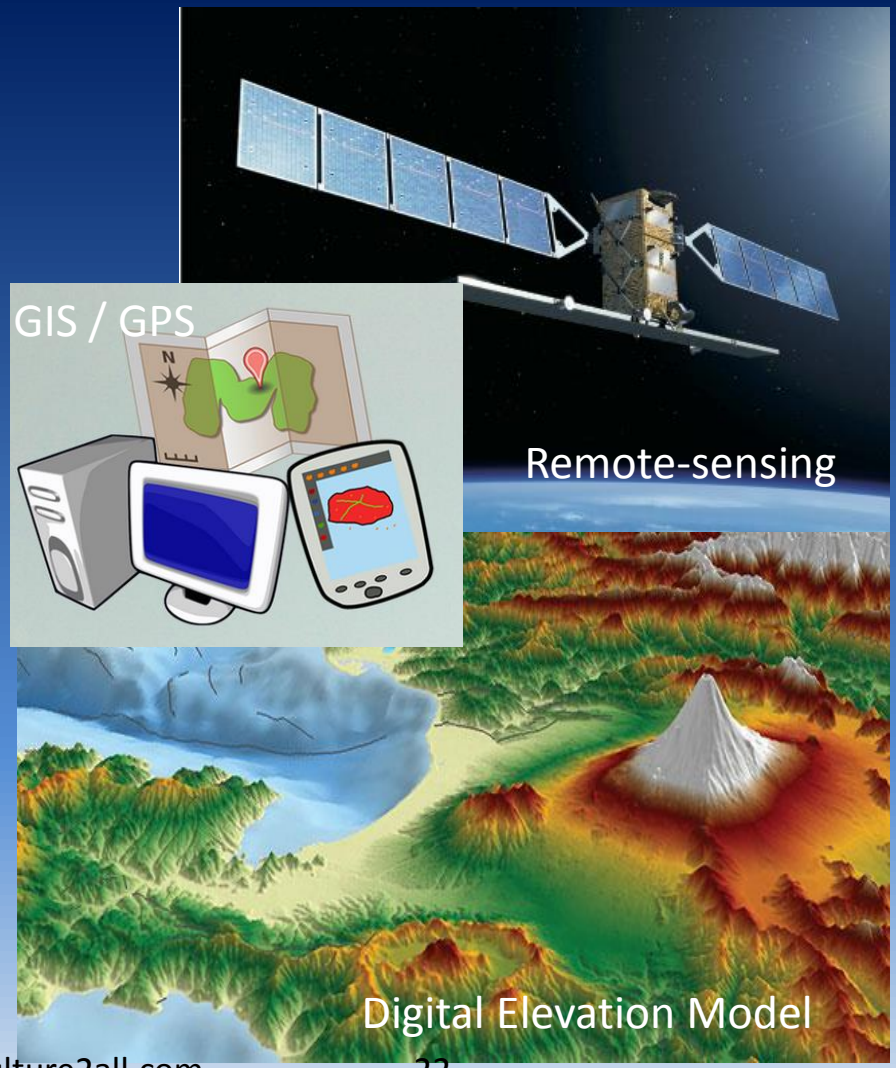
-- techniques for monitoring, surveying and designing
- automatic techniques for survey
- techniques for area and site monitoring

- computer aided design
- geographic information system
- building information modelling
- 3D modelling
- laser scanning
- finite elements computation
- radar detection
- UAV
- sensor enabled environment

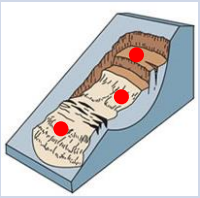
USABLE AT ANY SCALE

Geospatial technology

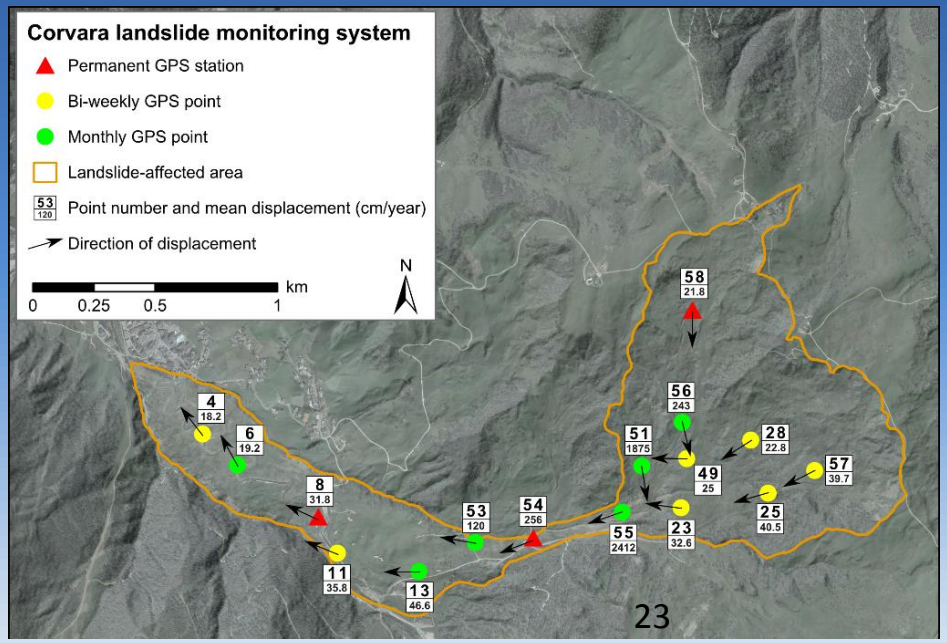
- plays an important role in management of cultural heritage
- provides a monitoring system to detect changes in conditions
- allows to set up GIS database/inventory for risk assessment of sites



Methods for landslide monitoring : solution 1

Method	Data	Scala		
GPS - GNSS	- Displacement vectors	- Local (punctual) 	☹☹	☹

Example: 3D deformation field of a slow-moving earthflow (Italian Alps) from periodic and permanent GNSS stations (Schlögel et al., 2017)



Methods for landslide monitoring : solution 2

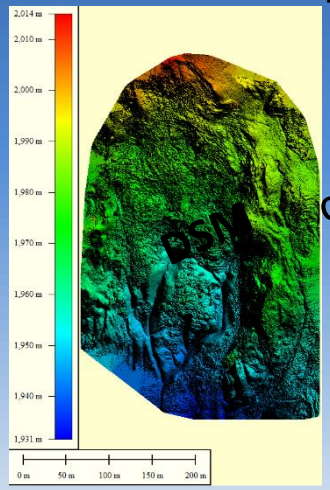
Method	Data	Scale	Money	Time
Laser scanner Drone	- Digital terrain model (DTM) - High resolution orthophoto (photogrammetry)	- Local (active sliding areas)	☺ Pilot licence/ permit	☹

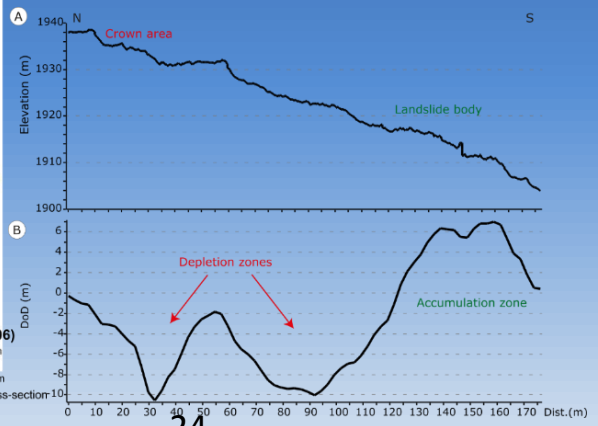
Example: UAV-based photogrammetry

Data processing

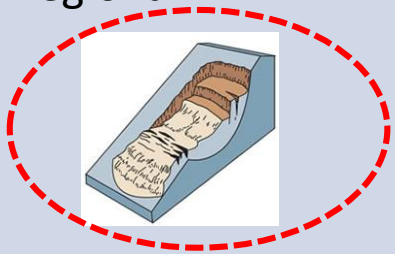
Post-processing

Interpretation

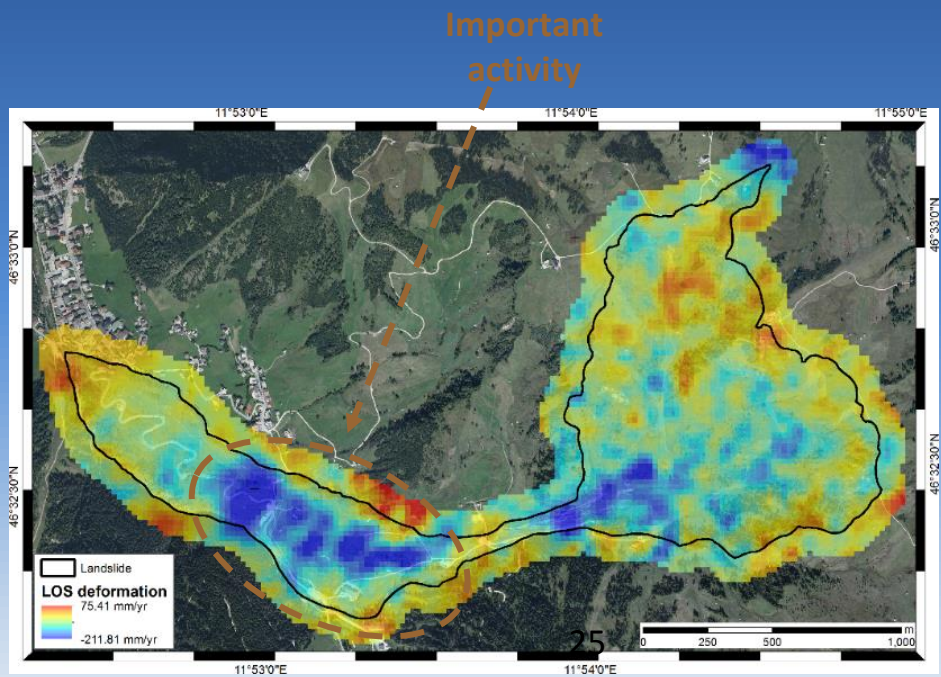




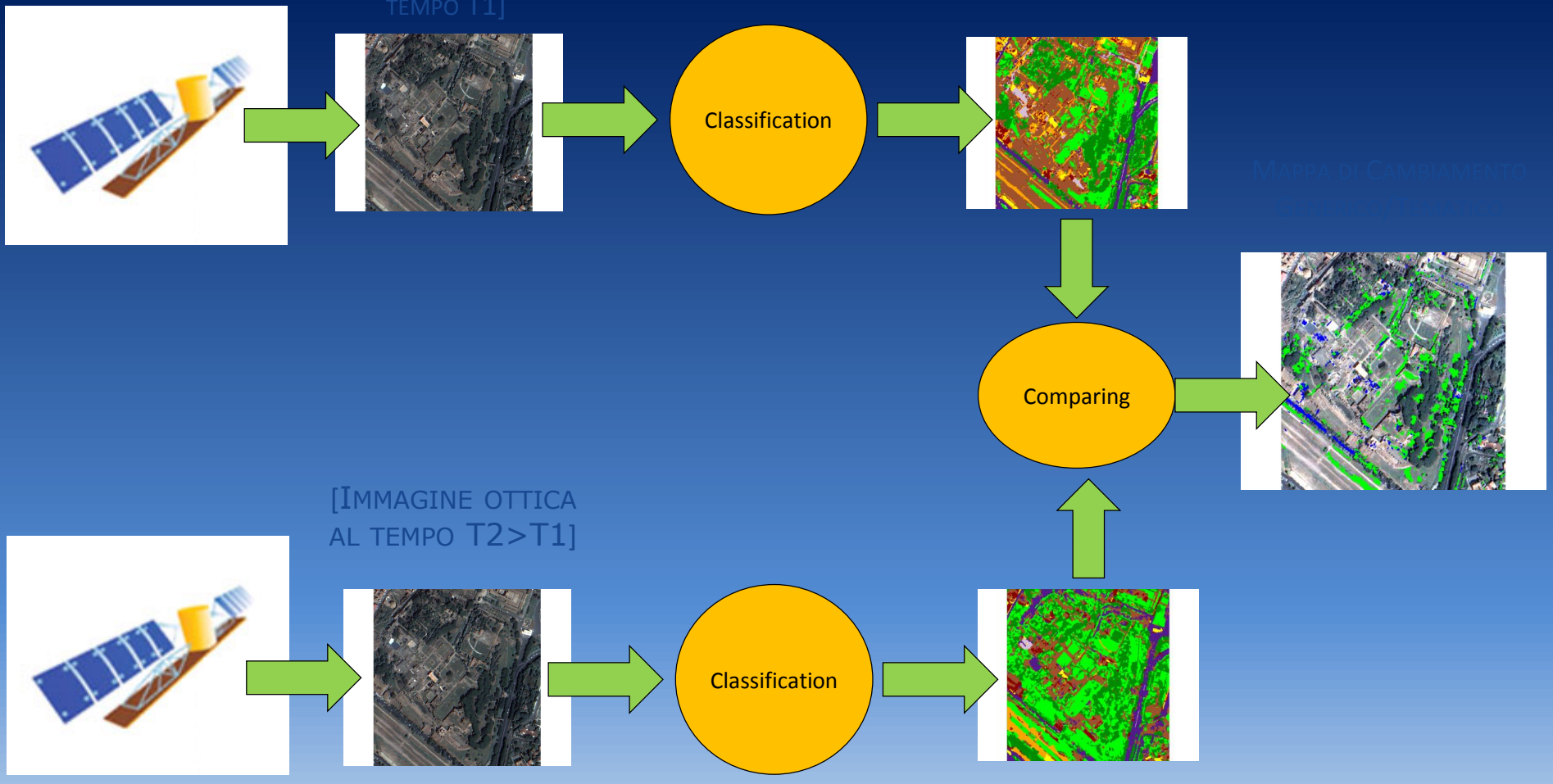
Methods for landslide monitoring : solution 3

Method	Data	Scale		
Remote sensing	- Deformation map (SAR interferommetry)	- Regional 	☺☺	☺ For expert ☹

Example: Line of sight (LOS) deformation map of a slow-moving earthflow (Italian Alps) from Sentinel-1 descending images of 2015 (Schlögel et al., 2017)



MONITORING SITES' CHANGES



Palatino archeological area - Roma

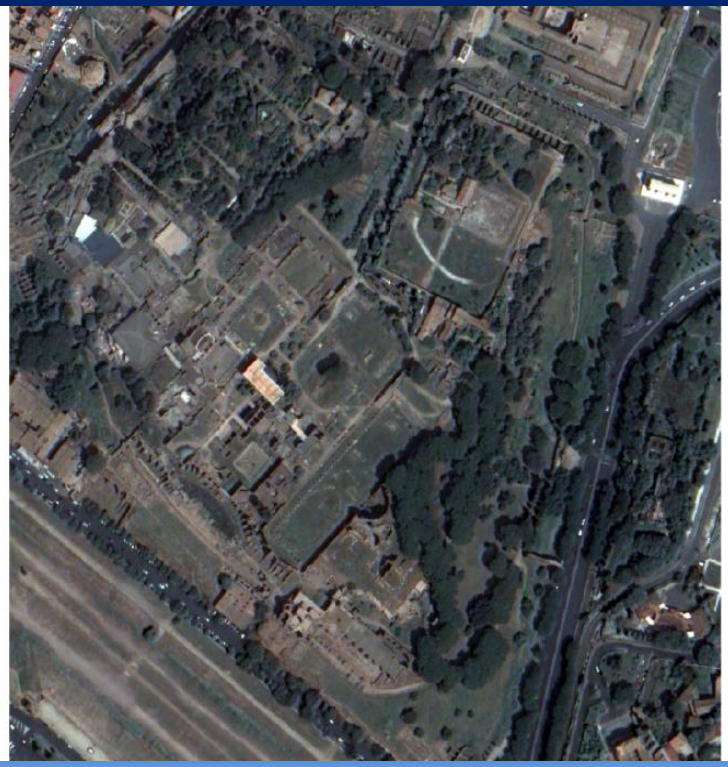
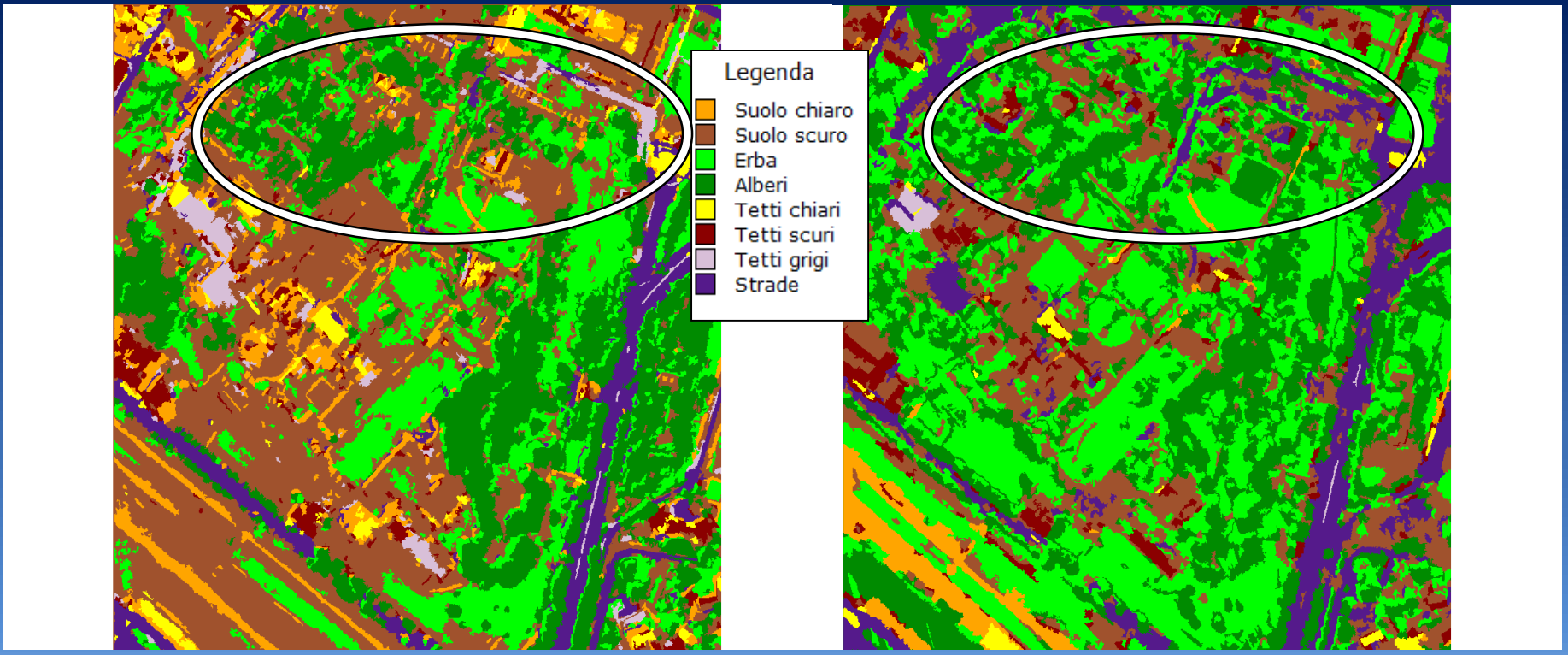


IMMAGINE SATELLITARE DEL 2002

IMMAGINE SATELLITARE DEL 2010

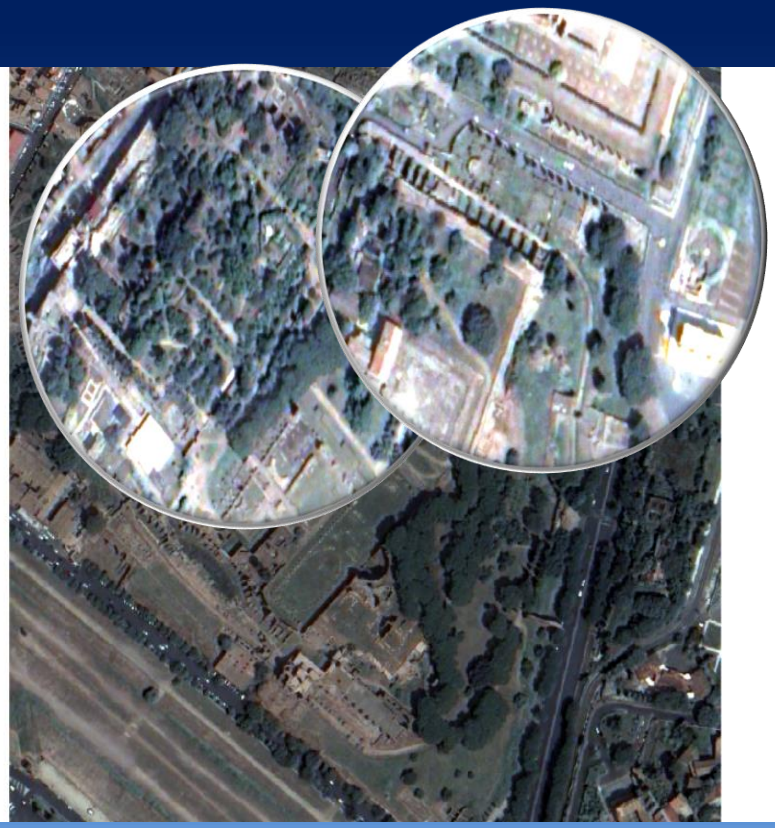
Land Cover in the Palatino area – Rome



CLASSIFICAZIONE DELLA COPERTURA DEL SUOLO NEL 2002

CLASSIFICAZIONE DELLA COPERTURA DEL SUOLO NEL 2010

3D Zooming



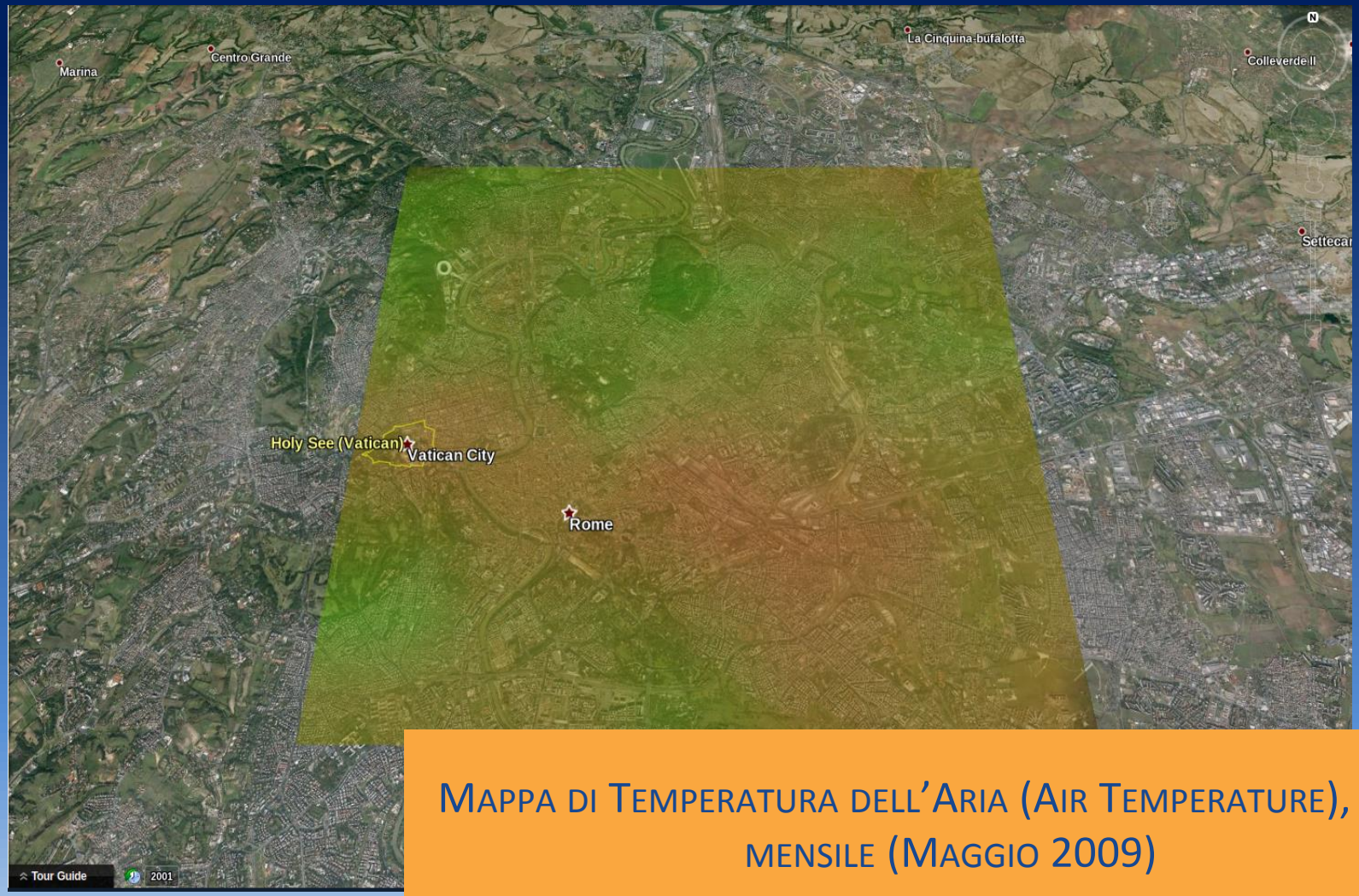
AREA DEL PALATINO NEL 2002

NUOVI SCAVI NEL 2010

By radar very accurate data and information

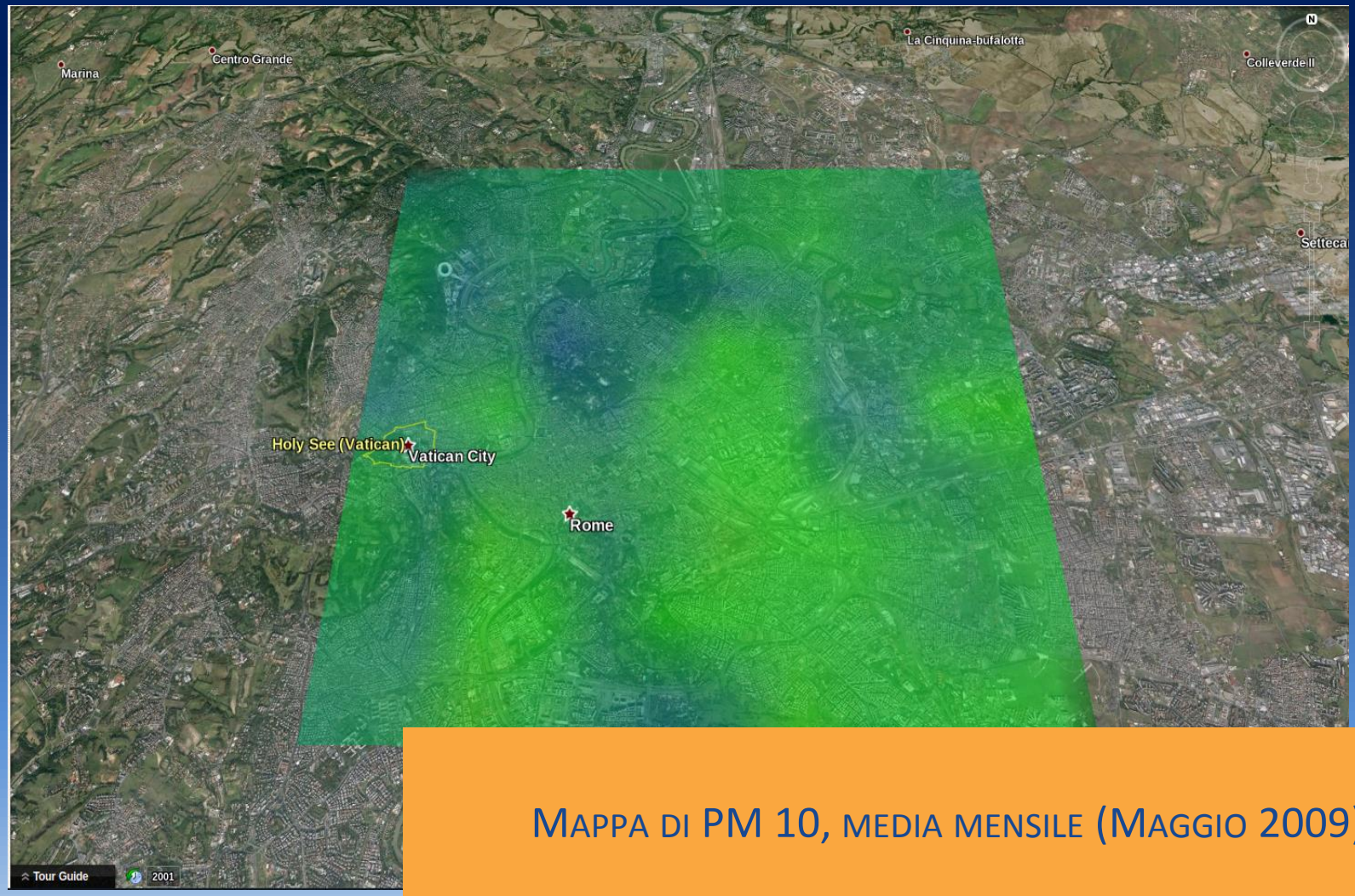
RADAR SATELLITE IMAGES SAR
COSMO-SKYMED

Monitoraggio ambientale da satellite



MAPPA DI TEMPERATURA DELL'ARIA (AIR TEMPERATURE), MEDIA MENSILE (MAGGIO 2009)

Monitoraggio ambientale da satellite



MAPPA DI PM 10, MEDIA MENSILE (MAGGIO 2009)

Environmental monitoring by satellite

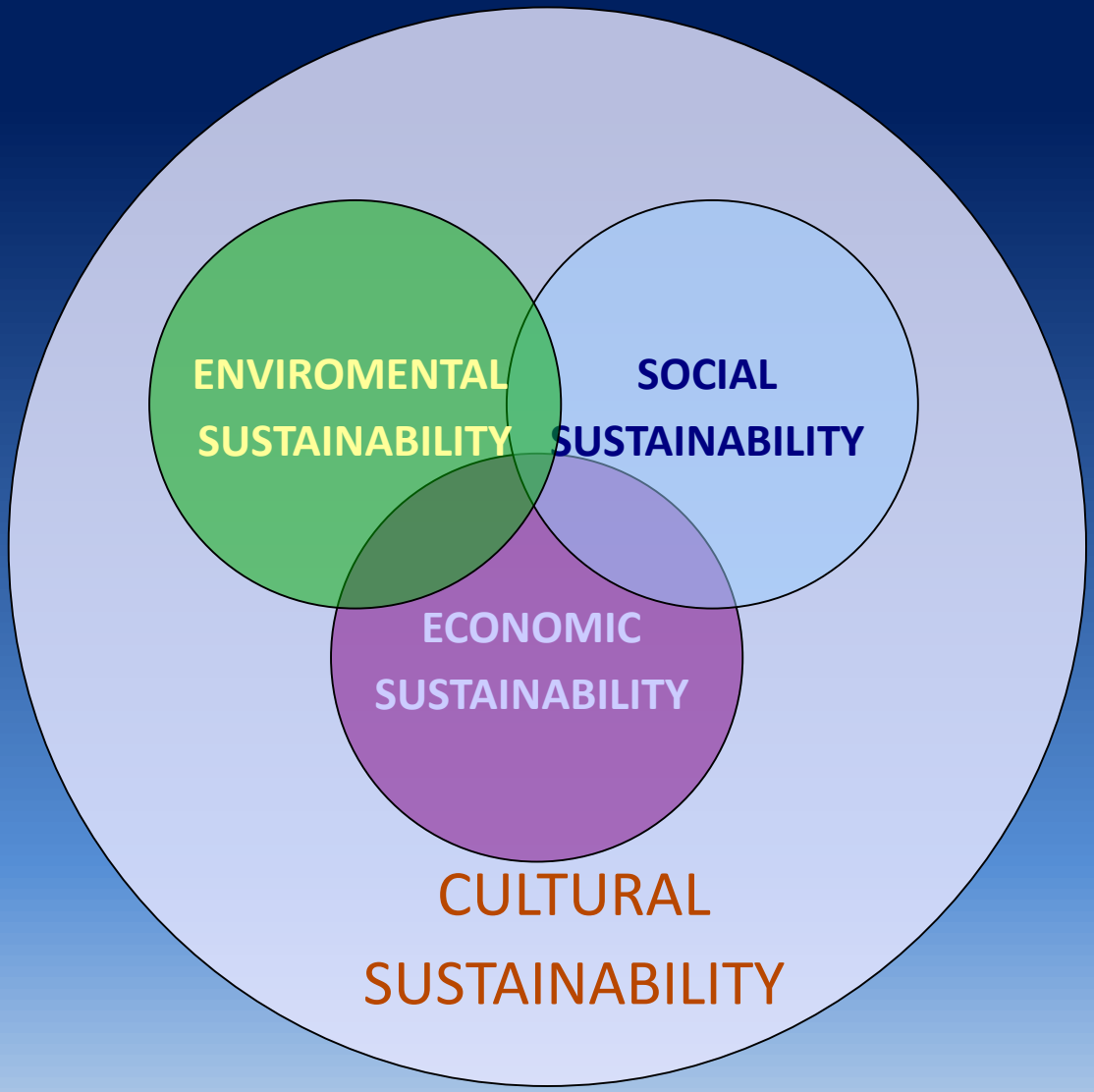
EFFECTS OF PARTICLES ON MONUMENTS AND EVALUATION OF BLACKNED RISK

green materials

suitability, durability and value for money

– training to institutions and companies ;
– laboratories (co-working, living lab, …) ;
– Integration with universities, research labs and NGOs

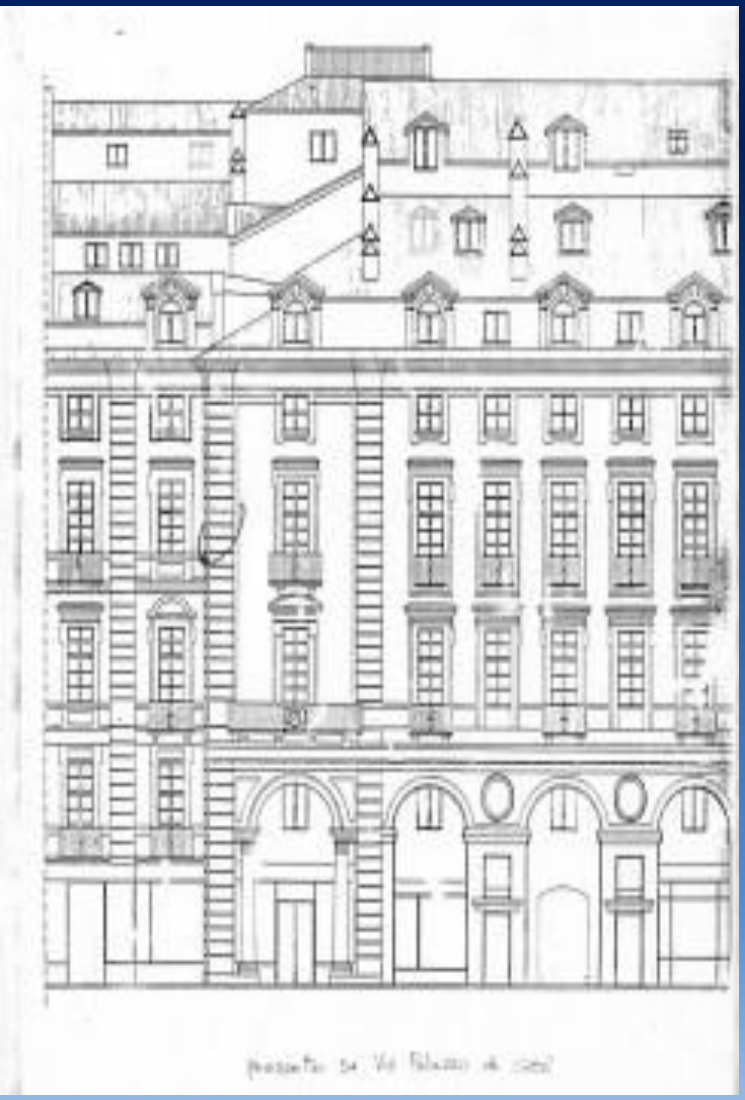
GREEN MATERIALS



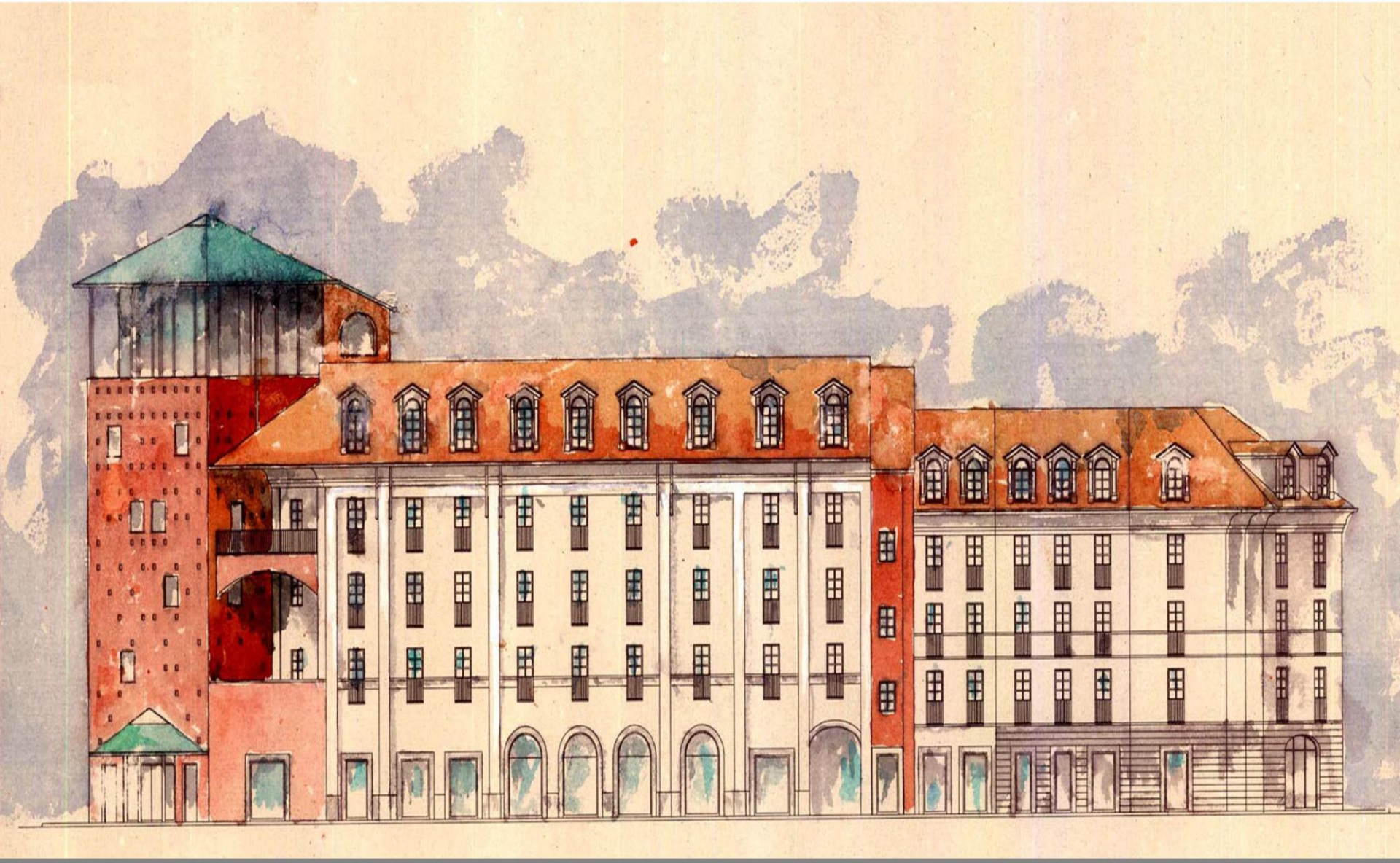
AS KNOWLEDGE AND CULTURE

INCLUSION

BEST PRACTICES



Via Palazzo di Città 19 – 21 Casa della Volta Rossa 1980, TORINO



NH Santo Stefano Hotel

NH Santo Stefano Hotel

NH Santo Stefano Hotel

NH Collection Torino Piazza Carlina Hotel

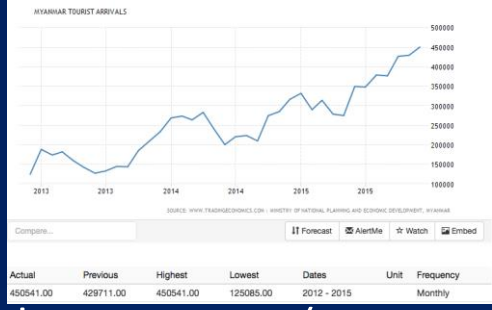
NH Collection Torino Piazza Carlina Hotel

NH Collection Torino Piazza Carlina Hotel

NH Collection Torino Piazza Carlina Hotel

4
8

Some basic considerations



1. Myanmar has an high **tourism growth yearly rate** ;
2. Myanmar has a huge number of **cultural heritage** places and monuments (Salvemini estimates **about 5000**) spread **in all the territory** ;
3. **Monument**s have to be **preserved and protected** : they are the value for tourism.
4. **The protection** and sustainable use of monuments has to be done mainly **involving local people and local culture**.
5. In Myanmar **people migrate** towards big metropolitan areas **leaving areas where cultural heritage is located** .
6. **Preservation of cultural heritage and tourism activities** give to people **opportunities for a better life and disincentive the migrat**ion.
7. Monuments will be preserved, people will find job opportunities, territory will be protected, culture and religion will be maintained in the place.
8. The **traditional culture and religion and young generations** have to be **involved in the action**.

CULTURE2ALL project

CULTURAL HERITAGE AND VILLAGES

- **arising awareness and building capacity in young generations the monuments will be preserved, people will find job opportunities, territory will be protected and, first of all, traditional culture and religion will be maintained in the place.**
- A tentative list of cultural heritage places and villages:
  - Kakku Pagodas in the Shan State ;
  - Sa Lay in Magway State ;
  - Mrauk U in Raikine State ;
  - Kyaukpadaung, Mandalay Division ;

CULTURE2ALL project

CULTURAL HERITAGE AND VILLAGES

- Fund and support raising ;
- To involve Institutions/ Agencies / Organisations (e.g. Private entrepreneurs and companies in the sectors of construction and of hotels);
- Express of interest and of awareness (Institutions and individuals) ;
- Indications for individuating villages and places ;

Kyayzuba

Thank you

Grazie

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