BDC

Università degli Studi di Napoli Federico II

17

numero 1 anno 2017

BDC

Università degli Studi di Napoli Federico II

17

numero 1 anno 2017

Circular City and Cultural Heritage Interplay

BDC

Università degli Studi di Napoli Federico II

Via Toledo, 402
80134 Napoli
tel. + 39 081 2538659
fax + 39 081 2538649
e-mail info.bdc@unina.it
www.bdc.unina.it

Direttore responsabile: Luigi Fusco Girard
BDC - Bollettino del Centro Calza Bini - Università degli Studi di Napoli Federico II
Registrazione: Cancelleria del Tribunale di Napoli, n. 5144, 06.09.2000
BDC è pubblicato da FedOAPress (Federico II Open Access Press) e realizzato con Open Journal System

Print ISSN 1121-2918, electronic ISSN 2284-4732

Indice/Index

RAPID URBANIZATION AND HERITAGE CONSERVATION IN INDIAN CITIES

Patrizia Riganti

Abstract

The paper discusses the issue of heritage conservation in Indian cities in the face of current rapid urbanization trends. The urban development pressure, coupled with the lack of an appropriate conservation framework, is causing the loss of important cultural heritage in India. The federal Indian government has recently launched a program on smart cities to improve cities livability and embrace technological progress. The paper discusses the current policy situation and the role that urban heritage is having within the internal debate. It presents results from an experts' workshop held in Mumbai in December 2016 and argues that a novel *smartheritage* approach is needed to support decision making in urban conservation.

Keywords: India, smart cities, heritage conservation

RAPID URBANIZATION AND HERITAGE CONSERVATION IN INDIAN CITIES

Sommario

L'articolo affronta la questione della conservazione del patrimonio culturale nelle città Indiane sotto pressione a causa di fenomeni di rapida urbanizzazione. Il Governo Federale Indiano ha promosso di recente un programma sulle *"smart cities"* allo scopo di migliorare le condizioni di vita urbana e sposare il progresso tecnologico. L'articolo discute la situazione corrente delle *smart cities* in India e il ruolo che il patrimonio culturale ha nel dibattito politico interno. Alcuni risultati di un incontro-studio di esperti sulla città, tenutosi a Mumbai nel dicembre 2016, vengono qui presentati. L'articolo si conclude illustrando la necessità di un nuovo approccio *"smart"* alla conservazione del patrimonio, qui definito come approccio *smartheritage*, inoltre viene brevemente discussa l'architettura di un sistema di supporto alle decisioni relative alla conservazione del patrimonio culturale.

Parole chiave: India, smart city, conservazione del patrimonio culturale

1. Introduction

Cities have always been catalysts for change and progress. Usually born at the intersection of trading routes and near channels of communication like rivers and ports, they have attracted migration phenomena from the adjacent rural areas, since people would move from their villages to the cities in the hope of better conditions of life and more job opportunities. In recent decades, this urbanization trend has become far more severe. The majority of the world's population (54%) is currently concentrated in urban areas and according to the UN World Urbanization Prospects (2014) this percentage should rise to 66% by 2050, with 90% of this increase concentrated in Asia and Africa. In particular, India is witnessing a constant increase in urbanization due to internal migration phenomena. India is one the most populated country, with 31% of the population (approx. 380 millions) living in urban areas and 69% (883 millions) in rural areas (HLRN, 2017). The majority of the population of India is facing poverty with denied access to basic services such as water, sanitation, and housing. The report titled "India's Smart Cities Mission: Smart for Whom? Cities for Whom?" published in June 2017 by the Housing and Land Rights Network, has focused the attention to the breach in human rights associated to the lack of access to goods and services in Indian cities, with particular reference to the Indian government's smart cities mission (Ministry of Urban Development Government of India, 2015a).

The current upwardly urbanization trends cause an excessive pressure on Indian cities' fragile cultural heritage, which is at threat of irreversible damage and ultimate loss. Traditionally, the increase in slums and informal development has matched the dramatic raise in housing demand. This has not resolved the issue of adequate housing for the urban poor and has happened at the expenses of historic sites. The issue of protection of cultural heritage might seem marginal compared to the extreme conditions faced by the urban poor in Indian cities. However, cultural heritage assets represent an essential resource for sustainable human development, economic growth and job creation and their protection is not only a moral call, but also a necessary financial investment to progress towards the creation of inclusive and sustainable cities (Fusco Girard, 2013; Angrisano *et al*., 2016).

This paper reflects on the nexus among smart technologies, heritage conservation and the progress towards inclusive, sustainable cities and communities as highlighted by UN Sustainable Goal (SDG) 11: Make cities and human settlements inclusive, safe, resilient and sustainable. To this extent, the implementation of Target 11.3 (*by 2030 enhance inclusive and sustainable urbanization and participatory planning*), and Target 11.4 (Strengthen efforts to protect and safeguard the world's cultural and natural heritage) is crucial to progress cities' social resilience.

In order to preserve our heritage, we have to attribute a value to it, in other words, to subscribe to its social relevance. The act of labelling something as "heritage", hence as a conscious act of social belonging, can bring important benefits to society. The appreciation of cultural heritage in a community enhances social cohesion, hence its social capital, making a city more resilient against external attacks, including forms of radicalization or segregation. To this extent, conservation of both tangible and intangible heritage is a peace-building process (UNESCO, 2017; G7, 2017) and the appreciation of its cultural, social and economic relevance a prerequisite for its appropriate preservation. The economics of conservation and the related cultural heritage valuation techniques can play an essential role in the process towards the development of sound heritage policies in any country.

The paper is structured as follows: first, the Indian urban context is presented; then the smart cities Programme for Indian cities is discussed together with the challenges faced by heritage in India; finally, some results from an experts workshop on heritage conservation in smart cities held in Mumbai in 2016 are illustrated, followed by a discussion regarding the potential of developing novel decision support systems to integrate heritage conservation within the smart cities agenda.

2. The urban context in India

The future of our contemporary world is urban. The constant upwardly urbanization trend witnessed by both developed and developing countries (United Nations, 2014), coupled with an unprecedented development of smart technologies and social media, is changing the landscape of urban management and cities' policymaking. The urban context, with its opportunities and contradictions, is the place where the battle for a sustainable conservation of heritage needs to be won first.

The appreciation and understanding of the diverse urban heritage is important in the path towards tolerance and unity (G7, 2017). As discussed, the preservation of cultural heritage implies a valuation process, since labelling something as heritage constitutes a value judgment, distinguishing a specific object/event from the others; it is a conscious act of belonging to a group, a city, a nation and the outcome of an important cultural journey (Riganti, 2010). The notion of heritage is therefore a social construct, created by communities who take the conscious step to subscribe to it. In certain cases, heritage might be shared by more than one community, and be contested, taking connotations positive for some and negative for others. This is the case, for instance, of British colonial heritage in Indian cities, which is highly appreciated by some, who feel a sense of nostalgia for the past, and at the same time is contested by others, who see it as the embodiment of foreign dominion.

In India one third of the population live in cities. Economic mobility and migration, mainly linked to agrarian poverty and land reform challenges forcing the poor to seek better conditions of living elsewhere, are the main causes of the current concentration of people in urban environments; and this is putting direct stress on city housing, infrastructure and services. This migrant influx can lead to poverty, unemployment and social tensions. The rapid urban growth is mainly concentrated in the megacities (>10M residents) and Class I cities (>100,000 officially registered people, usually far less than the actual population). These cities are facing the greatest challenges of rapid urbanization. Informal settlements are usually the response to the urgent demand for accommodation, with the relevant critical problems of living standards and lack of infrastructures, especially sanitation.

India is suffering from significant unplanned urban expansion with 35% of the urban population living in slums, which are growing twice as fast as other urban areas (UNESCO, 2016). This dramatic increase in urban poor is exacerbated by the lack of access to basic public services, such as water, sanitation, education and health. Social inequalities, an inheritance of the traditional casts system among other things, cause the extreme marginalization of women and ethnic minorities and the lack of inclusion of women and youth in any form of governance. Residents living in informal settlements (slums) have very limited access to land, sanitation, employment, services and healthcare. Despite government attempts to promote universal access to such services, 'traditional' social stratification leads to an urban planning agenda biased towards the advantaged (in wealth,

caste, cultural capital and social standing).

The Government of India has recently launched a few urban programs (AMRUT - Atal Mission for Rejuvenation and Urban Transformation; Smart Cities Mission) to facilitate urban renewal and retrofitting of its cities with the aim of making them inclusive and sustainable. Smart Cities are planning new housing for lower income groups; nonetheless, this will still not meet the current housing shortage for the disadvantaged. The lack of voice of lower income groups in urban planning in general, and in Smart City rhetoric in particular, is an ongoing concern.

The Atal Mission for Rejuvenation and Urban Transformation (AMRUT) and the Smart Cities Mission work in a complementary way to achieve urban transformation. While AMRUT follows a project-based approach, the Smart Cities Mission follows an area-based strategy (Ministry of Urban Development Government of India, 2015a). During the planning stage, Indian cities must seek convergence with several governmental programs: AMRUT, Swachh Bharat Mission (SBM), National Heritage City Development and Augmentation Yojana (HRIDAY), Digital India, Skill development, Housing for All, construction of Museums funded by the Culture Department and other programs connected to social infrastructure such as Health, Education and Culture (Ministry of Urban Development Government of India, 2015b). As it can be seen, a wealth of programs need to be coordinated and simultaneously accounted for, in order to progress towards an urban sustainability agenda in India and this can be at times challenging. The following section describes the Smart Cities mission into more details.

3. The smart cities mission in India

In the last few years, a multifaceted debate has spurred around the concept of "smart cities" (Batty *et al.*, 2012). Undoubtedly, the Internet of Things (Zanella *et al.*, 2014) is changing the way we live and plan our connected world. The role played by social media advancements during public uprising around the world is a testament on the impact that internet based on innovation can have on society. Information technologies can therefore respond to the need to promote inclusive, participative governance to support heritage centered sustainable urban development and economic growth.

Developing countries such as India have made the smart cities agenda one of the main priorities of their planning policies. The government of India launched a Smart city mission in June 2015 (Ministry of Urban Development Government of India, 2015a) with the aim of creating 100 smart cities in India by the year 2020. The Mission is one of the most publicized among the many slogan-led schemes of the National government, and is characterized by extremely ambitious goals, supported by large planned investments, multiple private sector actors, and the promotion of new governance structures as a consequence of a form of corporatization of Indian cities. In particular, each smart city is required to create a new entity named the Special Purpose Vehicle (SPV), which will be in charge of the planning, appraising and approving of any funding and development projects. This aims to create new forms of city governance, based on Public/Private partnerships.

The Smart Cities Mission has the objective to promote cities by developing core infrastructures and giving a decent quality of life to its citizens, a clean and sustainable environment thanks to the application of "Smart" Solutions. The focus is on a *sustainable and inclusive development.* The Smart Cities Mission of the Indian Government aims to set examples to be replicated both within and outside the Smart City, catalyzing the creation of

similar Smart Cities in various regions and parts of the country (Ministry of Urban Development Government of India, 2015a).

The Smart Cities Mission has been coupled with the creation of the HRIDAY mission (2015), for which 12 heritage cities were identified with the intent to progress the conservation of heritage in these highly tourist destinations by empowering local communities and involving them in the planning process.

The HRIDAY program was set in motion by the Ministry of Urban Development of India in January 2015 to preserve and revitalize historic urban areas. The program seeks to undertake strategic development of heritage cities, improving the overall quality of life of their citizens. To this extent, much attention is paid to tourism and heritage revitalization as well as sanitation and security. Identified activities target the development, conservation or revitalization of heritage sensitive infrastructure in historic cities' core areas and the implementation of heritage inventories (for built, intangible, as well as natural heritage). The program also focuses on local capacity-building to promote inclusive heritage-led activities and economic activities aimed at enhancing the livelihoods and cultural identities of cities. In particular, public private partnerships for adaptive reuse and urban regeneration have been promoted. Twelve historic cities have been identified to benefit from the program with a budget of around US$100 million (UNESCO, 2016).

The main objective of the HRIDAY programme was "*to preserve the character and soul of the heritage city and facilitate inclusive heritage linked urban development by exploring various avenues including involving private sector*". Among the specific objectives, the need to develop modern ICT tools and making cities informative, communicative and secure was clearly identified.

The *strategic components* of the Area-based development in the Smart Cities Mission are city improvement (retrofitting), city renewal (redevelopment) and city extension (Greenfield development).

Retrofitting will introduce planning in an existing built-up area to achieve Smart City objectives, to make the existing area more efficient and livable. After consultation with citizens, cities will prepare a strategy to become smart. In this model, the existing structures are largely to remain and a large number of smart applications will be packed into the retrofitted Smart City.

Redevelopment will replace the existing built environment and enable co-creation of a new layout with enhanced infrastructure. Two examples of the redevelopment model are the Saifee Burhani Upliftment Project in Mumbai and the redevelopment of East Kidwai Nagar in New Delhi.

Greenfield development will introduce most of the Smart Solutions in a previously vacant area (more than 250 acres) using innovative planning, plan financing and plan implementation tools (e.g. land pooling/ land reconstitution) with provision for affordable housing, especially for the poor. Greenfield developments are required around cities in order to address the needs of the expanding population.

Pan-city development envisages application of selected Smart Solutions to the existing citywide infrastructure. Application of Smart Solutions will involve the use of technology, information and data to make infrastructure and services better. For example, Smart Solutions could be applied to the transport sector (intelligent traffic management system) and reduce average commute time or cost to citizens. Similarly, wastewater recycling and smart metering can make a substantial contribution to better water management in the city.

The Smart City proposal of each shortlisted city was expected to encapsulate either a retrofitting or redevelopment or greenfield development model, or a mix thereof and a Pan-city feature with Smart Solution(s) (Ministry of Urban Development Government of India, 2015a).

The main purpose of the Smart Cities Mission is to drive economic growth and improve the quality of life of people by enabling local area development and harnessing technology, especially technology that leads to Smart outcomes. Area-based development will transform existing areas (retrofit and redevelop); including slums, into better planned ones, thereby improving livability of the whole City. New areas (Greenfield) will be developed around cities in order to accommodate the expanding population in urban areas. Application of Smart Solutions will enable cities to use technology, information and data to improve infrastructure and services. Such comprehensive development will improve quality of life, create employment and enhance incomes for all, especially the poor and the disadvantaged, leading to Cities that are more inclusive (Ministry of Urban Development Government of India, 2015a).

The Smart Cities Mission calls for active public participation in governance and reforms. The participation of citizens should be enabled through increasing use of ICT, especially mobile-based tools (Ministry of Urban Development Government of India, 2015a).

4. The challenges to heritage conservation in the face of rapid urbanization in India

Within the above scenario, heritage plays a strategic role. As discussed, heritage has a role in peace building and overcoming divisions (UNESCO, 2017; G7, 2017). In fact, cultural heritage, in both its tangible and intangible expressions, summarizes people's identities, shapes communities' ones, and contributes to the creation of social capital (Coleman, 1988; Portes, 1998). Therefore, the international community has clearly stated that the loss of heritage has to be avoided and its conservation calls for coordinated actions. Very interestingly, the International Crime Court has sentenced that the purposeful destruction by hand of terrorists of a nation's cultural heritage has to be considered as a war crime (ICC, 2015). Within this debate, understanding the value that heritage has for a community is becoming even more crucial than in the past.

Conservation of urban heritage cannot be pursued without an appropriate value judgment, without acknowledging the complex nature of our heritage, which encompasses both symbolic and economic values. If once heritage conservation was considered as a moral imperative and the realm of experts, now heritage is perceived as an important economic resource, and defined as cultural capital (Throsby, 1999). Local and national governments see the important economic implications and the potential impacts that the presence of cultural heritage can have on regional economic development.

A report (UNESCO, 2016) has recently identified the current main heritage conservation challenges in India:

- lack of urban policies on heritage conservation. Heritage conservation is not perceived as a main development objective, given the overall context of severe urban poverty and lack of basic urban services. Cultural heritage has not been mainstreamed into the overall development framework and there is the need to integrate heritage protection in urban planning legislation and practice;
- lack of awareness about cultural urban heritage and limited citizens' participation in local governance. This plays an important role in the systematic destruction of urban

heritage and has placed pressure on historic areas altering their character, often resulting in gentrification;
- unplanned and mismanaged tourism. Tourism, despite being a great economic opportunity, is often insensitive to local resources and the needs of local population. This has been translated into loss of local memory, sense of place and cultural identity, with commodification of heritage sites. Indian heritage infrastructure and services are much below the acceptable standards of access, quality and accountability. Poor *governance system* and poor knowledge management are the major concern for creating world-class heritage tourism delivery in India. Heritage tourism management needs information on various aspects like spatial mapping and availability of good IT infrastructure in order to take informed decisions on creating additional services and infrastructure;
- lack of skills on cultural urban heritage. Urban conservation skills are inadequate and there is the strong need of capacity building in this sector, e.g. traditional building conservation techniques.

There is the possibility to develop an appropriate framework in support of decision-making also in the face of the issues highlighted by the UNESCO report. Experts in India are fully aware of the current urban challenges, but are also eager to take the opportunities for change that the current governmental urban schemes are offering. In order to develop a sound approach to conservation and management of Indian cultural heritage within the Indian Smart cities mission, one has to focus on the potential of intelligent environments (IE) for the economic assessment and management of cities' cultural heritage (Riganti and Nijkamp, 2006; Riganti, 2017). Such IE have to target the main conservation challenges faced by Indian heritage under property development pressure. The next section focuses on the results of a workshop of experts held in Mumbai in 2017 on these themes.

5. Towards a smartheritage agenda for Indian cities: experts' workshop in Mumbai

As seen in the previous section, inclusiveness and community empowerment are part of the main discourse promoted by the Indian National Government (2015). However, there is still a great confusion among professionals and state planning departments on how the progress of the smart cities agenda should really take place. Some recent publications have importantly raised the issue of human rights and to what extent they have been accounted for within the smart cities mission. The report "India's Smart Cities Mission: Smart for Whom? Cities for Whom?" by the Housing and Land Rights Network (HLRN, 2017) clearly indicates that beside the Indian Federal State rhetoric on smart cities and their call for inclusiveness, the interventions that have been planned and implemented so far to promote a shift towards smart cities (e.g. forced evictions and destruction of slums without providing adequate alternative solutions), do raise great human rights concerns. The report also questions the smart cities mission's investment plan, which on one hand did not make an accurate assessment of priorities' for Indian cities, and on the other hand seems to disregard some of the basic rights such as proper sanitation and adequate shelter.

Access to shelter is an essential human right and should be high in the agenda of any government. India's urban population is projected to increase to about 600 million by 2030, but this projected growth has not been matched by increases in urban housing, infrastructure, and service delivery (HLRN, 2017). The housing shortage is for sure one of the main issues faced by Indian cities. Such shortage is due to unrestrained commercial

development of housing for the rich/elite at the expense of investment in housing for the less privileged. In the absence of low-cost, affordable, social housing options, millions of urban residents, usually workers in the informal sector are forced to live in extremely inadequate conditions (slums/informal housing/streets).

Despite the contrasting views about the appropriateness of the smart cities' mission, now more than 100 Indian cities have been designated as "smart cities" and need to identify a way to progress and be able to access the available funding. Research has been sponsored to shed a light on the way the smart cities mission should be implemented in the selected Indian cities, following best practices worldwide, and linking in particular with the experiences done in the UK on urban observatories. A number of UK Research Councils schemes have promoted research cooperation between India and UK scholars in the last few years. In particular, the author of this paper was the co-investigator of an UK funded project (The Smart Cities Network for Sustainable Urban Futures (Smarties Net) was funded by the UK Economic and Social Research Council in 2016, grant Ref. ES/P000517/1, the *smarties* networking project, aiming to discuss smart cities in the context of rapid urbanization in India. To this extent, a series of workshops on the creation of urban observatories took place from September 2016 to April 2017 in various cities in India, in order to gather experts' point of view about the direction that the Indian Smart cities agenda should take during the implementation phase.

During these workshops with local authorities and experts on the issues of urban planning, heritage conservation and the smart cities agenda in India, it became clear that the smart cities' program in India is progressing very slowly and that each smart city should develop a clear strategy for the future. In fact, every city that applied to be designated as smart cities, had to prepare a section called "Convergence Agenda" specifying how the city would address the various planning schemes launched by both Federal and State governments and indicated from which schemes funding would be sought. Therefore, the designated smart cities have to account also for the urban programs tackling heritage conservation. The debate with local and international experts during the *smarties* project, among other things, highlighted the need to develop a *specific* agenda for Indian smart cities, which could address both the Indian Government Mission on smart cities and at the Hriday mission's objectives. Such an agenda can be defined as a *smartheritage agenda* (The author of this paper presented the idea of a smartheritage agenda in several *smarties* workshops held in India between September 2016 and April 2017), in other words a *policy framework* in support of heritage conservation and management within the context of smart cities. Discussion took place in three of the SMARTIES project's workshops about the role that IT could have in support of the appreciation, conservation and management of urban heritage in the selected urban cities.

In particular, after a presentation on the concept of *smartheritage*, a questionnaire was administrated to the experts attending the workshop in Mumbai in December 2016.

Mumbai is one of the most creative cities in India, with a booming film industry and a rich cultural heritage, of both colonial and autochthon origins. Mumbai is also one of the Indian cities that has promulgated heritage conservation bylaws, which are considered a reference point for other local authorities.

The workshop was organized into several sessions over 2 days (5-6 December 2017). Keynote speeches were followed by interactive sessions where experts were discussing about specific issues/topics. Figure 1 shows a picture of one of these round tables'

discussion among participants. After the presentation about the concept of *smartheritage*, a self-administrated questionnaire was distributed to each individual expert sitting around the tables and some time was allowed for them to individually respond to the survey.

Fig. 1 - Experts' discussion during the Mumbai workshop on smart cities, 2017

Source: Riganti (2017)

The questionnaire included seven questions. Respondents were asked about their opinion on what are the main challenges that Indian cities face, on the main barriers to heritage conservation in India, as well as other questions concerning the perception of cultural identity and the level of attachment each respondent felt towards some specific Indian heritage (e.g. colonial vs mogul heritage for instance). Then, two open-ended questions, one on how the Internet of Things could help the conservation of heritage in Mumbai and the other on how the smart cities agenda might help heritage conservation in India, were asked. A few final questions intercepted the main socio-economic characteristics of the respondents, which are shown in Table 1. The sample was formed of 56 respondents of experts who attended the Mumbai workshop. The average respondent was a female academic, of approx. 35 years of age, and a resident of the city of Mumbai. Figure 2 shows the answers to the first question, on the main challenges faced by Indian cities.

Responses were consistent with the policy debate (UNESCO, 2015; HLRN, 2017) with 17% of respondents indicating that income inequality is the main challenge, followed by 16% of the sample ranking first extreme poverty, and another 16% ranking first lack of transportation. Over 25% of the respondents ranked first the lack of value attributed to cultural heritage when asked about the main barriers to the protection of cultural heritage (Fig. 3). This is in line with the argument of this paper, that unless communities value an asset as heritage, they would not subscribe to it, hence they would not invest in its conservation. Therefore, in order to manage cultural heritage appropriately, it is important

to understand and communicate its value. A *smartheritage* agenda can help progressing towards this objective.

Table 1 - Mumbai experts' sample characteristics (N= 56)

Gender	Age	Place of residence	Profession
Male 40%	35 years (mean)	Mumbai 85%	Academic 47%
Female 60%		Delhi 4%	Business 12%
		Pune 4%	Government 4%
		UK 4%	NGO 8%
		Others 3%	Others 29%

Source: Riganti (2017)

Fig. 2 - Main challenges faced by Indian cities

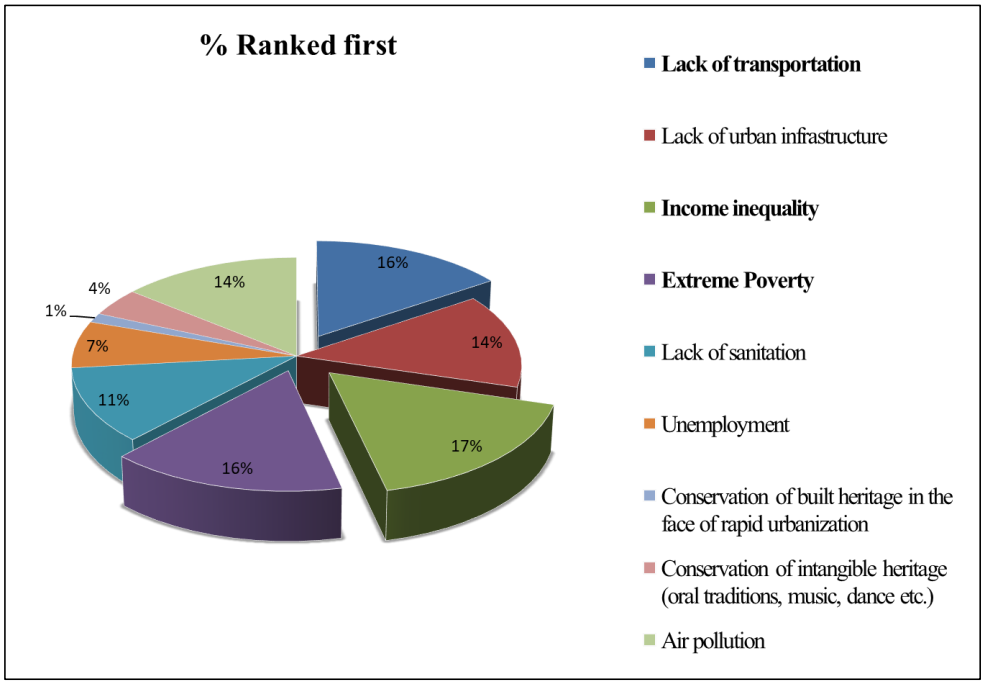
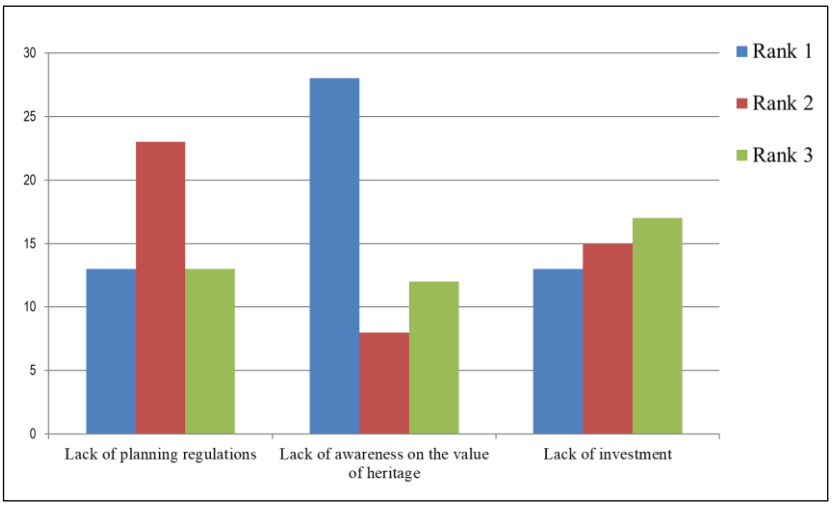


Fig. 3 - Main barriers to the protection of cultural heritage in India



Source: Riganti (2017)

The Indian context with its contradictions, challenges and opportunities represents a perfect example of a highly culturally diverse region of the world, with an extraordinary tangible and intangible heritage. Despite the complexity of the challenges faced by cities in India, there is still scope to develop an innovative policy framework/strategic urban agenda for smart heritage-led sustainable development. An intelligent environment should make best use of the advancement in information and communication technologies (ICT) and be of support for the inclusive development agenda aimed to empower citizens and other stakeholders involved in the conservation of Indian Heritage, as envisaged by the Indian National Government. In a first instance, a *smartheritage* agenda can be conceived as a policy framework to support an inclusive governance for heritage assets (Riganti, 2017). The following section discusses into more details how such an agenda could be developed into a decision support system.

6. Decision support system for heritage valuation

The above discussion on the challenges that the protection of heritage in India is facing against property development pressure highlights the need to develop tailored ICT based systems in support of heritage management. Since the valuation of heritage represents a crucial step towards the sustainable management of urban interventions, then it becomes important to develop an appropriate framework and identify the best assessment tools for this purpose (Fig. 4).

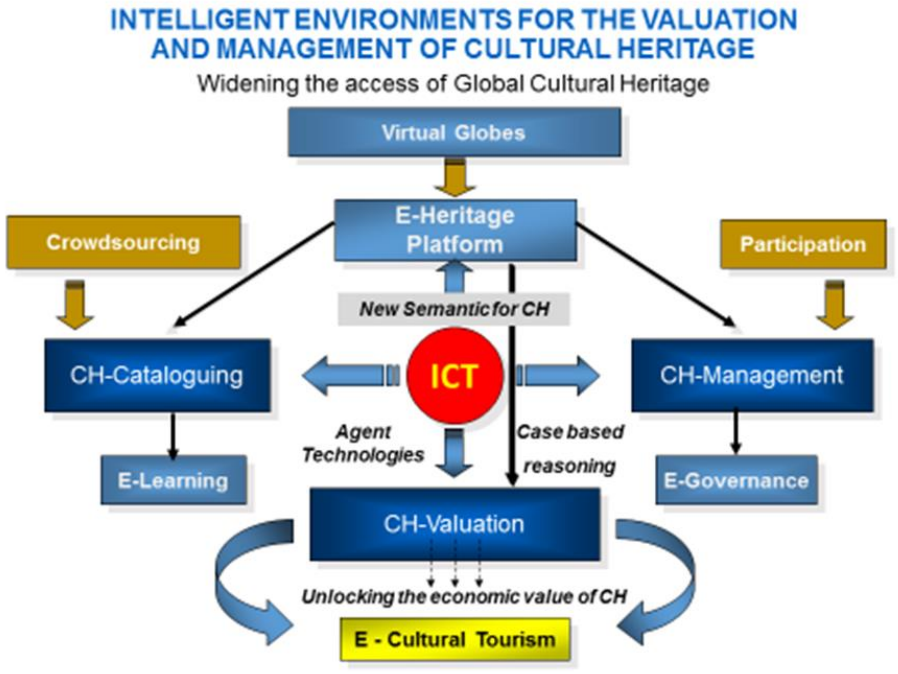
An ICT based DSS could potentially be very effective with respect to the first two critical points highlighted by the UNESCO report (2016): lack of urban policies on heritage and lack of awareness. The development of ICT intelligent environments would be timely, given some recent developments in India: the rise of mobile telecommunication networks,

which are rapidly extending to poor localities; the national government's drive towards local empowerment; the creation and promotion of national data activities such as the Indian National Spatial Data Infrastructure. At the same time, the international debate about the Sustainable Development Goals (United Nations, 2015) provide an impetus for action in urban development and heritage preservation. Of course, technological innovation is at the heart of the 'smart' heritage vision for smart cities and here are suggested some main features that a decision support system should account for (Riganti, 2017):

– a user-friendly platform/GIS-based intelligent environment based on agent technologies, to help customise contents for different communities of users (e.g. academics, policy makers and citizens);
– development of integrated Smart solutions (from tailored apps to sensors generating real time data);
– an open heritage-mapping platform, building upon a unifying, open virtual globe, OpenCitySmart, with an API for functionalities.

This global platform should have an initial suite of functionalities, including high-level definition 3D visualization and real-time data, based on the success stories of some municipalities in Italy (Brovelli *et al.*, 2013a, 2013b). Such functionalities might use the NASA World Wind globe (Kefalidou *et al.*, 2014; Oomen and Aroyo, 2012) (Fig. 4).

Fig. 4 – An intelligent environment for cultural heritage management and valuation



Source: Riganti (2017)

Figure 4 illustrates a possible Intelligent Environment infrastructure for the valuation and management of cultural heritage in India (Riganti, 2017). The possible architecture of the proposed IE could be characterized by the following:

1. agent technology would be at the core to allow comparison of issues and patters within a database of heritage case studies/goods (case based reasoning);
2. an element of the architecture would be dedicated to e-governance, where local authorities might input information to consult relevant stakeholders including citizens;
3. a part of the architecture could be dedicated to build a catalogue of heritage, using forms of crowdsourcing, helping forms of e-learning/ remote exploration);
4. all of the above would feed into another section of the architecture of the intelligent environment, where valuation and assessment of goods and services would take place in a participative manner, using surveys and other online valuation techniques.

Overall, one of the characteristics of the DSS should be the development of open access ICT infrastructures. However, this vision based on the concept of open and common knowledge, whilst incorporating the main progress in terms of crowdsourcing and virtual globes, brings some challenges in terms of privacy of data and willingness of policy makers to cooperate beyond the national (or at times even state/regional) boundaries. The issue of privacy might be critical not only in India but also in other countries.

7. Conclusions

This paper has discussed the challenges that the protection of cultural heritage is currently facing in India, mainly due to property development pressure and the lack of stringent mechanisms in support of decision-making. The author has presented the framework needed to address this knowledge's void and make heritage conservation a viable option. In particular, the paper proposes a GIS-based intelligent environment in support of decision-making for the sustainable management of cultural heritage. The main argument of the paper is that in order to achieve an inclusive, participatory governance of heritage assets it is necessary to understand the value attached by various stakeholders, and in particular local communities, to heritage goods. Such an evaluation of the economic dimension of cultural goods is an important aspect that should be embedded within any ICT environment that might be developed as decision support system, in order to progress towards *SDG 11: sustainable cities and inclusive communities*. In fact, a city that does not appropriately value and preserve its heritage is neither sustainable nor resilient.

Making the best of advancements in information technologies and social media is the necessary step to develop what here we defined as a *smartheritage* agenda for cities in both developed and developing countries. A *smartheritage* agenda is a heritage management/governance tool for smart cities. In a first instance, such an agenda could consist of a policy framework, but eventually would need to be developed into a proper ICT intelligent environment to support policy making related to the various risks that heritage faces in contemporary cities.

World Heritage is currently at risk of destruction for various reasons. Natural catastrophes as well as man-caused events have threatened our physical heritage several times in the past and will do so in the future. Whilst we cannot always oppose the forces of nature, we could and should put strategy in place to avoid that the testimony of the past is lost to the pressure of real estate and property development. A first step to avoid such indiscriminate loss is to find ways to assess and communicate the value of cultural assets. Valuing the social and

economic costs associated to heritage loss is a first step towards a sound conservation policy. The increasing world population and the associated rapid urbanization in countries like India are creating very difficult conditions for sustainability, putting a lot of pressure on cities infrastructures, making managing basic city services even more challenging, let alone preserving heritage for future generations. To achieve this goal, we need a collective approach to problem solving and tools that might help us become more efficient and effective.

Decision Support Systems (DSS) for this purpose, should be integrated in intelligent environments able to account also for public preferences on the way heritage sites are managed. Understanding the values that people attach to cultural goods is an important step towards their sound management and therefore towards the minimizations of the risks heritage faces. Given its complexity, the economic assessment of the risks brought to heritage needs a holistic approach. We can develop studies addressing the impacts and the risks brought by specific policy scenarios to our heritage on a case-by-case basis and assess the perceived damage that people associate with the loss of a specific cultural good or with the impacts of a specific management strategy.

Further research is needed to explore ways of addressing the risks faced by our world heritage. An intelligent environment, based on an open data approach, would be an ideal support for policy makers. Many of the challenges facing the cities of today are quite similar in nature, if not identical: from infrastructure management to essential public services. Ideally, cities would share best practices with each other and the progress in urban studies would accelerate.

This paper has highlighted the need to promote integration of academic approaches and disciplines, whilst emphasizing the role played by the economic valuation for the protection urban cultural heritage at risk. In order to protect our heritage, we need to develop a holistic approach to urban issues encompassing various perspectives. At a time when nationalism and terrorism bring division in communities all over the world, heritage has the potential for peace building and the digital era could make the world feel not only smaller, but also more united (UNESCO, 2017).

Acknowledgments

The author is grateful to all experts who attended the workshop held in Mumbai in 2016 as part of the *smarties* project's activities. The ESRC Grant ES/P000517/1 provided funding for this purpose. The author is also thankful to two anonymous referees for their comments. All errors remain solely responsibility of the author.

References

Angrisano M., Biancamano P.F., Bosone M., Carone P., Daldanise G., De Rosa F., Franciosa A., Gravagnuolo A., Iodice S., Nocca F., Onesti A., Panaro S., Ragozino S., Sannicandro V., Fusco Girard L. (2016), "Towards operationalizing UNESCO Recommendations on Historic Urban Landscape". *AESTIMUM*, no. 69, December 2016, pp. 165-210.

Batty M., Axhausen K., Fosca G., Pozdnoukhov A., Bazzani A., Wachowicz M., Ouzounis G., Portugali Y. (2012), "Smart cities of the future". *The European Physical Journal*, Special Topics, no. 214, pp. 481-518.

Brovelli M.A., Minghini M., Zamboni G. (2013a), "Participatory GIS: Experimentations

for a 3D Social Virtual Globe". *The International Archives of the Photogrammetry, Remote Sensing and Spatial Information Sciences*, vol. XL-2/W2, pp. 13-18.

Brovelli M. A., Hogan P., Minghini M., Zamboni G. (2013b), The power of Virtual Globes for valorising cultural heritage and enabling sustainable tourism: NASA World Wind applications. *The International Archives of the Photogrammetry, Remote Sensing and Spatial Information Sciences*, vol. XL-4/W2, pp. 115-120.

Coleman J. (1988), "Social Capital in the Creation of Human Capital". *American Journal of Sociology*, no. 94, supplement S95-S120. University of Chicago.

Fusco Girard L. (2013), "Toward a Smart Sustainable Development of Port Cities/Areas: The Role of the 'Historic Urban Landscape' Approach". *Sustainability*, vol. 5, n 10, pp. 4329-4348.

G7 (2017), "Joint Declaration of The Ministers of Culture of G7 On the Occasion The Meeting Culture as An Instrument For Dialogue Among Peoples", *Culture as Dialogue*. Florence, March 30-31, 2017.

HLRN (2017), *India's Smart Cities Mission: Smart for Whom? Cities for Whom?*, http://hlrn.org.in/documents/Smart_Cities_Report_2017.pdf

International Criminal Court (2015), S*ituation in the Republic of Mali in the case of the prosecutor v. Ahmad al Faqi al Mahdi*, www.icc-cpi.int

Kefalidou G., Mercourios G., Bryn A. C., Suchith A. (2014), Crowdsourcing Our Cultural Heritage. In: Clare Mills, Michael Pidd and Esther Ward. Proceedings of the Digital Humanities Congress 2012, *Studies in the Digital Humanities*. Sheffield, HRI Online Publications.

Ministry of Urban Development Government of India (2015a), *Smart Cities. Mission Statement and Guidelines*, www.smartcities.gov.in

Ministry of Urban Development Government of India (2015b), Operational Guidelines for HRIDAY: Heritage City Development & Augmentation Yojana, http://hridayindia.in.

Nijkamp P., Riganti P. (2009), "Valuing Urban Cultural Heritage" in P. Nijkamp, L. Fusco Girard (eds), Cultural Heritage, *Local resources and sustainable tourism*, Ashgate, Aldershot, UK February, pp. 57 -72.

Oomen, J., Aroyo, L. (2011), "Crowdsourcing in the Cultural Heritage Domain: opportunities and challenges", Proceedings of the 5th International Conference on Communities and Technologies, *C&T 2011*, The Edge, State Library of Queensland, Brisbane, Australia 29 June – 2 July 2011, 2011, pp. 138-149.

Portes A. (1998), "Social Capital: Its Origins and Applications in Modern Sociology". *Annual Review of Sociology*, no. 24, pp. 1-24.

Riganti P., Nijkamp P. (2006), "The Value of Urban Cultural Heritage: An Intelligent Environment Approach". *Studies in Regional Science*, vol. 36, no. 2, pp. 451-469.

Riganti, P. (2010), "Cultural capital, local identities and ethnic diversity: A study of Amsterdam cultural tourism trends", in M. Janssens, M. Bechtoldt, G. Prarolo, V. Stenius (eds), *Sustainable Diversity*. Edward Elgar, UK.

Riganti P. (2017), "Smart cities and heritage conservation: developing a smartheritage agenda for sustainable inclusive communities". *Archnet-IJAR*, vol. 11, no. 3, 2017, pp. 16-27.

Throsby D. (1999), "Cultural Capital". *Journal of Cultural Economics*, vol. 23, pp. 3-12.

United Nations (2014), *World Urbanization Prospects. The 2014 Revision Highlights*, https://esa.un.org/unpd/wup/publications/files/wup2014-highlights.pdf

United Nations (2015), *Transforming Our World: The 2030 Agenda for Sustainable Development*, www.sustainabledevelopment.un.org

UNESCO (2016), *Culture Urban Future: Global Report on Culture for Sustainable Urban Development*, www.portal.unesco.org

UNESCO (2017), *Unite4Heritage Partnership*, www.unite4heritage.org.

Zanella A., Bui N., Castellani A., Vangelista L., Zorzi M. (2014), "Internet of Things for Smart Cities". *IEEE Internet of Things Journal*, vol. 1, no. 1, February 2014, pp. 22-32.

Patrizia Riganti
School of Architecture, Design and the Built Environment, Nottingham Trent University
50 Shakespeare Street, Nottingham NG1 4FQ
Email: patrizia.riganti@ntu.ac.uk