



Traditional  
Knowledge  
Systems and  
the conservation  
and management  
of Asia's heritage



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*Rice field in Bali, Indonesia by Monica Volpin (CC0)/Pixabay.*



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Edited by  
Gamini Wijesuriya and Sarah Court



**Forum on the applicability and adaptability of Traditional Knowledge Systems  
in the conservation and management of heritage in Asia**

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*Traditional Knowledge Systems and the conservation and management of Asia's heritage*

Edited by Gamini Wijesuriya and Sarah Court



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*Harvesting during an unseasonal snowfall, Ladakh, India, by Tara Sharma.*

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## Foreword

This volume comprises the collection of papers presented at the Third Annual ICCROM-CHA Forum on the Applicability and Adaptability of Traditional Knowledge Systems in the Conservation and Management of Heritage in Asia, held in Thailand in December 2015. The Forums took place over a five-year period and were the result of an ongoing collaborative effort between the Cultural Heritage Administration (CHA) of the Republic of Korea and ICCROM. They were conceived as a new thematic programme for developing contextual heritage policy guidance and/or principles for the Asian region. While focusing on Asia in particular and contributing to regional capacity building processes in Asia, the programme also sought to provide benefits to the heritage sector globally.

The goals of the thematic programme were:

- to explore, research, and debate key themes emerging from the Asian region that have implications for the effective conservation and management of heritage;
- to formulate policy guidance notes and/or principles related to the above themes for improved and effective conservation and management of heritage;
- to contribute to capacity building efforts in the region.

This programme was launched in 2013 in the Republic of Korea. The theme of the first Forum was “Asian Buddhist Heritage: Conserving the Sacred” and its proceedings have already been published. The theme of the second Forum, held in Sri Lanka in 2014, was “Revisiting Authenticity in the Asian Context”; the papers from this Forum were published in 2018. Following this tradition, the theme selected for the third Forum, held in 2015, was “Applicability and Adaptability of Traditional Knowledge Systems in the Conservation and Management of Heritage”. While

awaiting the publication of the papers from the fourth Forum, held in 2016 in China, under the theme of “National Conservation Policy”, readers are invited to explore the results of these Forums, as the proceedings were designed to offer an overview of the debates currently taking place among Asian heritage practitioners, in relation to both theoretical frameworks and practical applications.

It is widely accepted that those places which are now designated as heritage have been sustained, managed and passed down to us today thanks to associated Traditional Knowledge Systems. This is particularly true in the Asian region, which is extremely rich in such knowledge systems, which, in many instances are now well-documented. However, largely as a result of the introduction of modern conservation approaches, less and less attention has been paid to traditional approaches, resulting, in many cases, in their marginalisation and gradual disappearance all over the world.

Nevertheless, many Traditional Knowledge Systems, especially in Asia, have survived the test of time and are still in practice today. Many heritage sites are still managed through customary law, which draws on various elements of existing social structures. The resources required for the continuity of heritage sites, in the form of human and other resources, are provided by members of social groups who also bring their knowledge, skills and techniques, as well as the necessary materials. Traditional societies have planning schemes in place for their work, setting targets and achieving results through their own systems of activity implementation, using their own resources. It should be noted that, within the natural heritage sector, the sustainability of ecosystems is, to a large extent, linked to the existence of Traditional Knowledge Systems: another sign of the links between nature and culture.

The importance of Traditional Knowledge Systems in the conservation and management of cultural and natural



heritage has only been recognised very recently. ICCROM's Living Heritage Sites programme was originally developed in the Asian region and later led to the development of a global programme on People-Centred Approaches to Conservation. It was a response to the need for the living dimension of heritage to be considered central to conservation decision-making at most sites, embracing the role of Traditional Knowledge Systems of local and religious communities in safeguarding heritage. More recently, the World Heritage system has acknowledged the significance of traditional practices in the effective protection and management of properties on the World Heritage List.

It is further recognised that traditions are not static and that their application gives rise to numerous challenges. At the same time, new and emerging requirements, such as those defined by the World Heritage process and sustainable development needs, oblige governing and oversight regimes to integrate new management demands with TKS, where applicable. It is in this light that the third Forum acted as a platform to explore Traditional Knowledge Systems and to discuss their applicability and adaptability to contemporary conservation and management practices. This volume of the proceedings of the Forum aspires to address all audiences involved in heritage, namely practitioners, policy-makers, and communities and networks, and thereby to contribute to regional capacity building efforts and to the raising of global awareness.

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*of the Republic of Korea*



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*Casting in Yangshuo by Rod Waddington (CC BY-SA 2.0)/Flickr.*



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**Introduction**





With the emergence of modern conservation discourse, the Traditional Knowledge Systems (TKS) which created and sustained heritage for centuries became overlooked. However, in recent decades, the conservation sector has begun to recognise the contribution of TKS in Asia (Wijesuriya, 1993, 2001, 2005) and Africa (Joffroy, 2005). One of the earliest official references to TKS at an international level appeared in the *Convention on Biological Diversity* (UN, 1992), while the World Heritage Committee first made reference to TKS in its *Operational Guidelines* in 2005 (UNESCO World Heritage Centre, 2005). Since then, Traditional Management Systems have become acknowledged components in the present-day management of World Heritage properties. Similar issues were raised by African professionals during the ICCROM-led Africa 2009 programme. ICCROM has continued to emphasise the use of TKS in its Living Heritage Sites programme (2003–2010) and in its People-Centred Approaches programme (2013–ongoing). It was in this context that the third Asian Forum, organised by ICCROM in 2016 in collaboration with the Cultural Heritage Administration of Korea, explored the theme of the applicability and adaptability of TKS in the conservation of heritage in Asia and beyond.

Today it is widely acknowledged that TKS are time-tested, dynamic processes which can contribute greatly to the conservation and management of heritage. TKS are often created by communities, are the outcome of a community's connection with heritage, and can potentially bring benefits to that community and to others. TKS can help conservation professionals better understand and safeguard the community's connection with heritage and, accordingly, the heritage itself. TKS can also help conservation professionals overcome the artificial divides between tangible and intangible heritage and connect cultural heritage to the specific natural environment in which it is located.

Moreover, a range of TKS continue to be practised successfully across the Asian region.

However, despite sharing inspiring examples of TKS in action, the participants of the Forum recognised that the reality on the ground is that TKS are all too often threatened by a range of internal and external pressures in our modern, globalised world. With regards to the heritage sector, this has included an increasing professionalisation of conservation practice that all too often fails to recognise the importance of TKS. The challenge, therefore, lies in reconciling TKS with modern heritage management systems, and demonstrating where the two are compatible and where they are mutually beneficial. Indeed, TKS should be respected as systems that have stood the test of time: their survival and adaptation is a sign of their efficiency and the potential of their applicability to heritage management today. While recognising continuity as key to management systems, it is widely accepted that TKS are not static and are subject to change.

The African region was the first to discuss the significance of TKS in the World Heritage context, and one of its leading researchers, Dr George Abungu, was able to present the results of this work at the Asian Forum (Abungu, 2016). Asian countries also offer compelling case studies that can be explored for their implications for the effective conservation and management of heritage, not just within the region, but around the world. In many cases, TKS are closely connected with religious practices. Indeed, the examples from Asia highlight the direct links between their TKS and, for example, Hinduism and Buddhism (Wijesuriya, 2001, 2005). This volume brings together a series of such examples, as analysed by some of Asia's leading practitioners at the Forum and now written up for this publication, allowing discussion to be grounded in real experiences, and promoting suggestions to move conservation practices forward.

## Characterising Traditional Knowledge Systems

As described below, a rich array of sources that contain TKS exist in diverse forms across the Asian region. Communities are a key source for TKS and,

in these cases, community members are knowledge-holders. These TKS are the outcome of a particular community's strong and distinctive connection

with its heritage, from community's very creation, to its identity, philosophy, way of life and practices. As a result, communities who continue to practice TKS tend to have a much stronger relationship with heritage than those communities who do not. TKS can include information on definitions, principles, processes, techniques, evolution of practice, and intangible practices relating to heritage and its safeguarding by the associated community over time.

Several authors explore the character of such community-based TKS. For example, Wayan Windia considers the *subak* system in Bali, Indonesia: a complex irrigation management arrangement where farmers share water resources to meet their agricultural needs. This TKS ensures an equitable and flexible distribution of resources, but it also embodies the Tri Hita Karana philosophy whereby people seek to live in harmony with each other, with the environment, and with God. Dramatic changes in land use, together with economic development are threatening the *subak* system, and government intervention may be required to ensure not only that the system survives, but also that it continues to benefit local communities and their land and supports new forms of tourism.

Anila Naeem's two case studies from the Sindh region of Pakistan highlight examples of heritage at risk in the context of globalisation and how protective measures are needed to safeguard tangible and intangible heritage, and also the associated communities themselves. In one case study, we see that traditional vernacular architecture is at risk for a variety of reasons: a new community living in the traditional houses; the economic constraints on owners unable to maintain and restore their homes; the economic pressure to sell architectural features to the antiquarian market; a lack of awareness of appropriate conservation interventions; and a lack of artisans and craftsmen with the traditional skills to carry out the maintenance and restoration work required. In a second case study, the tangible heritage created by the particular lifestyle of communities who live on boats is discussed. This example demonstrates the significance of heritage recognition and protection to broader social agendas and to the survival of communities at risk.

Phan Thanh Hai illustrates how traditional building and crafts skills in Hué, Viet Nam, have been revived through conservation projects for the city's built heritage. These projects draw on traditional skills that once thrived in the artisan villages surrounding Hué, but which were lost by the twentieth century. Efforts have been made to rediscover Hué's intangible heritage alongside the restoration of the tangible heritage, bringing socio-economic benefits for the community in addition to heritage conservation benefits.

Two thought-provoking examples from Sri Lanka, where local and religious communities are actively involved in maintaining and restoring heritage, are provided by Prasanna Ratnayake and Sumedha Mathota. The approach taken by the communities can be understood by considering Buddhist views on restoration and the living role Buddhist heritage monuments play in contemporary Sri Lankan society. The authors also highlight that these community-based management examples provide essential human and material resources that would not be otherwise available to heritage authorities, thereby ensuring continued survival of the heritage.

Elsewhere in this volume, authors put forward examples of TKS that were promoted by more formal management systems of the past. For example, Sangeeta Bais discusses the *karkhana* system of the Mughal period in India. The *karkhana* were production workshops under royal patronage that operated as a well-organised system for the many large-scale building projects of the period. Trained architects and artisans from these workshops offered a range of specialist skills and were highly knowledgeable about the use of specific materials and techniques. This system declined in the colonial period and, nowadays, different materials are used and techniques have altered. The author suggests that the differences between historic and contemporary practices need to be understood, so that suitable approaches can be found for the conservation of Mughal monuments. In particular she notes that traditional skills alone may not be enough, given the contemporary pressures; she argues that the artistic creativity nurtured by the *karkhana* system should be promoted instead.

Kou Vet and Robert McCarthy describe the extensive water management system that,



historically, was used around the Angkor region of Cambodia to support the agricultural needs of the region. Although the part of the system that can be found within the central archaeological area is no longer functional, there are sections which are still maintained and which continue to play a role in contemporary farming in Angkor. Ways of restoring the water management system are being explored, particularly given the contribution the system could make to flood mitigation and heritage conservation (the below-mentioned case study of Ayutthaya demonstrates that flooding is a consequence of the breakdown of the traditional water management system). It is thought that a restoration project could also bring increased economic benefits for the local community and support a religious revival.

The Wudang Mountain Building Complex in China is analysed by Lyu Zhou, who compares the management system of the Ming Dynasty (1368–1644) with the system that is in place today for World Heritage property. He notes that many features of the Traditional Management System could help to improve the current management of the Wudang Mountain Building Complex, including: local authority management and maintenance oversight over the mountain in order to protect its sacred values; a holistic management approach; flexible management to allow sustainable development. The author notes that the Traditional Management System is itself a part of the cultural values of the site and contributes to the site's authenticity and should be protected and implemented whenever possible.

## Sources for understanding Traditional Knowledge Systems

The range of examples examined during the Forum highlight how TKS have survived to date through a wide ranges of resources, including:

- oral transmission and transmission through practice, often where a more experienced person works alongside a younger person, reinforcing verbal lessons with practical experience;
- primary sources, including books, inscriptions, religious literature and other texts and illustrations;
- modern means of recording, such as sound and image archives, including secondary sources;
- where no other records exist, there is the physical evidence of TKS in the tangible results of their creative processes, such as architectural and engineering solutions, craft products, cultural landscapes and agricultural landscapes.

The richness of these sources demonstrates the importance of documenting and transmitting TKS for both continuing traditional practices and learning from the past. However, while documenting TKS as a resource, it is important to recognise their dynamic evolution and not

only to view them as a snapshot of knowledge at a single moment in time. Knowledge transfer of TKS from one generation to the next needs to be ensured: it is necessary to maintain both knowledge and practices, in order not to lose TKS, as there are decreasing numbers of people with specialist knowledge and/or technical skills and fewer opportunities for their transmission to others. Knowledge transmission will require the capacity building of young people and the cooperation of those who are more experienced. In addition, those TKS that are no longer practised should be studied and documented, and an assessment undertaken to decide whether it is possible and appropriate to restore them for the benefit of the community and for heritage conservation.

In the Asian context in particular it is important to note the wealth of written sources that describe TKS, providing precise information for their practice, as they do not always exist in other regions. Several authors in this volume give examples of such documentary sources, from different geographical areas and different religious contexts, discussing their significance for practitioners today.

The chapter by Radhika Dhupal presents the preliminary results of her bibliographical

research on both primary and secondary documentary sources, discussing traditional building knowledge in India (for example, the *Mayamata*, which dedicates an entire chapter to renovation). She provides an extensive appendix, intended as a resource for scholars and practitioners interested in English-language material on this subject, and her contribution illustrates the richness of literature available. Ancient treatises on the theory of architecture are shown to have been applied in practice, demonstrating the potential practical applications for today. In addition, Dhumal shows how many building traditions still form a part of living practices in India and how attempts to protect and revive these could gain much from looking to historic texts.

Sathyabhama Badhreenath studies the wealth of documentary and epigraphic evidence on the maintenance and restoration of Hindu temples in India. The evidence gathered covers centuries of religious practice and demonstrates a continued

emphasis on the importance of the physical temple and cult objects. She explains that the emphasis placed on restoration in religious texts means that large numbers of religious buildings have been conserved. In addition, inscriptions reveal the extent to which wealthy individuals supported religious heritage by paying for restoration work. The author argues that this body of evidence is of importance at a time when less respect is being paid to traditional materials and there is a lack of skilled craftspeople to carry out such work.

Tara Sharma presents another example, whereby the traditional management of villages and monasteries of the Ladakh region of India is placed within the context of the Buddhist worldview. She describes the various formal and informal management systems that have arisen to ensure that these communities have survived. In particular, she notes how the conservation of heritage can lead to tensions between community members, who hold a Buddhist perspective of renewal, and conservation professionals, who believe in minimal intervention.

## Benefits of Traditional Knowledge Systems

The many case studies brought to the Forum and subsequent discussions, have highlighted the importance of recognising the many benefits that can be gained from TKS, both for communities and for heritage professionals. In particular, with regard to local communities, it has been found that TKS has the potential to increase wellbeing by contributing to community empowerment, promoting social resilience, fostering local identity and social cohesion, strengthening intergenerational relationships, encouraging conflict avoidance and resolution, increasing income and employment opportunities, and providing support systems. Furthermore, TKS ensure that knowledge is maintained and transmitted across generations, so that people do not have to find solutions time and again to the same challenges, but can benefit from the experience of others, build on that experience and avoid the mistakes of the past.

In addition, the benefits are also numerous for those working in the heritage sector when it is recognised that the social system that serves as

the context for TKS also provides a pre-existing foundation on which heritage conservation can build. Additionally, it is significant that a community in which a TKS is practised sometimes has financial, intellectual and human resources for conservation in situations when the modern management system does not. TKS can also offer conservation solutions that have proven to be effective over time for use by heritage professionals.

In particular, one of the key areas where TKS play an important role in providing benefits to communities and heritage professionals alike is that of disaster and risk management. Several authors provide assessments of situations across Asia where TKS can potentially help with resilience, risk preparedness and post-disaster responses. For example, Rohit Jigyasu looks at the contribution that TKS can make to disaster risk management, notably in relation to earthquakes and flooding. By discussing examples from India and Nepal, he shows how, all too often, a lack of skilled builders in both



traditional and “modern” construction, contributes to loss of life in disaster situations. However, those traditional buildings that have withstood disasters offer insights into possible technical solutions. As TKS are, by their nature, evolutionary – adjusting to circumstances through trial and error – the author concludes by suggesting that TKS could be integrated with contemporary knowledge when deciding how to establish disaster management policy and preventions for heritage places.

Anie Joshi and Kai Weise discuss the *guthi* system in Nepal’s Kathmandu Valley: the traditional way that communities in this region have maintained their living heritage in both its intangible and tangible forms. The role of *guthis* has diminished over time as modern approaches to heritage management have developed within the country, limiting the resources available to communities for maintaining cultural continuity – a particularly crucial issue following the periodic earthquakes and the need to restore monuments and urban spaces. This failure to acknowledge traditional practices has been accompanied by modern conservation and restoration approaches that have not provided an appropriate response to seismic risk, as seen most recently in the 2005 earthquake. However, this failure of modern heritage management has provided an opening for a renewal in community-based approaches and offers an important example for understanding such traditional systems.

Akiko Umezu provides an overview of traditional vernacular architecture in Japan and discusses how it has evolved in response to specific geographic and environmental factors. In particular, she highlights the capacity of traditional vernacular architecture to be resistant to disasters, such as fire, earthquakes, floods and typhoons. She notes the difficulties of implementing such traditional building practices today, including: rigid building regulations, a lack of skilled builders and craftspeople, the increasing cost of materials, and the changing social context.

Hatthaya Siriphatthanakun describes the organisation of the historic city of Ayutthaya, Thailand, which was built in the middle of three rivers. The city’s water management system was elaborate and ensured that seasonal flooding was harnessed for agricultural purposes, that there was an efficient transport system and that the city was protected from enemies. The traditional vernacular architecture on stilts also demonstrates how, historically, the residents lived with flooding and adapted to it. However, in 2011, Ayutthaya suffered severe flooding, exacerbated by modern water management practices. The author notes that the challenge now faced by Ayutthaya is to study what lay behind the success of traditional water management and apply the knowledge gained to today’s changed circumstances.

## Reconciling Traditional Knowledge Systems and modern management systems

It is the collective experience and view of the Asian Forum participants that heritage conservation and management can only benefit from acknowledging the contribution of TKS. They also consider that renewed attention might help to reinforce those TKS that are under pressure in contemporary society. As there is increased recognition that modern management systems need to address the issue of reciprocal benefits (ensuring that conservation brings benefits to both communities,

as well as to the heritage itself), TKS should be promoted within the heritage sector as a particularly rich source for people-centred approaches to heritage conservation and management.

Analysis of modern management systems (for example, using the management systems tool developed by ICCROM (Wijesuriya, Thompson and Young, 2013)) can help to highlight where there are gaps in existing management systems – gaps which TKS may well help to fill, particularly

when analysis of effective Traditional Management Systems has been carried out. It must be recognised that these traditional approaches offer solutions that have already been tested over time, which can complement and inform “scientific” solutions. The conservation sector also needs to recognise the intangible elements of heritage and a full range of associated values in addition to its tangible expressions: this will allow for a more sophisticated understanding and protection of heritage and other values. In some cases, it may be appropriate to integrate TKS into formal legal frameworks in order to recognise their proven historic contribution to heritage management by law.

Success will require the voices of traditional knowledge holders and professionals from the conservation sector and from other relevant sectors to be heard when conservation decision-making takes place. Positive relationships need to be fostered between community members, professionals and policy-makers, so that conflict can be avoided. In addition, TKS should be integrated into teaching and other forms of capacity building, so as to afford TKS due recognition, and instil community members and professionals with confidence in TKS.

A number of chapters in this volume explore how TKS could be reconciled with modern heritage management systems, exploring the challenges the conservation sector is currently facing. For example, Neel Kamal Chapagain examines the relationship between TKS and Modern Knowledge Systems with regard to heritage. He presents two case studies from Nepal – the *guthi* system of the Kathmandu Valley and the traditional building techniques of the Mustang region – which highlight the contribution that TKS can make to heritage management, despite their diminished role in contemporary Nepalese society. Building on these real-world examples, he suggests a model for analysing the applicability and adaptability of both TKS and modern management systems, demonstrating how the proposed model might be used to identify where TKS can be used within heritage management, with particular regard to living heritage.

Pema describes the situation in Bhutan, where many living traditions are still respected, but where tensions have arisen in situations where communities want to maintain and renovate their

heritage sites, while conservation practitioners are seeking to implement a more minimalist approach. In the context of Vajrayana Buddhism, the author suggests a “middle way” between the two extremes, integrating conservation with TKS. He continues by illustrating the common ground that exists with examples of skilled craftspeople and traditional building techniques, demonstrating how these might also be applied to disaster risk reduction.

Sujeong Lee discusses the role of TKS in the conservation of Buddhist heritage, arguing that, while it is essential to understand how TKS created and sustained Buddhist heritage, it is not appropriate to apply Korean TKS to conservation in all circumstances. She examines the reconstruction project of the Sungnyemun Gate in Seoul, South Korea, to explore the challenges of integrating traditional knowledge into heritage practice. In conclusion, Lee calls for a creative process, based on a clear understanding of traditional knowledge, and analysis of how given Korean TKS are useful within conservation.

In another chapter, Saeedeh Hosseini discusses the use of Traditional Management Systems in the conservation of heritage in Iran. In the context of Islamic society, she discusses the particular circumstances of the *waqf* and how these religious institutions have played a key role in maintaining many examples of architectural heritage. Hosseini also examines the failure of modern heritage management to provide space for TKS, although, through a series of case studies, she demonstrates how traditional skills continue to contribute to heritage conservation and restoration.

Finally, Jade Hadfield provides an example from New Zealand of how one particular TKS has already been integrated into a modern heritage management system. Hadfield explains the importance of cultural and natural heritage within the Indigenous Maori belief system and how this importance was reflected in the Treaty of Waitangi, which defined the colonial government’s relationship with New Zealand’s Indigenous people. This Treaty now forms the basis for contemporary approaches to the conservation and management of Maori heritage, Maori representatives are involved in decision-making, and Maori can assert their ownership of heritage and also protect heritage from inappropriate



use. The influence of the Treaty of Waitangi on conservation practice at heritage sites and within museums, together with the participation of Maori people “has helped to ensure that Maori

heritage receives the attention and protection that it requires, while strengthening the relationship between the heritage sector and Maori” (Hadfield in the current volume).

## The future for Traditional Knowledge Systems?

The fruitful discussions that took place at the third Asian Forum clearly demonstrated that TKS should be respected as systems that have stood the test of time and that they should be considered a valuable resource for the heritage sector in many areas of endeavour, particularly as we seek to overcome the artificial divide that has been created between tangible and intangible heritage, nature and culture. It was recognised that TKS contain technical knowledge and practical understanding which is still relevant in the twenty-first century; indeed the survival and adaptation of TKS is a sign of their efficiency and the potential of their continued applicability today, despite disproportionate threats to their existence from global forces.

Indeed, the Forum participants recognised that there are a large number of challenges to be faced. As noted above, TKS are not static and, in most cases, the social, economic, environmental and political context in which TKS were formulated has changed dramatically. It was also acknowledged that, in some cases, pollution, development, environmental degradation, climate change and/or changes in land use have made it very difficult for certain TKS to continue. It was agreed that TKS may require specific governmental support mechanisms to safeguard them from powerful external pressures. Public authorities and non-governmental organisations must promote existing TKS where these are the appropriate and time-tested solution, particularly when doing so supports sustainable development. The economic context of TKS also requires consideration, as traditional practices may no longer be as economically viable as they once were, and they may also face resource competition from other more economically-powerful sectors, such as tourism.

It was also noted during the Forum that some individuals and communities find themselves

affected by evolving contexts and global changes that make it difficult to continue practising TKS; as a result there is sometimes a lack of clarity over who has responsibility for certain heritage and its management. Furthermore, the point was raised that modern lifestyles and technology have proved attractive, while some traditional ways of life, such as farming, are acknowledged to be extremely demanding and without a reliable income, leading many individuals to give up traditional practices and seek alternatives. A key aspect of TKS has been its intergenerational transmission, but this has also been impacted by changing lifestyles within communities and migration. Those TKS that are still in practice today must be viewed in the context of specific cultural traditions that need to be protected from external and internal threat factors.

In these situations, creative solutions need to be found in order to ensure that benefits continue to be shared, although context-specific solutions are to be encouraged, rather than seeking a one-size-fits-all response. In addition, since TKS have continued to develop in the face of contemporary circumstances, there is a need to map and study the evolution of TKS in terms of continuity and change. To do so will help to safeguard TKS in the present and ensure their continued existence in the future.

Recognising the significance of TKS and the benefits they bring, as well as the changing contexts described above, it should be noted that conservation efforts are an appropriate framework within which to promote TKS, as they provide opportunities for sharing traditional knowledge and reviving practices before they are lost. It is hoped that the contributions made by the authors to this volume will highlight new ways forward for the conservation of heritage in Asia and beyond.

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Sarah Court



## References

- Abungu, G.O., ed. 2016.** *Traditional Management Systems at Heritage Sites in Africa* [online]. Midrand: African World Heritage Fund. [Cited 13 November 2017]. <http://awhf.net/wp-content/uploads/2016/10/AWHF-English-Book.compressed.pdf>
- Joffroy, T., ed. 2005.** *Traditional Conservation Practices in Africa* [online]. Rome: ICCROM. [Cited 13 November 2017] [www.iccrom.org/sites/default/files/ICCROM\\_ICSo2\\_TraditionalPractices\\_en.pdf](http://www.iccrom.org/sites/default/files/ICCROM_ICSo2_TraditionalPractices_en.pdf)
- UNESCO World Heritage Centre. 2005.** *Operational Guidelines for the Implementation of the World Heritage Convention* [online]. Paris. [Cited 3 June 2019]. <https://whc.unesco.org/archive/opguide05-en.pdf>
- United Nations. 1992.** *Convention on Biological Diversity* [online]. New York. [Cited 3 June 2019]. [www.cbd.int/doc/legal/cbd-en.pdf](http://www.cbd.int/doc/legal/cbd-en.pdf)
- Wijesuriya, G. 1993.** *The Restoration of Buddhist Monuments in Sri Lanka: the case for an archaeological management strategy*. Colombo, Department of Government Printing.
- Wijesuriya, G. 2001.** Protection of sacred mountains: towards a new paradigm in conservation. In UNESCO World Heritage Centre, ed. *UNESCO Thematic Expert Meeting on Asia-Pacific Sacred Mountains*, pp. 47–62. Tokyo, UNESCO/Agency for Cultural Affairs of Japan. [https://unesdoc.unesco.org/in/rest/annotationSVC/DownloadWatermarkedAttachment/attach\\_import\\_5a238c42-6792-4269-8d13-5bc55odb6672?\\_=-147038engo.pdf](https://unesdoc.unesco.org/in/rest/annotationSVC/DownloadWatermarkedAttachment/attach_import_5a238c42-6792-4269-8d13-5bc55odb6672?_=-147038engo.pdf)
- Wijesuriya, G. 2005.** Past is in the Present: Perspectives in Caring for Buddhist Heritage. In H. Stovel, N. Stanley-Price & R. Killick, eds. *Conservation of Living Religious Heritage*, pp. 31–43. Rome, ICCROM. [www.iccrom.org/sites/default/files/ICCROM\\_ICSo3\\_ReligiousHeritage\\_en.pdf](http://www.iccrom.org/sites/default/files/ICCROM_ICSo3_ReligiousHeritage_en.pdf)
- Wijesuriya, G., Thompson, J. & Young, C. 2013.** *Managing Cultural World Heritage* [online]. Paris: UNESCO. [Cited 13 November 2017] <http://whc.unesco.org/en/activities/827>



**Characterising  
Traditional Knowledge Systems**



◁ CHAPTER I ▷

**Implementation of Tri Hita Karana  
philosophy for the sustainability  
of the *subak* irrigation system  
in Bali, Indonesia**

Wayan Windia



## Abstract

*Subak* is an indigenous traditional institution in Bali of farmer-managed irrigation which ensures the equitable use of water resources for certain compounds of rice fields built around a temple. In addition to managing irrigation water, the *subak* system is significant for its associated ritual ceremony activities. This paper discusses the implementation of the philosophy of Tri Hita Karana (THK), considered vital for the sustainability of *subak*. This paper concludes with the current challenges for the sustainability of *subak*. While *subak* has some strongholds as a sociocultural institution, it is not strong enough to protect itself from external interventions such as governments and investors. Thus there is a need to introduce economic and technological supports into the *subak* system, in order to increase income and encourage moral support to strengthen unity among the members of the communities who use this traditional system.

## Introduction: *subak* and Tri Hita Karana

*Subak* is a farmer-managed irrigation organisation used to irrigate certain types of rice fields, built around a temple (Figure 1). It is an indigenous traditional institution in Bali. Based on evidence from the Pandak Bandung inscription dating from 1071 CE (Purwita, 1993) the *subak* irrigation system has been established in Bali for more than ten centuries. Pusposutardjo (1975) noted that the *subak* system has developed in harmony with society and in compliance with government policy. The *subak* system has thus undergone structural organisational changes.

The *subak* who receive irrigation water from one water source/river developed a separate organisation called *subak-gede* (*subak* coordination body at one river). The *subak* who receive irrigation water from more than one water source/river developed another organisation called *subak-agung* (*subak* coordination body at more than one river). The functions of *subak-gede* and *subak-agung* are to coordinate the water management and to oversee the system of irrigation between the various groups of *subak*. They are effective in this task. Some *subak-gede* and *subak-agung* have been developed in the Tabanan and Buleleng Regencies, since 1990 (Sutawan, 2008).

The *subak* system was established in Bali due to the sloping topography of the island. Farmers use the gravitational power of the geography to spread and distribute the water to the farmer-members as fairly as possible. The farmers receive water based on a policy which allows the borrowing of water between farmers. Specifically, every farmer has one inlet and one outlet, at every rice field. If needed, one farmer can borrow water and stop the flow of water at the inlet of another farmer as long as those farmers agree. So all of the farmers in one *subak* are able to cultivate rice together at the same time, equitably. This is one example of the implementation of the philosophy of THK, which helps to ensure harmony. The result is that all the rice field terraces are planted at almost the same time, together forming the rice landscape of Bali.

*Subak* maintain the cultural landscape of Bali by employing the philosophy of Tri Hita Karana (THK). THK provides for the following

means of obtaining happiness through the harmony and togetherness of people's activities:

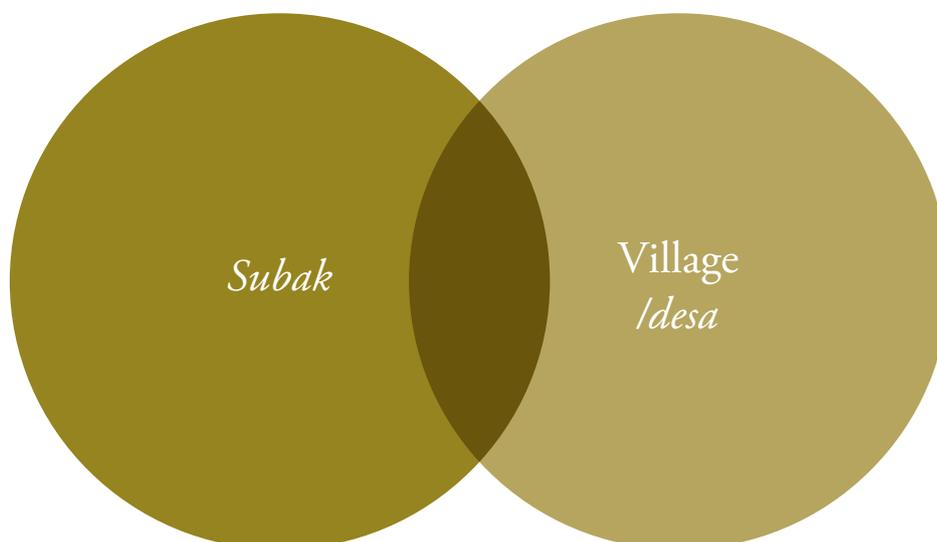
(i) *parhyangan*: the harmonious relationship between people/farmers and God. *Parhyangan* employs ritual activities which are symbolic of the *subak* members' respect of, and harmony with the many manifestations of God. Hindus believe that rice rituals are a symbol of the harmony between farmers and the goddess Lakshmi. Irrigation water rituals are a symbol of the harmony between farmers and the god Vishnu. Aside from the practical aspect of managing irrigation water, the most important feature of the *subak* system is the ritual ceremony activities. The rituals increase farmers' morale, assisting their work in the rice fields, and in maintaining the landscape. All members of the *subak* demonstrate a strong interest in managing the irrigation water. There are 16 ritual ceremonies individually performed by farmers as members of the *subak*, from the ritual of fetching irrigation water to the post-harvest ritual ceremony. There are also ritual ceremonies conducted by all of the *subak* members at the co-op level. There are also ritual ceremonies carried out together with all the other *subak* in the temples located near dams and lakes. The *subak* system has been regarded as the guardian of Balinese culture through the implementation of THK; as a result, UNESCO has recognised *subak* and the associated rice paddies as a World Heritage Cultural Landscape (UNESCO World Heritage Centre, 2019).

(ii) *pawongan*: the harmonious relationship between farmers. Regarding *pawongan*, *subak* activities mean maintaining the *subak* landscape, achieving consensus among members through adherence to the established regulations (*awig-awig*). The regulations basically dictate what *subak* members can or cannot do in *subak* areas. Nowadays, some *subak* have included a regulation stating *subak* members are not allowed to sell their rice fields or convert them to another crop or function. The regulations are very important for conserving the rice fields and the *subak* landscape. Consensus among *subak* members is a symbol of *pawongan* in practice.



 **Figure 1**  
Students at a *subak* site,  
checking the condition  
of the rice fields.

 **Figure 2**  
Overlap between village  
boundary management  
and *subak* in Bali.





(iii) *palemahan*: presents the harmonious relationship between farmers and the environment (see also above). The farmers have developed the rice fields without destroying the sloping land using the natural contours of the landscape. The activities

undertaken to develop and maintain rice terraces in Bali play an important role in attracting people to come to see these rice terraces. *Palemahan* is a part of the philosophy of THK, as a symbol of harmony between farmers and the environment.

## *Subak* as a traditional irrigation system

*Subak* are also viewed as farmers' groups on irrigation water management, including farming activities and their associated ritual activities. *Subak* are therefore characterised by: (i) physical aspects, including compound rice fields, irrigation facilities (such as canals and temples) and water sources; and (ii) non-physical aspects, such as socialcultural activities (Windia, 2007). The two aspects are thoroughly intertwined. As an organisation *subak* have an autonomous management structure.

*Subak* are not under the formal control of a village – the two coordinate management of certain activities (Windia, 2007). A *subak* is a hydrological boundary limit, not an administrative boundary. In many cases, aspects of *subak* overlap with aspects of village management and even sub-district and district management (Figure 2), where the water source is located upstream and its canals pass through several villages.

Irrigation of *subak* land is fully dependent on the availability of water sources (for example, the capacity of a dam) and the location of the *subak*. *Subak* lands scattered on hilly areas are smaller than those located in the downstream area. The existence of *subak* varies according to the use of the water source through the dam (Figure 3). There is a singular *subak* where there is an individual dam on the river. For those *subak* with one dam as a water source, there is a coordinating body of *subak* which locally are called *subak-gede*. The *subak* which collect water through several dams constructed along the river might fall under a different coordinating body, known locally as *subak-agung*. *Subak-gede* and *subak-agung* oversee the coordination of water management among the *subak* as members of *subak-gede*, along with the coordination of the ritual ceremonies at the temple that is constructed near the dam.

Coordination among *subak* is much needed as water availability becomes scarce. These *subak* coordinating bodies might give a solution to coping with the water availability problem, particularly during the dry season.

Irrigation water is the most important resource for the *subak* system, and it constitutes an affiliating factor for farmers. In Bali, farmers, who are mostly Hindu, personify water as the god Vishnu. The rice fields cultivated by *subak* are personified as the goddess Lakshmi (the goddess of fertility and Vishnu's consort). These beliefs helped to sustain the stance that the *subak* must maintain and manage water at a source level (rivers), which flows to the rice fields cultivated by *subak* members. Accordingly, the *subak* system in Bali not only oversees water management, but also conducts ritual ceremony activities. *Subak* members believe that water is a sacred element.

Therefore, it is believed that conflict caused by problems concerning water ought to be avoided. The government has encouraged some *subak* receiving irrigation water from one particular source, to join a forum for coordination in order to provide additional means to avoid the conflict caused by problems over irrigation water.

The boundaries of the *subak* correspond with natural borders, such as rivers, canals, or rural areas. These boundaries indicate that *subak* do not flow any further upstream since they are blocked by the cited borders. The *subak* and the village work together however, particularly in the implementation of ritual ceremonies and other social activities within the village. In the language of political science, this cooperation and coordination is known as the concept of polycentry (McGinnis, 1999).

Land conversion, particularly in the city area and its surroundings is currently

happening at a very fast rate (an average of 750 hectares per year). Several *subak* areas in Bali have subsequently shrunk in size. Land conversions will reduce cash contributions into the water management system of *subak*. *Subak* farmers have to bear an increasingly heavy financial burden for the conduct of ritual ceremonies. The farmers have limited resources and, as a result, many *subak* temples are not well-maintained or are abandoned. In some cases, there might be friction as to whether the temple should be managed by the village or by the *subak*.

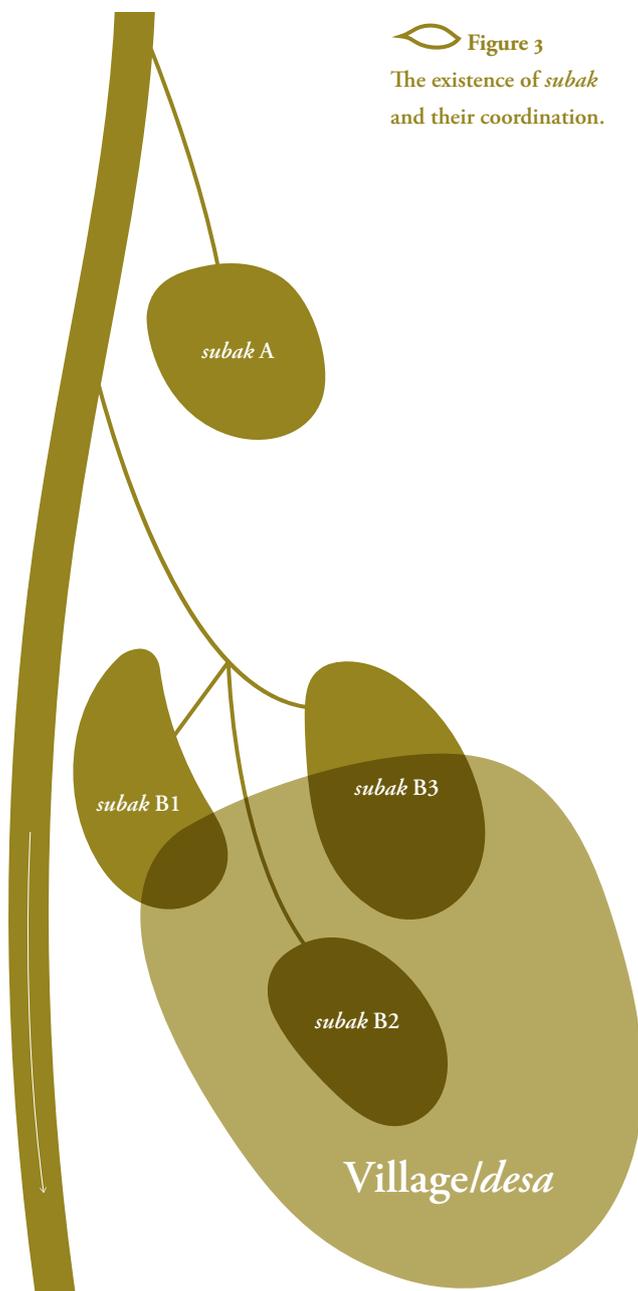
Arif (1999) states that there is a significant relationship between the condition of the *subak* temple and the efficiency of the *subak* organisational system. It can be further stated that the existence of the *subak* system is linked to the role of the king in Bali in the past. The existence of the *subak* system was predated by the presence of farming systems that have evolved in Bali since the year 678 CE (Wardha, 1989; Arfian, 1989). This means that the existence of the *subak* system emerged 393 years after the development of the agricultural system. Purwita (1993) stated that the terms of the *subak* system in Bali were founded in 1071 CE. Studies have indicated that in the past, the Balinese kings provided subsidies for farmers working on irrigated land. Such subsidies were not available to farmers of dry land. The king gave permission for *subak* to create new rice fields by utilising existing forest areas and allowed *subak* to take and drain the water from the river to the wetlands created by farmers. Therefore, the *subak* irrigation system can be described as a traditional institution based on sociocultural and local community values supporting the irrigation water management system for the welfare of the farmers and society more generally, in accordance with the Hindu context.

The *subak* irrigation system has continued to develop in accordance with the development of the surrounding communities, based on sociocultural and local community values (Pusposutardjo, 1975). The current developments in the Balinese *subak* system are: (i) the scope of the *subak* management system; (ii) the institutionalisation of the *subak* system; (iii) the authority of the *subak* management system; and (iv) stakeholders who play a role in the *subak* system.

UNESCO recognised the system as World Cultural Heritage in 2012 on the basis of the following criteria (UNESCO World Heritage Centre, 2019):

(iii) The cultural tradition that shaped the landscape of Bali, since at least the 12th century, is the ancient philosophical concept of Tri Hita Karana. The congregations of water temples, that underpin the water management of the *subak* landscape, aim to sustain an harmonious relationship with natural and spiritual world, through an intricate series of rituals, offerings and artistic performances.

Figure 3  
The existence of *subak*  
and their coordination.





(v) The five landscapes within Bali are an exceptional testimony to the *subak* system, a democratic and egalitarian system focused on water temples and the control of irrigation that has shaped the landscape over the past thousand years. Since the 11th century the water temple networks have managed the ecology of rice terraces at the scale of whole watersheds. They provide a unique response to the challenge of supporting a dense population on a rugged volcanic island that is only extant in Bali.

(vi) Balinese water temples are unique institutions, which for more than a thousand years have drawn

inspiration from several ancient religious traditions, including Saivasiddhanta and Samkhya Hinduism, Vajrayana Buddhism and Austronesian cosmology. The ceremonies associated with the temples and their role in the practical management of water together crystallise the ideas of the Tri Hita Karana philosophy that promotes the harmonious relationship between the realms of the spirit, the human world and nature. This conjunction of ideas can be said to be of outstanding significance and directly manifest in the way the landscape has developed and is managed by local communities within the *subak* system.

## Currents threats to the sustainability of the *subak* system

The existence of a sociocultural institution has strengths and weaknesses. Pospositardjo (1975) listed the strengths of *subak* as follows: (i) adoption for technological development; (ii) adoption for cultural transformation; (iii) flexibility; and (iv) good governance. However, a significant weakness is that *subak* as sometimes not strong enough to resist influence from external stakeholders such as governments and investors.

Tourism is developing rapidly in Bali. The central government has a policy of encouraging tourism in an attempt at increasing government income. Many investors have been invited to Bali to build tourism infrastructure. Migrants come to Bali to look for jobs in the tourist sector: according to the 2010 census, more than 61 000 migrants come to Bali every year. The investors and migrants therefore need land in Bali and generally use rice fields for their resettlement especially because rice fields also guarantee irrigation water, canals, and drainage. Balinese rice fields are thus decreasing by around 750 hectares per year (2014 data provided by Bali Province Statistics Office). These conditions are very dangerous for the *subak* institutions. The main components of the *subak* are water and rice fields. If there is no irrigation water and no land for rice fields *subak* can no longer continue to exist. Water is already limited,

notably because there is competition between the irrigation water needed for the *subak* and the drinking water needed for companies, tourism, and domestic use. Irrigation water has also been polluted with plastic and rubbish causing many problems for the *subak* members. Land tax is also very high in Bali because it is based on the existence of rice fields and not on farmer production. Without a governmental strategic policy to protect *subak* they will continue to be threatened. Additionally, *subak* income is usually generated from contributions from members as well as grants from the provincial government. Therefore, if *subak*-controlled areas decrease then *subak* income will also decrease.

We consider that the *subak* system in Bali requires regulations such as Subak Forever Regulation (a regulation for *subak* sustainability); to be exempted from land tax; to receive sufficient irrigation water long-term; to receive subsidies on inputs or output; and support of its economic activities (farmer cooperatives). Without additional support Balinese farmers will sell their land and the *subak* system in Bali will collapse or come to an end. It is very important to note that the *subak* system supports Balinese culture and tourism activities. Without *subak* and agricultural activities, tourism activities in Bali will also collapse.



## Conclusion

*Subak* is a farmer-managed irrigation system which incorporates intensive ritual ceremony activities under the philosophy of THK. THK provides three means to obtain happiness and is reflected in the harmonious relationships between farmers and their lands.

Many rituals are implemented in *subak* rice fields. They represent the implementation of the aspects of *parhyangan* (harmony between farmers and God) and *pawongan* is symbolised by consensus for every decision that is taken by a *subak* organisation. Additionally, constructed irrigation distribution is based on one inlet and

one outlet system at each farmer's level. The points of consensus have been drawn together in a list of regulations (*awig-awig*). Moreover, the aspect of *palemahan* is implemented by *subak* for the maintenance of the rice terraces in *subak* areas. All *subak* activities that are based on the THK philosophy can help towards the conservation of the cultural landscape of Bali.

Today, the *subak* is under threat, because of increasing tourism activities in Bali. Government intervention is needed to regulate and protect the existence of *subak* in Bali.

## References

- Arfian, S. 1989. *Pendayagunaan sumberdaya air dan lahan pada zaman Indonesia Kuno di Bali, analisis hasil penelitian arkeologi* (Use of water resources and land in the old Indonesian era in Bali, an archaeological research result). Denpasar, Faculty of Literature UNUD.
- Arif, S.S. 1999. Applying Philosophy of Tri Hita Karana in Design and Management of *subak* Irrigation System. In S. Susanto, ed. *A Study of Subak as Indigenous Cultural, Social, and Technological System to Establish a Culturally Based Integrated Water Resources Management, Vol III*, pp. 118–126. Yogya, Faculty of Agricultural Technology, Gadjah Mada University.
- Mc.Ginnis, M.D. 1999. Introduction. In M.D. Mc.Ginnis, ed. *Polycentric Governance and Development*, pp. xi–xiv. Ann Arbor, The University of Michigan Press.
- Purwita, I.B.P. 1993. Kajian sejarah subak di Bali. In I.G. de Pitana, ed. *Subak, Sistem Irigasi Tradisional di Bali* (Subak, traditional irrigation system in Bali), pp. 34–41. Denpasar, Upada Sastra.
- Pusposutardjo, S. 1975. *Konsep konservasi tanah dan air untuk keberlanjutan irigasi* (Concept of land and water conservation for irrigation sustainability), Professorship inaugural speech at Gadjah Mada University, Yogya.
- Sutawan, N. 2008. *Organisasi dan manajemen subak di Bali* (Organisation and management of subak). Denpasar, Pustaka Bali Post (Bali Post Library).
- UNESCO World Heritage Centre. 2019. *Cultural Landscape of Bali Province: the Subak System as a Manifestation of the Tri Hita Karana Philosophy* [online]. Paris. [Cited 5 June 2019]. <https://whc.unesco.org/en/list/1194>
- Wardha, I. W. 1989. *Subak dari segi perkumpulan, analisis hasil penelitian arkeologi* (Subak as a group, an analysis of archaeological research results). Denpasar, Faculty of Literature UNUD.
- Windia, W. 2007. *Transformasi sistem irigasi subak yang berlandaskan konsep tri hita karana* (Transformation of *subak* irrigation system, based on Tri Hita Karana philosophy). Denpasar, Pustaka Bali Post (Bali Post Library).



◁ CHAPTER 2 ▷

**The diminishing wealth of  
Traditional Knowledge Systems  
and practices: a growing challenge  
for the sustainability of historic  
environments and cultural  
landscapes in Pakistan**

Anila Naeem



## Abstract

Recent decades have witnessed the impact of globalisation on development trends, leading to the gradual demise of the traditional knowledge and practices which evolved in response to the climatic and geophysical conditions, and socio-economic and cultural traditions, specific to a place and community. The close association and dependence on a given combination of variables endowed unique qualities upon historic environments and cultural landscapes, which today, are recognised as invaluable elements of the distinct character and spirit of a place. Yet, too often we see a blind race towards “modern development”, disregarding the wisdom of traditional knowledge, which, in many contexts, defeats sustained growth. This paper will analyse two case studies: the fast-disappearing traditional *havelis* (mansions) in the historic town of Shikarpour, and the threatened state of the Indus boat communities and seek to identify the areas where the wealth of Traditional Knowledge Systems and practices is diminishing within the province of Sindh. It will emphasise the need for urgent measures to revive dying traditional crafts, for example through offering support to artisans and craftsmen. This would help to ensure the sustained management of historic environments and cultural landscapes, allowing continuity of the traditional practices that establish a connection between people and their environment.

## Introduction: waning Traditional Knowledge Systems

The ICOMOS *Charter of Built Vernacular Heritage* (1999) identified the “homogenisation of culture” and “global socio-economic transformation” as threats to traditional ways of life, as they pushed traditions to “obsolescence”. In light of this concern, UNESCO, through its *Universal Declaration on Cultural Diversity* (2001) and the *Convention on the Protection and Promotion of the Diversity of Cultural Expressions* (2005), reinforced the need for the recognition and protection of Traditional Knowledge Systems, as core elements of sustainable development. Among the twenty principles set forth as the key actions required to achieve the objectives of the Declaration, is the incorporation of “traditional pedagogies” into the education process. Recognising the value of artists, craftsmen, and other living “libraries” or “treasures” of traditional knowledge, official patronage is recommended as a way to “ensure the transfer of their know-how, techniques and skills” to future generations (UNESCO, 2001, pp. 32–33). The absence of such patronage for traditional building skills in Pakistan has led to the erosion of historic environments and cultural landscapes, where resident communities, despite having strong associations with their built heritage, have been unable to maintain traditional skills and prevent their replacement

by modern materials and techniques. Under the pressures of commercialisation, modernisation and development trends, which disregard the importance of traditional systems, the choice to continue employing traditional practices has become impossible, thus forcing a departure from practices which symbolise cultural expression.

The province of Sindh in Pakistan has, over the past few decades, experienced the worst decline in its vernacular traditions, in both its historic urban environments and rural dwellings, particularly in the Lower Indus Basin. More often than not the dramatic damage caused to historic environments is a consequence of poor planning decisions, insensitive development schemes, or simply the absence of appropriate regulations. Neglect of Traditional Knowledge Systems and cultural values, and the exclusion of Indigenous communities from decision-making processes have led to a rapid loss of material culture, particularly in the cases of the built environment and cultural landscapes. Two case studies will be presented in this paper, highlighting the challenges faced by historic environments being damaged or destroyed by insensitive development, thus affecting their associated communities, which are being pushed to extinction.

### Case study 1: urban *havelis* of Sindh

#### Disappearing traditional way of life and skills

The tradition of the *haveli* lifestyle prevailed across Northern Indian towns for approximately five centuries (1550–1950 CE) under the patronage of Mughal, Rajput, and other rulers of princely states, as they provided an ideal accommodation for courtiers and nobles (Jain, 2004; Pramar, 1989). The *havelis* can be defined as mansions, or a cluster of interconnected living quarters, for an extended family or clan, designed and built to incorporate the highest levels of comfort as well as artisanal craftsmanship. The salient physical features include a central or series of interconnected courtyard/s, highly

decorated façades, and hierarchical spatial planning incorporating sociocultural values including codes of conduct and interaction between family members, visitors and servants. Traditional *havelis* retained their original form up to the last decades of the nineteenth century, after which strong colonial influences began to merge the form of the *haveli* with the form of the “bungalow”. In the process, a hybrid residential architecture evolved, integrating both a traditional way of life and the technological advancements which were the result of European influences, reflecting the struggle to “retain customary ways”, as much as the aspiration to “depart from them”

(Pramar, 1989; Hosagrahar, 2001, p. 41). The redefined colonial-oriental hybrid *haveli* evolved as a means for the emerging class of landlords and mercantile and burgeoning professionals to display their newly-acquired wealth and elevated position in society. They even symbolised political proclamations in the form of iconographic representations, such as Queen Victoria's bust, or the carving of the crown on façade decorations. In areas that are now part of Pakistan, the *haveli* tradition has prevailed in many historic towns. However, current development trends and the desire for modernisation are affecting their long-term chances of survival. A case in point is the city of Shikarpoor,<sup>1</sup> where these historic residences are under continued threat of demolition, or unsympathetic alterations, despite receiving protected heritage status under The Sindh Cultural Heritage Preservation Act 1994 (Province of Sindh, 1994).<sup>2</sup>

The traditional *havelis* of Shikarpoor are a mixture of a variety of inter-regional<sup>3</sup> influences, expressed through a range of architectural language

and features, representing a wide range of period styles and trends. These demonstrate a rich experimentation with construction materials,<sup>4</sup> use of technology and decorative detailing, which was not limited to interior decoration, but also extended to façade fenestrations, contributing to the unique character of the city's urban fabric.

A brief chronological analysis of the residences with known construction dates indicates that the most elaborately ornate architectural styles corresponded to the last two decades of the nineteenth century and the first half of the twentieth century. Two distinctly identifiable sub-groups include: those with extensive timber features<sup>5</sup> on street-facing and/or courtyard-facing façade/s, and those that use stucco plaster for ornate decorations and carvings, combined with iron grills and lesser woodwork used only in doors and windows. The most noteworthy aspects of these façades include the iconography which adorns the tympanum of entrance doorways,<sup>6</sup> the exposed

- 1 Established in 1617 CE, Shikarpoor became the hub of caravan trade activities from the eighteenth to the nineteenth century, with its trading houses dominating the financial scene across India, Afghanistan, Central Asia and Khorasan.
- 2 In 1998, the Sindh Department of Culture declared the entire city of Shikarpoor a protected heritage site. However, demolition of historic *havelis* continued. From 2006–2011, a comprehensive research undertaking for mapping and heritage inventory compilation was conducted, which in 2012 led to the enhancement of earlier enlistment notification by identifying 1 203 properties as protected under the law (Naeem, 2013).
- 3 The network of Shikarpoori merchants spread into Persia, Afghanistan, Central Asia and India; knowledge gained through their travels became a source of inspiration for Sindh.
- 4 Traditional architecture comprises mud and/or brick constructions, with exterior mud-plaster or ornately carved stucco renderings, together with wrought iron/cast iron metalwork. The interiors are embellished with colourful geometric floor patterns, carved timber doors, and marble fireplaces, with timber-glass decorations on the ceilings.
- 5 An extensive timber trade, primarily of teak wood, which made use of the sea route from the Malabar Coast and Burma to Britain, flourished during the eighteenth and nineteenth centuries, for which Karachi served as a major depot (Troup, 1921, p. 183; Howard, 1922, p. 254; Mann, 2001, p. 420), perhaps becoming a source for good quality timber for Sindh. In addition, the commercial exploitation of Sindh's own forests was also initiated by the British between 1857 and 1895 (IUCN, 2004, p. 110; Howard, 1922, p. 254), opening opportunities for better quality timber in local markets. These facts indicate that the last few decades of the nineteenth century were a benchmark for the evolution of timber architecture in Sindh.
- 6 There are five distinct carving religious iconography groups, used on front door tympanum, in particular (Naeem, 2015a, pp. 8–15): the first group, following the *Nanakpanthi* tradition, where the trio of *Guru Nanak*, *Bhai Bala* and *Bhai Mardana* are represented; the second group, where Hindu deities are represented, with sub-groups of *Vaishnavite* and *Shaivite*; the third group has carvings, which represent the *Daryapanthi* tradition, with *Jhulelal* or *Khawaja Khizr* depicted as a bearded figure seated on the famous Indus fish pala; the fourth group comprises floral and foliate motifs, in combination with birds, or other animal shapes; and the fifth group of carvings conform to the use of only floral, foliate and geometric patterns as required by Muslim patrons.

strut ends, the brackets<sup>7</sup> that support upper floor cantilevers or balconies, the pelmet bands or side-boards nailed along protruding sharp edges of balconies, upper floors or *chajjas*, and grill-work on parapets and windows. The interesting array of motifs characterises the diverse multicultural, ethnic, political and religious orientations of the city's original population, indicating a symbiotic coexistence, balanced by harmonised intercultural tolerance, integration and respect for individual choice. The variety of compositions and woodcarving also reflects the skills of the craftsmen, their creative design capabilities, and their capacity to use various techniques.

The *mohari*<sup>8</sup> also employs extensive woodwork: it is a timber-colonnaded arcade on one or more levels. On the upper floors, it creates a loggia overlooking the courtyard and/or a long continuous covered balcony running along the entire length of the street-facing façade. On the ground floor, the *mohari* creates a verandah, which either buffers the living room area and courtyard, or forms a semi-covered sitting space overlooking the street. The ornamented ceilings are also of interest; primarily a feature of interior decoration, in Shikarpoor's *havelis*, they were also employed as an exterior decoration feature, in particular on the underside of upper floor cantilevers.

In the wake of the 1947 Indo-Pakistan Divide and the resulting mass exodus of Hindus from Pakistan, Shikarpoor underwent demographic and sociocultural transformations with an impact on its historic fabric. Privately-owned residential properties suffered, especially due to the change in ownership from rich merchants to people with few economic resources, often from rural backgrounds. The vulnerability of the new property owners, both

for financial reasons and as a result of their lack of awareness of the heritage value of the *havelis*, has made them an easy prey for the exploitative antique dealer market. The risk remains that the city's historic fabric has been reduced to the status of an inexpensive quarry, serving the demands of élite collectors. The *havelis* of Shikarpoor have, over the past few decades, seen increased numbers of wood antiquarian enthusiasts, who have created a demand for salvaged woodwork features from demolished structures. In large cities, there is a current architectural trend for those with money to display these in their homes, claiming them as prized collectible items. In violation of the law, an increasing number of showrooms, shops and *godowns* (warehouses) in Karachi and Shikarpoor have built thriving businesses using historic materials (Figure 1). In addition, over the past sixty years, administrative controls have slackened, resulting in a striking reversal of the city's historically high standards of urban sophistication, when the City Municipality still played an active role in maintaining civic facilities. Bowing to the forces supporting the growing antique dealership businesses, local authorities have shrugged off their responsibility to curb the illegal demolition work that has been continuing at an alarming rate.<sup>9</sup> The ornate architectural or decorative elements salvaged from *havelis* that have been demolished and looted have provided profitable gains for a few individuals, while the larger community and former *haveli* owners remain oblivious of the fact that such gains are being reaped at their expense. The immense loss of historic fabric suffered by Shikarpoor requires immediate action to revive the socio-cultural values that could help to protect the city's built heritage legacy.

7 Timber brackets on building façades also have extensive displays of figurative motifs, mostly derived from the characters of Hindu mythology, and thus have ornamental, antiquarian and artistic values.

8 *Mohari* is a construction with a series of equally spaced slender timber posts, with lintels forming the main framework; the divided panels within are decorated with timber trellis- and fret- and lattice-work.

9 More than 12 percent of the properties listed as heritage monuments or sites in 2007 were confirmed as demolished in the three years that followed (Naeem, 2011, p. 68; Naeem, 2012, p. 132). Even after the enlistment notification of 2012 (see previous page, footnote 2), the demolition work has continued, as confirmed by site visits to 50 select properties in September 2015, of which 10 were found to have been demolished (Naeem, 2015b).



### Challenges for heritage maintenance: interviews with property owners

A survey of fifty select residences in Shikarpour, incorporating detailed interviews with heritage property owners helped to identify the two primary challenges for regular maintenance: affordability, and the availability of skilled craftsmen with knowledge of working with traditional materials. The lack of availability of traditional materials for repairs, such as lime mortar, gypsum and stucco plaster, makes it difficult for property owners to maintain the original character of their historical houses. This latter issue is clearly reflected by the trends observed in almost all surveyed cases, where repairs or renovations demonstrate a current use of materials which is inconsistent with original materials. Common interventions include the re-plastering of lime-plastered walls with cement plaster; the filling of joints or re-pointing with cement; and the replacement of

terracotta brick flooring with ceramic tiles, vinyl or cement flooring. These prevailing trends in renovations and repairs represent a “third challenge” for heritage preservation, which is the lack of awareness on the part of property owners about appropriate conservation approaches and a lack of respect for, or knowledge about, original materials. There also appears to be a lack of conviction that traditional building materials remain valid and the best choice in present times.

With every set of repairs or renovations, after every spell of severe monsoon rains, and with every change of ownership (for reasons of inheritance or financial constraints), the traditional *havelis* of Shikarpour lose more of their historic character. The following examples illustrate the severity of this situation:

- The house of Fateh Mohammad Buriro in Civi Dar Mohalla had an ornate courtyard wall decorated with stucco plaster features, including oil lamp (*diya*) niches, mouldings

**Figure 1**  
An example of the thriving business of woodwork features.

- and cornices. The entrance was decorated with an arched portal-like detail and the door and window openings were adorned with carved timber panels made of teak wood. These were significant seventy-five-year-old features, which are now lost; one of the house walls collapsed during monsoon rains of 2014, as a result of untreated, long-term wood decay. The owner was unable to rebuild these detailed features and therefore replaced them with a brick wall. The only remaining feature of the original courtyard wall is the reused wooden door. The owner has expressed a feeling of loss, but, not having any other options available to him, he resorted to a practical and affordable course of action.
- The ancestral home of Rafique Thaeem (who is now residing in Karachi) was in an eminent location at the junction of two main roads. Its top floor had a fine woodwork *mohari* adorning the cantilevered upper floor, which started to deteriorate due to a lack of regular maintenance, and eventually became a safety hazard. Following complaints from street vendors of the area, a First Information Report (FIR) registered with police, was launched against the house owners, giving them three days' notice to remove the upper storey. Without access to any professional guidance, the family had no choice but to demolish the upper floor, resulting in the loss of significant architectural features that had contributed to the urban fabric and streetscape aesthetics. Rafique Thaeem expressed a deep sense of loss and regret that professional guidance was not available to them in time. Under the pressure of police action, he was left with no choice but to proceed with removal of the upper storey.
  - Professor Abdul Baqui Sheikh stated that he felt strongly connected to his home, declaring that demolition for him was never an option. He was, however, unable to prevent the deterioration in the woodwork features of the upper storey of his home, which eventually had to be removed completely. The renovations that followed, upon the suggestion of the hired contractor, led to a complete re-plastering of the interior and exterior surfaces with cement plaster.
  - The family of late Ishtiaq Ahmed has a thirty-year connection with their home. However, the

children who have inherited the home are now contemplating a sale, if they are able to get a good price. The most valuable feature of their home is the teak woodwork on the courtyard-facing façade (HC-DAPNED, 2016). Even though it is in a good state of repair, some parts of the timber are showing signs of deterioration. However, the specific form and extent of the deterioration have not been analysed scientifically. A craftsman known to be a specialist in woodworking provided an estimate for the necessary repairs, but that quotation seemed unaffordable to the family. They are, therefore, considering either selling the woodwork (*mohari*), while the deterioration is still at its current stage, or perhaps selling the entire property.

- Agha Riaz Ahmed's home has already undergone major alterations: half of the original *haveli* is a new construction – all of the original interior plasterwork has been replaced, and the flooring has also been replaced with cement. Responding to how he plans to repair the external plasterwork on the house, which comprises stucco work with figurative and decorative carvings, he said that he planned to re-plaster the outside of the house with cement plaster, when he could afford another phase of renovation work. The reason given for not keeping the original stucco work was the lack of availability of craftsmen with the skills to work with that material.

The examples above, and the overall feedback received from most of the households who were interviewed, indicate that the biggest challenge for the preservation of the *havelis* is accessing both craftsmen and materials compatible with traditional ones. It is increasingly difficult to find skilled craftsmen, as knowledge of working with traditional building materials and of using traditional construction techniques is gradually diminishing. Even where such craftsmen can be found, their services are out-of-reach for low-income households. Interviews with property owners demonstrate that they feel helpless, largely as a result of their financial position, but also because of a lack of professional and technical guidance about better options. Additionally, financial constraints impact upon the frequency



of maintenance initiatives, with repairs being delayed until they become unavoidable, leading to the advanced deterioration of historical materials, and making repairs more expensive. Priorities are to maintain living and safety standards; anything beyond these must have a functional purpose to make it a worthwhile expenditure. Work purely of aesthetic value can be sacrificed, rather than incurring the extra expense of repair. Woodwork details are more willingly sold, as their sale brings in additional income.

Therefore, a resurgence in the use of traditional building materials and in the training of artisans

in the skills to use them is perhaps what is needed the most to ensure the successful preservation of traditional buildings. Research-based analysis, cataloguing and record-making of the dying techniques traditionally used in various building crafts are essential in order to develop mechanisms to provide skilled support for historical property owners, and help to improve confidence in the use of traditional materials. The training of craftsmen and the capacity building of locally available artisans and conservation professionals is the only way towards a successfully sustained heritage preservation movement.

## Case study 2: Indus Boat Houses

### Background

For centuries, the Mohanna fishing community have lived along the banks, tributaries and *dhunds* (lakes) of the Indus River Basin in “Indus Boat Houses”, which have become an expression of their cultural identity. Until recent times, the largest Mohanna community lived on Manchar Lake<sup>10</sup> in boat houses docked in groups (Naeem, 2015c). Fleets of up to twenty or thirty houseboats and other smaller vessels formed the core of each village cluster, defined through a system of extended family structures and clanships. These mobile boat-villages have traditionally come to settle in the midst of the tallest grasses, and when the waters recede during the dry season, the nearby banks become the community’s extended habitation, where temporary huts built of mud, reed, thatch and tamarisk form their village clusters called *mianis* or *paras* (terms used for a settlement

in Sindhi language). Capturing the life of the Mohannas in a captivating documentary, Pelletier (2005) refers to them as “the bird people”, with special abilities to connect and communicate with exotic birds: to tame and train them as comrades, companions, playmates and accomplices in fishing and fowl-catching. The Mohanna learn to communicate with birds and to care for them in “bird school”, conducted by the community members with expertise in this art.

In his film, Pelletier estimated that their population has diminished to only 200 families and 15 000 people, whereas the Pakistan Fisherfolk Forum gives an estimate of 25 000 people (Hussain, 2004; Sanghar, 2012). The dwindling Mohanna population is the result of callous development policies and the unfortunate mismanagement<sup>11</sup> of Manchar Lake over the past few decades, which have led to water

10 Manchar Lake is a freshwater lake formed at a natural depression on the western edge of central Sindh, reputed as having sustained human inhabitation for at least five millennia. The resident Mohanna community is believed to have roots in prehistoric times, and the Mohanna are considered descendants of the Indus Valley Civilisation, given the striking similarity between their boats and those depicted on Indus seals (Lambrick, 1964; Hewitt, 1977; Sehrai, 1997; Hasan & Dawani, 1997; Majumdar, 1934).

11 Manchar Lake was originally fed by two sources: storm water and hill torrents from the Kirthar mountains and inundation canals from the Indus, namely the Aral *Wah* and Danister *Wah* (Hughes, 1876, p. 687; Smyth, 1919).

contamination reaching levels that are severely damaging the habitat which has hitherto sustained this community. The Indigenous lake community that has, for centuries, appreciated, respected and understood nature's intricacies, living in step with their environment, through the wisdom of traditional knowledge, has thus been forced to abandon its ancestral territories and livelihoods in search of alternative ways to survive.

### **The Indus Boats: flat-bottomed vessels for navigation**

The most tangible expression of Mohanna traditions and cultural landscapes that has evolved over centuries and has retained its original form to the present is the flat-bottomed Indus boat. The ingenuity of design in these native navigation vessels has been proved by their sustained existence, outlasting the steam-powered vessels introduced by the British in the late nineteenth century for commercial navigation on the Indus.<sup>12</sup> Their specific design evolved in response to the need to navigate shallow and turbulent waters, to resist the impact of running ashore, which is a common occurrence on the Indus (Meyer *et al.*, 1908; Thornton, 1844; Ross, 1883; Hasan & Dawani, 1997; Sahrai, 1997). According to Hughes (1876), the Mohanna built their vessels with “the wood of the country, such as *ber*, *babul*, *karil*, etc.” (local tree species of

Sindh) (Hughes, 1876, p. 271). Traditionally, cane or wooden plugs were used when building the boats, instead of nails. For maintenance purposes, the boats were painted with fish oil, (dolphin oil was conventionally used as a timber preservative), and oiling and repair activities usually took place during the dry season. The average lifespan of the boats is said to extend to fifty years (Sahrai, 1997). However, Hughes (1876) disagrees and quantifies the lifespan to be only seven to ten years. Among the Mohanna, the Sheikh caste are known to be expert craftsmen, specialising in the art of building native flat-bottomed boats. Their workshops are located on the banks of Danister Wah, near Bubak, where the skill has been handed down from generation to generation.

The boats on the Indus and Manchar Lakes are a variety of sizes and shapes, as required by their specific function. There was the house-boat (*dhoondhi* or *choplandi*), the cargo-boat (*doondah*, *zobruk*, or *hara*), the ferry-boat (*kauntal*) and the game/fishing-boat (*dundi* or *beddi*) (Thornton, 1844; Ross, 1883; Meyer *et al.*, 1908; Postans, 1843; Hasan & Dawani, 1997; Sahrai, 1997; see also Naeem, 2015c). The floating houses of the Indus (*dhoondhi* or *choplandi*) are built in different sizes, according to the number of family members in the household. The floating houses contain all the facilities required for working, sleeping, cooking and

A third inundation canal, the Main Nara Valley Drain (MNVD) was added to the system in 1932. The MNVD was later remodelled to remove sewage from the towns of upper Sindh and central Punjab. Yet, by the 1980s further industrial and agricultural effluents were added. As a result, in the 1990s the MNVD was further expanded, under the Right Bank Outfall Drain (RBOD) Scheme – a megaproject initiated with support from the World Bank (WB) and the Agriculture Development Bank (ADB) to drain industrial and agricultural effluent directly into the sea. However, this megaproject was left incomplete, and thus RBOD, has, for over two decades, drained untreated, toxic effluent into Manchar Lake, turning the water in the region's largest natural reservoir into water that is unfit for human consumption. The reduction in freshwater supply due to frequent droughts and the excessive drawing of lake water for the irrigation of agriculture during the winter, have added to the catastrophe, directly impacting the life and livelihood of the communities concerned.

12 In 1835, the first “Indus” steamer was put on the river (Hughes, 1876, p. 272; Ross, 1883, p. 41; Meyer *et al.*, 1908). Between 1843 and 1883, naval and commercial flotilla services were run between Karachi and Multan, transporting troops, passengers and goods. For forty years, experimentation was carried out on the Indus, with the transportation of various types of iron steam vessels and steam trains, during which many vessels met with accidents and proved to be inappropriate for navigation on this river. Given the heavy losses suffered, the idea of commercial navigation and transportation on the Indus was finally abandoned.



storage. They are between 9 and 18 metres long and between 10 and 5 metres wide,<sup>13</sup> and possess a central cabin, with three sides that can be opened or shut as desired, with straw mats and a closed back. The front is equipped with a clay stove, used for cooking and washing, and the aft is used for storing equipment and for navigation. A small platform covered with reeds, mats or rugs, or, alternatively, a small boat, attached to the *dhoondi* serves as the toilet. Other small boat/s (*batilo*) tied to the house-boat, are used for running errands or visiting other house-boats. Depending on its size, the central cabin can sleep between six and 15 people, and others can sleep on the roof, weather-permitting (Sahrai, 1997; Hasan & Dawani, 1997; Pelletier, 2003). Installed with rudders, steer [a standard term for a boat's steering wheel], sails, a mast, and bamboo or flat wooden oars, *dhoondhies* can be used in any season.

Among all of the Indus boats, the *dhoondhi* are also the most ornate, with elaborate carvings (both internally and externally), intricately carved hulls, colourful painted motifs, and even inlaid mirror work and glazed tile inserts. “Internally, carving is always on the dark mahogany doors to the storage area in the hull of the boat ... [which] stand out in sharp contrast to pale *dayar* planks that form major part of the boat” (Hasan & Dawani, 1997; pp. 820–821). The cost of house-boats has doubled over the last decades: in 2012, the price ranged from PKR 150 000 to PKR 300 000 (approximately EUR 1 190 to 2 390) for a large boat, and was approximately PKR 50 000 (approximately EUR 397) for a smaller one. A team of eight boat-building craftsmen required 25–30 days to build a large boat and 10–20 days to build a smaller one (Sahrai, 1997; Sanghar, 2012).

Other types of flat-bottomed boats, designed for specific functions, are also mentioned in nineteenth-century texts. The cargo-boat is explained in particular detail (*doondab*, *zobruk*/

*zoruck*, or *hara/saurak*), and used for transporting goods. It has an unusual form, with a slightly convex shape, well-suited to the stowage of cargo and also has the capacity to extricate itself from sand banks and to navigate rivers such as the Indus (Postans, 1843; Hughes, 1876; Ondaatje, 1996; Hasan & Dawani, 1997; Naeem, 2015c). Given the construction of dams and the development of alternative means of transportation during the twentieth century, navigation on the Indus is now confined to short distances in small pockets, used mostly for the domestic purposes of the fishing community, the carrying of wood for fuel from jungles along the river banks, and, in recent years, the transportation of drinking water to communities residing in the vicinity of the lake. The commercial vessels described by Hamilton (1744), and the state barges of the Mirs called *jhampitis*<sup>14</sup> are no longer seen on the Indus. However, other types of boats and vessels mentioned in historic texts are still used by the Mohanna today.

#### On the brink of extinction

The Mohanna have historically been under the mercy of nature's wrath, but they have always managed to resist and maintain their ancestral ways. The return of displaced Mohanna in large numbers after the 2010 super-flood, when the Indus flooding replenished Manchar Lake is testimony to their connection with nature. However, the continued implementation of ill-conceived policies has inflicted extreme poverty and chronic diseases on the Mohanna. The biggest irony is that, today, the community living on the fresh-water lake has to carry drinking water for four kilometres on donkey carts, and then transport it to their boat-houses. The ongoing destruction of the natural resources that form the basis of this Indigenous community's sustained existence could lead to the extinction of tangible elements

<sup>13</sup> According to Hasan & Dawani (1997; p. 821), the *choplandi* (house-boat) is 8 to 10 metres long and 2.5 to 3.5 metres wide.

<sup>14</sup> The state barges of the Mirs, known as *jhampitis*, are described as “large and commodious [...] 120ft. in length, with a beam of 18½ ft. [...] had four masts, two large open cabins, and drew but two and a half feet of water; ...mostly [built] at Mugalbhin and Karachi” (Hughes, 1876, p. 271) using teak wood. 120 feet = 36 metres; 18.5 ft = 5.6 metres; 2.5 ft = 0.76 metres.

of Mohanna cultural heritage. Unless appropriate measures are taken to conserve these natural resources, this distinctive culture and way of life will remain under threat.

There is thus an urgent need to map and prepare an inventory of the traditional skills and knowledge-base of the Indus boat community. The insight acquired through this process will help to plan and develop sensible schemes, which not only ensure the material culture

of this heritage landscape is protected, but also to implement programmes which promote the sustained socio-economic uplift of the associated community. Given the financial position and the insecure situation of this Indigenous community, a means of mobilisation should be sought to allow the community to claim their customary rights to natural resources, emphasising their centuries-long contribution to the maintenance of a balanced ecosystem.

## In search of a revival of lost artisanship and craftsmanship skills

In the blind race towards globalisation, industrialisation, modernisation and development, we have seen the gradual loss of many of the intricacies of fine artisanship and craftsmanship. Traditional practices and ways of life have consistently been side-lined in planning policies and ignored in the process of urbanisation and development. Where communities associated with indigenous lifestyles and traditional crafts skills fail to receive patronage, they are forced to abandon their ancestral ways and opt for alternative means of income. Growing concerns about this loss have led to international initiatives seeking the revival of dying crafts through support mechanisms to help artisanal communities to sustain themselves economically. The two case studies above demonstrate the severity of situation for the traditional skills and heritage of communities within Sindh, but the state of affairs is not much different in other parts of Pakistan.

Recognising the significance of Shikarpoor's historic fabric as an important chronicle in Sindh's urban history, in particular in relation to its traditional building practices and local craftsmanship, a campaign has been initiated by the Heritage Cell – Department of Architecture and Planning, NED University (HC-DAPNED, 2016), Karachi, to raise awareness of the threat of the demolition of traditional *havelis*. A series of initiatives have been undertaken so far, such as: recognising *havelis* as heritage on a provincial level and recognising them on an international level through inclusion in the World Monuments Fund (WMF) Watch List cycles (2008, 2010, 2014);<sup>15</sup> publication of the heritage inventory monograph<sup>16</sup> for wider dissemination; and continuing public awareness outreach work and community support through collaborative initiatives undertaken

<sup>15</sup> Inclusion on the WMF Watch List meant recognition and also helped to instigate a day-long community motivational programme in November 2014 and a more comprehensive community interactive workshop in January–February 2016, establishing cooperation between local administrative bodies and other stakeholders, and provoking an enthusiastic response from the community.

<sup>16</sup> A two-volume monograph, *Shikarpoor: Historic City, Sindh, Pakistan – Inventory and Mapping of Heritage Properties*, published in February 2013 (Naeem, 2013), provides a comprehensive record of identified cultural heritage properties within the city's municipal limits (see also [www.neduet.edu.pk/arch\\_planning/Heritage/webpages/PDFS/ShikarpoorProject\(vol1\)-2016.pdf](http://www.neduet.edu.pk/arch_planning/Heritage/webpages/PDFS/ShikarpoorProject(vol1)-2016.pdf)).



by HC-DAPNED.<sup>17</sup> To promote these ongoing initiatives, recent interactive community research has identified the need to provide technical support, particularly for restorations using traditional materials. The revival of traditional building crafts, including ensuring the availability of materials and skilled craftsmen, would be of significant benefit to heritage property owners. The heritage inventory database also indicates that vacant and disused properties are under a high degree of threat. Using the information that is currently available, pilot projects can be identified, to implement restorations that employ the use of traditional materials and traditional craftsmanship. This would provide the opportunity of artisan training and experimentation to local artisans and craftsmen. Parallel initiatives, raising the awareness of property owners in preventive conservation approaches could prove effective in convincing them to hold onto their *havelis*, rather than opting for their demolition.

Pursuant to the Shikarpoor campaign, resources are now being sought to raise awareness about the Mohanna way of life, not only as means for learning how to respect nature, but also as an opportunity offering a unique cultural experience, with the potential of becoming a driver for the local economy. There is a need to implement supportive policies to help to reinstate the significance of cultural heritage of this oldest surviving Indigenous community in Sindh, to ensure their continued existence. An essential initial step towards achieving this goal is the undertaking of an inventory of indigenous boathouses (ownership and state of conservation), and the recording of the associated aspects of tangible/intangible cultural resources and oral traditions of the fast-diminishing community of Indus boat dwellers. The recorded information and knowledge gained through this first stage of information-gathering would then become a resource for

the identification of the important aspects of material culture, such as local boat-building and maintenance yards, where experimental workshops could be set up, providing hands-on experience for the younger members of community under the supervision of older craftsmen, for example teaching maintenance, repair and the construction of indigenous boathouses. Such activities could be recorded visually, and thus serve as technical manuals for future reference, preventing further loss of the traditional knowledge-base. The long-term success of such initiatives can only be assured if dealt with on an inter-sectorial basis, involving organisations and institutions that are not only limited to heritage preservation, but also address issues of humanitarian, sociological, environmental, and economic relevance. This collaboration could produce concrete proposals to revive this marginalised community and the ailing cultural landscape of Manchar Lake and its natural resources.

The challenge would nevertheless maintain momentum and build a chain of support mechanisms for longer sustenance. The understanding and appreciation of the significance of traditional knowledge is perhaps the key to success. Artisans and craftsmen skilled in the use of traditional materials need to be identified and patronage provided for the revival of their respective crafts, keeping in mind economic considerations. Focused programmes to support the revival of historic building traditions and the associated craftspersons skilled in those traditions are needed and should be approached with “community participatory activism” to address the issue of a decline in the sense of cultural ownership and reinstate the lost pride in indigenous building traditions and cultural landscapes. Effective long-term policies and strategies should seek the collaboration of government departments and educational institutions to ensure continuity in

<sup>17</sup> HC-DAPNED, in collaboration with WMF and EFT, has successfully organised two consecutive community involvement events. The “Shikarpoor Project 2016” collaboration has been instrumental in providing four heritage property owners with technical information and documentation of their houses. Further work is still needed, however, to initiate restoration pilot projects that can become training worksites for local craftsmen, artisans and conservation technicians (HC-DAPNED, 2016).

cultural heritage management, training and local capacity building. Local administrations need to address the crisis of historic built environments urgently, by developing policy guidelines that would steer new development processes in

a carefully-gauged direction that is sensitive to heritage management. Only by employing a balanced approach, can the history and practices of unique living cultures remain intact for future generations to cherish.

## Conclusion

In the context of Pakistan, for reasons of political friction, professional laxity, a shaken sense of pride and ownership, economic impoverishment, and a lack of scientific research, the diverse cultural landscapes of Indigenous communities and historic environments remain deprived of their due status in the national framework of recognised cultural heritage. The two case studies above provide insights into diversely contrasting situations: the first case is in a purely urban context, which has lost elements of its historic fabric; the second is in a rural context, where the stakes are even higher, with a much broader range of impact, putting the environment, ecosystems, natural resources and, above all, communities at risk. When taken side-by-side, these two cases seem to be miles apart; yet the binding thread central to both is the continued risk of the loss of heritage values in spite of these having immense potential to contribute towards social, economic, cultural and environmental issues. It is time for a greater awareness about the value of these time-honoured traditions as

being fundamental to the sustenance of cultural and natural resources, so that they are given their rightful place in development policies and common practice guidelines. Unless serious efforts are made by all stakeholders to realise their responsibilities, combined with a forceful implementation of the law, the chances of survival for historic environments and cultural landscapes will remain bleak.

Encouraging sociocultural revival and economic regeneration that benefits the associated communities is singularly the most crucial aspect for the long-term sustenance of cultural heritage assets and their associated communities. This requires serious steps towards the establishment of an oversight system, which develops appropriate regulations, creates supportive technical and financial mechanisms, organises programmes to inculcate a sense of pride and appreciation amongst resident communities and administrative authorities, and encourages them to engage in their responsibilities as custodians of their inherited legacy.

## References

**Hamilton, A. 1744.** *A New Account of the East Indies*. London, A. Bulleswork & C. Hitch.

**Hasan, A. & Dawani, M. 1997.** Houseboat: Mohannas (Pakistan). In P. Oliver, ed. *Encyclopedia of Vernacular Architecture of the World*. Cambridge, Cambridge University Press.

**HC-DAPNED. 2016.** Heritage Property Owners Interactive Workshop: Architectural Documentation Camp – Shikarpour Historic City Centre. 23–31 January 2016: Project Report 2 ed. A. Naeem, pp. 43–52; Heritage Cell, Department of Architecture and Planning, NED University, Karachi. [www.neduet.edu.pk/arch\\_planning/Heritage/webpages/PDFS/ShikarpourProject\(vol1\)-2016.pdf](http://www.neduet.edu.pk/arch_planning/Heritage/webpages/PDFS/ShikarpourProject(vol1)-2016.pdf)



- Hewitt, K. 1977. Desertification, Development, and the 'Admirals' of Manchar Lake in Sind, Pakistan. *Economic Geography*, (53): 358–363.
- Hosagrahar, J. 2001. Mansions to Margins: Modernity and the Domestic Landscapes of Historic Delhi, 1847–1910. *Journal of the Society of Architectural Historians*, (60): 26–45.
- Howard, A. L. 1922. Timbers of India and Burma. *Journal of the Royal Society of Arts*, (70): 238–255.
- Hughes, A. W. 1876. *Gazetteer of the Province of Sindh*. London, George Bell and Sons.
- Hussain, S. 2004. *Lake Manchar is Dead*. India, Environment Portal: Knowledge for Change.
- ICOMOS. 1999. *Charter on the Built Vernacular Heritage* [online]. Paris. [Cited 20 September 2017]. [www.icomos.org/images/DOCUMENTS/Charters/vernacular\\_e.pdf](http://www.icomos.org/images/DOCUMENTS/Charters/vernacular_e.pdf)
- IUCN. 2004. *Sindh State of Environment and Development*. Karachi, IUCN Pakistan, Sindh Programme.
- Jain, S. 2004. *Havelis – A Living Tradition of Rajasthan*. Haryana, India, Shubhi Publications.
- Lambrick, H. T. 1964. *Sind: A General Introduction*. Hyderabad, Sindhi Adabi Board.
- Mann, M. 2001. Timber Trade on the Malabar Coast, c. 1780–1840. *Environment and History*, (7): 403–425.
- Majumdar, N. C. 1934 (1981). *Explorations in Sind*. Karachi, Indus Publications.
- Meyer, W. S., Burn, R., Cotton, J.S. & Risley, H.H., eds. 1908. *The Imperial Gazetteer of India* (INDUS). Oxford: Clarendon Press, His Majesty's Secretary of State India.
- Naeem, A. 2011. Eroding Historic Townscapes: A Case of Shikarpour, Sindh. In A. Naeem & M. Karrar, eds. *Sixth Seminar on Urban and Regional Planning Historic Urban Landscapes: Retrospection – Transformation – Revival*. Karachi, Department of Architecture and Planning, NED University of Engineering and Technology.
- Naeem, A. 2012. Shikarpour: Experiences of a City under Shadows of a Glorious Past. In P. Vandal, ed. *Life in Small Towns: 3rd THAAP Conference*. Lahore, Trust for History, Art and Architecture.
- Naeem, A. 2013. *Shikarpour Historic City, Sindh Pakistan: Inventory and Mapping of Heritage Places – Vol. I & II*. Karachi, Endowment Fund Trust for Preservation of Heritage in Sindh.
- Naeem, A. 2015a. Wooden Symphonies of Bygone Times: Perishing Legacy of Traditional Havelis, Sindh, Pakistan. *World Wood Day Conference*, 21–23 March 2015, Eskishehir, Turkey, International Wood Culture Society.
- Naeem, A. 2015b. *For an Economically Impoverished Context – Developing Viable Strategies to Guide and Encourage Community Initiated Actions for Preventive Conservation/ Restoration of Heritage Properties and Historic Areas*. Leuven, Belgian Science Policy Office – Raymond Lemaire International Centre for Conservation (unpublished).
- Naeem, A. 2015c. Mohannas of Manchar Lake, Sindh: An Indigenous Cultural Tradition Pushed to the Edge. *THAAP Journal 2015: Culture, Art & Architecture of the Marginalized & the Poor*, pp. 97–118. [www.thaap.pk/assets/anila-naeem\\_00.pdf](http://www.thaap.pk/assets/anila-naeem_00.pdf)
- Ondaatje, C. 1996. *Sindh Revisited: A Journey in the Footsteps of Captain Sir Richard Francis Burton*. Toronto, Harper Collins.
- Pelletier, F. X. 2005. *The Bird People* [video]. Upside Distribution. [Cited 5 June 2019]. [www.upsidedistribution.com/?THE-MOHANA-PEOPLE-OF-THE-INDUS](http://www.upsidedistribution.com/?THE-MOHANA-PEOPLE-OF-THE-INDUS)
- Postans, T. 1843. *Personal Observations on Sindh*. London, Longman, Brown, Green and Longmans.
- Pramar, V. S. 1989. *Haveli – Wooden Houses and Mansions of Gujrat*. Ahmedabad, India, Mapin Publishing Pvt Ltd.
- Province of Sindh. 1994. The Sindh Cultural Heritage (Preservation) Act 1994 [online]. Sindh. [Cited 5 June 2019]. [https://sherloc.unodc.org/cld/en/legislation/pak/the\\_sindh\\_cultural\\_heritage\\_preservation\\_act\\_1994/article\\_18/the\\_sindh\\_cultural\\_heritage\\_act.html?](https://sherloc.unodc.org/cld/en/legislation/pak/the_sindh_cultural_heritage_preservation_act_1994/article_18/the_sindh_cultural_heritage_act.html?)

- Ross, D. 1883. *The Land of Five Rivers and Sindh*. London, Chapman & Hall.
- Sahrai, T. M. 1997. *Lake Manchar: The Most Ancient Seat of Sindhu Cultures*. Karachi, Sindhi Kitab Ghar.
- Sanghar, A. 2012. *Manchar: The Dying Lake*. NewsOne. [www.youtube.com/watch?v=Fomiz8nK-Ko](http://www.youtube.com/watch?v=Fomiz8nK-Ko)
- Smyth, J. W. 1919. *Gazetteer of the Province of Sindh*. Bombay.
- Thornton, E. 1844. *A Gazetteer of Countries Adjacent to India on the North-West Including Sindh, Afghanistan Beloochistan, the Punjab and the Neighboring States*. London, W. H. Allen & Co.
- Troup, R. S. 1921. Indian Timbers. *Journal of the Royal Society of Arts*, 69: 177–188.
- UNESCO. 2001. *UNESCO Universal Declaration on Cultural Diversity* [online]. Paris. [Cited 5 June 2019]. [www.unesco.org/new/fileadmin/MULTIMEDIA/HQ/CLT/pdf/5\\_Cultural\\_Diversity\\_EN.pdf](http://www.unesco.org/new/fileadmin/MULTIMEDIA/HQ/CLT/pdf/5_Cultural_Diversity_EN.pdf)
- UNESCO. 2005. *The 2005 Convention on the Protection and Promotion of the Diversity of Cultural Expressions* [online]. Paris. [Cited 15 September 2017]. <http://en.unesco.org/creativity/convention>



*Huế Imperial City by Mark Turner (CC BY-NC-SA)/Flickr.*



◁ CHAPTER 3 ▷

**Preserving heritage and  
traditional artisan and craftsmanship  
skills in Hué, Viet Nam**

Phan Thanh Hai



## Abstract

The Complex of Hué Monuments, added to the UNESCO World Heritage List in 1993, is the first Vietnamese site to feature on the list, highlighting its significance for Viet Nam, in general, and for Hué, in particular. Traditional artisan and craftsmanship skills, such as carpentry, masonry, bricklaying, lacquer- and gilt-work, porcelain inlaying, and Vietnamese traditional enamel, are highly valued and continue to be studied. The present paper will examine the process of creating and developing traditional artisan and craftsmanship skills over time, and also their gradual disappearance, prompting current efforts to preserve Hué heritage and ensure the continuation of traditional skills. It will show that since 1996, the restoration of Hué heritage buildings and monuments has contributed to the revival of traditional artisan and craftsmanship skills and associated professions. This paper will also examine suitable policies to ensure the sustainable safeguarding of Hué traditional skills, including local workforce training, and the establishment of systems whereby skilled masters pass on their heritage knowledge.

## Introduction

Huế was the last monarchical capital of Viet Nam (1788–1945), during which period, royal buildings – including fortifications, palaces, temples and pagodas – and Huế’s rich intangible heritage such as music, dance, festivals, gastronomy, and traditional craftsmanship skills were maintained to a high level. Huế features on the UNESCO World Heritage List twice: it was included for the Complex of Huế Monuments in 1993 (UNESCO World Heritage Centre, 1993), and for its Court Music in 2003 (UNESCO World Heritage Centre, 2003). Traditional artisan

and craftsmanship skills have indeed always been valued and studied in connection with heritage restoration. Since 1996, the restoration of Huế heritage monuments and buildings has contributed to the revival of traditional artisan and craftsmanship skills that were once famous in the ancient capital city of Huế, such as carpentry, masonry, bricklaying, lacquer- and gilt-work, porcelain inlaying, and Vietnamese traditional enamelling. Heritage restoration has helped to revive traditional skills and other forms of intangible heritage.

### The process of creating and developing traditional artisan and craftsmanship skills, and their gradual disappearance

Huế was the sociocultural and economic centre of Cochinchina (the central part of Viet Nam) (1636–1788) and later the capital city of the united country (1788–1945),<sup>1</sup> leading to the development of Huế’s rich artisan village system. With the establishment of Cochinchina as a social and financial hub in 1636 alongside the Huong river (firstly by Kim Long, and then Phu Xuan in 1687) and the creation of Thanh Ha harbour as a core supplier of goods for the lords’ mansion, a strong network of artisan villages emerged in and around Huế. Nguyen Lords not only implemented an open-door policy, encouraging trade with foreign countries, but they also facilitated the development of the artisan village system for the production

of commodities, in order to meet the demands of the lords’ mansion, as well as trade and export. As historical records demonstrate, until 1775 there were 35 artisan villages in Huế,<sup>2</sup> which manufactured bricks and tiles, produced pottery and specialised in masonry, porcelain mosaics, lacquering, carpentry, conical hats, silk weaving, wine making, kite making, and silver and gold jewellery making.

From 1788 to 1945, and from 1802 to 1945 in particular, Huế, as the capital of the now united country, became one of the biggest centres for artisan villages nationwide.<sup>3</sup> The governmental workshops or governmental handicraftsmen association of the villages were directly organised

- 1 In 1558, Lord Nguyen Hoang (the forefather of Nguyen Lords) was assigned to take over Thuan Hoa region (today’s Quang Tri and Thua Thien Huế) from Le King. He expanded the territory of southern Viet Nam. His descendants continued his cause by further expanding the territory towards the south. However, the civil war (1627–1775) between Le King-Trinh Lord of Tonkin and the Nguyen Lords of Cochinchina led to the separation of Viet Nam into two parts, which could be considered two independent nations. During this period, Huế played the role of the capital of Cochinchina.
- 2 In the *Phu bien tap luc* (a miscellany of the neighbouring country), compiled in 1775, Lê Quý Đôn (one of the commanders of Lord Le King-Trinh’s army who was sent to conquer Huế) describes in detail every activity taking place in Cochinchina, including the craftsmanship skills.
- 3 In 1788–1945, Huế was the capital of the unified Viet Nam, with two ruling dynasties, Tay Son (1788–1801) and Nguyen (1801–1945). During the Tay Son dynasty, artisan and craftsmanship skills did not develop, due to the ongoing war.

and managed by the Court. When Hué became the capital of the country, the artisan village system was concentrated in the capital city and all of the production and distribution activities were directly managed by the Court, and the artisans worked in the factories of the imperial court.

According to the records maintained by Nguyen Lords (Phan Tien Dung, 2005), as early as the nineteenth century, there were approximately 95 governmental artisan and craftsmanship associations in Hué, to which thousands of skilled artisans and craftsmen belonged, working in a variety of fields. By the second year of Emperor Dong Khanh (1887), there were nearly 1 682 workers working in 67 workshops, managed by the Ministry of Construction and the Cabinet: the former was responsible for 50 workshops and 1 200 workers, and the latter oversaw 17 workshops and 482 workers. The workers came from nationwide, but mainly from the centre and the north of the country. They were to ensure that the Court was supplied with all it needed and provide for the royal family; in particular, they carried out the construction, maintenance and restoration of Hué's royal palaces, ramparts, esplanades, temples (Quoc su quan trieu Nguyen, 2010).

It was this governmental association system that led to the rise in Hué's prosperity. Hué's tangible heritage was formed and reinforced over time, especially during the period from 1802–1945 when Hué served as the headquarters for the Nguyen Lords. Vietnamese traditional artisanship and craftsmanship contributed significantly to this growth.

However, once the Nguyen monarchy came to an end in 1945, the capital moved away from Hué. The war interrupted the traditional artisan and craftsmanship system, which, as a result, declined dramatically, especially because there was no longer a need for high-quality artisan and craftsmanship work for the royal family. In addition, the war decreased business demand, leading to further decline in the artisan village system and causing artisans and craftsmen to leave Hué.

In the difficult post-war years, from 1975–1995, after national unity, almost all of Viet Nam's heritage buildings were in a dilapidated condition. In the early 1990s, especially after UNESCO placed the Complex of Hué Monuments on the World Heritage List in December 1993, some artisan and craftsmanship skills associated with heritage restoration began to see a revival.

## Preservation of heritage

Among the ancient capitals of Viet Nam, only Hué has managed to maintain its royal architectural complex, including the city's ramparts, palaces, temples and tombs, in a good condition. Hué's heritage buildings are considered masterpieces, built by artisans and craftsmen: they serve as examples of the great talent that existed at the time. Furthermore, Hué demonstrates harmony between the monuments and the natural landscape. The city is a symbol of "landscape architecture", a typical Vietnamese architectural style. Even with the passage of time, Hué has maintained its image as a capital with hundreds of great works of art employing a variety of Vietnamese styles, which exist in harmony with Viet Nam's natural landscapes of historic as well as cultural-artistic significance. The conservation of Hué's monuments

must therefore take into account natural landscape preservation.

In addition to its valuable tangible heritage, Hué is also home to intangible and spiritual heritage, including folk and royal cultural traditions. The roots of the latter can be found by the Ly Lords, with strong links also to the Tran and Le Lords. Later, royal cultural traditions merged with the cultural traditions of central and southern Viet Nam, as was first seen under the Nguyen Lords and continued under the Nguyen Emperors. Hué's intangible and spiritual heritage is now acknowledged worldwide as UNESCO "Masterpieces of the Oral and Intangible Heritage of Humanity".

The system of intangible heritage incorporating diverse royal activities and festivities, such as

the *Nam Giao* sacrifice (Heaven-worshipping), attendance at Court, enthronement, royal ploughing (the ceremony at which the emperor initiates the first activity of ploughing; this ceremony is a kind of blessing/hope for a good crop and at the same time encourages farmers to work hard) and traditional craftsmanship, was created and developed during the establishment of the capital. All of the skills – carpentry, masonry, bricklaying, Vietnamese traditional enamelling, lacquer- and gilt-work, embroidery, porcelain inlaying, and sculpture – not only need to be preserved, but also to be developed for heritage restoration. Hué used to be known as the place where skilled artisans gathered and could be located; these artisans would then work locally and nationwide.

However, the 30 years of war, between 1945 and 1975, saw the destruction of many of Hué's heritage buildings. After the war, the Vietnamese government with the significant financial support of international partners, especially UNESCO, attempted to restore the country's heritage buildings.<sup>4</sup> From the 1990s onwards, in particular after the Complex of Hué Monuments was added to the UNESCO World Heritage List, the restoration of Hué heritage properties was fostered, with remarkable results. Hué heritage has thus been rescued and continues to be revived. Central and local government invested in moving workshops and factories out of the capital city, in order to provide a temporary means to restore constructions that were on the point of collapse. When the General Director of UNESCO called for the restoration of Hué heritage monuments and buildings in December of 1981, international support rallied, and central and local governments did gradually provide the investment needed for the preservation and restoration of Hué's tangible heritage, and for the revival of traditional

artisan and craftsmanship skills through the Hué Monuments Conservation Centre.

### **Project of Planning, Preservation and Enhancement of the Complex of Hué Monuments**

On 12 December 1996, the Project of Planning, Preservation and Enhancement of the Complex of Hué Monuments 1996–2010 was approved by the Vietnamese government. It was the first national-level heritage preservation project to be approved in Viet Nam. The project focused on the long-term sustainable preservation of royal architectural buildings and their landscape, and of royal intangible heritage, and offered the opportunity for the revival of some traditional Hué artisan and crafts skills. As a result of this project, between 1996 and 2009, over 130 architectural Hué heritage site buildings were restored, with a total capital investment of over 600 billion Vietnamese dong (approximately USD 40 million). The investment increased dramatically between 2010 and 2015. In these five years, Hué received the same amount of money as it had received over the previous 15 years. This was the direct result of the government's Project of Planning, Preservation and Enhancement of the Complex of Hué Monuments 2010–2020, brought about further to Prime Ministerial Decision 818TTg. Included among the 170 buildings that have been restored or rebuilt over the past 20 years are: Ngo Mon Gate, Thai Hoa Palace, Hien Lam Pavilion, the Complex of The Mieu Temple, Dien Tho Residence, Duyet Thi Duong royal Theater, Truong Sanh Residence, the long-covered verandah system (the Forbidden Purple City), Tu Phuong Vo Su Pavilion, East and West Bastions, Long An Palace (the Hué Museum of Royal Antiquities), An Dinh Residence, Nam Giao Esplanade Complex, Xa Tac Esplanade (the main esplanade), Gia Long tomb

4 On 25 November 1981, General Director of UNESCO Sir Amadou Mahtar M'Bow travelled to Hué and called for its protection, initiating thus an international campaign for its preservation and restoration (M'Bow, 1981). The UNESCO campaign did not prove successful. From 1981–1990, diverse sponsors and the Vietnamese government stepped in to save Hué's heritage: the Hué Relic and Landscape Management Company was established in May 1982 (renamed Hué Monuments Conservation Centre in May 1992) marked a shift in the level of awareness concerning the significance of Hué's heritage.

complex, Minh Lau Pavilion, Sung An Temple, Huu Tung Tu (the Left Minor Temple), the Stele House, Hien Duc Mon Gate (Minh Mang Tomb), Hoa Khiem Temple, Minh Khiem Duong Theatre, On Khiem Temple, Xung Khiem Waterside Pavilion, Du Khiem Waterside Pavilion, Tu Duc Tomb and surroundings, Thien Dinh Hall, Stele House (Khai Dinh Tomb), Thien Mu Pagoda, An Dinh Residence, the 10 gates of the capital city and the observatory, Ngu Ha Royal Canal; the road system, the light system illuminating the Complex of Hué Monuments (specifically the citadel, the Ngo Mon Gate-Flag Tower Square, the road system leading to the tombs of such emperors as Gia Long, Minh Mang, Tu Duc, Khai Dinh, Dong Khanh). The system of courtyards at Hung Mieu Temple, The Mieu Temple, Dien Tho Residence, Truong Sanh Residence, Co Ha Garden, Thieu Phuong Garden, the An Dinh Residence, the fire prevention and lightning protection systems, and the restrooms.

Infrastructure, landscape preservation and restoration projects have been carried out, alongside intangible heritage safeguarding projects. Between 1996 and 2010, the Hué Monuments Conservation Centre undertook a series of studies on Hué court music, royal dance, royal festivities, documentary heritage, and the publication of books written under the Nguyen Lords. It also hosted several national and international conferences on the safeguarding of intangible heritage. Finally, it revived a number of royal rites and regular festivals performed at Hué heritage sites, and at anniversaries and important events in Thua Thien Hué Province, notably: music pieces on the *Nam Giao* sacrifice (the ceremony

at which the Emperor worshipped Heaven and Earth for the nation's peace and happiness); nine music pieces on Royal Ancestral Worshipping (the ceremony which took place at the death anniversaries of the royal ancestors); five music pieces for the Double Five Festival (marking the middle of the summer); music pieces for the emperor's birthday and lunar new year; 37 music pieces of "small music" (including the Ten Continuous Pieces: Pham Tiet, Nguyen Tieu, Lien Hoan, Ho Quang, Binh Ban, Tay Mai, Kim Tien, Xuan Phong, Long Ho, and Tau Ma); and 10 pieces of "great music" (Tam Luan Cuu Chuyen, Nam Ai, Nam Bang, Thoet, Bong, Ma Vu, Man, Dang Dan Cung, Dang Dan Don, and Dang Dan Kep). Additionally, 15 typical royal dances, including Trinh tuong tap khanh, Tu linh, Nu tuong xuat quan, and Bat dat, were revived. Many ancient royal pieces such as Phu Luc Dich, Long Ngam, Long Dang, Tieu Khuc, Ngu Doi thuong and Ngu Doi Ha, and play extracts were revived for festivals. In addition, traditional royal festivals were given new life, such as the *Nam Giao* sacrifice, the successful examination proclamation and successful examinations ancestor thanksgiving, and other festivities developed, such as as Huong River Legend, the Royal Palace by Night, the Territory Expansion Routine, and the Supreme Peace.

The preservation of antiquities has also been a focus. The Hué Museum of Royal Antiquities (the Museum of Khai Dinh, originally established in 1923) is responsible for approximately 13 000 antiques made of a range of materials in silver, gold, enamel, elephant ivory, stone, wood, crystal ware, glass, and porcelain.

## The revival of traditional artisan and craftsmanship skills

Today, the restoration of royal buildings and the revival of traditional skills requires the active participation of artisans and craftsmen. Hué heritage preservation has created opportunities to revive, nourish and develop the once-famous artisan skills of Hué. Artisans are being drawn back to Hué, although not on the same scale as under the Nguyen Lords.

In the heritage restoration process, the Hué Monuments Conservation Centre has cooperated with partners that have applied a combination of modern constructional arrangement and traditional techniques. The Centre includes a Project Management Board, a Consultancy, a Department of Historical Research, and a Department of Landscape and Environment, which work together

to ensure cooperation with partners, especially in the field of research, for example IBST and VINAREMON (i.e. governmental organisations of highly-qualified heritage experts and artisans).

### Carpentry

From the middle of the eighteenth century onwards, many palaces and buildings were built using elaborate carpentry skills for the Nguyen Lords and mandarins at the Phu Xuan headquarters. As early as the nineteenth century, the Nguyen Court mobilised numerous artisans and craftsmen from all over Viet Nam, to build the capital at Hué. Many of the carpenters came from the north (for example, Ha Noi, Bac Ninh, and Nam Dinh) and a significant number settled in Hué thereby founding carpentry villages, the most famous of which was My Xuyen. After 1945, when the Nguyen Lords no longer existed, those carpenters worked mostly for commercial markets, or diversified into creating different kinds of wooden products. Where heritage restoration was given priority, local and northern carpenters worked together. Significantly, all of the artisans ensured that the techniques used in the restoration of the royal buildings of Hué took into account the knowledge that they had inherited from their ancestors. The rituals associated with the inauguration ceremony, the ridge-beam ceremony, the roofing ceremony, the new home celebrations were also adopted. Carpentry processes, from material preparation, to the assembly stages and the implementation of rituals need to be further studied, synthesised and documented for the purposes of research.<sup>5</sup>

### Porcelain inlaying

Phuoc Tich Village saw the use of porcelain inlaying in the sixteenth century. Later, the skill developed to serve the needs of Nguyen Lords in Cochinchina. Until the seventeenth and eighteenth

centuries, in addition to using domestic porcelain, the Nguyen Lords brought special porcelain from China and Japan for the lords and royal family to use. At that time, porcelain wares were bought for architectural decoration, as well as for daily use or as display pieces, as the art of applying porcelain to mortar became more popular. In the early nineteenth century, when the Nguyen Lords established Hué as the capital city, the need for porcelain wares increased. The lords made a direct request for porcelain wares for royal use to the Jingdezhen (Jiangxi, China) factories who also made high-quality porcelains for the Chinese court. In Viet Nam, the famous porcelain kiln Bat Trang was used to serve the court's architectural construction and restoration needs. During the reign of Emperor Khai Dinh (1916–1925), the use of porcelain inlaying reached a climax. The buildings of that time, such as Hien Nhon Gate, Chuong Duc Gate, Kien Trung Gate (in the Imperial City), An Dinh Residence, and, in particular, Thien Dinh Hall (Emperor Khai Dinh's Tomb), are considered unique works of art. Porcelain inlaying spread from the court to religious architecture. Almost every temple and pagoda in the Hué region and the central region of Viet Nam, built or restored in the early and middle of twentieth century, applied this porcelain inlaying.

In Hué heritage restoration, masonry, bricklaying and porcelain inlaying were highly important. The organisation of mason-artisans and porcelain-inlaying artisans was similar to that of carpenters. The artisans' working procedures were respected, and their skills and techniques were in great demand.

### Lacquer

The traditional craft of lacquering was imported from the north of Viet Nam. Under the Nguyen Lords, craftsmen worked under good conditions and in an environment conducive to developing

5 Such as the following: the anthology of research essays on the techniques of restoration and preservation, printed in the *Tạp san Di san van hoa Hué-Nghien cuu va bao ton*, (The research and preservation bulletin), vol. 1 (2007), 2 (2012), 3 (2013); the science reports upon the completion of the restoration of each construction, printed by IBST/C; and Ms Nguyen Thuy Vi's publication on Hué's traditional wooden houses (2010), under the supervision of Hué Monuments Conservation Centre.

the skill of lacquering in the capital city. The majority of constructions within the Imperial City, including the main hall in the Royal Tomb complex, were lacquered and gold or silver gilt; many of the royal wares, and decorative wares of the court and the royal family were made of lacquer, along with the daily tools employed by the mandarins. Under Emperor Dong Khanh (1885–1889), when the Nguyen Lords lost their sovereignty and became dependent, there were 100 lacquer craftsmen in the capital, 50 of whom were painters from Hanoi, and 50 of whom belonged to the Governmental Craftsmen Association (20 from Thua Thien, 10 from Nam Dinh, 10 from Hanoi, and 10 from Ninh Binh). Today, the majority of traditional lacquerers (comprising between 40 and 50 lacquerers) come from the famous artisan villages of the north, such as Nam Dinh, Bac Ninh and Hanoi, while local lacquerers have been also recruited to meet the need to complete restoration work. Restoration work has led to training, which has enhanced the skills of local lacquerers, reviving the skill of lacquering in Hué.

The secrets of traditional lacquering and gilding have been systematised through the recording, filming, photographing, researching and compiling of techniques, thanks to the cooperation of the Hué Monuments Conservation Centre and international partners. At present, there are many heritage restoration sites in the Imperial City of Hué (Phu Van Pavilion, Ngo Gate, Trieu To Temple, the long-covered corridor system, Emperor Minh Mang's Tomb, Emperor Tu Duc's Tomb and Emperor Dong Khanh's Tomb), attracting a number of lacquerers, who are working and developing their craft for the purpose of long-term heritage preservation and restoration.

#### ***Phap lam* (Vietnamese traditional enamel)**

Enamel work appeared in the nineteenth century, coming to Viet Nam from China's Guangdong provincial traditional enamel kilns. Historical documents of the Nguyen Lords show that, in 1827, under Emperor Minh Mang, a *Phap lam* workshop, with 15 craftsmen, was established,

under the management of the Royal Wares Manufacturing Workshop. Under the Nguyen Lords, artisan workshops were directly managed by the court. In reality, in Hué, the manufacture of *Phap lam* existed only within the court for the needs of the lords and royalty. The *Phap lam* workshops reached their peak in the period between the beginning of Emperor Minh Mang's reign and the end of the reign of Emperor Tu Duc. However, a governmental *Phap lam* workshop, with six craftsmen, existed under the reign of Emperor Dong Khanh (1885–1889), and continued to exist until the rule of Emperor Khai Dinh (1916–1925).

In 1885 as a consequence of the colonisation by the French, many handicrafts were underused and artisans scattered. However, two years later, in the second year of Emperor Dong Khanh's reign, the enamel craft was restored; and developed under the reign of Emperor Khai Dinh. *Phap lam* wares were used for exterior decoration work, ritual tools and royal wares. Not until the early twenty-first century did local research groups begin to study *Phap lam* again, and they successfully reproduced some of the wares for heritage restoration and tourism. The restored *Phap lam* wares have since been used to restore the Trung Dao bridge gate (behind the Ngo Mon gate), the Nhat Tinh gate and the Nguyet Anh gate (behind the Thai Hoa hall), the Phuoc Duyen tower (in the complex of Thien Mu pagoda), Bieu Duc Hall (in the complex of Emperor Thieu Tri's tomb), the Thong Minh Chinh Truc Bridge at Emperor Minh Mang's tomb, the Ngo Mon gate, Ngung Hy Hall (in the complex of Emperor Dong Khanh's tomb. *Phap lam* products created as souvenirs have gained their first successes in terms of production and commerce. The need to use *Phap lam* in heritage restoration is considered a remarkable boost for the revival of this specialised skill.

In addition to some of the traditional skills and crafts discussed above, others have also been brought back to life as part of Hué heritage preservation and restoration; such as decorative tree planting, traditional *aodai*-tailoring, traditional flag-making, bamboo curtain-making, and parasol-making, for decoration, festivals and rituals.

## Conclusion

The past 20 years (1996–2015) have seen a significant growth in heritage restoration in Huế, also resulting in the resurgence and development of the artisan and craftsmanship skills for which the city has long been famous – in particular, carpentry, porcelain inlaying, lacquering, and Vietnamese traditional enamel work. In the future, along with the anticipated further concern as well as funding for Huế restoration, these skills are expected to have further development options. The experience of Huế artisans and craftsmen has shown that traditional artisan and craft skills can be safeguarded and developed further in close connection with heritage conservation.

Since almost all traditional craft masters transmit their skills orally from generation to generation, it is important to create opportunities

for this transmission. In addition, research and archives need to be documented, synthesised and systematised.

For the sustainable development of traditional artisan and craftsmanship skills, it is important that Viet Nam establishes vocational training policies for local artisans and craftsmen centred on handicraft masters from other regions. During the construction process of Huế capital city, many skilled artisans from all over the country were gathered here. Therefore, nowadays it is necessary to have appropriate policies of heritage conservation. Additionally, there is a need to produce high quality handicraft products for tourists. However, it is also important to create local human resources for heritage conservation. This would allow Huế to become again the leading heritage centre of Viet Nam.

## References

**Le Quy Don.** 1775. *Phu bien tap luc (the miscellany of the neighbouring country)*, Translated by the Vietnam Institute of History. Khoa hoc Xa hoi Publishing House.

**M'Bow, Amadou Mahtar.** 1981. *Vi cong cuoc bao ve, giu gin, tu sua va ton tao di san van hoa cua Thanh pho Huế (For the preservation, reconstruction and restoration of Huế city's cultural heritage)*. Paris, UNESCO.

**Phan Tien Dung.** 2005. *Vai tro cua bo Cong trong viec xay dung kinh do Huế duoi trieu dai Nguyen (1802–1884)* (The role of the Ministry of Construction in building Huế capital under Nguyen dynasty), HMCC, Huế. (PhD dissertation)

**Quoc su quan trieu Nguyen (Nguyen Dynasty's Historiographers' Office).** 2010. *Kham dinh Dai Nam hoi dien su le tuc bien (The book recording every activity of Dai Nam nation's dynasty, the follow-up compilation)* vol. 9, The Ministry of Construction. Translated by Vietnam Institute of History, Giao Duc Publishing House.

**UNESCO World Heritage Centre.** 1993. *Complex of Huế Monuments* [online]. Paris. [Cited 5 June 2019]. <https://whc.unesco.org/en/list/678>

**UNESCO World Heritage Centre.** 2003. *Nha Nhac, Vietnamese court music* [online]. Paris. [Cited 5 June 2019]. <https://ich.unesco.org/en/RL/nha-nhac-vietnamese-court-music-00074>



*Maintenance of the Ruwanweli Stupa, Sri Lanka, by Gamini Wijeyuriya.*



◁ CHAPTER 4 ▷

**Documenting traditional heritage  
conservation and management  
in Sri Lanka**

**Prasanna B. Ratnayake and Sumedha Mathota**



## Abstract

This paper compiles literary sources for heritage conservation and management in Sri Lanka, and studies Traditional Management Systems and conservation practices in relation to their modern alternatives. The authors focus on Buddhist heritage, as Buddhist heritage is significant to the heritage of Sri Lanka. Since its introduction to Sri Lanka in the third century BCE, to date, Buddhism has remained an essential element of the identity and living traditions of most Sri Lankans. Buddhist heritage has survived throughout this time thanks to ongoing maintenance carried out by the communities under the authority of kings and rulers. A preventative form of conservation has existed, enhancing building development, since construction techniques have constantly been in use. Building conservation has continued taking into account intangible values, building functions and the changing needs of the people. Building alterations, additions, extensions, and repair works have been carried out by each and every subsequent king. The continuity of Traditional Management Systems and conservation practices, and their application to modern systems and practices, is discussed in relation to the case studies of Buddhist Temples in Anuradhapura and Embekke Devale.

## Literary sources for heritage conservation and management

There are numerous sources of information on Sri Lanka's historical heritage conservation and management, including Buddhist literature, ancient chronicles and various inscriptions. Buddhism was established in Anuradhapura, the first capital of the country, in the third century BCE. It remained the major administrative and religious centre until the eleventh century. Even though the kings moved administrative (capital) cities, they still considered Anuradhapura an important centre (a detailed account on Anuradhapura appears below). King Parakramabahu I, who ruled Polonnaruwa from 1153–1186 CE, sent a minister for restoration to renovate the monasteries of Anuradhapura, which had become dilapidated over the centuries (*Mahavamsa*, 78, p. 101 as translated in Geiger, 1960). King Nissankamalla (1187–1196 CE) also appointed an officer for restoration, as mentioned in one of the inscriptions “He placed Loke Arakmena in charge, and offered him also (to the Ruwanvali – dagaba) [stupa]. He was asked to restore the Mirisaviti [stupa] and other *vihara* [monastic buildings], and was given unlimited wealth and hundreds of yalas of paddy [lands], to restore the city of Anuradhapura, to how it was in former times, like the City of Gods” (*Ceylon Archaeological Department et al.*, 1912, p. 83). In the inscription, Loke Arakmena's position has been translated as Chief Conservator of Monuments or the Chief Conservation Officer in present conservation practices. King Kirthi Sri Rajasinghe (1747–1780), who was one of the last kings of Kandy sent a mission to repair the ruined temples of Anuradhapura, and, in particular, to restore Sri Maha Bodhi (the sacred fig tree in the Mahamevna Gardens in Anuradhapura). According to ancient chronicles, a severe penalty system existed for not attending to the repair works of religious buildings.

### The Buddha's teachings on monasteries, and other literary sources on conservation

The Buddha's teachings, Buddhist monastic orders (*dhamma* and *sangha*) and Buddhist heritage have survived since the time of the birth

and the enlightenment of the Lord Buddha in the sixth century BCE. Buddhist literature containing the Buddha's teachings provides numerous guidelines for the planning and conservation of Buddhist monastic architecture. The Buddha's teachings on monasteries are described in the *vinaya* – the disciplinary code for monks. The code provides guidelines on the construction of monastic buildings: it states that dilapidated buildings are not suitable for the meditative life of monks, and it allows monks to be involved in carrying out repairs to the monasteries.

*Manjusri Vastuwidyasasthra* written in the fifth century CE, contains a chapter on conservation. It first identifies the causes of deterioration and possible preservation remedies, introducing cultural and religious beliefs into that conservation process, and thereby maintaining not only the physical material but also, more importantly, the spirit of restored buildings.

The influence of various texts/*sasthra* traditions can also be seen in the architecture in India and in certain buildings in Sri Lanka. The key text is the *Mayamatha*.

The *Mayamatha* (an Indian text dating from the sixth century CE) contains a chapter, titled Temple Renovation, which lists restoration rules and discusses traditional conservation practices:

A temple [may be] ruined, broken down, fallen down, aged as to its materials or decrepit, or it may not conform to *jati*, *chanda*, *vikalpa* or *abhasa* modes. Those [temples] whose characteristics are still perceptible in their principal and secondary elements [are to be renovated] *with their own materials*. If they are lacking in anything or have some similar type of flaw, the sage wishing to restore them, [must proceed in such a way that] they *regain their integrity* and that they are pleasantly arranged [anew]; this [is to be done] with the dimensions – height and width – which were theirs, with decorations consisting of corner, elongated and other aedicule, *without anything being added* [to what originally existed] and always in conformity with the *advice of the knowledgeable*. (Dagens, 1985, p. 337 **emphasis added**)

It also provides a general rule for renovation as follows:

When a temple, a linga, a pedestal or images are to be renovated, the work is always to be done with materials similar [to those used initially] or better ones and never with less good ones. In the case of a decrepit [object], the knowledgeable one wishing to restore it, will proceed as indicated above in order to return to its original condition according to rule; [but], if the object was small it is desirable that it be restored to at least equal size or even larger one for that is always auspicious. (Dagens, 1985, p. 339)

### Inscriptions dating back to the beginning of Buddhist culture in Sri Lanka

There are numerous surviving inscriptions dating back to the third century BCE which serve as useful resources of information. For Buddhists, constructing monastic buildings and attending to repairs are considered meritorious acts, restoration must be carried out systematically, and every man must be paid for his work. The Jetavana Sanskrit inscription, dating from the ninth century CE, provides a precise description of Sri Lankan traditional conservation practices:

[There shall be] clever stone cutters and skilled carpenters in the village devoted to the work of [temple] renewal. They all shall be experts in their [respective] work... Means of subsistence, to same extent as is given to one of these, shall be granted to the officer who superintends works. Moreover, when thus conferring maintenance on the latter, his work and so forth shall [first] be ascertained, and the name of he who is [thus] settled [with a livelihood], as well as his respective duties, shall be recorded in the register. Those of the five castes who work within the precincts of the monastery shall receive [their] work after it has been apportioned; and they alone shall be answerable for its correctness. The limit for the completion of work is two months and five days. Blame [shall be place on] the superintendents, the *varikas* and labourers who do not perform it according to arrangements. (Ceylon Archaeological Department *et al.*, 1912, pp. 8–9)

The Mihintala inscription demonstrates how traditional practices were employed in renovation

work, repairs, the whitewashing of religious buildings and *dagebas* (stupas).

The Mihintala slab inscription of Mahinda IV allows us to observe how religious buildings were maintained. There are two slab inscriptions, which are identified as part A and part B. These inscriptions provide an insight into what was considered a properly constituted Buddhist monastery in the eleventh century CE. Part A of the inscription describes, in detail, the rules and regulations for the maintenance and administration of the buildings and the monastery premises. “All of the villages and lands belonging to the *vihara* shall be administered on leasehold deeds, but no [absolute] transfers [of the same] shall be executed” (Ceylon Archaeological Department *et al.*, 1912, p. 104). Part B describes the wages and remuneration of those working on the maintenance of the buildings:

For the cost of whitewashing and flowers [shall be given] three *kalan* and two *aka* [of gold] a year; to a servant who attends to the rearing of calves, one *kiriya* [of land] and *vasag* from Damiya; for cloths [used] for the merry festival of the great Bodhi-tree... (Ceylon Archaeological Department *et al.*, 1912, p. 108)

It explains that the maintenance of the *dagebas* at the *vihara* (monastery) was carried out in a systematic way:

To each of three warders of the *dagebas* – Navagunnamaha-saya, Nateviya maha saya and Ambulu dagaba, – [respectively shall be assigned] two *paya* [of land]; to each of those sweep, go repeatedly round and take care of the dagabas which belong to At-vehera [and are] on the upper and on the lower rock of this *vihara* shall be granted one *vasag* relic-house in the image-house and in the refectory, as well as to the two laundrymen who wash clothes, yellow robes for covering the body with, and head-vestments-to [all] these [servants] three *kiriya* [of land] in the village mangulava (Ceylon Archaeological Department *et al.*, 1912, p. 112).

### Attani or pillar inscriptions

There is also a particular type of inscription known as Attani, which provides details of land donations made on behalf on monasteries. The



information contained on these pillars states that the income generated from the donation of lands should be allocated to the repair and maintenance of monasteries.

The pillar inscription at Mannar describes the way that these lands were protected:

To these villages, royal officers and *piyovadaran* shall not enter. Those of the archery department, the tax officers, headmen in charge of districts and of provinces shall not enter. The employees of two offices, *deruwana*, *perelaki*, archers, guards, and those of the paid services shall not enter. Carts, oxen, laborers, imposts of cooked and raw rice, and periodical gifts of milk and oil should not be taken. The *perenattuwam* shall not enter. The ferrymen residing in these villages should not take *avalin* [oars?] of [or from] the tenants. *Sadaladdan* shall not enter. Officers in charge of *kabhali* shall not enter. Those who reside at the Navehera shall not enter. Those who reside at the Rakavehera shall not enter. Having forbidden the entry of the aforesaid persons, we, two of us [the two officers who planted the pillar] have given to these villages the immunities [sanctioned by] the council.

(Ceylon Archaeological Department *et al.*, 1912, p. 105)

### Chronicles

The great chronicle of *Mahavamsa* written in the fifth century CE, along with other chronicles, such as *Chulavamsa* are good sources of information for the details of monastic buildings and their conservation. They include numerous references to the philosophy that underlies the continual construction and maintenance of monastic buildings.

The *Mahavamsa* (Great Chronicle) discusses more than 100 examples of the repair, restoration and renewal of monastic buildings. It notes that the first stupa in Sri Lanka (the *Thuparama*), built in the third century BCE, has been renovated more than 16 times, and that it was the foremost duty of a newly-crowned king to repair or renew a monastic building. The *Mahavamsa* and *Chulavamsa* describe the renovation- and plaster-work festival of a stupa:

During the reign of King Bhatikabhaya [...] here he did carry out the work of repairing the *lohapasada* and built two *vedikas* for Mahathupa, and the [hall] called the

Uposatha [-hall] in the [*vihara*] named after the thupa [a thupa is a restored stupa]. (Geiger, 1960, 34, 39)

The *Chulavamsa* describes the ancient practice or renovation of religious buildings: it is the act of conservation that brings continuity to the heritage:

He removed *mayura piriwena* which was five and twenty cubits high, and replaced it by a *pasada* twenty-one cubits in height. To Kumarasena [his brother] he made over his former revenues and fixed them exactly; [namely] one half to the Kalavapi and two hundred fields. He renovated the ruined Lohapasada and he restored the dilapidated umbrellas on the three great thupas. (Geiger, 1953, 38, 52–55)

In the same chapter, he describes the renovation of holy places as offerings carried out by the Kings:

In the Thuparama [the King instituted] as offering to the thupa a restoration of what was ruined [in the thupa]. Likewise in the temple of the Tooth Relic he repaired what was dilapidated, and to the Tooth Relic he dedicated a casket for the tooth relic, a halo made of closely fitting mosaic thickly set with precious stones and golden lotus flowers, and he instituted offerings without number. To the Bhikus dwelling on the island he distributed robes and other nine gifts. Having undertaken renovations in the vihara here and there, he had some fine stucco work executed for the wall of the [Relic] house. [In the same way] he had valuable stucco work made for three big *chetiys* and put golden umbrella as well as a ring for the protection against lightning. (Geiger, 1953, 38, 70–75)

Also,

He [King Dhatusena] undertook buildings for the enlargement of the Abhayauttara *vihara* and for the stone image of the Master [Buddha] he had a shrine erected with a mandapa [pavilion]. As the eye placed by Buddhadasa [in the image] had been lost, he made a pair of costly jewels into eyes for the Master. Further he wrote gleaming diadem of rays and out of dark blue gems a shining coil hair, like-wise a bandolier of god and a tuft of down [between the brows] and a golden garment, mandorla of gold, a lotus flower and a magnificent lamp. There also he presented countless robes of diverse colours. In the image house

of Bahumangala-cetiya, he erected Bodhisattva figures and in the same [image house] he had diadem of rays made for the image of then Master in black stone and for the world teacher named Upasumbha. Also he had the ornament described above made for the Buddha image known as Abhiseka and a Bodhisattva temple on the left side of the Bodhi Tree. For the [Bodhisattva] Metteya he had the complete equipment of a king prepared and ordered and ordained a guard for him within the radius of yojana. He had the *vihara* adorned with bands of ornament called *dhaturaji* and [he

erected] for a hundred thousand [gold pieces] a large and splendid house for the Bodhi tree. (Geiger, 1953, 38,61–69)

Apart from the renovation of these main shrines, evidence can be found of conservation acts, and the restoration of other sacred places, like Mihintale. The *Mahavamsa* records that King Devanampiya Tissa also planted a Bodhi Tree at the Chetiya Pabbataarama monastery and completed building repair works at Mihintale (Geiger, 1960, xix, 69).

## Traditional heritage management and maintenance

History provides several examples illustrating how people have devoted themselves to the conservation of Buddhist heritage in the past. Buddhist heritage has been preserved with the direct involvement of the people and brought into the present as a result of their repairs, restoration work and also new construction work (Wijesuriya, 2007). Traditional repairs and renewal practices focus on continuity. Throughout Sri Lankan history, with the exception of royal buildings, only religious buildings have been built to be durable and to benefit present and future generations through repair work and renewal practices. The buildings have adapted over time to the changing needs of society, through the use of additions, alterations and expansion. Other buildings have been built using non-permanent materials, such as wood, hay and bamboo. Many religious monuments show evidence of the changes that they have undergone. New additions have been placed over older structures. We also see changes and adaptations in decorations and artwork. Through repair and renewal, new materials and techniques have been introduced. As a result of this progression, adaptation and change, these monuments can be viewed as carriers of cultural and spiritual values, passed on from distant ancestors to the present. Even if little of the original structure of a structure remains, its life spirit, history and integrity remain unbroken through ritual ceremonies. Renewal can also be seen as an opportunity for the application and

practice of new art works and knowledge, for example, the addition of front pieces to the dome of the stupa.

Properties were given to the care of monasteries to ensure regular maintenance would take place, and they were also protected by property maintenance laws and regulations. People had to pay taxes to occupy the monastery-owned lands, by contributing regular maintenance work, both in tangible and intangible forms.

The temple villages – the *devale* villages – in the Sri Lankan countryside have played a major role in Sri Lankan society. There are hundreds of *vihara* and *devale* throughout the country, built with the direct patronage of different kings and regional leaders, during different eras. The *vihara* are dedicated to the Buddha while the *devale* are dedicated to different deities, which are regional, national and even international.

The kings and leaders built these monuments to fulfil their religious requirements, but they also wanted to ensure the long-term survival of these temples, even after their lifetimes. More specifically, one of the foremost duties of a newly-crowned king was to pay homage to the monastery and *sangha* (monastic community), to donate money for their maintenance, and attend to repair work (Rahula, 1956, p. 70). According to the *Mahavamsa*, a king who neglected the Thuparama Stupa was threatened in a dream that, if he did not attend to repairs, the relics would be removed from the stupa. The key role of the kings in temple

restoration is highlighted in the above-mentioned chronicles: “[...] ruler of men, and in like manner the restoring of ruined buildings must be carried out; one should take five precepts on himself and keep them carefully, and one should also keep them solemn [...]” (Geiger, 1960, 35–75). The kings appointed officials to carry out the repair works of religious buildings.

Two distinct construction methods can be identified. Some temples were built by well-known foreign craftsmen, depending on the power of the patronage, with the hope that they would be finished using the highest craftsmanship skills. Others were built by local artisans and craftsmen. Whatever the construction method, those who initiated projects took action to establish systems, not only to look after the buildings and monuments themselves, but also to ensure the continuation of the rituals and festivals related to those temples.

As described above, the *vihara* and *devale* have different purposes within Sri Lankan society: the *vihara* is dedicated to Buddha and the *devale* are dedicated to deities. Buddhism, as a philosophy, shows the path to a better way of life. It is based on karma: the good and bad actions of a person, which result in good or bad consequences for the person’s current and future lives. It is based on reason and alongside the four noble ways of the Buddha forms the basis of the life of a Buddhist.

However, under the tradition of worshipping gods, people expect different benefits from those offered by Buddhism. They pray for good health, wealth and prosperity for themselves, but bad fortune for their enemies. They think only to their current life and expect material gains through the undertaking of various types of offerings and rituals. However, it is significant that there is a tradition of worshipping the Buddha before worshipping gods. Therefore, there remains a small Buddhist shrine in most *devale*.

Buddhist priests in the *vihara* conduct rituals, ensure Buddhist traditions are upheld and provide religious support for their communities. They live inside the temple premises, within separate buildings. Rituals in the *devale* are conducted by lay custodians and this duty is passed from generation to generation. They live within the village, as part of the community, but hold a special position in the

social strata. They usually conduct the daily rituals three times per day, when alms are also offered.

Although there is a clear difference between the two practices of *vihara* and *devale*, their management systems are similar, as they were established by the same rulers. When a temple is built, whether *vihara* or *devale*, the greatest concern is the long-term survival of the temple, as it will ensure the survival of a ruler’s name throughout history. Therefore, in addition to appointing priests and custodians, they created a community-based management system of allocating property to the temples. They had the power to offer hundreds of acres of land in the name of a temple, mostly in the surrounding area, even where people were already living and working on the land in question. Under the management system, those already living and working on the land were permitted to continue doing so, but they were required to carry out various tasks for the benefit of the temple in return. However, they did not consider that their actions were carried out on behalf of the temple; instead, they considered that their actions were in the name of their duty to the king. They carried out this duty with dedication, as they believed that it would provide them with benefit for a better life. Thus, the skills of the people were used to maintain the system, and the people were responsible for both the tangible and intangible tasks related to the temple. Some duties were conducted by the community and, as a result, were performed well.

Actions that helped to conserve and maintain the temples improved people’s skills and allowed them to earn additional income. Therefore, people with highly-developed skills were cultivated, and those skills were passed down from generation to generation. This led to the creation of a self-sustained caste system within Sri Lankan society.

According to tradition, a temple should conduct daily, monthly and annual rituals, including several *pujas* (services), festivals and other programmes. For a Buddhist *vihara*, every full moon is special, and certain full moons throughout the year are celebrated specifically by certain temples. For a *devale* dedicated to a god, Wednesdays and Saturdays are considered special, as they are believed to be beneficial days. In both practices, there is an annual festival to demonstrate the full might of the temple.

## Case studies

### Buddhist temples in Anuradhapura

Anuradhapura is considered the most important place in Sri Lankan history, as it carries much religious, cultural and social significance. Historically, Anuradhapura was the first capital and the first planned city in Sri Lanka; indeed, the Buddha visited Anuradhapura, and named it as the future religious capital during his lifetime. Town planners have since identified Anuradhapura as a well-designed city, consisting of different circles of functional zones. There are eight main Buddhist shrines that have existed since the Buddha's time, called Atamasthana. These shrines comprise different monasteries built during the reign of different kings; six of them are stupas. The main shrine, the Sacred Bodhi Tree, a sapling from the original Bodhi tree in Bodhgaya in India, is considered the most sacred.

The stupa, the most dominant structure and the sacred object of worship, plays a major role within a Buddhist monastery, both religiously and symbolically. Therefore, most kings invested much of their energy in building very large stupas, each one seeking to out-do the one before. It is significant that the world's tallest brick structure, the Jethawana Stupa, is also in Anuradhapura.

The stupas and other monasteries built between the third century BCE and the tenth century CE in Anuradhapura were also managed through the above-described system, where monks and the community were involved. That system continued for several more centuries until the Dry Zone Civilisation, (recorded settlements in Sri Lanka are considered to have started in the north central of the island, identified as a Dry Zone; after the twelfth century, those areas were abandoned and the civilisation moved to regions in the north western, central, western and further south identified as Wet Zones, depending on the climatic conditions) where Sri Lankan civilisation had begun, collapsed at the beginning of the second millennium. Civilisation shifted to the south, due to health threats, such as malaria, and political threats, especially from southern India.

During the British colonial period, archaeological explorations started as a hobby in Sri Lanka. Several British civil servants engaged in collecting and documenting archaeological remains, especially in the Dry Zone. Thereafter, the Department of Archaeology was established in 1890, in order to safeguard Sri Lankan archaeological heritage. Exploration and restoration works took place in the Anuradhapura, Polonnaruwa and Sigiriya areas. One major example of restoration work carried out in this period was the conservation of the square platform of the Jetawana Stupa. Although the cube and pinnacle were restored, the dome was not conserved, as it was in a ruined condition and vulnerable to collapse, due to the thick vegetation that had grown up around it.

There was a Buddhist awakening in the 1920s due to the oppression felt in the community under British rule. There was a movement to restore the Ruwanweli Stupa, considered the most sacred by Buddhists, although it was only the third tallest. The movement was led by Buddhist monks and supported by Buddhist philanthropists. There was no professional involvement in the technical aspects of the project; the restoration was carried out using the skills of those in the community.

During the time that the Dry Zone was abandoned, there were only a few people living in Anuradhapura. They stayed with the intention of protecting the sacred Bodhi Tree from enemies and wild animals. It is said that they engaged in the task with great dedication. However, once the restoration works began, a number of people from other areas of the country settled in the area. The development of highways, railways and irrigation works by the British rulers assisted the influx of people and Anuradhapura began to urbanise.

In parallel to the restoration works, monks began to live in other monasteries and people from all over the country began to make pilgrimages to Anuradhapura. The Department of Archaeology commenced several other restoration projects. The reoccupation of monasteries by monks saw



the reestablishment of traditional systems within the community. However, unlike other Sri Lankan temples, the temples of Anuradhapura were supported at a national level. Given their religious importance, these temples have a large number of both local and foreign visitors, and participation in activities is relatively high. In particular, when the June full moon takes place, more than two million pilgrims visit Anuradhapura for the festival known as Posa, to celebrate the arrival of Buddhism in Sri Lanka.

Every year therefore, leading up to the June festival, significant restoration work takes place in order to welcome the pilgrims. One such major restoration project is the whitewashing of the Ruwanweli Stupa, with lime (Figure 1), requiring a budget of approximately USD 50 000, which is beyond the means of the Department of Archaeology. However, thanks to the reestablishment of the traditional system, the Buddhist community manages to collect almost double the amount needed.

A trained group of people, from the south of Sri Lanka, carry out this difficult restoration work, using basic techniques and manual tools, over a period of almost three months. They use a natural bamboo structure to reach the top, with the help

of ropes, but without wearing safety harnesses or helmets, as they believe that they are protected when carrying out this good deed. This group receives the support of many trained volunteers, and especially from pilgrims visiting from faraway places. The surface of the stupa is first cleaned and the dust is washed away. There is a belief that, after cleaning the surface, a sudden rain will fall so there will be no need to bring water up to the stupa. Thereafter, the surface of the stupa is painted with lime wash.

Whitewashing the stupa is considered a task that brings merit to Buddhists, and it is also a means for those carrying out the work to purify their minds, as it is an aesthetically-pleasing object. Buddhists tend to view contributing to whitewashing the stupas as a tradition.

The maintenance and conservation work of other two main stupas in Anuradhapura has recently been carried out with the involvement of professionals from the Department of Archaeology. The professionals from the Department of Archaeology have adopted Western conservation principles, such as minimum intervention, without the use of plastering and

 **Figure 1**  
The Ruwanweli Stupa.

whitewashing. The stupas have thus been left with exposed brick surfaces. However, for the Buddhist pilgrims who visit the stupas, this exposed brick does not promote a feeling of spirituality. Additionally, the rough brick surfaces of the stupas are vulnerable to decay and encourage plant growth; the surface of the dome and the pinnacle of the stupa tend to be washed away with the rain water, as they collect a high volume of water, and the grooves in between the brick layers provide a good environment for plants to grow. The lifespan of these stupas is therefore lessened, compared with the stupas that have been plastered and whitewashed. Additionally, as community participation in restoring the brick stupas is low, they are difficult to maintain. All of the maintenance work must be carried out by government authorities, which is a heavy burden for the Department of Archaeology.

#### Embekke Devale

Embekke Devale is an historic shrine, dedicated to the god Kataragama and situated in the central hills, close to the ancient capital of Kandy. Its history dates back to the fourteenth century, and it is believed to have been built by the queen of the ruler of the Kingdom of Gampola. This *devale* is considered a place of miracles, bringing wealth, prosperity and good health to its devotees. The *devale* complex consists of eight different structures built according to a traditional temple village layout.

There are 32 such traditional *devale* in Sri Lanka, which are similar in design, but not identical. They are dedicated to different Gods, but conduct comparable rituals, with only minor changes.

The ruler had granted 174 acres of land to the Embekke Devale and 40 different groups of people were assigned with duties to serve the *devale*. Those people were directed to carry out various duties, of four general types:

- conducting rituals
- participation in rituals and festivals
- maintaining buildings and monuments
- serving within the community.

The people who were assigned to carry out these duties, did so using their full capacity and

dedication. They lived on and cultivated the lands they were given. Even where lands were far from the *devale*, responsibilities were taken seriously. Those who had daily ritual responsibilities lived on the premises full-time and took decisions without requiring direction from superiors.

For 600 years, from 1370 CE, the *devale* were maintained by the community, protecting both the tangible and intangible heritage. When the Department of Archaeology undertook restoration works on the *devale* in 1976, all of the physical aspects were intact, meeting professional requirements. Once the maintenance works were complete, it was possible to see that, in over 600 years, the architecture of the *devale* had not been damaged. Thanks to the in-depth knowledge, understanding and traditional conservation skills, ongoing interventions had been carried out on the *devale*. Although the reparations and maintenance were not carried out on the structures under the remit of any written legal, or accepted, set of restoration regulations, they were undertaken in a professional way.

Undoubtedly, structural components have been amended as a result of decay or damage, but the significance of the temple has not been affected. The timber columns and roof, clay tiles, and wattle and daub walls on earth-filled plinths are vulnerable to decay, as they are made of primary organic materials. With the tropical climate, heavy rains, powerful lightning and high humidity in the central hills, the organic materials deteriorate easily. Maintenance therefore requires that these components be replaced as necessary. Until recently, the granary and kitchen were thatched with dried hay, which had to be replaced annually.

Most significantly, the repair and maintenance work was carried out with care, using the skills and resources of the community. The timber came from their own lands, the hay from their paddy fields and the clay tiles were made by assigned potters. Skilled carpenters, masons, stone masons and wood carvers undertook the work. People were assigned to whitewash the walls, remove spiders' webs, clean the floors and sweep the yard.

However, two major incidents had an impact on traditional heritage and conservation management in Sri Lanka. The first was the change in the country's economic system after 1977.

In 1977, an open economy was introduced and thereafter the country also saw sociological change. Sri Lankans began to go abroad for employment, in particular to Middle Eastern countries. Once the economic conditions changed, the traditional cultural pattern was washed away.

The second was the Department of Archaeology's interference in conservation practices in 1976. The Department of Archaeology became involved in roof conservation in 1976, using materials purchased with government funds and employing permanent technical staff. Architects and archaeologists were consultants on the project and technical officers and draftsmen supervised. The staff employed came from outside of the local area, and materials were bought through the government procurement process. It is likely that some of the materials were imported from other countries. Clay tiles came from the government tile factory some 80 kilometres away.

Previously, under the traditional maintenance system, timber was provided by the village, clay tiles were made by the assigned potter, ironworks were provided by the village blacksmith, and brass locks were made by a craftsman in the village; the entire workforce thus came from the same village. Indeed, in every village, there were enough

skilled craftsmen to carry out the carpentry, masonry, stone work, and carving work required. Once the Department of Archaeology took over, however, traditional artisans and craftsmen lost the opportunity to work in the temples and had to find alternative ways of making a living.

The custodians of the *devale* tried to dissuade the government from spending their funds and using their materials. The *devale* community has continued to provide services, as there is a belief that avoiding duty is bad for their karma and future good. Although maintenance work is no longer fully carried out by the local community, the local community still participates in rituals and festivals. Some people, unable to undertake their assigned duties, seek instead to fulfil their duties by sending a hired person in their place, or by reimbursing the cost of hiring a person.

However, there has been a slight drop in *devale* income, attributed to the fact that it is now run by people who have not traditionally been attached to the *devale*, and who are not responsible for the assigned duties of the past. These people are not Buddhists, and so are not rendering religious service in the work they carry out, and therefore their work might sometimes not be in accordance with the local cultural context.

## Conclusion

In the last century, Western conservation principles have been applied all over the world, including Asian countries, with little or no concern for the diversity of local cultures. These principles served their purpose at that time (Wijesuriya, 2005, p. 30). The conservation profession has since grown and asserted its professionalism in the heritage sector, and conservation professionals have adopted the role of acting as advocates and guardians of heritage. While this approach has its place within institutions, the reality of working within communities requires a different attitude. Sometimes communities are suspicious of outside intervention, particularly when their heritage is involved. The difference in values and approaches has, at times, created unease between

conservation professionals and local communities. Even quite ordinary conservation practices can appear insensitive.

Most Buddhist religious monuments were abandoned and hidden after the devastation caused by the final siege of South Indian King Raja Raja I (985–1014 CE). The colonial government subsequently explored the deserted monuments and documented the findings. The Department of Archaeology, the principal institution responsible for the management of archaeological remains of Sri Lanka, was established in 1890. Institutional conservation practice placed importance on the retention of the material of the monuments as historical evidence. This approach was applied by conservation professionals whose experience came



from working with collections within institutions, not with communities whose built heritage expressed ancestral connections and identity. Many researchers have overlooked the existence of the conservation approaches that have developed in Asian societies. This may well be due to the fact that such approaches and their underlying rationales have not hitherto been placed before the modern conservation community (Wijesuriya, 1996, p. 95). The West has introduced Western conservation concepts to the East which conflict with the traditional maintenance of both tangible and intangible heritage.

It can be difficult to apply conservation processes to a living heritage that is constantly changing. Although conservation work might be seen as an intrusion on cultural practices, it is important that living communities are aware of all of the options for maintaining their monuments, so that they are able to make informed decisions. The opportunity should be taken more often to strengthen the relationship between traditional skills and modern Western-inspired conservation practices, so that the two perspectives for retaining the cultural and spiritual values of buildings and monuments work hand in hand.

## References

- Ceylon Archaeological Department. 1912. *Epigraphia Zeylanica: Being Lithic And Other Inscriptions of Ceylon, Vol. I(IV)*. London, published for the Government of Ceylon by H. Frowde.
- Dagens, B., trans. 1985. *Mayamata: An Indian Treatise on Housing, Architecture and Iconography*. New Delhi, Sitaram Bharatiya Institute of Scientific Research.
- Geiger, W., trans. 1953. *Chulawamsa: being the more recent part of the Mayahama*. Translated from German into English by C.M. Rickmers. Colombo, Ceylon Government Information Department.
- Geiger, W., trans. 1960. *Mahavamsa or the Great Chronicle of Ceylon*. Colombo.
- Rahula, W. 1956. *History of Buddhism in Ceylon: The Anuradhapura Period 3rd Century BC – 10th Century AC*. Colombo, M.D. Gunasena & Co. Ltd.
- Wijesuriya, G. 1996. Conservation and Maintenance. In G. Wijesuriya, ed. *Monuments and Sites: Sri Lanka*, pp. 95–113. Colombo, ICOMOS Sri Lanka.
- Wijesuriya, G. 2005. The past is in the present: Perspectives in caring for Buddhist heritage sites in Sri Lanka. In H. Stovel, N. Stanley-Price, & R. Killick, eds. *Conservation of Living Religious Heritage: Papers from the ICCROM 2003 Forum on Living Religious Heritage: conserving the sacred*, pp. 31–43. Rome, ICCROM.
- Wijesuriya, G. 2007. Conserving Living Taonga in Aotearoa: the Concept of Continuity. In D. Sully, ed. *Decolonizing Conservation: Caring for Maori Meeting Houses outside New Zealand*, pp. 59–70. London, University College London Institute of Archaeology Publications.



◁ CHAPTER 5 ▷

**From *karkhanas* to  
the modern conservation  
management system in India**

Sangeeta Bais



## Abstract

*Karkhana* (workshops) were established in medieval India by the rulers of different time periods to create and maintain unique masterpieces of art and architecture. A peak was reached during the reign of the Mughals. *Karkhana* were overseen by court nobles, using a well-established management process. Quality of production was assured through the use of: strict supervision; rewards for the artisans; a defined hierarchy, reflected in the wage structure, with master craftsmen at the top and apprentices at the bottom; and technical (including spiritual) training. The decline of the Mughal Empire from the early nineteenth century onwards also saw a decline in the *karkhana*. By the time of British rule, *karkhana* had become standardised: pre-defined items of work were introduced, and the Public Works Department established requirements for the use of new colonial construction materials and techniques.

The present paper aims to explore and compare the historic imperial *karkhana* system with the modern system of craftsmanship used for the conservation of historic medieval architecture in India. The decline of the *karkhana* system and the present state of craftsmanship will be examined through the use of comparative technical and non-technical parameters to compare original construction techniques and contemporary artisan skills in conservation work. The need to recognise the significance of the role of traditional management in fostering master craftsmanship will be highlighted, and its implications for contemporary conservation practice and policy will be emphasised.

## Introduction: Mughal heritage and the challenges of its conservation

The Mughal architecture of North India constitutes a significant part of India's architectural heritage: five Mughal monuments and constructions have been designated World Heritage Sites by UNESCO. These are a unique amalgamation of Indian and Persian architecture, in terms of geometrical architectural proportions, spiritual symbolism and an unrivalled quality of craftsmanship, as the skills of Indian artisans were adopted to implement new design schemes under the guidance of Iranian artists. Prevalent Indian Traditional Knowledge Systems concerning Indian construction artisanship, especially those regarding masonry and stonework, also played an important role in inventing a new architectural approach called the Mughal style.

The foundations of the Mughal Dynasty were laid by the Mughal Emperor Babur in 1526. The Mughal style evolved principally during the reign of the Babur's successors: Akbar (1556–1605), Jahangir (1605–1628) and Shah Jahan (1628–1658). Under the patronage of these emperors, Mughal architecture reached its peak, and distinctive masterpieces were created. For example, Humayun's Tomb (1572), Fatehpur Sikri (the sixteenth century), Agra Fort (1565–1573), Lahore Fort (1556–1605), Akbar's Tomb (1605–1613), Jahangir's Tomb (1627–1637), the Tomb of Itimad-ud-Daula (1622–1628), the Taj Mahal (1632–1643), Red Fort (1639–1648) and Jama Masjid (1644–1656). Mughal

architectural craftsmanship began to decline during the reign of successors: Aurangzeb (1658–1707) and Bahadur Shah Zafar (1837–1857). This can be seen in Bibi ka Makbara (1661), the Tomb of Safdarjung (1754) and Zafar Mahal (1842), where techniques degraded in terms of artistic craftsmanship, scale and perspective.

The conservation of these monuments is a challenging task, given their unique architectural characteristics and unparalleled craftsmanship, which developed during a period when rulers patronised the construction of monuments. Building and craftsmanship subsequently underwent a period of neglect and decline, which lasted for more than 350 years. As a result, new skills emerged, in response to clients' demands. Conservation of these monuments is thus seen as a significant challenge, as the building and craftsmanship techniques and skills employed varied widely. The introduction of modern materials has also had a significant impact on artisan traditions.

It is thus important to explore the differences between traditional and modern artisan building skills before they can be utilised for conservation works. This paper is an attempt to explore and compare the traditional *karkhana* system, which patronised monument-building and associated artisan skills and craftsmanship, with the current system of craftsmanship used in the conservation of historic medieval architecture in India.

### The *karkhana* system

Mughal *karkhana* were originally craft production centres, patronised by rulers and their ministers, and other persons of influence, and attached to forts and palaces (Verma, 1994). Here, some of the most accomplished artisans from all over the world, with a diverse range of craftsmanship skills, worked together to produce remarkable artworks under

the supervision of masters, who were patronised by the Mughal emperors. Large-scale architectural projects, which adopted geometrical proportions, unique compositions, innovative engineering and technological expertise, and outstanding craftsmanship, were carried out under the oversight of well-organised administrative systems. These

administrative systems included the establishment of *karkhana*; the involvement of highly-qualified scholars; the careful selection, categorisation, and supervision of artisans; and well-formulated training programmes, all of which contributed to the creation of unique architectural works.

The establishment of *karkhanas*, originally known as *buytutat*, (*buytutat* refers to an imperial *karkhana*) proved to be an important step in increasing the standards and quality of craftsmanship. *Karkhanas* were responsible for the development of artisanal skills to create products that met the expectations of the ruling classes, and which were of a standard that it was not possible to find in products made elsewhere (Vanina, 2004). There were several types of *karkhana* that existed during the Mughal period, including masonry, stone-cutting, carving, embossing and calligraphy workshops. In Shahjanabad and Fatehpur Sikri, the *karkhana* were situated in the heart of the fort and not in separate areas. The role of the *karkhana* in artisan production was thus crucial.

### Persian influence

Artisans were primarily influenced by Persian art, as Persian artists were numerous within the *karkhana*. Emperor Humayun brought architects, painters, weavers and other artisans from Persia and Afghanistan in 1555. Additionally, in the mid-sixteenth century, the Mughal courts attracted many artists, craftsmen and calligraphers from Iran and Central Asia. These artists were trained in the finest Safavid art works (Persian Safavid Dynasty 1501–1720) and were a part of Akbar's court, and formed the core group who established the imperial *karkhana*. This significantly influenced the Mughal art and architecture of India (Soucek, 1987).

### Management system

The *karkhana* system had a well-formulated management system, which was overseen by imperial nobles from court such as family members of the emperor, courtiers, and other important influential people, known as Khan Saman or Mir Saman. There is a reference to Abu'l Fazl ibn Mubarak (one of the Nine Jewels of Akbar's Imperial Court, Prime Minister of the Mughal Emperor Akbar and author of the *Akbarnama*, the official history of Akbar's reign in three volumes)

offices and workshops, over one hundred in number, each resembling a city, or rather a small kingdom, all under *diwan-i-butuyat* (the head of the *karkhana*). Historical records depict that many *mimars* (architects) also held the post of Mir Saman before designing or supervising construction activities. Each workshop was devoted to the production of one particular article and was supervised by an expert in the article concerned. In addition, two officers, an accountant, a *mushrif* (chief accountant) and various other persons were also employed. The quality of the work produced was inspected by *sairafi* or *sarraf*, who was a quality assurance expert. The result of such supervision can clearly be seen in the features of Mughal architecture.

### Building department

The building department, established and controlled by the rulers, was responsible for all forms of building activities, including design, execution and maintenance, all within a well-structured administrative system. The building department included several experts who would carry out the construction work:

- **Mir-Imarat (chief architect)** – The building department was headed by a *mir-Imarat*: the position was only assigned to a person of high status, generally a *mansabdar* (member of the imperial bureaucracy of the Mughal Empire). An administrative manual, *Hedayat-ul Qaqaid* (1715) summarises the qualifications and functions of a *mir-Imarat* (Qaisar, 1988), comprising: knowledge of accountancy; the ability to quantify building materials from measurements taken; knowledge of the wage-levels for different tasks; and knowledge of the market rates for building materials. The qualifications listed are still relevant today, but, as the materials and construction systems have changed, so has the knowledge bank of the *mir-Imarat*.
- **Mimars (architect)** – It was the responsibility of a *mimars* to prepare drawings. An architect's qualifications played an important part in their being selected to design the buildings. The architects, before being awarded a design assignment, had to undertake several stages of

practical training on-site, under the supervision of a *mir-Imarat* who was highly experienced in Persian architecture.

- **Darogha-i-Imarat (project head)** – Following the design stage, a cautious approach was taken to the building construction, which was carried out under the guidance of a *darogha-i-Imarat*. They were selected according to the qualifications required for the project. For example, Qasim Khan was chosen to be the *darogha-i-Imarat* for the construction of Agra Fort because he was a great military engineer and builder, with pre-eminent civil engineering skills. He was an expert in creating *sabat* (covered passages), and *naqab zadan* (bridges and mines), using gunpowder (Beveridge, 1939). Mir Abdul Karim and Makramat Khan were experts in multiple fields of science and were therefore appointed *darogha-i-Imarat* for the Taj Mahal and Red Fort in Delhi, respectively (Dayalan, 2009; Balasubramaniam, 2009).

### Design process

Designing a building was a process undertaken with a great deal of care, requiring the completion of various stages before finalisation. The key steps in the design process included: preparation of the conceptual ideas (generally carried out by the emperor); discussions on the concepts; preparation of the *tarah* (drawings); and the finalisation of the proposal by the emperor. Following the emperor's approval, sacred judicious notes (documents prepared following the religious philosophy, scientific knowledge systems of that time, given the final approval of the emperor, at the end of a series of processes) were produced to serve as a *dast-arriz* (guide) for the building's *mutasaddiyan* (overseers) and *mi'maran* (architects) (Begley and Desai, 1989).

### Involvement of experienced architects

Mughal monuments and buildings constructed from 1556 to 1658 were designed by highly-experienced architects and engineers, who drew up detailed plans using their geometrical, mathematical and astrological knowledge, all seen as essential elements of Islamic design (Farhat, 2014; Marshall, 2006). Ustad Ahmad Lahori was one of the greatest *mi'mar* of the seventeenth century; he designed the Taj Mahal, the Red Fort complex and

the Jama Masjid in Delhi. He was an accomplished engineer and highly recognised for his work in various scientific fields. As a result of his high standing and expertise as an architect, he became the chief architect of Shah Jahan (1628–1658), and was awarded the title of *Nadir al-'Asr* (the Wonder of the Age) in circa 1634–1635. Archival records also inform us that many other *mir-Imarats* received a number of *khitabs* (awards) for their designs and creativity. Ustad Ahmad Lahori's three sons were also qualified architects, calligraphers and science scholars; they received patronage from Aurangzeb, and later designed Mughal buildings, such as Bibi ka Makbara and Dara Shikoh (Begley and Desai, 1989). Despite Ustad Ahmad Lahori's sons being qualified architects and engineers who worked under skilled supervision, they were not able to reproduce such architectural masterpieces as those produced in earlier Mughal periods due to changing priorities.

### Supervision of construction works

An evaluation of Mughal monuments, their materials and construction techniques, and historical records, including miniature paintings, reveals that Mughal supervision of the work can be classified into several categories: supervision for quality checks, stone work, art work (carving, inlay, etc.), masonry work, dome and arch construction, lime mortar preparation and application work, material procurement, site monitoring, and quality checking. It is to be assumed that many more other supervisors certainly existed, but further careful evaluation of individual materials, skills and construction techniques is required, as every architectural element was a meticulous creation by many artisans. Historical records show that thousands of labourers and artisans were involved in the construction process, raising questions as to how supervision on such a large scale took place. It is arguable that very strict supervision must have been in place to achieve such high-quality craftsmanship. Indeed, this is evidenced in the Mughal miniature paintings found in the *Akbarnama* (the official history of Akbar's reign in three volumes, written by Abu'l Fazl) of the Agra Fort and in Fatehpur Sikri, depicting the different stages of construction.

## Artisans and historical craft skills

Several types of artisans were involved in Mughal building and construction work, including *gilkaran* (clay workers), *khisht malan* (brick layers), *sangtarash* (stone cutters), *durudgaran* (carpenters), *khisht puzanb* (brick burners) and *ahak puzain* (lime burners) (Beveridge, 1939). Every artisan was categorised according to their individual skills and was paid accordingly (Beveridge, 1939).

### Selection process

The selection of artisans for building construction, and in particular, for the artistic elements, such as decorative works, was carried out with a great deal of care, taking family traditions and skills into account. Sambul Halim Khan states that the social status of Mughal artisans was also viewed in relation to the family to which he belonged, or the caste to which he was a member (Khan, 2015).

Selection criteria were based on an artisan's inherited family knowledge, and the teacher with whom he had studied. In order to produce the best results, a strict selection process was essential when choosing artisans for the *karkhana*, especially as expensive materials were used. Those selected were considered specialised artisans, and, as a result, their social status was very high, and their skills were held in high esteem by the emperor. Artisans were hired by the state and thus did not have to submit to market pressures; they therefore enjoyed a level of freedom which would have helped them to focus on their work. An engraver would have received a fixed salary equal to that of a *yuzbashi*, or commander of a one hundred-man army (Vanina, 2004). Some of their work was sold by specially-authorized officers of the state. Given that they had more time for their craft, as they were not pressed by market forces, *karkhana* artisans would have tried their best to create masterpieces in order to attract attention, financial rewards and fame. Above all, the artisans were treated well in the *karkhana*, as is made clear in the Dastur-ul-amal, a seventeenth-century manual for officials. It recommended that the *karkhana* superintendent treated the artisans well, so that they felt "attached" to their supervisor "by the ties of

gratitude". It is also stated that lazy, negligent and dishonest employees had to be fined (Sarkar, 1920, p. 50). These working conditions were effective in encouraging artisans to produce their best work, as evidenced by the architectural examples that remain. In other words, the nobles created ideal conditions for the artisans to produce their best-quality work.

### Training of artisans

The importance of the practice and transmission of newly-developed skills was also promoted, alongside production. As such, *karkhana* were also hubs for the provision of artisan training. Akbar recruited many artisans from a number of different countries, and, in particular, recruited from Persia and Central Asia; these artists in turn provided training in different skills to the Indian artisans (Beveridge, 1939). A hierarchy of expertise existed within the *karkhana*: master artisans were at the top with their apprentices subordinate. According to Abu'l Fazl, *chelas* (trainees) were assigned to experienced artisans, so that the master artisans could train them in specific skills (Beveridge, 1939). *Karkhana* thus acted as vocational education centres, for expert artisan training skills (Khan, 2015). The one hundred years of *karkhana* meant rigorous training and constant work, producing many great artisans. Consistent practice would have refined the skills of the artisans, again reflected in the Mughal monuments.

Mughal monuments such as Humayun's Tomb, Fatehpur Sikri, the Taj Mahal, the Red Fort and the Agra Fort, demonstrate several forms of building craftsmanship, broadly grouped into three major material categories: stones, lime and brick. These materials were crafted into several forms to establish new art forms, including stone carving, stone *jaalis* (lattice screens), carved panels, engraved plaster works, frescos, *muqarnas* (ornamented vaulting), stucco and painted surfaces. In the case of each material, different skills were executed by different artisans. The craftsmanship of these three material forms are analysed below.

## Stonework

Looking at the scale of the architectural projects where stone was used as the main construction material, we see that stonemasons played a significant role in Mughal building and construction. They worked with a variety of stones, including quartzite, sandstone, white marble, limestone, slate and black marble, while semi-precious stones were also used for decorative work, such as stone inlaying (Centre for Development of Stones, 2013).

### Categories of stonework

A detailed survey of Mughal monuments reveals that architectural stonework can be divided into four different types:

- **Wall masonry** – The Mughal monuments in Delhi primarily adopted random rubble, ashlar and fine ashlar masonry, using Delhi quartzite stone. Without the use of machines, the hard Delhi quartzite stone was cut into perfect rectangular shapes to be used in fine ashlar masonry, as can be seen at the West Gate to Humayun's Tomb. Unfortunately, no archival records exist to indicate the techniques that were used. Random rubble masonry was employed mainly for the construction of core walls and enclosure walls. In the case of the Red Fort, the Agra Fort, Humayun's Tomb and Fatehpur Sikri, the majority of the walls were clad with red sandstone of various thicknesses, using iron clamps.
- **Structural construction work (other than walls)** – This includes single domes, double domes, flat domes, vaults, deep foundations along rivers, towers, a variety of arches, and underground chambers and tunnels. The core walls and enclosure walls of Humayun's Tomb are made of Quartzite stone, while the domes were clad using white marble and iron clamps.
- **Decorative stonework** – This is used in architectural features, such as stone columns, brackets, beams, ceilings, *jaalis* (lattice screens), *jharokhas* (projected balconies) and carved panels. We see examples of several varieties of design, including simple and complex geometrical patterns, used in *jaalis* in particular,

including exquisite depictions of flowering plants found in dadoes, plinths and panels, and arabesque patterns, together with a number of other forms of motifs as seen in Figure 1.

- **Stone inlay works (*parchin kari*)** – The flowering plants found in dadoes, plinths and panels, and the arabesque patterns and several other forms of motifs, featured simple to complex geometrical patterns, and, for example, hundreds of semi-precious stones in a single flower (Figure 2).

### Categories of stonemason and decorative stoneworkers

Historical records show that stonemasons and decorative stoneworkers were recruited in particular from Gujarat and Rajasthan for major Mughal construction projects, such as Fatehpur Sikri (Rezavi, 2013). Their influence is clearly visible in the carved columns, beams, *jharokhas* and *jaalis*, which were the main features of Rajputana architecture (i.e. a style of architecture which flourished in the Rajputana states of Rajasthan). The execution of these designs appears to have been influenced by the old Sanskrit text, *Rajavallabha*, written by architect-artisan Mandan during Rana Khumbha's reign in the fifteenth century. Stonemasonry and decorative stoneworkers at this time demonstrated an amalgamation of Indian and Persian motifs. According to Abu'l Fazl in the Ain-i-Akbari (volume III of the Akbarnama detailing the administration of Emperor Akbar), stonemasons and decorative stoneworkers were divided into specialised categories, according to their skills and the requirements for different decorative patterns. The different categories of *sangtarash* (stone cutters) are classified as below:

- **Quarry labourers** – The uniformity of the colour of the stones, especially in the case of sedimentary rocks, indicates that the stone was carefully selected from the quarries.
- **Sadabkar (stone planer)** – The quarry stone was first given to the *sadabkar*, who would cut the stone into the required shape. The stones were cut with the help of iron wedges and sledge

hammers. Mughal paintings depict the use of a variety of tools and methods.

- *Naqqash* – A person, considered a specialised worker, who traced floral or geometrical designs onto stone, as required. Originally, *naqqash* were the designers of the decorative stone patterns, which would later have been carved by other stone artists.
- *Stone carvers for decorative works* – *parchinkars* (engravers), *mambatkar* (embossers) and *gultarash* (floral design carvers) were assigned the task of carving intricate designs into marble. The *parchinkar* was held in high esteem, and his work

was considered close to art. He received a fixed salary equal to that of the *yuzbashi* (a commander of a one hundred-man army) (Beveridge, 1939).

#### Stone-inlay works

The Itimad-ud-Daulah Tomb, the Taj Mahal, the Red Fort and the Agra Fort are prime examples of Mughal stone-inlay work, reflecting the artistic tastes of the rulers. Stone-inlay work evolved over many years, from the construction of Humayun's Tomb, to its peak during the construction of the Taj Mahal (Dayalan, 2009; Balasubramaniam, 2009). Voysey, a materials scientist, who carried out a scientific

study on the stones of the Taj Mahal in 1825, noted that “A single flower in the screen around the tombs, or sarcophagi, contains a hundred stones, each cut to the exact shape necessary, and highly polished; and in the interior alone of the building there are several hundred flowers, each containing a like number of stones” (Koch, 2006). He also studied some of the precious and semi-precious stones used in the original inlay works and the processes used. The stones were first cut into pieces of various shapes and sizes, using, for example, a bow saw. The stone



 **Figure 1**  
An example of decorative stonework.

 **Figure 2**  
An example of stone inlay work.

pieces were then inlaid onto marble in such a way that the look of the desired image was obtained using a combination of colours, and the stones were subsequently fixed with glue and polished. The end result was that the joints became invisible. Traditional stone inlay techniques are not in use today; nowadays, stone inlay-skills are mostly used to make small products, using cheap stones.

### Stone jaalis

Original decorative patterns were drawn directly onto the stones, using traditional techniques and mathematical calculations, which were then

carved by artisan stonemasons. Stone *jaalis* were a significant feature of Mughal architecture. They were traditionally categorised by geometrical shapes: for example, a *jaali* utilising a hexagon is called a *chhamaas*; one that employs a pentagon is called a *panchmaas*; and a *jaali* that is based on an octagon is called an *aithmaas*. These basic designs were further utilised to develop more complex designs directly onto the stone. Paper drawings never played an important role in craftsmanship and artisan skills. A detailed study of the original stone *jaalis* and carved panels shows that the artisans drew their intricate patterns directly onto the stone.

## Lime works

Lime was an important building material, used in several forms in Mughal buildings and monuments for:

- structural purposes: lime was used as a binding medium in construction in the preparation of lime mortar;
- plastering: lime was also used for plain lime plastering, often employing different layers, depending upon the type of wall construction;
- plaster finishes: lime was used extensively to create glossy finishes. The Taj Mahal, Akbar's Tomb and the Red Fort demonstrate this technique;
- concrete: lime was sometimes used as a base material for the terracing and flooring of buildings.

Decorative lime works were also an important architectural feature of early Mughal structures: incised plaster work was used for calligraphic inscriptions, floral patterns and arabesque designs on dome ceilings and walls. The ceiling of the entrance chamber to Humayun's Tomb is a prominent example. Lime was also used for stucco and fresco works, such as those visible at the entrance gate to Akbar's Tomb in Agra.

Many different types of lime have been used in Mughal buildings. These have been categorised as: *Gach Shrlin* (sweet limestone),

*Qala'i Sangnin* (*Pathhar ka chuna*), and *Chunab* (*Kankar* lime, i.e. a type of hydraulic lime, which was the most common building lime in India), and were used according to requirements. For example, hydraulic lime mortar was prepared from *kankar* lime, which was mixed with *surkhi* (pulverised brick), *san* (jute fibres), *samgh* (gum) and *sirish-i-kahi* (reed glue) for structural purposes. Mughal miniature paintings depict the process of preparing hydraulic lime mortar, which was done by hand, on flat ground and was used immediately after mixing. Miniature paintings also show the diverse stages of lime mortar preparation, including sieving, the process of preparing brickbats and the manual mixing of lime mortar. Abu'l Fazl also discusses the use of *kankar* lime for plastering, called *astarkari*, prepared using four ingredients, namely: *chuna* (*kankar* lime), *qalai* (*Pathhar ka chuna*), *surkhi* and *san* along with other articles. The *qalai* (lime procured from limestone) was used mainly for *sandalkari* (whitewashing). There is no reference of lime *chakki* (stone wheels), commonly used today for all kinds of lime mortar preparation works in North India. Historical records and miniature paintings show that knowledge of hydraulic lime existed during the sixteenth century, and that the builders of Mughal monuments used it to prepare lime mortar of different compositions for different purposes.

## Monumental Islamic calligraphy

Monumental Islamic calligraphy is one of the most important elements in Mughal architecture (Begley, 1981). This art form can be seen most prominently at the Taj Mahal, the Jami Masjid, Akbar's Tomb and in Fatehpur Sikri. Monumental Islamic calligraphy was carried out on stone inlay, stone carvings, and on painted and incised plaster work. The designs and materials used indicate that two types of professionals were involved in this process: (1) designers and (2) craftsmen (according to the material medium). Islamic calligraphy is the artistic practice of handwriting, mainly on paper. Calligraphers were among the most highly regarded artists in Islamic societies, and their status was based not only on the excellence of their work, but also on the eminence of their teachers. As a result, a literary tradition developed in which the history of calligraphy was conceived as a chain of transmission from master to apprentice, extending over very long periods. Training could take many

years, with a pupil learning to copy exact models, as provided by the teacher. Only when the pupil had thus mastered the principles could he or she – both men and women trained as calligraphers – become a master and begin to create new work. It is said that only the best calligraphers were commissioned to create compositions that could be taken from paper, and executed on other materials such as tile, plaster, and stone. The calligrapher had to take into account the space available, and design the lettering to fill that space, in a well-balanced way, according to the rules for the chosen style of the script. Amanat Khan, who was the calligrapher for the Taj Mahal and Akbar's Tomb, was trained in Shiraz, in Persia. He worked for 20 years as a calligrapher before designing the calligraphy for the Taj Mahal, which took four years. The intricacy of the work and the amount of time required for such high-quality works is apparent from looking at the monument.

## Decline in the *karkhana* system in the colonial period and modern periods

The major decline in the *karkhana* started during the later Mughal period and they ceased to exist during the colonial period particularly following the war in 1857. In 1891, Pandit Kundan Lal, an expert on Indian art with a passion for the subject published a book on *jaalis* (Sachdev, 2003). For him, the regretful decline in the art form was due to the neglect of Indian craftsmanship, art history and theory (*deshi shilpa vidya*) by the British; a lack of opportunity for Indian artisans to showcase their skills, except at a few international exhibitions; a lack of promotion, or use, of modern techniques to advertise Indian products; and the ready availability of machine-made goods on the market. Lal also states that, at times, the craftsmen were reluctant to share their knowledge with others and, in some cases, did not even pass

their skills on to their sons (Sachdev, 2003). The art of calligraphy also gradually declined with the use of the printing press. Many art forms could not sustain themselves without patronage, or without consistent market demand. As architectural forms changed, the artisanship used in Mughal monuments and buildings was no longer in demand. Although several attempts were made by John Lockwood Kipling (father of Rudyard Kipling) to revive Mughal building and construction artisanship, he was unsuccessful in the long term.

Colonial architecture, based on the European architectural education system, began to emerge in India. In the nineteenth century, the Public Works Department (PWD) was established by the British, establishing standards for the building of public buildings, using European architectural systems.

In early PWD specifications, references can be found of the use of lime for general works, which was in itself a deviation from the constructions of the Mughal period. After the introduction of modern construction principles (frame and reinforced cement concrete (RCC) structures), colonial specifications (such as jack arches) became obsolete, as they were no longer applied in practice. It is worth mentioning that the current PWD specifications are applicable to all kinds of building and construction work, as well as to conservation work, although there are no defined guidelines for conservation work. Without guidelines, when it comes to conservation, rate analyses are carried out, based on predefined specifications, compositions, processes and techniques to produce match results. Given the absence of scientifically-proven specifications, conservation professionals and archaeologists face a number of issues when executing conservation work, mainly in working out the appropriate composition of lime mortar for repair works.

Many colonial studies inform us that inlay art declined significantly after the reign of Shah Jahan,

as such intricate work was no longer employed in the construction of monuments, especially after the construction of the Taj Mahal and the Red Fort. Inlay art was later revived by the British, but only for the production of souvenirs, for which it is still practiced today. The *Monograph on Stone Carving*, written in 1906 explains that only between 80 and 100 inlay craftsmen existed during the 1900s, predominantly producing small articles, such as paper weights, chess boards and boxes (Crosthwaite, 1906). The author of this study (with a team of architects and film-makers to document the existing craft skills of stone inlay) recently carried out a sample survey of inlay artists in Tajganj in Agra, which also revealed that the main focus of stone inlay craftsmen was indeed to produce small products. In addition, only a few artists were selected to carry out stone inlay work on modern buildings in small areas on a contract basis. While existing artisans are very skilful, unfortunately modern equipment is now being used instead, leading to a drop in quality in order to fulfil the market demand for small and cheap products.

## Conservation issues: materials and skills

The lack of continuity in the use of traditional materials has also led to a series of technical issues. *Kankar* lime, as mentioned in many historical texts, was the chief binding medium for Mughal monuments and buildings. It was used extensively in a number of parts of northern India. The construction of grand Mughal monuments was only possible as a result of traditional knowledge concerning the hydraulic properties of lime: the deep foundations dug along the Yamuna River would not have been possible with the use of quick lime. Nowadays, non-hydraulic lime is used extensively for all types of conservation work in monuments from north to south. As a result, there have been many examples where conservation using lime in Mughal monuments has failed. Much recent conservational work has not lasted for more than three years, which could be due to the use of the incorrect composition of lime mortars, as the compositions needed for the conservation work

on historical buildings differs significantly from the compositions used today. This demonstrates that the principle of using matching materials for conservation works as contained in the National Policy for Conservation is not being upheld. Stonework has also changed to meet the needs of modern culture. Historical records show that 2 000 stone cutters, 2 000 lime mortar workers and 8 000 labourers worked on the construction of the Agra Fort (sixteenth century), under the reign of Akbar. Similar records were also found for the Taj Mahal, the Red Fort and the Jama Masjid, which demonstrates that, for more than 100 years, thousands of artisans were employed to work on construction sites. These craftsmen worked under the *karkhana* system, where they underwent vigorous training programmes, were presented with a variety of opportunities and patronage, were educated in the transmission of skills for future generations (there was a cultural



doctrine of hereditary transmission), were provided with highly-skilled guidance and supervision, and received admiration and rewards for their work. In contrast, according to a survey carried out in 2007 by the District Industries Centre (DIC) (this programme was started by the central government in 1978. The DIC is a district-level institution, providing all of the necessary services and support facilities for entrepreneurs to set up micro, small and medium enterprises) in Rajasthan, there are only approximately 1 250 masons and stoneworkers, who are listed under 39 groups in different districts (Crosthwaite, 1906). Within these groups, workshops focus primarily on furniture, *jaalis*, stone columns, beams, railings and statues for modern needs. Few workshop groups provide ready-made materials for temple construction. Nowadays artisans mainly use predefined designs, as provided by clients, or pre-existing templates. The practice of using of hand tools has decreased and nearly all of the work

is now carried out using machines. The role of *naqqash* has completely changed.

The quality of modern products is suitable for modern construction, but when we talk about applying modern products and techniques to conservation, we need to ask more questions. Are current techniques or Traditional Knowledge Systems being followed? National conservation policy (Archaeological Survey of India, 2014) says the focus must be on the use of traditional craft skills for conservation works. In this context, can the fluidity of the original lines and shapes, which were originally drawn onto the stones using traditional techniques, be replaced by the straight and defined lines of AutoCAD? Before applying current knowledge of traditional skills to conservation work, an evaluation of the skills and techniques used in the original build, together with the skills and techniques that are currently available is essential to exploring possible knowledge gaps.

## Conclusion

The conservation of these monuments is a complex subject, requiring a multidisciplinary approach to explore the whole process of designing, building, and construction, along with the material and structural deterioration pattern of structures that are more than 350 years old. Although national conservation policy suggests matching materials and techniques for conservation work, no specific, defined process has developed that would prove

successful in practice. Unfortunately, no research or published reference works that document the material specifications and construction techniques for conservation work have been found to date. It is therefore essential to understand the original context, artisanship skills, craftsmanship skills and construction techniques of these masterpieces before undertaking conservation or restoration work.



## References

- Beveridge, H., trans. 1939 (2000). *The Akbarnama of Abu'l-Fazl* (History of the Reign of Akbar including an account of his predecessors), 3 volumes. Calcutta, The Asiatic Society.
- Archaeological Survey of India. 2014. *National Policy for Conservation of the Ancient Monuments, Archaeological sites and remains (NPC-AMASR)* [online]. New Delhi. [Cited 7 June 2019]. <https://asi.nic.in/wp-content/uploads/2018/11/national-conservation-policy-final-April-2014.pdf>
- Balasubramaniam R. 2009. New Insights on Architects of Taj. *Indian Journal of History of Science*, 44(3): 389–410.
- Begley, W. E. 1981. The Symbolic Role of Calligraphy on Three Imperial Mosques of Shah Jahan. In J. Williams, ed. *Kaladarsana: American Studies in the art of India*. Leiden, E.J. Brill.
- Begley W.E. & Desai Z.A. 1989. *Taj Mahal The Illumined Tomb – An Anthology of Seventeenth-Century Mughal and European Documentary Sources*. The Aga Khan Program for Islamic Architecture. Seattle and London, The University of Washington Press.
- Centre for Development of Stones (CDOS). 2013. *The Stone Crafts of Rajasthan: A Manual*. Jaipur, Centre for Development of Stones.
- Crosthwaite, H.S. 1906. *Monograph on Stone Carving in the United Provinces, Allahabad*. Allahabad, the Superintendent, Government Press, United Provinces.
- Dayalan, D. 2009. *The Taj and its Conservation*. Delhi, Abhishek Prakashan.
- Farhat, K. 2014. *The Organization of Artisans in Building Construction: A Case Study of Jaipur*. Aligarh, CAS Department of History, Aligarh Muslim University.
- Khan, Sumbul H. 2015. *Art and Craft Workshops under the Mughals, A Study of Jaipur Karkhanas*. Delhi, Primus Books.
- Koch, E. 2006. *The Complete Taj Mahal and the Riverine Gardens of Agra*. London, Thames and Hudson Ltd.
- Marshall, J. 2006. *Conservation Manual*. Delhi, Caxton Publications.
- Qaisar, Ahsan Jan. 1988. *Building Construction in Mughal India: The evidence from Painting*. Aligarh, Aligarh Muslim University.
- Rezavi, Syed Ali Nadeem. 2013. *Fatehpur Sikri Revisited*. Oxford, Oxford University Press.
- Sachdev, V. 2003. In a Maze of Lines: the theory of designs of Jaalis. *South Asian Studies, The Journal of the British Association for South Asian Studies*, 19(1): 141–155.
- Sarkar, J. 1920. *The Mughal administration*. Calcutta, M.C. Sarkar & Sons.
- Soucek, Priscilla P. 1987. Persian Artists in Mughal India: Influences and Transformations. *Muqarnas* 4: 166–181.
- Vanina, E. 2004. *Urban Crafts and Craftsmen in Medieval India (Thirteenth – Eighteenth Century)*. New Delhi, Munshiram Manoharlal Publishers.
- Verma, T. 1994. *Karkhanas under the Mughals from Akbar to Aurangzeb, a study in economic development*. Delhi, Pragati Publications.



*Angkor Wat, Cambodia by RightSaidFrodo (CC0)/Pixabay.*



◁ CHAPTER 6 ▷

**Khmer water management in  
Cambodia: traditional practices  
and religious associations**

Kou Vet and Robert McCarthy



## Abstract

The Kingdom of Cambodia, along with much of Southeast Asia, has been, and remains, an agricultural-based society, where water is tied to strong religious beliefs and is heavily relied upon for production. From the dawn of the Khmer Empire, water management has manifested itself as a practical application of the power of the king and the ruling classes, while at the same time sustaining Hindu and Buddhist religious rituals. The water supply management system comprised a series of structures, based on usage, each of which played a significant role in the daily secular and religious life of the Angkor population. After much research the true nature and extent of the water management system is now better understood. The Authority for the Protection and Management of Angkor and the Region of Siem Reap (APSARA National Authority) has, after careful consideration, undertaken initiatives to restore at least a portion of the ancient water system to benefit temple and landscape preservation, and to restore the religious associations that form the basis of Khmer cultural heritage. The present paper examines the traditional water management system of Angkor, focusing on its water network development, water supply, and water-use, all in relation to the religious traditions and beliefs of the local community. The actions that have been taken for the conservation and management of the system over the course of history are also discussed. This paper concludes with the current challenges and actions for the management of the system.

## Introduction

The Kingdom of Cambodia is an agricultural-based country in Southeast Asia, with strong religious beliefs. The water management system has been of utmost importance for Cambodia since the pre-Angkor period. The kings presiding over the foundation and continuation of the kingdom, based their authority, at least in part, on the management of water resources. Prosperity of agriculture, and aggressive kingship were the keys to the development of the unique, centrally-governed Khmer civilisation. The retention and distribution of water, as well as the ability, during flooding, to disperse water to Tonle Sap Lake, was of paramount importance, as it intertwined religion, defence, and economics into the fabric of daily life, as far back as a rudimentary water network in Angkor Borei, and the formalised establishment of canals, dykes, weirs, and basins in Sambor Prei Kuk in the late sixth and early seventh century (a map showing Great Angkor can be found in Fletcher *et al.*, 2008, p. 58, and a map showing the water system around Angkor can be found at Aymonier, 1901, vol.III, p. 400). This tradition of water management and distribution extends to the current fabric of Khmer life. When looking at the importance of water to the Southeast Asian countries of Thailand, Viet Nam, Laos, and Cambodia, one must look to the annual monsoon rains, the Mekong River, and localised water management features.

Ancient and modern Cambodian water-based assets are varied. The system of water management was complicated, multifunctional and encompassed a wide range of features that have different functions within the management system, which, in some cases, are difficult to detect. As early as 1901, a hydraulic system was recognised by the French explorer Aymonier (1901).

Some recent research has resolved two major puzzles. First, what kind of city was Angkor? And second, what was the function (or what were the

functions) of the large water reservoirs, called barays (an artificial reservoir which has not been excavated, but in which water is contained by man-made dykes), with their millions of cubic metres of water? In 1979, the brilliant French archaeologist Bernard Philippe Groslier, suggested that Angkor was a “hydraulic city”, in which the reservoirs provided water that was used to irrigate rice fields during the dry season. He calculated that, as a result, up to two million people could have lived in Angkor. This claim aroused spirited opposition from some geographers, who considered that the barays were used only for rituals, but excavations by archaeologists from the University of Sydney’s Greater Angkor Project (GAP) and the École Française d’Extrême-Orient (EFEO) have shown that, at least in part, Groslier was right: water was collected and distributed in large quantities to support a year-round cultivation of rice (Coe *et al.*, 2011, p. 14).

Water was a source of both economic and political strength, with power generally vested in the king.

Such public works took a great deal of effort to maintain, and, at the same time, they provided a great deal of political power, not only for the king, but also for the persons in charge of water distribution. One consequence of the delegation of water management to officials in provinces outside the central administration of the capital city of Angkor was the gradual deterioration of royal power in the early thirteenth century. While the local population looked to the local ruler and officials to provide water management facilities – to a politically and economically powerful individual for example – smaller potentates further away from the capital city often lacked the resources to perform major repairs and therefore neglected the water system. This was possibly one reason, in addition to drought and conflict, for the decline of the Khmer civilisation (Dumarçay, 2003, pp. 46–63).



## Water management network

The water management network in Angkor was developed in stages, as the population and economic demands on the land increased. Six major stages of development were identified by the Greater Angkor Project (Fletcher *et al.*, 2008, p. 60):

- Roluos network (eighth – ninth centuries)
- East Baray addition (late ninth century)
- West Baray addition (eleventh century)
- Angkor Wat addition (early- to mid-twelfth century)
- Jayatataka addition (late twelfth century)
- Siem Reap river/canal addition (late thirteenth century?).

## Water use

### Household ponds

Historically, both the royal city and the rural areas had a large number of household ponds. In *The Customs of Cambodia*, written by Zhou Daquan, a member of a Chinese delegation, who was sent to Angkor by Timur Khan, the grandson and successor of Kublai, described several topics such as the Cambodian religion, justice system, kingship, agriculture, vegetables, bathing customs, and slaves. He visited the royal capital of Yashodharapura (present day Angkor Thom) in 1296–1297. The section on bathing contains a passage that mentions “a custom of bathing several times a day” and describes how “each house necessarily had a pond, or if not, two to three homes shared a pond”. It was also noted that “women inside the city go outside the city once in every three to four days or five to six days to bathe in the river”. Women therefore frequented the Siem Reap River that flows to the east of Angkor Thom (Chou Ta-Kuan, 1992, p. 69). From these passages, it can be assumed that each house needed a number of ponds to collect water for household use. The majority of the ponds in rural areas collected rainwater. However, in the case of Angkor Thom, water came not only from

rain, but also the diversion of water from the Siem Reap River. The ponds would have been sufficient for rudimentary personal needs, but insufficient for the large-scale agrarian/economic requirements of the kingdom. No evidence of religious significance has been identified with these personal ponds although private religious observance may have occurred.

### Religious ponds and moats

Great religious significance has generally been attached to ponds that are within sacred precincts, and moats that surround religious temples (*prasat*). While religious cleansing and the storage of holy water have been attributed to these ponds, the moats carry a different connotation. Moats are said to delineate a sacred space, and separate it from the common space, and are representative of the cosmic ocean surrounding Mount Meru, prominent in Hindu, Jain, and Buddhist cosmology. The religious aspects of some of the water features will be explained below. Moats were not generally seen as defensive barriers, although there may be a duality of function, as in the case of the moat and accompanying ramparts of Angkor Thom.

## Water supply

There are extensive aquifers – geological formations of permeable rock – which are able to hold or transmit water underground, normally found on the slopes of mountainous areas, such as the Dângrêk mountains, bordering Thailand and Cambodia, and more localised areas, such as Mount Kulen, adjacent to the World Heritage Site of Angkor Archaeological Park. These aquifers provide well water but are insufficient to support agriculture. Additionally, the Tonle Sap, or the Great Lake (Figure 1), the largest fresh water lake in Asia, fed primarily by the reverse flow of the Mekong River during the peak flow season, as well as water from the Tonle Sap River, fills Tonle Sap Lake. Minor rivers and streams supplement its volume during the rainy season, but not significantly. The lake is a consummate source of water for fish and aquatic products, agriculture, personal hygiene and transportation, and the area's

water catchment management skills (catching, storing, and distributing/dispersing water), were the reason for the expansion of the empire, as they brought greater economic and social prosperity. This know-how remains significant for the region's agriculture today.

### Flowing water management: the catchment

There are two methods of water catchment in Cambodia used for agriculture, and in some cases also for religious, hygienic, and defensive purposes. There are naturally occurring depressed formations, such as flood plains, and also catchment areas that are man-made. The constructed catchment areas have five basic variations: (i) water retained within dykes constructed at ground level, known as barays; (ii) water retained within dykes



**Figure 1**

A view of Tonle Sap or the Great Lake.





in which a shallow depression was excavated (modified barays), generally indistinguishable from a baray; (iii) water retained in an excavated area, reservoir, pond, canals, or moat, without the employment of dykes, and, generally, in the case of a moat, with the surrounding soil retained by laterite or sandstone-stepped embankments; (iv) dams constructed across depressions, accumulating water behind the dam area for either storage or distribution; and (v) dams used in conjunction with laterite bridges across rivers. While these are the five basic sets of water catchment, variations are possible.

Essentially, the purpose of the barays, dykes, canals and dams were to hold and supplement the annual flood waters for agriculture, should the flood waters be insufficient. In spite of what is believed to be their main purpose, other religious and secular uses were developed. The success or failure of barays has significant economic and political implications for farmers and royalty alike.

The origin of the system of barays is difficult to determine, but archaeological surveys have shown that the baray has always had at least three rudimentary elements: (i) a raised dyke ensuring the retention of water; (ii) an aqueduct bringing water into the confined area; and (iii) a parallel canal outside the dyke for water distribution. The three baray components, in conjunction with the natural rivers, diverted river channels, subsidiary canals, and raised dykes along topographical boundaries, formed the Khmer water management system.

Some of the first sophisticated water management systems appeared in Sambor Prei Kuk, around the late sixth and early seventh century. However, a rudimentary example of the system can be seen in Angkor Borei. A reservoir of the southern baray at Vat Phou in present-day Laos was built at the end of the eighth century. It was only later, in the Angkor region, with the beginnings of a more centralised Khmer state administration, that irrigation assumed its full importance. From the eighth century, the Khmers began to develop the Mount Kulen area, particularly on the slopes of the mountain. Probably under Javanese, or potentially under Indian or even Sambor Prei Kuk historical influence, rivers were dammed to form reservoirs in natural basins, and canals

were created employing the flow of gravity to irrigate the rice fields below the dam (Dumarçay, 2003, p. 47). In subsequent periods, the baray was constructed on the gentle plains adjacent to Mount Kulen, and Mount Kulen's city centre was largely abandoned, but the river water features retained their religious significance. When the Cambodian people established themselves in the Angkor region below Mount Kulen, they knew how to create an irrigation system by diverting a river, but on the gentle hills and in the Siem Reap plain, where the rivers have a relatively modest flow, a 0.1 percent grade, and do not adapt well to diversion, they adopted a different strategy.

A recent survey on water management in Angkor carried out by l'École Française d'Extrême-Orient (EFEO) and the Great Angkor Project of the University of Sydney, in collaboration with the APSARA National Authority, clarified that the group of Angkor temples lay at the centre of a dispersed, low-density urban complex of approximately 1 000 square kilometres, containing a vast, linear network of embankments and channels. In the region of Angkor, the rivers flow from the northeast and southwest, and can, primarily, be classified into five components, as follows (Fletcher *et al.*, 2008a, pp. 57–66):

- East-West embankments trapping the water flow from the north and northeast;
- North-South channels delivering water to the baray;
- the baray and the large temple moats;
- embankments;
- channels oriented from northwest to southeast that could distribute water back from west to east, across the natural slope of the land; and channels oriented towards the southwest, which could dispose of water quickly in the Tonle Sap Lake. The later major channels, such as the Angkor Wat canal and the canal that pre-dated the current Siem Reap River also dispose of water in Tonle Sap Lake (Fletcher *et al.*, 2008, p. 57).

The vast water management network seen in Angkor developed, over time, into three main sectors, encompassing the five components above: (i) a northern zone, where water was dispersed across the landscape and its flow rate



could be reduced; (ii) a central zone around the temples, where water was held in the baray; and (iii) a southern zone between the centre of Angkor and Tonle Sap Lake, where water was either disposed of rapidly to the lake or distributed slowly from west to east across the slope of the landscape (Evans and Kummu, 2003, pp. 1–11). An understanding of topography, and the utilisation of each zone, with its man-made features, was paramount to making the system a success.

Their size, and the complexity of planning and design to ensure maximum water catchment, meant that the construction and daily maintenance of the barays and their ancillary features required extensive and prolonged employment of labour. The coordination of the labour force required strong management that could have come only from the powerful administration of the king. The king, seen as a god, was responsible for the well-being of his subjects, and it is likely that, through his advisers, he devised schemes to ensure prosperity, though the production of sufficient surplus, beyond the

subsistence of the farmers, to provide trade goods, and feed a standing army and royal entourage. It is thought that kings employed the *corvée* labour system, whereby vassals of the king were required to perform unpaid labour for the crown for a certain period of time, to dig and maintain the barays, or water reservoirs, to store the water during the dry season, as well as other tasks.

There are several large reservoirs, or barays, still extant at the Angkor archaeological site and other sites in Cambodia. These barays were built in different periods, for instance, Indratataka (3 800 x 800 metres) in the region of Angkor, was built during the reign of Indravarman I (reigned 877–c. 889) to provide water for the irrigation system of Hariharalaya City (ninth century), which is present-day Roluos, Siem Reap province (APSARA, 1996, p. 43). This baray is dry during the



**Figure 2**

A view of West Baray, the eleventh century reservoir with its size 7.8 km long by 2.1 km wide.



dry season, but, to this day, is used for rice cultivation during the rainy season. Another large reservoir, called Yashodharatataka, or the East Baray (7 500 x 1 800 metres and capable of holding 55 million cubic metres of water), in the region of Angkor, was built during the reign of Yashovarman I (reigned 889–c. 915), by the son of Indravarman I, to provide water for the irrigation system in Yashodharapura City (tenth century) (Jacques and Freeman, 1997, p. 83). Today, the East Baray contains no water in the dry season, but the farmers till crops on its bed during the rainy season. The West Baray (8 000 x 2 200 metres, and capable of holding 123 million cubic metres of water) (Figure 2), in the region of Angkor, is said to have been built during the reign of King Suryavarman I (reigned 1002–1049) and King Udayadityavarman II (reigned 1050–1066), to serve as the water supply for the irrigation system of Yasodharapura City (eleventh century) (Jacques and Freeman, 1997, p. 134; Coedès, 1968, p. 138). Jayatataka Baray, believed to have been partially renovated by Jayavarman VII (reigned 1181–c. 1220), is 900 x 3 500 metres, and

lies directly west of the Temple of Preah Khan; it is estimated to hold 8.7 million cubic metres of water (Freeman and Jacques, 2003, p. 171; Coedès, 1941).

Approximately 90 kilometres to the northeast of Angkor City, there was a large tenth century reservoir at Koh Ker, called Baray Rahal, built during the reign of Jayavarman IV (reigned c. 928–c. 941), to provide the water supply for Lingapura City. There is a baray at Beng Mealia, approximately 45 kilometres south of Koh Ker. In the northwestern part of the region of Angkor, there is a temple complex called Banteay Chhmar. In the eastern section of the main temple city, there is a large reservoir or baray (1 600 x 800 metres), built during the (early) reign of Jayavarman VII, to serve as a catchment for water for the irrigation system of the city (Sharrock, 2015, p. 48). Currently, local people use this baray, as it was once used originally, as a water source to cultivate rice during both the rainy and dry seasons. The water catchment management at Koh Ker, and Banteay Chhmar each employ slightly different techniques, and rely primarily on surface water accumulation being channelled to dyke-enclosed depressions.

## Water and religion

The ability to manage water was and is integrated with the management of sacred spaces, namely monuments, associated structures, and rituals both in the past and present. However, religious aspects should not be viewed as the primary function of water management networks.

Each of the barays within the Khmer Empire, whether large or small, was dedicated to a god, and was generally constructed with a religious monument in the centre, although most have disappeared.

In the case of the East Baray, the East Mebon (East Island Temple) was dedicated to the divinity Rajendresvara, with a tenth century stele, an upright slab of stone, inscribed in Sanskrit with a poem, declaring the baray to be under the protection of Ganga, the goddess of the River Ganges in India. The West Baray had a shrine at its centre, built by Udayadityavarman II,

with the addition of a large bronze image of Vishnu. The shrine, in the centre of Jayatataka, called Neak Pean, is unique in that it may represent the sacred Himalayan Anavatapta (sacred lake at the centre of the world) in the Hindu tradition. Later, the thirteenth century stele inscription of Preah Khan of Angkor, with an inscription found in front of the western Gopura I of Preah Khan main temple complex of Angkor (Coedès, 1941, pp. 255–301), gave it the Buddhist name *Rajysari*, meaning the fortune of the Kingdom. The Chinese diplomat, Zhou Daquan, described the shrine in *The Customs of Cambodia* as follows:

The Northern Lake lies one and a quarter miles to the north of the Walled City. At the centre stands a square tower of old with several dozen stone rooms. If you are looking for gold lions, bronze elephants, bronze



} oxen, bronze horses, here is where you will find them.  
 } (Chou Ta-Kuan, 1992, p. 3)

Water in Khmer mythology can be seen in a variety of ways, but particularly in relation to the gods who were worshipped.

The god Indra was of the first rank in Vedic times but declined in status in later mythology. From the king of the gods, he became the lord of the atmosphere, governing the weather and dispensing rain water (Roveda, 2005, p. 177).

Naga is the serpent-god of the water, living underground or in water. From early times, Naga was the mythological protagonist of the legend of the origin of the Khmer people, when an Indian Brahmin married a Naga princess by the name of Soma, thus founding the first local royal dynasty. The Naga is the guardian of the treasures of the earth, keeper of the energy stored in water, and the one who safeguards the prosperity of the region, traditionally linked with abundant water resources. In Buddhist mythology, the king of the Nagas, Muchalinda, saved and protected the Buddha from drowning, thus becoming a powerful symbol. The image of Buddha sitting in meditation on the coils of the Naga, protected at the back and over his head by the seven-headed hood of Muchalinda is one of the most venerated Khmer Buddhist icons (Roveda, 2005, p. 212).

In the region of Angkor, Kbal Spean on Mount Kulen, or Mahendra Paravata in the Sanskrit language, was considered as the Himalaya, and the Siem Reap River was considered as the Ganga River. Angkor became the centre of an empire based on a water system where people could grow a surplus of rice and food crops, and where they built huge temples.

Darryl Leon Collins has stated that an ancient inscription from Bat Chum Temple (Coedès, 1908, pp. 213–254) ascribes sanctity to the waters of the Siem Reap River:

} With the exception of the sacrificial priest, no-one may  
 } bathe in the waters (contrary to the chronicles of Zhou  
 } Daquan) [...] born at the summit of the holy mountain  
 } of Mahendra. (Collins, 2006, p. 87)

An eleventh century inscription at Kbal Spean (Jacques, 1999, pp. 357–364) describes it as the

“torrent of Rudra, river of Siva, this Ganga”, and also references the legendary ruler Preah Thong, who was cured of leprosy by the holy waters of the Siem Reap River, identifying him with the equally legendary Khmer Leper King (Sdach Kamlong) (Collins, 2006, p. 87). At Kbal Spean River, on Mount Kulen, there are many sculptures representing Shiva, Brahma, Vishnu, linga and yoni. Water flows from Mount Kulen across the linga and yoni, carved into the base rock of the riverbed at the headwaters, then onto the Siem Reap Canal River and ultimately to Tonle Sap Lake. In Khmer, the water that flows from Mount Kulen is believed to be sacred water that can wash away sins as well as fertilise crops. Even today, people come from all over the kingdom to bathe in the water, or take water back to their homes to wash away ills.

The reservoir, or baray, represented the ocean surrounding the home of the gods (Higham, 2001, p. 12). The stele inscription of Preah Khan (Coedès, 1941, pp. 255–301), an upright inscribed stone slab associated with the consecration of a temple, states that “Holy Jayasri (Preah Khan) was like a beautiful braid [on the head] of the king’s radiant bride, who is the Earth herself; a braid in which the hair is perfectly arranged and plaited together, and which is highlighted with stones, gold, and garlands. In that braid (Preah Khan), this king, lord of earth, has placed the mirror of the Jayatataka (Victory Lake), abounding in beauty”. With this verse, we move from the small qualities of water required for bathing individual images (the theme of verses 166 and 167) to the great source of holy water provided by Jayavarman in the form of his Preah Khan Lake, Jayatataka. Marriage of the king to the earth is an ancient concept: the king is he who masters the earth, conceived as a beautiful woman. The Temple of Preah Khan is compared to a braid in the hair of the earth-goddess who has been beautified for her wedding to the king (*avanidra*, lord of the earth), Jayavarman. In this braid on the head of his bride (*mahisi*, his first wife) he places a mirror-like (*adarsa*) ornament, which is Victory Lake (Jayatataka), seen as the finishing touch, which perfects her radiant beauty. Through the completion of this temple and its lake, the marriage is consummated and Jayavarman truly becomes king over his own



domain. Yet the blood imagery is never far away, as the next verse shows (Maxwell, 2007, p. 100). Maxwell explained that far out in Jayatataka Lake, there is an island with an artificial pond filled with a single body of water, taken from sacred bathing places. The island washes away the mud of sin from those who make contact with it; it is a boat for crossing beyond the ocean of worldly existences. In the same stele inscription of Preah Khan, this stanza concludes the treatment of the theme of holy water, introduced in verse 166. Rajyasrī is the island in the Jayatataka on which the Temple of Neak Pean stands, surrounded by its moat and sacred pools. The theme of salvation which begins here is continued in the next two verses (Rajyasrī Island is “a boat for crossing the ocean of worldly existences”, and, in verse 172, Jayavarman prays that the enlightenment of his father might result in “all creatures crossing the ocean of worldly existences”). The likening of Rajyasrī to the boat of salvation implies that the Jayatataka is compared

to the *bhavāvḍhi*, the ocean of existences, and therefore that the pilgrims’ crossing from the eastern quay at Preah Khan to Neak Pean was regarded as a metaphor for escape from the cycles of rebirth. Verse 172 then extends the symbolism, by suggesting that the return crossing, back to the entrance of Preah Khan, was seen in the same light, since Jayavarman’s enlightened father was enshrined there as Avalokiteśvara (Maxwell, 2007, pp. 101–102).

Angkor Wat enables the Khmer to give full expression to religious symbolism. Michael Freeman and Claude Jacques (Freeman and Jacques, 2003, p. 47) have stated that Angkor Wat, above all else, is a microcosm of the Hindu universe. The moat represents the mythical ocean surrounding the earth, and the successive concentric galleries represent the mountain ranges that surround Mount Meru, the home of the gods. The towers representing the ascent to the central shrine are a fairly convincing imitation of climbing a real mountain.

## Water conservation and management in the past

After the defeat of the Cham in about 1200, Jayavarman VII realised that the system was in a poor condition after years of neglect due to war. He found that the rivers along the royal road, as well as other select rivers, could be bridged and used as water management tools, along with the natural topography and the existing dykes, canals and reservoirs, despite being in a state of disrepair. In some ways, this demonstrated a reversion to the use of some of the water management facility concepts first initiated on Mount Kulen in the eighth century such as holding and diverting water with dams, and natural catchments. It must be assumed that extensive restoration work was carried out on existing barays and water management structures, alongside permanent bridge-building.

While the technique of water management was used extensively in the Angkor area, the same can be said to a lesser extent for the kingdom as a whole. The many bridges, which were built to serve as water retainers, much like dams, were sometimes very large. The bridge at Spean Praptos,

near Kampong Kdei, for instance, had a span of 87 metres, and the banks were covered with laterite for over a distance of 130 metres. Another bridge, called Spean Tip, in Udon Meanchey province is about 150 metres long.

When the capital was moved south in the sixteenth century, to the current capital of Phnom Penh, it became impossible for the central government to maintain irrigation works. As the water became stagnant, it could have become a breeding place for malarial mosquitoes, further depleting the population in a downward spiral (Chandler, 2003, p. 76). The demise of the system most likely began in the early fourteenth century with the last of the Angkor kings. When the water management network no longer functioned, the temples flooded and agricultural assets were destroyed with greater and long-term consequences. The once important watersheds of the Roluos River in the south of the Kulen Hills, the Siem Reap River in the centre, and the Puok River to the west of the Siem Reap River, and

their associated canals and barays, became silted, and unusable. The study of the hydraulic network route in Angkor Park by Dr Hang Peou, Deputy Director General of the APSARA Authority, noted that the largest flow of water comes from Phnom

Kulen during heavy rains, and flows into the Siem Reap River towards the city, flooding the Angkor site and Siem Reap City (Hang, 2012, p. 124). Not enough was known about the network to take action until recently.

## Water conservation and management today

Based on the early research by EFEO and current research by the Greater Angkor Project, there has been a realisation that the ancient water management network was both extensive and complex, and that the restoration of that network has implications that are economic, and, in some cases, religious. Improvements in agricultural output at a time of drought, and in disbursing water during flooding, will lead to more regulated economic growth. Repair of the network may renew old religious traditions and beliefs. Furthermore, the renovation of the water management network will have beneficial consequences for the protection of monuments and restoration of the environment. APSARA has suggested three alternatives: (i) revive the former system (barays and channels) and reopen the original inlet canals; (ii) create new

settling ponds (barays) and utilise existing canals; and (iii) modify the existing structures (Hang, 2010, pp. 117–119). These are all complex, and could be expensive, and could also displace the farmers who currently use the land. Additionally, alternatives (ii) and (iii) have the potential of altering or destroying the authenticity of the features (barays, canals and dykes) that currently exist in the Angkor Archaeological Park. The APSARA National Authority has begun to restore some of the basic functionality of the system in the central zone of the barays, moats and canals in response to several flooding incidents. However, this may be insufficient when the individual monument drainage systems and northern and southern zones remain in disrepair. Further careful planning and action are required.

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## References

- APSARA. 1996. *Royaume du Cambodge*, Autorité pour la Protection du Site et l'Aménagement de la Région d'Angkor. *Angkor passé, présent et avenir*. UNESCO et Programme des Nations Unies pour le Développement, Agence Suédoise pour le Développement International.
- Aymonier, E. 1901. Leroux, E., ed. *Le Cambodge*, Paris, II-Les Provinces Siamoises.
- Chandler, D. 2003. *A History of Cambodia*. Third Edition. Thailand, Silk Worm Books.
- Chou Ta-Kuan (Zhou Daquan). 1992. *The Customs of Cambodia*, trans. Paul Pelliot French to English. Original in Chinese. Bangkok, The Siam Society.
- Coe, M.D., Cunin, O., Jacques, C., Pottier, C., Rooney, D.F. & Stubbs, J.H. 2011. *Preah Khan Monastic Complex, Angkor, Cambodia*. New York, World Monuments Fund.
- Coedès, G. 1908. Les Inscriptions de Bat Chum. *Journal Asiatique*, 10: 213–254.
- Coedès, G. 1941. La stele de Prah Khan d'Angkor, *Bulletin de l'Ecole Française d'Extrême-Orient*, XLI.
- Coedès, G. 1968. Vella, W.F. ed. Brown Cowing, S. trans. *The Indianized States of Southeast Asia*. An East-West Center Book. Honolulu, The University Press of Hawaii.
- Collins, Darryl Leon. 2006. Siem Reap: Then and Now, Udaya. *Journal of Khmer Studies*, 7: 73–99.
- Dumarçay, J. 2003. Smithies, M., ed., trans. *Architecture and Its Models in South-East Asia*, The Baray and Collective Intelligence. Bangkok, Orchid Press.
- Evans, D., & Kummu, M. 2003. Modelling Cultural and Natural Hydrology Using Radar Imaging at Angkor. 16–19 September 2003, Three Gorges Dam, China, Paper presented at the ICGRHWE conference.
- Fletcher, R., Pottier, C., Evans, D., & Kummu, M. 2008. *The Development of the Water Management System of Angkor: A Provisional Model*, IPPA Bulletin 28.
- Fletcher, R., Penny, D., Evans, D., Pottier, C., Barbetti, M., Kummu, M., Lustig, T., & APSARA. 2008a. The water management network of Angkor, Cambodia. *Antiquity* 82.
- Freeman, M. & Jacques, C. 2003. *Ancient Angkor*. Bangkok, Thailand, River Books.
- Hang, P. 2010. Reflooding of Angkor Thom moat 19th Technical Session ICC (International Coordinating Committee for the Safeguarding and Development of the Historical Site of Angkor) Report, APSARA National Authority 8–9 June 2010; ICC publication.
- Hang, P. 2012. Hydraulic circuit of Angkor. 21st Technical Session ICC (International Coordinating Committee for the Safeguarding and Development of the Historical Site of Angkor) Report, APSARA National Authority 6–7 June 2012; ICC publication.
- Higham, C. 2001. *The Civilization of Angkor*. London, Weidenfeld & Nicolson.
- Jacques, C. 1999. Les Inscriptions du Phnom Kbal Spean. *Bulletin de l'Ecole Française d'Extrême-Orient*, 86: 357–364.
- Jacques, C. & Freeman, M. 1997. *Angkor Cities and Temples*. Bangkok, River Books.
- Maxwell, T. S. 2007. The Stele Inscription of Preah Khan, Angkor, Udaya. *Journal of Khmer Studies* 8: 1–110.
- Roveda, V. 2005. *Images of the Gods, Khmer mythology in Cambodia, Thailand and Laos*. Bangkok, River Books.
- Sharrock, P. 2015. *Banteay Chhmar: Garrison-Temple of the Khmer Empire*. Bangkok, River Books.



◁ CHAPTER 7 ▷

**The management systems  
of the Wudang Mountains  
in China as a Taoist site and  
as a World Heritage Site:  
origins and adaptability**

Lyu Zhou



### Abstract

This paper will discuss the significance and the management systems of the Wudang Mountains, initially as a World Heritage Site, and subsequently as a Taoist site. An attempt is made to adapt the site's Traditional Management System to the modern system, in line with the development of a living heritage approach, tourism management and respect for the carrying capacity of the site. This paper will also place the site's Traditional Management System in the context of broader developments at a national level, with the revision of the *Principles for the Conservation of Heritage Sites in China* and also at an international level, in relation to the concepts of Outstanding Universal Value, authenticity and integrity.

## The significance and management of the Wudang Mountains as a World Heritage Site

The Ancient Building Complex in the Wudang Mountains (henceforth cited as the Wudang Mountains) was nominated as a World Heritage Site in 1994, and was added to the World Heritage List on the basis of the following criteria (UNESCO World Heritage Centre, 2017):

Criterion (i): The ancient buildings in the Wudang Mountains represent the highest standards in Chinese art and architecture over a period of nearly one thousand years.

Criterion (ii): The Wudang buildings exercised an enormous influence on the development of religious and public art and architecture in China.

Criterion (vi): The religious complex in the Wudang Mountains was the centre of Taoism, one of the major eastern religions and one which played a profound role in the development of belief and philosophy in the region.

These criteria are quite different from the criteria employed today, in particular, criterion (ii). In 1994, when judging the World Heritage nomination of the Wudang Mountains, much weight was given to its architectural significance and its relationship with the Chinese traditional religion of Taoism (UNESCO World Heritage Centre, 1994). The Wudang Mountains are one of the most important spiritual landscapes of Chinese traditional martial arts kung fu, which is a key part of Taoist practice. For this reason, Wudang also became a training place for young people, and

remains so today. The Wudang Mountains also constitute a highly significant cultural landscape. Structured in accordance with traditional Chinese feng shui concepts, Taoism shrines have a special relationship with the surrounding mountains and rivers. Since the Ming Dynasty (1368–1644), with the development of Taoism in the Wudang region, there has also been a growth in the number of people living a Taoist way of daily life. Therefore, it is not only important historic buildings extant at Wudang, but also a special way of life and cultural traditions. Wudang is living heritage.

The Wudang Mountains were added to the World Heritage List in 1994. The proposed management rules submitted to the World Heritage Centre and the World Heritage Committee stated that, as the Wudang Mountains are world heritage, different levels of Chinese government must bear the responsibility for the management of the site, in accordance with the heritage protection system in China. The Wudang Mountain Special Administrative Region was declared responsible for the conservation of the World Heritage Site. Additionally, under the Wudang Mountain Special Administrative Region, the Cultural Relics Bureau is responsible for routine maintenance and management. The Wudang Mountains Taoism Association participates in the protection of palaces and temples. It is noteworthy that, given that the Wudang Mountains are a significant religious site, where many religious activities take place, the current conflict between government administrative departments and religious groups is affecting the preservation of the site.

## Taoism and the Wudang Mountains

Taoism is a traditional religion, born and developed in China. It is one of the three religions in Chinese culture, along with Confucianism and Buddhism.

Confucianism focuses on etiquette and on beautifying the country; Buddhism has a unique logic, centered on the consciousness of the world;



and Taoism has Chinese origins and thus a stronger Chinese character. The complex pantheistic system of Taoism inherited the traditional Chinese concept of animism. The integration of Taoism into people's daily lives affected, to some extent, the development of Buddhism in China. Indeed, some supernatural beings within Taoism even transform into the Buddha, Bodhisattvas and the Buddhist heavenly kings, adding distinctly Chinese features to the Buddhist culture. Taoism entered maturity during the Han Dynasty (206 BCE–280 CE) in China, at a time when Buddhism was already widespread in China. Taoism and Buddhism continue to compete and blend with each other. Directed by traditional Taoism, which advocates polytheism, Chinese people have often mixed the two religions, creating a complex immortal world and a heterogeneous belief system.

Furthermore, the *Tao Te Ching*, the works of ancient Chinese philosopher Lao Tzu, are a classic in Taoism. This work, emphasising effortless action, stillness and openness, has shaped the traditional Chinese view of the world. In Taoism, the Tao (the way) incorporates the fundamental and complex rules of the growth and evolution of all things on the earth: a seemingly simple holistic concept. Tao is not only a unique way to understand the world, but also a method to master and control the development and changes of the world. Intellectuals can keep their inner world intact in a changing and broken world by fully understanding the core essence of Tao. Non-intellectuals can use the magic figures or incantations of Taoism to help avoid misfortune and receive benefit in the face of uncontrollable social change. Taoism is thus widespread throughout China, as it is useful for people of different social and educational strata. Furthermore, Taoism contains a rich theory, full of respect for nature, yin and yang and the Five Elements, and feng shui. Practices and intervention have been developed to prolong life and to avoid disasters. Alchemy has been developed in the search for eternal life. Navigation skills have been developed to find the immortal world. Studies of magic figures, incantations and related magic arts have been formed to avoid disasters. Martial arts such as kung fu, are practised for a healthy life, and, as a result, the Wudang Mountains, as Taoist

sacred mountains, have also become a holy land for Chinese martial arts.

Taoism has undergone several phases during the course of its development. In around 400 BCE, the state of Qin was in the Spring and Autumn period and a Warring States period. It was a time when Chinese philosophy and ideas developed, such as the philosophies of Lao Tze, Zhuangzi, yi-ology, and the Yin-Yang School, which laid the foundation for Taoism. The Wudoumi sect (Tianshi Taoist) and the Taiping sect, which developed during the second century CE, marked the formation of Taoism. From the third to fourth centuries CE, during the Wei and Jin Dynasties in China, the Huangdi and Lao Tzu Schools were popular within society, fostering the development of Taoism, together with metaphysics, another prevailing philosophy. There was also a trend within society of people taking pills for the purposes of longevity, and alchemy became an important aspect of Taoism. During the fifth century CE, under the Northern and Southern Dynasty, Taoism grew further, as a result of the reform efforts by Kou Qianzhi and Lu Xiuqing. Taoism thrived from the sixth century CE until the twelfth century CE. During the early years of the Tang Dynasty (618–907 CE), Emperor Gaozu issued an Imperial Edict, ranking the religions in China: Taoism was to come first, followed by Buddhism. Taoism also gained the support of the Emperor of the Northern Song Dynasty (960–1127). The Zhengyi sect was one of most important sects in Taoism. In the twelfth century, Wang Chongyang established Quanzhen Taoism, which developed greatly in the Yuan Dynasty (1271–1368). By the end of the fourteenth century, the newly established Ming Dynasty exerted strict control on Taoism, positively pushing its development forwards. A special office dedicated to the management and oversight of Taoism was established. Quanzhen Taoism and Zhengyi Taoism became the two main sects of Taoism. During the eighteenth century, Taoism receded because the Qing Dynasty (1644–1912) favoured Tibetan Buddhism. Taoism has survived in the twentieth and twenty-first centuries, but it has lost its former influence.

Taoism is practised in a palace or a temple, depending on the scale of the building.

Management positions have been established, for example: manager of social affairs, manager of the dormitory, warehouseman, manager of financial affairs, scripture hall teacher, dining hall supervisor, and supervisor of pilgrims. Given the significance of the task, it was the duty of an abbot to oversee construction of a new building, or the repair of palace and temple halls.

The Wudang Mountains are one of the most sacred Taoist sites in China (Lu n.d.; Ren n.d.). Legend holds that it was at the Wudang Mountains that Yin Xi, who invited Lao Tze to write the *Tao Te Ching* in around 400 CE, practised Taoism, prompting the beginning of Taoism in the Wudang Mountains. The Wudang Mountains were already a famed holy site for Taoism during the Tang Dynasty, and also the place where the God of the North was thought to dwell. The Tang Emperors sent delegates to the Wudang Mountains to pray for rain during the drought years. Huge Taoism building complexes such as the Wulong Palace were constructed. During the Song Dynasty, the Wudang Mountains became the most important place for Taoism because it is believed that God of the North, Zhenwu practised and became immortal here. During the early years of the fifteenth century, Zhu Di, King of Yan, stationed in Beijing, seized the throne from his nephew through war, and became the third emperor of the Ming Dynasty. Zhu Di firmly believed that, King Zhenwu, the God of North, and also the God of Water and the God of War, blessed him, enabling him to win the throne. For this reason, he invested a great deal of effort in further developing the Wudang Mountain complexes after he moved the capital from Nanjing to Beijing. While building the imperial palaces (Forbidden City) in Beijing, Emperor Zhu Di planned and built the main Taoist palaces and temples in Wudang dedicated to Zhenwu. The buildings of the Wudang Mountains are the only Taoist sacred site designed by an emperor and constructed as a royal site. Moreover, Emperor Zhu Di even came to Mountain Wudang to invite the great Taoist master, Zhang Sanfeng (who also invented taijiquan), to assist him in the governance

of the country. The Yuzhen Palace, the largest of the Taoist palaces, was built especially for Zhang Sanfeng. Emperor Zhu Di fully recognised the Taoism of the Wudang Mountains. A dedicated army-like team of 15 000 was organised to ensure the maintenance and management of the Taoist buildings in the Wudang Mountains and the surrounding landscape as though the complex were a royal palace in Beijing. However, the Taoism of the Wudang Mountains did not hold such a privileged position after the eighteenth century, as the Qing Dynasty favoured Tibetan Buddhism. The repair and maintenance of Taoist palaces and temples in the Wudang Mountains at this time depended on the palaces or temples funding the work themselves. Some important buildings were therefore not restored after disasters.

In the 1980s, the Chinese government protected Taoism and other religions. The main palaces and temples in the Wudang Mountains were listed as a National Historical and Cultural Site for their significant aesthetic, historic, and architectural values. Most of these palaces and temples continue to be managed by the Wudang Mountains Taoism Association. Under the relevant laws and regulations, the repair and maintenance of national heritage shall follow the prescribed process: (1) Certified conservation design institute submits design proposal; (2) Gain approval from State Administration of Cultural Heritage; and (3) Local cultural relics protection department or management department, such as the Wudang Mountains Taoism Association, hires a qualified conservation construction company to undertake conservation projects for repair or maintenance. Government departments provide partial subsidies, or the full amount, depending on the project. In the twenty-first century, the maintenance fees of national properties are covered, for the most part, by the central government. The main challenge for Wudang is to safeguard its cultural traditions. Social change and the development of tourism have placed this heritage site under pressure. In order to protect its values and cultural traditions, both financial and policy support are required.



## The Traditional Management System of Wudang Mountains during the Ming Dynasty

The Wudang Mountains became a holy site under the Ming Dynasty in the fifteenth century. A review of the changes and development of management schemes in the Ming Dynasty would serve to provide insight for the operation and management of the Wudang Mountains as a World Heritage Site today.

Taoism activities in the Wudang Mountains started in the Northern Song Dynasty (Lu n.d.; Ren n.d.). In March of the Tenth Year of the Yongle Reign (1412), Yongle Emperor Zhu Di decided to revive Zhenwu Taoist rituals. He ordered the high-ranking Taoist priest Sun Biyun to carry out a study and write a report on the palaces and temples of Zixiao, Nanyan, and Wulong. In July of the same year, a group was formed under two very high senior officers (one of them was a marquis) to start the construction of the palaces and the temples. The first phase of construction took five years to complete, ending in the Sixteenth Year of the Yongle Reign (1418).

- The governor in charge of the administration of Dayue Taihe Mountain (another name for the Wudang Mountains). In 1419 Emperor Zhu Di assigned a vice governor of Huguang province to be in charge of the administration of Dayue Taihe Mountain (the Wudang Mountains) and the area of Junzhou. This indicates that Emperor Zhu Di already intended to assign a local officer to oversee administrative affairs at the Taihe Mountain before the construction works were complete, to push ahead with construction.
- Army commander for Junzhou region. In 1424 Emperor Zhu Di ordered the repairing of the palaces and temples and the renovation of the irrigation canals and ditches, with workers being recruited from the army of the Junzhou region whenever necessary. The Ming Dynasty army was responsible not only for military affairs, but also other miscellaneous affairs, such as the construction of official buildings, the governance of rivers and canals, and the building of cities.

The governor and commander were the key officers in charge of construction at the Wudang Mountains. In 1424 CE, Emperor Renzong made some policy changes. He gave written orders to be exempted from all of other duties but the maintenance of Wudang Mountains.

- The abbot of Yuxu Palace. In 1426 Emperor Xuanzong issued a written order to the abbot of Yuxu Palace, who was also the Taoist leader of the whole Wudang Mountains complex, to join the leadership of the management and maintenance of Wudang Mountains with the governor and commander. Taoist priests, as the users of all the palaces and temples at Wudang Mountains, were to participate in the management and maintenance work upon completion of construction. This was to ensure that all the projects were carried out pursuant to the law and in accordance with religious rituals.
- Eunuch officer from the Emperor Affairs Office. Inner court officials were the servants to the emperor. They had the advantage of being able to win the trust of the emperor. Therefore, many royal affairs were implemented through the eunuchs. In 1435 Emperor Xuanzong gave a written order to appoint a eunuch officer to help with the management and maintenance works in the Wudang Mountains, because the eunuch officer could report directly to emperor. As a result, it was easy for the emperor to monitor the condition of the Wudang Mountains. This marked the establishment of the “four-people group”, including the governor, the commander, the abbot and the eunuch officer, working together to oversee the management of the Wudang Mountains. However, the Ming Dynasty royal family did not exploit its people to ensure the maintenance of the Wudang Mountains. Emperor Zhu Di stated that the palaces and temples were built by the court for all of the people, and encouraged all of the people to contribute to the repair and maintenance of the palaces



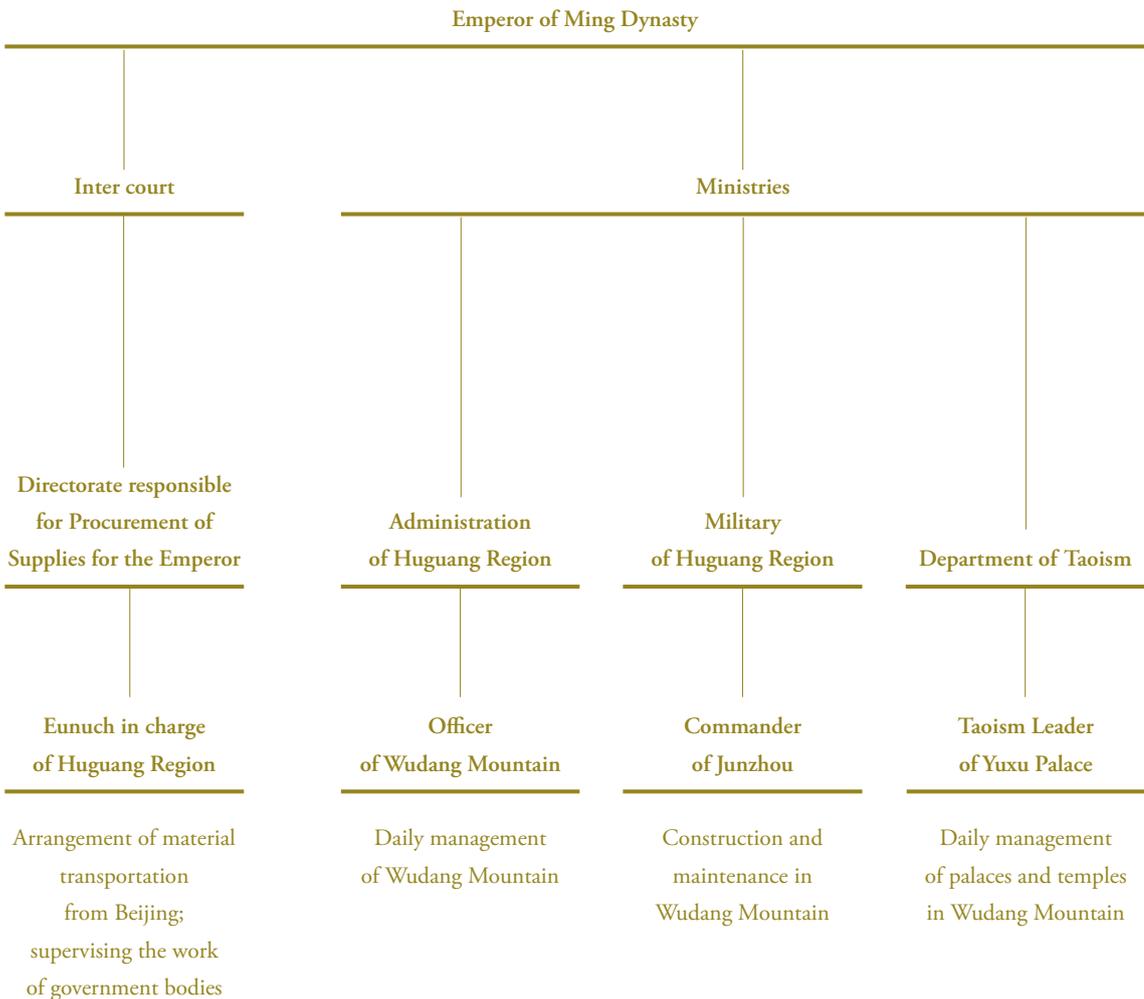
- and temples. From the Qing Dynasty to date, maintenance work on the palaces and temples at Wudang Mountains has continued, thanks to the efforts of countless Taoist believers.
- This management system laid the foundation for the development, protection and management of the Wudang Mountains during the glory days of the complex (Lu n.d.; Ren n.d.). The three related parties – central government, local government and Taoism associations – found a balance to deal with the demands and overlapping pressures. The eunuchs, as the inner-court officials that acted as the emperor’s representatives,

were responsible for the supervision of, and coordination between, local government and Taoist associations. Local government appointed the civilian officials, who were in charge of daily management, maintenance fees and materials, and the military officials, who were responsible for maintenance and engineering.

Taoist associations were responsible for the ongoing affairs of the palaces and temples. They could submit their requirements to the emperor via the inner-court officials. The emperor was the one to make the final decisions.



**Figure 1**  
Wudang Mountain management system.





## The adaptability of the Traditional Management System of the Wudang Mountains to contemporary management

The Traditional Management System in the fifteenth and sixteenth centuries, under the Ming Dynasty, was integrated and organised. The management covered the whole area of the Wudang Mountains and the extensive surrounding areas, as these areas guaranteed the supply of resources for the operation and maintenance of the Wudang Mountains. The management system was clear and explicit so as to protect Taoism and the status of the Wudang Mountains as a sacred site. The leader (such as the abbot of Yuxu Palace) of Taoism in the Wudang Mountains was always appointed by the emperor's court. Officers also were dispatched by central government in order to keep the Wudang Mountains as a holy site, and to pray for and protect the safety and prosperity of the country. For this duty, they are able to use resources from the surrounding areas.

Within the contemporary management system, the Wudang Mountains Complex, as a World Heritage Site, is managed by the local authority. The local authority is a multifunctional government body, which not only protects and manages the World Heritage Site, but also tries to improve the living standards of the local population, and to foster social and economic development. Inevitably, the authority faces many conflicts, and the difficult challenge of balancing local peoples' benefits and local social and economic needs, with the protection of the heritage of the Wudang Mountains as a whole. In many cases, social development wins. The government hierarchy is structured as follows: local (Shiyan City) government, for which the local authority has the responsibility; provincial (Hubei) government; and the central government. This means that the local authority cannot contact the central government directly but has to go through the provincial government.

The experts of the World Heritage Centre listed several problems faced by the Wudang Mountains in their 2014 reactive monitoring report. These problems, which can be seen as the reflection of

the above-mentioned conflicts, include: how to act in the fact of the commercialised environment; how to build up infrastructure; and how to adjust protective zones. The experts stressed the following in their conservation status report of the Wudang Mountains as a World Heritage Site (UNESCO World Heritage Centre, 2014):

- development of a living heritage management approach for this serial property that takes into account the entirety of the cultural landscape, rather than looking at the 62 component parts as individual elements that need protection;
- management of tourism development to ensure that tourism infrastructure does not overwhelm the delicate landscape setting of the property;
- respect for the carrying capacity of the individual elements of the property;
- harmonisation of the various planning instruments that cover the World Heritage property, Wudang Mountains Special Zone, and Wudang Mountains National Scenic Zone.

It is clear that there are multiple heritage management objectives. As is well known, tourism is a powerful means of fostering the development of a local economy. People understand that tourism can have a negative impact on heritage sites but focus instead on the economic benefits brought by tourism. As a result, it is difficult for those with power over heritage sites to exert effective tourism management while truly protecting the heritage values. Furthermore, local governments may mistakenly think of protection of heritage sites merely as a means to solidify heritage elements; the fundamental rule that heritage sites must develop and change, as living heritage, is therefore lost. In cases where there are many restrictions, the conflict between local government and the stakeholders of the core elements of heritage management increases. The Wudang Mountains are a National Heritage site, a scenic location and a World Heritage Site; as a result, there are overlapping



management systems and departments, resulting in ineffective protection and oversight.

The Traditional Management System of the Wudang Mountains has, for the most part, focused on the Wudang Mountains as a holy site, making its management and maintenance clear and simple. Most significantly, its sacred status has not restricted local social and economic development. Traditional management methods can serve as reference for amendments to the protection and management of the Wudang Mountains as World Heritage in order to:

- clarify the nature of the heritage site; establish an accountability system centred on protection of the value of heritage site; and avoid establishing management goals that cover every aspect, but cannot be implemented effectively;
- establish effective management schemes, with a clear division of responsibilities and clear goals;
- establish evaluation, adjustment and arbitration mechanisms;
- highlight the role and functions of core heritage value stakeholders within the protection and management system.

## Conclusion

Conservation of World Heritage means protecting universal cultural values. For living heritage, protection also means safeguarding traditional culture. As the number of living heritage sites on the UNESCO World Heritage List increases, the protection of living cultures becomes increasingly important. The preservation of tangible heritage is as important as the transmission and promotion of intangible cultural traditions. Therefore, tangible heritage and intangible heritage are not to be separated in the process of cultural heritage protection.

Focus should be placed on maintaining the authenticity and integrity of World Heritage. Integrity is manifested in all aspects of the carriers of heritage significance, including the heritage itself, but also the spiritual and cultural environment. Furthermore, integrity includes all aspects of the value of the heritage, including its tangible, intangible, ontological and environmental features. From the perspective of protecting the authenticity and integrity of heritage, a Traditional Management System is also an important element, carrying heritage significance. It is vital that contemporary management systems understand and learn from the traditional management of the site. In some cases, not only are the traditional systems still

efficient and effective, but they also constitute a part of the heritage itself.

Based on Chinese protection practices and related discussions, the *Principles for the Conservation of Heritage Sites in China* were revised in 2015, in order to highlight that the protection of cultural relics and historic sites also means the protection and transmission of cultural traditions: “When a heritage site’s values depend on the continuation of associated cultural traditions, consideration needs to be given to preserving these traditions along with the site itself” (ICOMOS China, 2015, p. 69).

Indeed, the *Principles for the Conservation of Heritage Sites in China* (Revised 2015) emphasise the cultural value of heritage: “Cultural value comprises cultural diversity, the continuation of traditions, and essential components of intangible cultural heritage” (ICOMOS China, 2015, p. 61).

The key to enhancing the protection and management of the Wudang Mountains is to: integrate the relevant aspects of its Traditional Management System, as first implemented under the Ming Dynasty, into the modern conservation system; highlight the core values of the Wudang Mountains as a World Heritage Site; and focus on the protection of both the natural landscape of the Wudang Mountains and its status as a Taoist sacred site.



## References

- ICOMOS China** (中国文物古迹保护准则). 2015. 国际古迹遗址理事会中国国家委员会 [Principles for the Conservation of Heritage Sites in China (revised edition)] in Chinese and English [online]. Paris. [Cited 20 September 2017]. [http://openarchive.icomos.org/1650/1/china\\_prin\\_heritage\\_sites\\_2015.pdf](http://openarchive.icomos.org/1650/1/china_prin_heritage_sites_2015.pdf)
- Lu Zhong-hua n.d.** *Taiyue Taihe Mountain Chronicles*, Ming Dynasty.
- Ren Zi-heng n.d.** *Royal Taiyue Taihe Mountain Chronicles*, Ming Dynasty.
- UNESCO World Heritage Centre.** 1994. *Nomination Dossier for the Ancient Building Complex in the Wudang Mountains*. Paris. UNESCO.
- UNESCO World Heritage Centre.** 2014. *State of Conservation Report for the Ancient Building Complex in the Wudang Mountains*. Paris. UNESCO.
- UNESCO World Heritage Centre.** 2017. *Ancient Building Complex in the Wudang Mountains* [online]. Paris. [Cited 20 September 2017]. <https://whc.unesco.org/en/list/705>



*Wudang Shan by Tauno Tõhk (CC BY)/Flickr.*

B

Sources for understanding  
Traditional Knowledge Systems

◁ CHAPTER 8 ▷

**Rediscovering Traditional  
Knowledge Systems in the  
conservation and management  
of heritage in India:  
a bibliographical research**

Radhika Dhumal



## Abstract

The aim of this research paper is to develop a bibliography to assist in the understanding of Traditional Knowledge Systems (TKS) in India in line with contemporary conservation philosophy and practice. This research attempts to bring together a list of manuscripts, books, drawings and images from the Vedic to the Contemporary, including primary and secondary sources. This bibliography attempts to develop a more comprehensive database for the study of TKS in India, which could potentially contribute to the establishment of conservation guidelines and best practices for India, and ultimately also for Asia. It is hoped that the attached Appendix (Bibliography), containing over 350 reference books, will enhance the understanding of the heritage and TKS of India. When approaching TKS, it is essential to understand the aspects of the culture and society which they represent and to have the insight to embrace the essence of the values, philosophy, perspective and, sometimes, also the technical details, which could be utilised to formulate a TKS cultural policy and/or guidance note, for improved and effective heritage conservation and management.



## Introduction

In recent practice, the conservation of historic properties – from colonial-era buildings and unprotected historical structures, to building sites and historic towns – has generally been carried out pursuant to international charters and treaties such as the Burra Charter. However, Indian treatises discussing traditional knowledge practices are largely ignored in today's conservation practice. With regard to heritage management, while the majority of monuments and sites of historical and archaeological significance are under the protection of the Indian Government – meaning, for the most part, under the tutelage of the Archaeological Survey of India (ASI) and the State Department of Archaeology and Museums – there are a number of monuments and sites that remain unprotected by law. The ASI implements and regulates the law, namely, The Ancient Monuments and Archaeological Sites and Remains (Amendment and Validation) Act, 2010 (Government of India, 2010), which was initially written in 1904, amended in 1958 and most recently in 2010. The conservation of these protected monuments is governed by the conservation policies of the ASI and the Archaeological Works Code, created and implemented by the Circles (Circles are Regional Offices of the ASI spread throughout the country), and under the supervision of the director general of the ASI. Some states have their own laws for the protection of monuments and sites under their care, but most do not, in which case they follow national laws. In most cases where heritage monuments or buildings are surrounded by a community, it is very possible that the community has been taking care of and protecting their heritage through their beliefs and Traditional Knowledge Systems, as in the cases of temple complexes and mosques, forts and historic cities. Incorporating traditional knowledge into the law and instruments providing protection for monuments and historical buildings would be advantageous.

Bibliographical research has sought to cover certain periods of India's history (please refer to the dating system in Table 1), where written sources exist, sometimes in Sanskrit, or local languages, and a few translated into English by various scholars. In order to follow the dating system for archival research,

a reference table has been prepared especially for this paper. The archival research starts from the early twentieth century under British rule based on their understanding of the cultural heritage of the country. The system of protection of the architectural heritage and traditional knowledge of building construction extends back to the Mughal Rule and the Medieval Era, to the Princely States and to the ancient systems of construction and planning. Traditional knowledge was transmitted via the oral tradition until it was recorded in manuscripts. The information that is available to us today dates from the time that these treatises were written. The *Manusmriti* (an ancient Hindu legal text, written in Sanskrit), the *Vedas* (a Vedic collection of hymns, or poems, written in archaic Sanskrit), and texts on the science of architecture, including the *shastras* (rules) contained in the *Vastu Shastra* (the science of architecture), *Manasara* (book on the essence of measurement; *mana* means measurement and *sara* means essence) (see discussion below), *Shilp Shastra* (the science of craftsmanship), and *Samarangana-Sutradhara* (encyclopaedic work on classical Indian architecture) are a few examples of the works which form the basis for TKS. TKS was known by the guilds, formed within the feudal and religious institutions of Ancient India, which integrated building construction and protection systems into the social fabric of village communities. Hindus, Buddhists, Jains, Muslims and Christians each have their own knowledge systems, philosophies and treatises that are followed in the region.

This paper provides an introduction to some of the TKS material available, to illustrate the richness of the texts discovered during this bibliographical research, focusing on Indian treatises. *The Hindu Temple* by Stella Kramrisch (1946 and see appendix no. 118) is a key source for understanding of the science of architecture, together with the *Vastu Shastra*, *Mayamata* and *Manasara*. The traditional knowledge contained in these manuscripts has been translated and studied by a number of scholars; yet, further research is required to provide a practical analysis of the texts in terms of the information provided about the architecture of the monuments, forts, towns and temples. This



paper also briefly examines the *shastras* (texts on Indian TKS), which deal with the architectural heritage that survives from these periods and develops a conservation approach. The body of this

paper comprises an introduction to architectural and conservation texts and treatises, the qualities expected of the *Shapati* (the architect or restorer), and a brief description of the *Vastu Shastra* and its

## Dating system: India

Description	Christian	Common	Islamic
<b>Before Ancient India</b>			
Rock Shelters of Bhimbhetka	9000 BC to 7000 BC	9000 BCE to 7000 BCE	
Mehrgarh Culture	7000 BC to 3300 BC	7000 BCE to 3300 BCE	
Indus Valley Civilisation	3300 BC to 1700 BC	3300 BCE to 1700 BCE	
Early Harappan Phase	3300 BC to 2600 BC	3300 BCE to 2600 BCE	(4040 BH–3937 BH) to (3319 BH–3216 BH)
Mature Harappan Phase	2600 BC to 1700 BC	2600 BCE to 1700 BCE	(3319 BH–3216 BH) to (2392 BH–2289 BH)
Late Harappan Phase	1700 BC to 1300 BC	1700 BCE to 1300 BCE	(2392 BH–2289 BH) to (1980 BH–1877 BH)
Vedic Period/Age	1700 BC to 500 BC	1700 BCE to 500 BCE	(2392 BH–2289 BH) to (1156 BH–1053 BH)
Early Vedic Age	1700 BC to 1000 BC	1700 BCE to 1000 BCE	(2392 BH–2289 BH) to (1671 BH–1568 BH)
Later Vedic Age	1000 BC to 500 BC	1000 BCE to 500 BCE	(1671 BH–1568 BH) to (1156 BH–1053 BH)
<b>Ancient India Onwards</b>			
Ancient India	550 BC to 550 AD	550 BCE to 550 CE	1106 BH to 176–7 BH
Medieval India	550 AD to 1526 AD	550 CE to 1526 CE	176–7 BH to 932–33 AH
Early Medieval Period	Up to 1300 AD	Up to 1300 CE	Up to 700 AH to 803 AH
Late Medieval Period	1300 AD to 1500 AD	1300 CE to 1500 CE	(700 AH–803 AH) to (906 AH–1009 AH)
Post-Medieval Era	1526 AD to 1881 AD	1526 CE to 1881 CE	932–33 AH to 1296–97 AH
Colonial Era	1881 AD to 1947 AD	1881 CE to 1947 CE	1296–97 AH to 1365–66 AH
Free And Modern India (Contemporary)	1947 onwards	1947 onwards	



specific discussions of conservation, and, before the conclusion, it includes a case study demonstrating how TKS can be incorporated into the present practice of conservation.

The key issues concerning heritage conservation and management in India, incorporating TKS, are as follows:

- as the state of conservation at heritage sites is poor, including TKS may improve the situation and build capacity for doing simple maintenance tasks;
- there is a lack of initiative by and for stakeholders, whether private owners or government, as heritage properties may have multiple owners who are uncooperative with the established system and sometimes among themselves; for example, there are no ownership papers or documents to prove that

the property belongs to a particular stakeholder for the heritage properties which are occupied/encroached, hence no action can be taken by any party;

- inconsistent conservation approaches; and, most importantly;
- TKS – craftsmen and artisans exist, and appropriate materials are available within the region, although they are fast diminishing. However, current heritage conservation interventions are unacceptable, artistically as well as technically.

The authenticity of surviving traditional knowledge practices, in relation to building craftsmanship and knowledge, has been questioned. However, gaining insight into current conservation practices will help us find and establish a clear approach and sustainable techniques.

## Traditional Knowledge Systems

The decline of the Indus Valley Civilisation spanned the second quarter of the second millennium BCE. Major upheavals in Ancient Eurasia began, and diverse tribes originating from the steppes of Central Asia began to enter India from Persia through the passes of the northwest. They are known as Indo-Aryans, their language was Sanskrit, and their traditions are enshrined in a great series of writings called the *Vedas*.

The synthesis of the Vedic and native traditions generated a change and evolved a Vedic religion known as Hinduism and is of prime importance in the evolution of India's religious architecture

 **Table 1**  
Timetable of Indian dynasties/period. The shaded area of this table represents the period considered for the bibliographical research of this paper and that presented at the ICCROM-CHA Forum in 2015.

(Tadgell, 1994 and see appendix no. 74). The earliest and most important of the Aryan writings, the *Rig Veda*, was a collection of hymns, written circa 1500 BCE. There were four known *sambhitas* (collections) of the

*Vedas* – *Rig, Sama, Atharva* and *Yajur*. The *Rig Veda* hymns invoke the special deity, Vastopati, who is held to preside over building sites. Architecture in India is intimately associated with religion and astrology (Shukla, 1934 and see appendix, no. 10). The *Atharva Veda* refers to houses of varying shapes and different sizes; it also contains architectural terms such as *vansa* (beam) and *sthun* (post). Architecture is linked to ancient knowledge and exists in two of six *Vedanganas* (auxiliary disciplines in Vedic culture that developed in ancient times, connected with the study of the Vedas) and in the *Jyotisa* (astrology and astronomy) and *Kalpa*, which lays down the rules for sacrificial acts and rituals. Both are essential constituents of the science of architecture; *Kalpa Sutra* (standardising procedures for Vedic rituals). *Vastu Shastra*, the traditional science of architecture, forms an important part of the *Veda*.

The books of the *Vastu Shastra* (the science of architecture) are records of oral traditions, which go back into the undefined past. The *Brhat Sambhita* (an encyclopaedia that covers a wide range of subjects, including astrology, planetary



movements, eclipses, rainfall, clouds, architecture, growth of crops, matrimony, domestic relations, gems, pearls and rituals; compiled by Varahamihira, an Indian astronomer, mathematician and astrologer who lived in Ujjain, India) of the sixth century CE is based on the expertise of the master architects, namely Maya, Visvakarman, Garga and Manu. The *Brhat Samhita* is a brief account of their treatises and it is the earliest datable source on the *Vastu Shastra*. Varahamihira introduces the chapter on architecture, *Vastu Jnana* (architectural knowledge). The design and construction of a building was always initiated under favourable stars. An architect in charge of a building was called a *Shhapati*, meaning master of what stands or abides (Kramrisch, 1946 and see appendix, no. 118).

*Silpasastra* or *Vastu Shastra* in the pre-*Samarangana Sutradhara* works (i.e. before the eleventh century) included writings on architecture like *Mayamata* and *Manasara*, which described details of planning, design, construction, etc. Some works which were not directly related to architecture but influenced it and provided further information regarding the subject, are *Brhatsambhita*, *Matsya-purana*, *Agnipurana*, to name a few Puranas and Agamas<sup>1</sup> such as *Kamika*, *Suprabheda* and other treatises such as *Arthasastra* of Chanakya and *Sukra-nitisara*. *Silpa* literally means fine art, hence the *Silpasastra* are interrelated to the overall architectural treaty of *Vastu Shastra*.

The *Samarangana Sutradhara* is one of a number of treatises written by King Bhoja of Dhara between 1018 and 1060 CE. He wrote approximately 34 books on various topics, including poetry, politics, astronomy and medicine and the *Samarangana Sutradhara* is his book on architecture, and the *Yukti Kalpataru* is his book on sculpture. The first seven chapters deal with the need, origins, schools and scope of architecture and also with the qualifications required for an architect; next follows regional planning, land surveying, the examination of soil conditions (*bhumipariksa*), the system of

measurements (*hasta-laksana*) and details of town planning (*puranivesa*). There are site plans of different categories of the *Vastu-padas* of towns and temples as well as residential design and palaces of kings. It also deals with secular architecture, i.e. the building of houses; civil architecture; aspects of foundation-laying (*silanyasa-vidhi*), the architectural details of planning and construction, materials, masonry, doors, pillars, and decoration. Lastly, it covers the ideas associated with Hindu architecture such as *vedha* (obstruction), *bhanga* (breakage) and defects; four chapters from SS are dedicated to *bhanga* (chapters 42, 43, 46 and 47) (Shukla, 1934 and see appendix, no. 10). They give details of how to repair broken/damaged parts of the building, its procedures, sometimes rituals, and construction or reconstruction details.

*Manasara* means the essence of measurement (*mana* means measurement and *sara* means essence). It is a treatise with 70 chapters and the first eight are introductory; the next 42 deal with architecture; and the last 20 discuss sculpture. The manuscripts of the *Manasara* were translated and interpreted by Dr P. K. Acharya (in seven volumes) in 1914, and first published in 1934.

*Mayamata* (Treatise of Housing, Architecture and Iconography), is an important and comprehensive treatise on architecture. It has been quoted as an authority by subsequent writers on architecture and appears to be the oldest among the extant treatises on the subject. An old Tamil translation of this work is in the possession of the Department for Publications of Sanskrit Manuscripts, in Trivandrum, under the authority of His Highness the Maharaja of Travancore. There is a chapter on repair and maintenance, in other words, conservation.

In the case of some temples and forts, inscriptions have been found, describing the rules of property maintenance, including an annual maintenance contract. In South India, many temples from the eighth century CE until the late medieval period have been found with such

1 These are more technical than the *Puranas*, *Agamas* contribution to *Silpasastra* is more extensive and technical in matters of architectural and sculptural traditions, having specifications like styles, shapes, materials, mixture of two materials, *ayadi* formula in selecting the right proportions. *Agamas* and *Tantras* are the same and deal with the worship of Shiva and Shakti.



inscriptions. Details of these have been provided by A. K. Sesadri in his book *The Conservation of Monuments in India*, published in 1997. The following are characteristic references to temples:

- The Pallava ruler, Parmeswaravarman I (675 CE) is said to have built a Shiva Temple in Kuram Village, near Kanchipuram, and to have gifted lands from Devakarma and Navakarma, for the service of God (worship), and for the maintenance and renovation of the temple. This is said to be recorded on a copper plate. This interesting record reveals that, even at the time of the temple's construction, provision was made to ensure regular income for periodical maintenance and renovation.
- As stated in the inscription by Raja Raja I in 1012 CE, in order to dismantle an existing temple and rebuild it, the king's specific orders were required. Permission was gained for repairs to be made to the Shiva Temple at Tirumalavadi and it was dismantled and rebuilt in stone. Instructions were issued by the king in which it was said that, documentation of the *vimana* (the structure over the sanctum sanctorum where the presiding deity is enshrined; the most prominent and visible part of South Indian Hindu temples) should be undertaken and registered, before the structure be dismantled.
- *Agamic* texts (Hindu religious texts) emphasise the use of materials that conform to the original in terms of substance and proportion, when carrying out repairs.

Maintenance of a historic building is a vital part of conservation. The book *The Conservation of Monuments in India* provides examples to suggest that TKS recommended a philosophy and approach to conservation.

### The architect – The *Sthapati*

Visvakarma and Maya represent the two schools of Indian architecture, known as *Nagara* and *Dravida*. The following texts belong to the two schools:

#### Northern or Aryan or *Nagara*

- *Visvakarma Vastuvidya*
- *Samrangana Sutradhara*
- *Aparajita Praccha*

#### Southern or *Dravidian*

- *Manasara*
- *Mayamata*
- *Silparatna*

The architect (the *Sthapati*) and the architecture (the *sthapatya*) are an integrated whole, as was already a well-established concept by the tenth century CE and as recorded in the *Samarangana Sutradhara*. The practice of *sthapatya* is said to be fourfold and traditional (*sastra*); practical experience (*karma*); intuitive insight (*prajna*); and righteous conduct and character (*sila*). It was fundamental for a *Sthapati* to embody these qualities. Furthermore, he was to be a master craftsman, and the key authority in any building activity, whether civil or royal (Shukla, 1934 and see appendix, no. 10).

The *Sthapati* had to be able to direct (*sthapana*) the construction work and to be well-versed in all of the *shastras* (the traditional sciences); he had to know mathematics and the *Puranas*, (the ancient compendium of myths); and he was to be concentrated in mind, and free from the seven vices (as decreed in the *Manu-Sambhita* [in Indian mythology Manu is the first man and the legendary author of an important Sanskrit code of law, this book. It is also called *Manu Sambhita* and *Manu-smriti*.]). A disciple of the *Sthapati* was called a *Sutragrahin*; he was required to carry out the orders of the *Sthapati*; had to be an expert in many aspects of construction work, including how to be able to work out proportional measurements using the chord (*sutra*) and rod (*danda*). The *Sutragrahin* was also responsible for directing the *Taksaka*, who cut and carved both the large pieces of stone and the intricate details, and the *Vardhakin*, who assembled what the *Taksaka* had carved, and painted and added finishing touches. These four were a team, without whom no building could be created (Kramrisch, 1946 and see appendix, no. 118). It is noteworthy that punishments were prescribed for *Sthapati*.

#### Architecture – *Vastu Shastra*

The Sanskrit word *Vastu*, also known as *Sthapatya-sastra-veda*, means planning. It is the knowledge of ordered and planned extension (*vastu*) and is put into practice by the master who makes existing things (*vastu*) abide in order. *Sthapatya-sastra-veda* is enumerated as an *Upaveda*, a lesser applied



knowledge subordinated to the *Atharvaveda*. *Vastu Shastra* in its fullest exposition belongs to Tantra which is applied knowledge of the *Atharvaveda* too.

The prime resource for a description of the *Vastu Shastra* is *The Hindu Science of Architecture, Volumes I and II*, by D. N. Shukla (1934 and see appendix, no. 10). However, parts of the description regarding the Hindu Temple Architecture are best described by Stella Kramrisch (1946 and see appendix, no. 118). The *Samarangana Sutradhara* presents the *Vastu Shastra* manuscripts, which are translated and interpreted.

The Hindu science of architecture is based on five fundamental principles:

- 1 *Dinnirnaya*, the doctrine of orientation;
- 2 *Vastu-pada-vinyasa*, site planning;
- 3 *Mana (Hastalaksana)*, the proportional measurements of a structure;
- 4 *Ayadi-Sadvarga*, the six formulae for Hindu architecture;
- 5 *Patakadi-sat-chandas*, the character of the building.

From the selection of the site, to the preparation of the site for building work, the *shastras* prescribe processes to follow and refer to the cosmic

order using astrology. The *Vastu-purush-mandal*, a metaphysical plan for the science of architecture, is explained by Stella Kramrisch (1946 and see appendix, no. 118). The square is the purest and most stable form, this form is the base of the *Vastu-purush-mandal*. Before starting the construction of a temple, a diagram and the metaphysical plan is laid out on the levelled ground on a particular day and time according to the astrological requirement. This ritual continues today before any construction activity begins. Furthermore, it is the adherence to the measurement, which is imperative in all creative activities whether it is architecture or sculpture. Unless a building is proportionally and perfectly measured out, it cannot give an auspicious result. The *Mana* and the *Hastalaksana* in the treaties say that the measurement must be complete. The *angula* (3/4 inch) and the *hasta* (18 inch) are the standard measurements. The proportions of the buildings have been described based on the visual effects, for example *jayada* (joy giving) wherein the proportion of the height is one and a half of the breadth. This gives a pleasant appearance to the building/structure. These are a few examples of traditional knowledge available in the texts.

## Application of Traditional Knowledge Systems in modern conservation practice

Current practices in conservation refer to the international charters (see above) or the policies of the Archaeological Survey of India (ASI). The ASI authored three policy documents during the colonial era, which have been and are being followed even today for conservation works on the monuments protected by the ASI and a Conservation Policy written by the then director general of the ASI in 1907, an Archaeological Policy written in 1915, and a Conservation Manual by John Marshall in 1923. These documents aimed rather exclusively at immediately recording and protecting the built heritage and archaeological sites of India. The (colonial) context within which

these documents were crafted, as well as their impact on the development of heritage policy over the course of time to the present, needs to be further explored.

The National Policy for Conservation for the Ancient Monuments, Archaeological Sites and Remains (NPC-AMASR) (ASI, 2014), authored by ASI and approved by the Ministry of Culture, Government of India in 2014, is the latest policy document of India. An attempt to include TKS and the use of local materials and craftsmanship has started a trend; however, there are gaps in the said policy and implementation of conservation works in the ASI.

Another recent document is the INTACH Charter – Charter for the Conservation of Unprotected Architectural Heritage and Sites in India, 2004 (INTACH, 2004), essentially written for the members of INTACH (Indian Trust for Art and Cultural Heritage) to follow in the works carried out. The charter appreciates and acknowledges TKS in India:

Recognising the unique resource of the 'living' heritage of Master Builders/ Sthapatis/ Sompuras/ Raj Mistris who continue to build and care for buildings following traditions of their ancestors;

Recognising, too, the concept of jeernodharanam, the symbiotic relationship binding the tangible and intangible architectural heritage of India as

one of the traditional philosophies underpinning conservation practice;

Noting the growing role of a trained cadre of conservation architects in India who are re-defining the meaning and boundaries of contemporary conservation practices;

Convinced that it is necessary to value and conserve the unprotected architectural heritage and sites in India by formulating appropriate guidelines sympathetic to the contexts in which they are found. (INTACH, 2004)

It is surprising that it is only now that India as a country has been discussing the changes in policy or developing an approach to conservation which recognises its TKS and their application in light of best conservation approach and practices.

## Application of Traditional Knowledge Systems and a study of Jaisalmer Fort

Jaisalmer Fort was built during the Medieval period, in 1156 CE, and has been protected by the Archaeological Survey of India under the Ancient Monuments and Archaeological Sites and Remains Act since 1951. The entire fort, including the fort walls and temples are protected. There are approximately 349 residential *havelis* (traditional townhouses or mansions) within the fort. Most of these *havelis* are inhabited by local residents, or have been converted into hotels and shops, and some are also vacant. The main activity in the city is tourism, and, as a result, it is essential for the necessary infrastructure to be in place to support the tourist industry and local needs. However, over the past decade issues have increased, reaching a critical level, affecting the protection and conservation of the property.

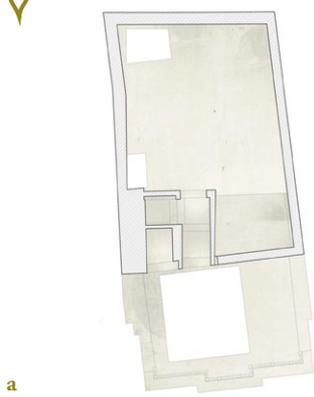
In 2013, Jaisalmer Fort was one of six forts to be inscribed on UNESCO's World Heritage List, as Hill Forts of Rajasthan (UNESCO World Heritage Centre, 2019), under criteria (ii) and (iii):

**Criterion (ii):** The Hill Forts of Rajasthan exhibit an important interchange of Princely Rajput ideologies

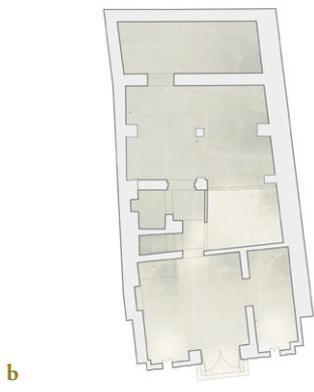
in fort planning, art and architecture from the early medieval to late medieval period, within the varied physiographic and cultural zones of Rajasthan. Although Rajput architecture shared much common ground with other regional styles, such as Sultanate and Mughal architecture, it was eclectic, drawing inspiration from antecedents and neighbours, and had a degree of influence over later regional styles such as Maratha architecture.

**Criterion (iii):** The series of six massive hill forts are architectural manifestations of Rajput valour, bravery, feudalism and cultural traditions, documented in several historic texts and paintings of the medieval and late medieval period in India. Their elaborate fortifications, built to protect not only garrisons for defence but also palatial buildings, temples, and urban centres, and their distinctive Rajput architecture, are an exceptional testimony to the cultural traditions of the ruling Rajput clans and to their patronage of religion, arts and literature in the region of Rajasthan over several centuries.

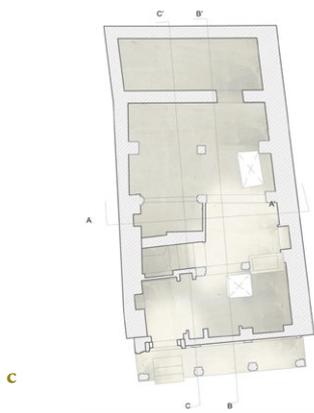
Jaisalmer Fort requires complex and sophisticated planning and ample resources to resolve



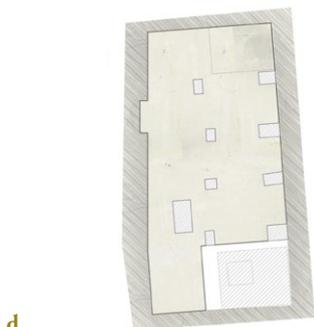
a



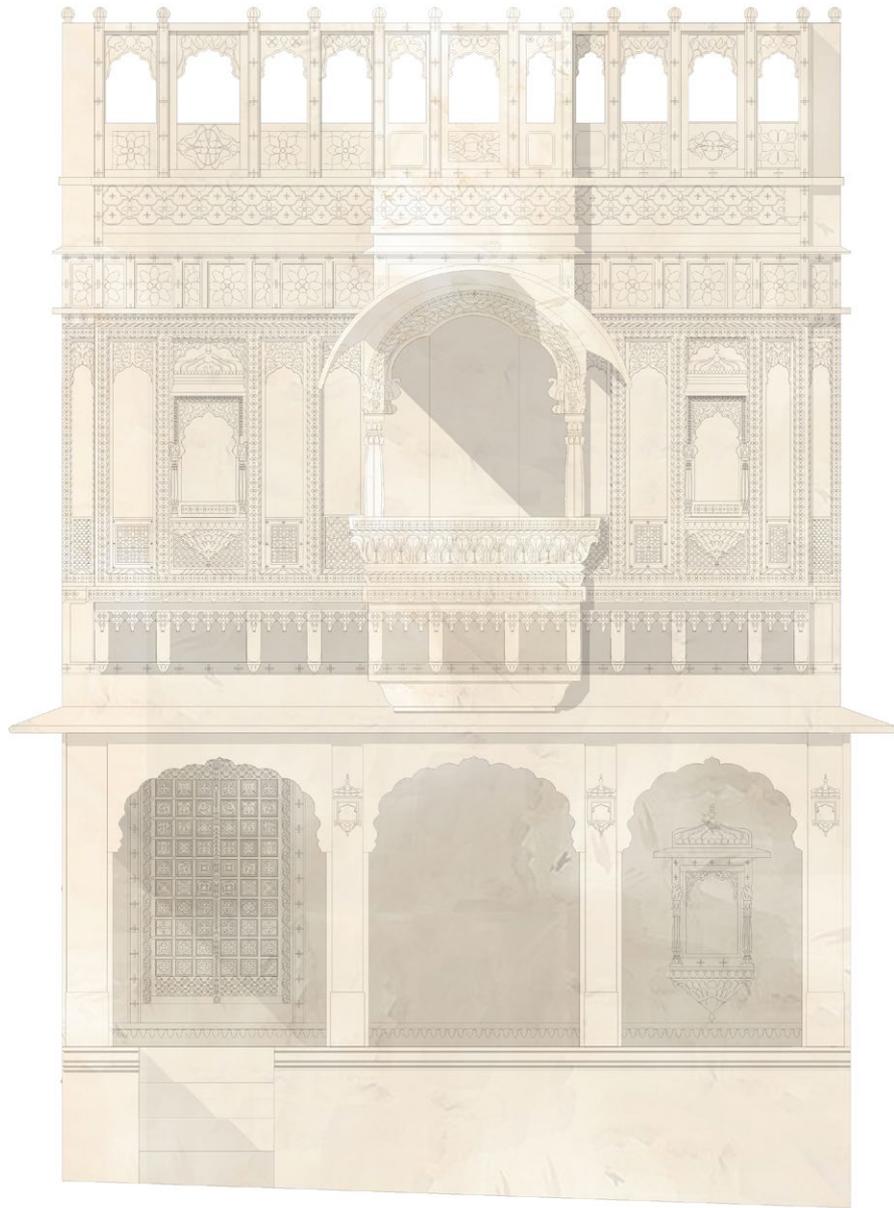
b



c



d



 stone wall/filling

 inaccessible

 openings to basement

 ground

 collapsed ceiling

a – terrace

b – 1st floor

c – ground floor

d – basement



Figures 1–5

Haveli: Figure 1 and 3d view; Figure 2 and view from the street; Figures 3, 4 and 5 and conservation project.

Sketches and elevation not to scale. For details of the drawings, readers are welcome to contact the author at the address provided on page 270.

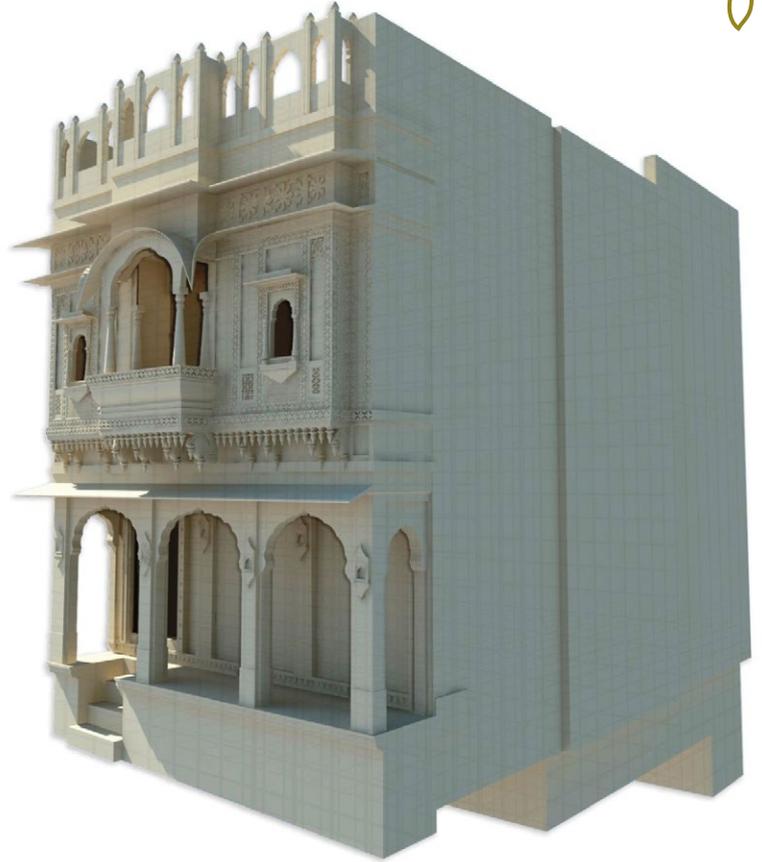


conservation issues, using minimal intervention techniques and sustainable design. In order to ensure a successful and dynamic system of protection and conservation, thorough research into, and understanding of, the causes of deterioration and conservation techniques is vital.

Research has shown that Jaisalmer Fort was constructed in the context of a knowledge system which prized science and beauty. The *shastra* shows that certain aspects of the fort reveal the design principles and policies that may have been upheld during its development and construction, for example the planning layout of the fort and typologies of the *havelis*, etc. An interview with the *Gajdhars* of Jaisalmer confirms this. The *Gajdhars* were the western (Indian) region's fort-builders, who knew the content of the *shastras* and the required construction techniques. Only a few survive in this area. Most importantly, *Gajdhars* are still surviving and so are the techniques and materials for traditional building. Further research is required.

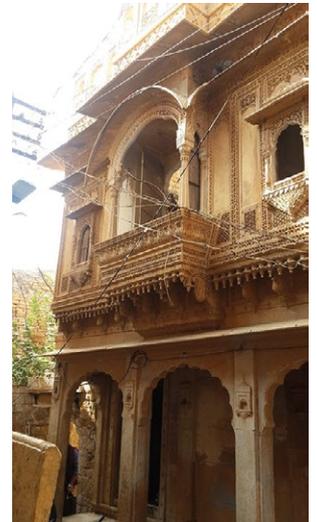
The treatises of the *Vastu Shastra* include town-planning rules such as *Nagar laksana*, *Gram laksana* and *Durg laksana*. The Jaisalmer Fort would have fallen under the rules of *Durg laksana* (a type of fort design and planning as per the *shastra*). Furthermore, the *Manasara* and *Mayamata* treatises of the *Vastu Shastra* classify the forts into 12 categories. However, the *Samrangana Sutradhara* classifies forts into two broad categories. According to the *shastra*, the Jaisalmer Fort is an *Irinadurg*, meaning desert fort, and according to the *Samarangana Sutradhara* it is a natural fort, i.e. a *krtrima*, rather than an artificial one; it is labelled as natural because its geography, as a desert, means that it is inaccessible to hostile influences.

Jaisalmer Fort is a typical desert fort (*dhanvana*) built on a hillock, situated in the middle of the desert and devoid of any water. Typically, an oasis is turned into a fortified town, which was also the case for Jaisalmer, which was a *gadisar* (oasis). The *Silparatna* outlines the special characteristics of the fort, stating



that all strongholds worthy of the name must be protected by walls. According to Muni Maya (*Mayamata*), all forts must have large storage areas for provisions such as grains, food, other things required for daily living, a water source, and must be secured by walls and several guarded gates.

The town planning of Jaisalmer Fort has all of the above-mentioned qualities, including a huge granary, wells to provide water and beautifully constructed guarded gates. The *shastras* also suggested that, for a place to be named a fort, groups of people must live together in an area, with specific requirements being met, i.e. *padas* where people belonging to the same section – as per *Pada Vinyasa* (the scheme of plot-disposition used in the art of ancient Hindu architecture sometimes with a specific diagram



(one only) being traced on the building terrain during the *padavinyasa* ceremony, before starting the construction). According to the *Silpsastra* and *Samrangana Sutradhara*, distribution of professions and castes, as well as the allotment of sites, are made entirely with reference to the *Pada-vinyasa*. The *shastras* describe an intensive road layout system within the fort [specifically within the Jaisalmer Fort], with roads running on a grid system, from east to west or north to south in the Jaisalmer Fort.

The rules of the *Vastu Shastra* also governed the architecture of the houses within the fort. In *Architecture of the Indian Desert*, K.B. Jain and Minakshi Jain describe the *havelis* of Jaisalmer in detail:

Almost every house is built in the beautiful yellow sandstone. Grown out of a modulation at the domestic scale, dictated by the limitation of stone construction, the town presents a picture of unique order. Yet, it is not regimented. The smallest house is generally a two bay house with one of the bays having the courtyard. The whole idea of the house developed around the concept of privacy, thereby generating very specific expressions and elements. The ground floor has no openings on the street except the entrance door approached by some steps; the houses are on plinth. These plinths became informal interactive spaces in front of the houses where people do not have a strong notion of privacy. The house starts opening up as one moves up from the street. The need for privacy from the house across the street is much less as compared to from the strangers passing through the street. With compact organisation, the house and street become very close to each other, so the most natural thing was to close the house to the exterior and open it to the interior, thus the courtyard became essential. This idea is reinforced by climatic needs. (Jain and Jain, 2000, p. 100)

During field research,<sup>2</sup> a *haveli* which is approximately three hundred years old was studied with the help of a *Gajdhar* and was described. It is a typical *haveli*, with an elaborate front façade,

a courtyard, a basement, two floors and a terrace. It was built of yellow Jaisalmer stone, with a roof made of *chiyad* (wood). The front façade had an entrance, covered *otta* and an intricately carved wooden door. Over the door was a carved *jharokha* (balcony) and windows surrounded with Jaisalmer stone. The door opens onto the *mole* (an entrance foyer of approximately 6m<sup>2</sup>) leading onto a courtyard, which is the central open space (an area of approximately 2m<sup>2</sup>). From the courtyard, it is possible to access a *pathial* (a semi-open space to the rear of the structure), and then a *kothar* (a closed room at the back of the *haveli*), and a staircase leading to the first floor and the terrace. Although the courtyard is small, it is positioned to receive sunlight and the breeze throughout the day. Climbing the stairs to the first-floor landing, you see two rooms and a semi-open space overlooking the courtyard. The room to the right is beautiful, and leads to the *jharokha* (balcony); it has a small room attached, and a ceiling panelled with dark wood, and decorated modestly with carvings, and two windows: one looking out onto the street, and the other looking out over the courtyard. To the left on the first floor, the plan is identical to the ground floor, except for the addition of the *pathial* and *kothar*. The staircase leads to the terrace (Figures 1–5). The materials used in the building include: Jaisalmer stone, lime, mud, sand, and wood. The walls, columns and stairs are made of stone, and the roof beams and roofing are made of wood, while the flooring is made of mud.

Jaisalmer Fort is a prime reference point for traditional skills, materials and craftsmanship, and a study of its construction and materials helps to develop an approach towards its conservation. The use of traditional materials, their composition, the architectural features, and joinery work in Jaisalmer need to be recorded and studied and the information collected needs to be integrated into modern conservation techniques and systems. For example, an analysis of the material composition of a terrace slab from a *haveli*, reveals the layering

2 The author had been chosen by the Government of India for Research Fellowship for Outstanding Person in the Field of Culture 2012–13, Category and Field – New Areas and Sub Field – Scientific and Technological Principles of Conservation, Title and Conservation of Haveli in Jaisalmer Fort.



and composition of materials traditionally used for waterproofing and heat insulation. During the research, one of the interesting details learned was that, for strength and water proofing, small sized baked Jaisalmer stone, natural organic additives and natural fibre (animal or plant based organic fibre) were used 300 years ago. Thus, one result revealed that these additives gave the slab/roof

hydrophobic characteristics and added tensile strength to it. In direct application of TKS, it is proposed that, instead of using a concrete slab (which is a standard practice in the construction or conservation in the fort these days), a traditional approach be employed, using traditional, local materials and casting techniques to create a sustainable terrace slab.

## Living heritage

Hindus still believe in the *Vastu Shastra*, and try to follow it to the best of their abilities. For example, when buying a new house, Hindus will look for a plot or buy a new home which is *vastu* compliant. This clearly demonstrates the belief in TKS in India, especially among Hindus. At the same time, in some historical areas, forts and towns, the value of traditional knowledge among the residents seems to have diminished greatly. Given the social changes that have taken place in India and the foreign invasions faced by India over the past millennium, it is critical to understand the importance of traditional knowledge and how it can be applied. In the early twentieth century, many scholars tried hard to protect and revive Traditional Knowledge Systems, especially

during the colonial era, but these efforts have not been supported or updated in more recent times. Reviving TKS through training in a way that generates interest and excitement among stakeholders, craftsmen and artisans, and their awareness of the TKS may be the key to preserving and managing cultural heritage.

Another point of discussion is the more practical consideration of how to apply traditional knowledge directly to conservation processes. In conclusion, there are several aspects contained in the *shastras*, and the science of architecture, which form a resource based on which new paradigms can be created to be incorporated into conservation and management approaches to historical and archaeological sites.

## Conclusion

The collection of the research material and bibliography presented here was made possible largely due to access to libraries and older books and their bibliographies. The reference libraries consulted in India include the Central Archaeological Library, the Oriental Research Institutes, the National Archives, and State Libraries to name but a few. The bibliography provided is a first attempt to understand what resources are available in order to carry out further research and develop an approach that incorporates both TKS and modern technologies into Indian conservation practices. Inclusion of TKS into the

practice for conservation is essential. The skills, materials and craftsmanship that are available in India, give hope that TKS may be incorporated into modern approaches. Modern conservation policies could include TKS through the technical know-how and the materials and specialised resources required.

The description of TKS is available in various languages and details the immense knowledge of design and craftsmanship in India. There is a variety of texts written within the different cultural traditions of the religions of Hinduism, Jain, Islam and Buddhism. The understanding of such details



in the present-day practice of conservation would be useful knowledge for making conservation decisions in the light of best practices.

The discussion in this paper on the *shastras*, the *Sthapati* and the science of architecture demonstrates that information on TKS is still readily available in India, opening the door to further research into the texts and treatises mentioned above. The TKS, through the texts and treatises that are available, contains a great deal of detail and information about how buildings were designed and constructed, and about the skills and qualifications of the architects. Such information would seem essential to conservation processes and training. The descriptions of the persons involved in the design and building processes demonstrates that a multidisciplinary approach was and is required. Therefore, a multidisciplinary team, led by an architect with a thorough understanding of TKS, sensitivity to design and respect for the other

professionals on the team would seem to be the best way forward for conservation work.

Because of the lack of research in TKS India is struggling to establish a conservation policy. Further discussion is required to bridge the knowledge gap.

Applicability of TKS for professionals working in the field of conservation could vary from preparing a multidisciplinary team for undertaking conservation works to directly applying the knowledge of design, proportions, details of construction, material usage for conservation of historical structures; from preparing good bricks for repair works and strengthening of heritage structures to replacing and repairing sculptures in temples.

Adaptability of TKS and integrating the knowledge into present day practice would provide a unique system of conserving and protecting heritage sites in India.

## References

Archaeological Survey of India. 2014. *National Policy for Conservation of the Ancient Monuments, Archaeological Sites and Remains (NPC-AMASR)* [online]. New Delhi, Ministry of Culture Government of India. [Cited 9 June 2019]. [https://mmrhcs.org.in/images/documents/regulation\\_guidelines/national\\_consrv\\_policy\\_monuments-2014.pdf](https://mmrhcs.org.in/images/documents/regulation_guidelines/national_consrv_policy_monuments-2014.pdf)

Government of India. 2010. *Ancient Monuments and Archaeological Sites and Remains Act, 1958 Updated as per the Ancient Monuments and Archaeological Sites and Remains (Amendment and Validation) Act, 2010* [online]. Paris. [Cited 9 June 2019]. [https://en.unesco.org/sites/default/files/inde\\_act24\\_1958\\_enorof.pdf](https://en.unesco.org/sites/default/files/inde_act24_1958_enorof.pdf)

INTACH. 2004. *Charter for the Conservation of Unprotected Architectural Heritage and Sites in India* [online]. New Delhi. [Cited 9 June 2019]. <https://architexturez.net/doc/az-cf-21208>

Jain, K. & Jain, M. 2000. *Architecture of the Indian Desert*. New Delhi, India Research Press.

Kramrisch, S. 1946. *The Hindu Temple*. Calcutta, University of Calcutta.

Shukla, D.N. 1934. *Vastu-Sastra: Vol. I: Hindu Science of architecture: (Engineering, town planning, civil architecture, palace architecture, temple architecture and an anthology of Vastu-laksanas)*. New Delhi, India Munshiram Manoharlal Publishers Pvt. Ltd.

Tadgell, C. 1994. *The History of Architecture in India*. London, Phaidon Press.

UNESCO World Heritage Centre. 2019. *Hill Forts of Rajasthan* [online]. Paris. [Cited 9 June 2019]. <https://whc.unesco.org/en/list/247>



## Appendix

S.No.	Title	Author	Publisher	Year
1	Rajput Architecture	G.S. Ghurye	Popular Prakashan Bombay	
2	Architecture of Manasara (Vol III and II)	Parasanna Kumar Acharya	New Bhartiya Book Corporation, Delhi, India	
3	South India and Its Architecture	Manorama Jauhari	Bhartiya Vidya Prakashan	
4	Early India Architecture: Palaces	Ananda K. Coomaraswamy	Munshiram Manoharlal Publishers Pvt. Ltd.	
5	The Conservation of Antiquities and Works of Art	H.J. Plenderleith	London Oxford University Press	
6	Illustrations of Buildings Near Muttra and Agra Showing the Mixed Hindu-Mahomedan Style of Upper India	Henry Hardy Cole	India Office; First Edition (1873)	
7	The Design Development of Indian Architecture	Claude Batley	D.B. Taraporevala Sons & Co. (p) Ltd.	1934
8	Canons of Indian Art: Study on Vastuvidya	Bhattacharyya, Tarapada	Firma K.L. Mukhopadhyay	
9	History of Indian and Eastern Architecture	James Fergusson	John Murray	1910
10	Vastu-Sastra: Vol. I: Hindu Science of architecture: (Engineering, town planning, civil architecture, palace architecture, temple architecture and an anthology of Vastu-laksanas)	D.N. Shukla	New Delhi, India Munshiram Manoharlal Publishers Pvt. Ltd. (1934)	1998
11	Dravidian Architecture	G. Jouveau Dubreuil	Printed at S.F.C.s Press	1917
12	Magadha, Architecture and Culture	Sris Chandra Chatterjee	University of Calcutta	1942
13	Conservation In The Tropics	Edited by: O.P. Agarwal	International Centre for Conservation, Rome (1972)	
14	Dravidian Architecture	G. Jouveau Dubreuil	Bharat Bharati	
15	Vastu-Sastra: Vol. I: Hindu Science of Architecture With special reference to (11th century) Bhoja's Samarangana Sutradhara	D.N. Shukla		



S.No.	Title	Author	Publisher	Year
16	Tibetan Sacred Art	Detlef Ingo Lauf	Shambhala, Berkeley and London	1976
17	Conservation of Cultural Property in India	Edited by: O.P. Agarwal	Conservation Laboratory, National Museum, New Delhi	
18	Indian Architecture according to Manasara-Silpasastra	Parasanna Kumar Acharya	Oxford University Press	
19	Rajput Art and Architecture	Jyotindra Jain and Jutta Jain-Neubauer	Franz Steiner Verlag	1978
20	Hindu Architecture in India and Abroad	Parasanna Kumar Acharya	Oxford University Press	
21	Architecture of Manasara	Parasanna Kumar Acharya	Oxford University Press	
22	Indian Architecture	O.C. Gangoly	Kutub	
23	Purna Kalsa or The Vase of Plenty	Prithvi Kumar Agarwala	Prithvi Prakashan	
24	The National Value of Art	Sri Aurobindo	Arya Publishing House, Calcutta	1946
25	Gupta Art	Vasudev S. Agarwala	Prithvi Prakashan	
26	Mansara on Architecture and Sculpture	Parasanna Kumar Acharya	Oxford University Press	
27	Architecture and Sculpture of India		Ministry of Information and Broadcasting, Govt of India	
28	The Ancient and Medieval Architecture of India: A Study of Indo-Aryan Civilisation	E.B. Havell	John Murray	1915
29	Essay on the architecture of the Hindus	Ram Raz	Indological Book House	1834
30	Stupa: Cult and Symbolism	Gustav Roth, Lokesh Chandra, K. Tanaka	International Academy of Indian Culture and Aditya Prakashan	
31	Ancient Indian Sculpture and Architecture	Dr Priyabala Shah	Gujarat University, Ahmedabad	
32	Studies in Early Bhuddhist Architecture of India	H. Sarkar	Munshiram Manoharlal Publishers Pvt. Ltd.	



S.No.	Title	Author	Publisher	Year
33	Bhartiya Vastu Shastra Hindu Prasad	D.N. Shukla		
34	Chalukyan Architecture	Alexr Bea	Indological Book House	
35	Calukya Architecture	Gerard Foekema	Munshiram Manoharlal Publishers Pvt. Ltd.	
36	The Taj	Kanwar Lal	R&K Publishing House	
37	Some Aspects of Mughal Architecture	R. Nath	Abhinav Publications	1976
38	Mathura Railing Pillars	Prithvi Kumar Agarwala	Prithvi Prakashan	
39	The Charm of Indo-Islamic Architecture	John Terry	D.B. Taraporevala Sons & Co. (p) Ltd.	1953
40	Arts, Crafts, Self-Improvement, Self-Instruction, Occult Sciences and Illustrated editions		D.B. Taraporevala Sons & Co. (p) Ltd.	
41	Illustrations of Ancient Buildings in Kashmir	Henry Hardy Cole	Indian Museum, London	1869
42	Cannons of Orissan Architecture	Nirmal Kumar Bose	R. Chatterjee, Kolkata	1932
43	Jaina Monument of Orissa	R.P. Mohapatra	D.K. Publications	
44	Architecture of Mansara	Parasanna Kumar Acharya	New Bhartiya Book Corporation, Delhi, India	
45	The Hindu Temples in Southeast Asia	Sachchidanand Sahai	Indian Institute of Advanced Study, Aryan Books International	
46	Ancient Art, Architecture and Environment	H.K. Pathak	Cyber Tech Publications	
47	Science and Golden Ratios in Mandala Architecture	Rekha Rao	D.K. Printworld (P) Ltd.	
48	Encyclopaedia of Hindu Architecture	P.K. Acharya	Oriental Book Centre	
49	Temples of India	Krishna Deva	Aryan Books International	
50	Indian Temple Styles	K.V. Soundara Rajan	Munshiram Manoharlal Publishers Pvt. Ltd.	
51	Temples of Gujarat	Dr Priyabala Shah	Parimal Publications	



S.No.	Title	Author	Publisher	Year
52	Govindadev, A Dialog In Stone	Margaret H. Case	New Delhi: Indira Gandhi National Centre for Arts	1996
53	Gupta Temple Architecture	Prithvi Kumar Agarwala	Prithvi Prakashan	
54	The Symbolism of the Stupa	Adrian Snodgrass		1985
55	Symbolism of Indian Architecture	Ananda Kentish Coomaraswamy	Humanities Pr	1984
56	Bhartiya Durgavidhan	Prabhashankar Ogadhbhai Sompura, Madhusudan Dhanki	Somaiya Publications Pvt. Ltd.	
57	Temples of North India	Krishna Deva	National Book Trust	1969
58	Temple Architecture of Eastern India	Ajay Khare	Shubhi Publications	
59	Early Buddhist Rock Temples	Vidya Dehejia	Thames and Hudson	1972
60	Report on the Buddhist Cave Temples and Their Inscriptions	Jas Burgess	Indological Book House	1964
61	Architecture Decorated with Architecture. Later Medieval temples of Karnataka 1000–1300 AD	Gerard Foekema	Munshiram Manoharlal Publishers Pvt. Ltd.	
62	Album of Indian Architectural Designs	Prabhāsañkara Oghaḍabhāi Somapurā	Sompura & Brothers	1977
63	Aparajitaprccha – A Critical Study (Encyclopaedic Manual on Art and Architecture)	Lal Mani Dubey	Lakshmi Publications	
64	Architecture of Mansara: illustrations of architectural and sculptural objects	Parasanna Kumar Acharya	Oxford University Press	
65	Bhagavadgomandal (Gujarati Dictionary)	Bhagwantsinhji	Rajkot:Pravin Prakashan	1986
66	Indian Architecture (Buddhist and Hindu)	Percy Brown	Bombay: Taraporevala Sons and Co. Pvt. Ltd.	1995
67	Indian Architecture (Islamic period)	Percy Brown	Bombay: Taraporevala Sons and Co. Pvt. Ltd.	
68	Traditional Buildings of India	Illy Cooper and Dawnson Barry	London: Thames and Hudson	1998



S.No.	Title	Author	Publisher	Year
69	Epigraphical Study, École française d'Extrême-Orient	Darasuram	Paris: Orient Memoires Archeologiques	1987
70	A History of Architecture	Banister Fletcher	New York: The Butterworth Group	1987
71	Vistara: The Architecture of India, Festival of India	Carmen Kagal	Mumbai: Tata Press Ltd.	1986
72	Ritual Art of India	Ajit Mookerjee	London: Thames and Hudson	1985
73	Vastu Shastra: Hindu Science of Architecture. Vol.II	D.N. Shukla	New Delhi: Munshiram Manoharlal Publishers Pvt. Ltd.	1993
74	The History of Architecture in India	Christopher Tadgell	UK: Logman Group Ltd. (1994)	1990
75	The Cambridge History of India (6 Vols.)	H.H. Dodwell	Cambridge	1934
76	The Wonder that was India	A.L. Bashram	London	1954,63,67
77	The History of Indian and Indonesian Art	A.K. Coomaraswamy	London	1927
78	The History of India as told by its own Historians (6 Vol.s)	H.M. Sir Elliot, Dowson	London	1876,77
79	The Arts of India	B. Gray	Oxford University Press	1981
80	India: Five Thousand Years of Indian Art	H. Goetz	London	1964
81	The Art and Architecture of the Indian Subcontinent	J.C. Harle	Harmondsworth	1986
82	The Art of Ancient India	J.C. and S.L. Huntington	New York	1985
83	The Art of India	S. Kramrisch	London	1954
84	The Speaking Tree	R. Lannoy	Oxford	1971
85	Historical Geography of Ancient India	B.C. Law	Paris	1954
86	The History of Culture of Indian People (7 Vols.)	R.C. Majumdar	Bombay	1951-77
87	Ancient India and Indian Civilization	P. Masson-Oursel	London	1934



S.No.	Title	Author	Publisher	Year
88	The Culture and Art of India	R. Mukerjee	London	1959
89	A Comprehensive History of India	K.A. Neelkanth Sastri	Bombay	1957
90	L'Inde Classique (3 Vols.)	L. Renou and J. Filliozat	Paris	1947,53
91	The Art and Architecture of the India	B. Rowland	London	1967
92	A Historical Atlas of South Asia	J.E. Schwartzberg	Chicago	1978
93	Royal Conquest and Cultural Migration in South India	C. Sivaramamurti	Calcutta	1955
94	The Oxford History of India	V.A. Smith	Oxford	1919
95	A History of Fine Art of India and Ceylon	P. Spear	Oxford	1911
96	A History of India (Vols. 1 & 2 respectively)	P. Spear and R. Thapar	Harmondsworth	1965,66 (rev:1978)
97	Annals and Antiquities of Rajasthan (2 Vols.)	J. Tod	London	1829–32
98	The Mythology of Brahma	G. Bailey	Delhi	1983
99	Hindu Places of Pilgrimage In India	S.M. Bharadwaj	London	1973
100	The Dance of Shiva	A. Coomaraswamy	London	1924 (rev:1969)
101	Buddhist Monks and Monasteries of India	S. Dutt	London	1962
102	The Hindu Tradition	A.T. Embree	New York	1966
103	Tantra	P. Rawson	London	1973
104	Myths and Symbols in Indian Art and Civilization	H.R. Zimmer	New York	1946
105	Mansara Series, I: A Dictionary of Hindu Architecture, II: Indian Architecture according to Mansara-Silpasastra, III: Mansara on Architecture and sculpture, IV & V: Architecture of Mansara (Translaton & Illustration), VI: Hindu Architecture in India and Abroad. VII: An Encyclopaedia of Hindu Architecture	P.K. Acharya	London	1946



S.No.	Title	Author	Publisher	Year
106	Forts and Palaces of India	P.V. Begde	Delhi	1982
107	Silpa Prakasa	S.R. Sarma and A. Boner	Leiden	1966
108	Vastusutra Upanisad; The Essence of Form in Sacred Art	B. Baumer	Delhi	1982
109	Studies in Indian Temple Architecture	P. Chandra	Delhi	1975
110	Early Indian Architecture	A.K. Coomaraswamy	Delhi	1975
111	Encyclopaedia of Hindu Temple Architecture	M. Meister and M.A. Dhaky	Delhi	1983
112	Town Planning in Ancient India	B.V. Dutt	Calcutta	1925
113	A History of Indian and Eastern Architecture	J.A. Fergusson	London	1976 (rev:1981)
114	Jaina Art and Architecture (3 Vols.)	A. Ghosh	Delhi	1974–75
115	The Architecture of India: Buddhist and Hindu	S. Grover	Sahibabad	1980
116	Architecture in Pakistan	Kamil Khan Mumtaz	Singapore	1985
117	Architecture and Art Treasures in Pakistan	F.A. Khan	Karachi	1969
118	The Hindu Temple (2 Vols.)	S. Kramrisch	Calcutta	1946
119	The Hindu Temple	G. Michell	London	1977
120	Buddhist Monuments	D. Mitra	Calcutta	1971
121	Indian Temples	O. Monod-Bruhl	Oxford	1952
122	History of Sultanate Architecture	R. Nath	Delhi	1978
123	History of Mughal Architecture (2 Vols.)	R. Nath	Delhi	1985
124	Villages, Towns and Secular Buildings in Ancient India	A. Ray	Calcutta	1964
125	Indische Palaste und Wohnhauser	O. Reuther	Berlin	1925
126	Aspects of Jaina Art and Architecture	U.P. Shah and M.A. Dhaky	Ahmedabad	1975
127	Indian Temple Styles	K.V. Soundara Rajan	Delhi	1972
128	Temples of South India	K.R. Srinivasan	Delhi	1972



S.No.	Title	Author	Publisher	Year
129	South Indian Temples	B. Stein	Delhi	1978
130	Strongholds of India and Fortified Cities of India	S. Toy	London	1957,65
131	Temples de l'Inde centrale et occidentale (2 Vols.)	O. Viennot	Paris	1976
132	Living Architecture: Indian, and Islamic Indian	A. Volwahren	New York	1969–70
133	Islamische Grabbauten in Indien	F. Wetzel	Osnabruck	(original ed.:1918) 1970
134	The Rise of Civilization in India and Pakistan	B. and R. Allchin	Cambridge	1982
135	Prehistoric Civilization of the Indus Valley	K.N. Dikshit	Madras	1973
136	The Roots of Ancient India, Archaeology of Early Indian Civilization	W.A. Fairservis	Chicago	1975
137	Mohenjo Daro and the Indus Civilization	J. Marshall	London, Delhi	1931,73
138	Ancient Cities of the Indus	G.L. Possehl	Durham	1979
139	The Indus Civilization	Sir R.E.M. Wheeler	Cambridge	1953,60,68
140	The Rig Veda		Doab	700 B.C.
141	Kautilya's Arthashastra	R. Shamasastri	Mysore	1929
142	The Origin of the Buddha Image, Art Bulletin 12	A.K. Coomaraswamy	Calcutta	1927 (reprinted 1970)
143	The Heliodorus Pillar: A Fresh Appraisal, AARP 6	J. Irwin		1974
144	The Achaemenids and India	S. Chattopadhyaya	Delhi	1974
145	L'Inde aux temps des Mauryas	L. de La Vallee-Poussin	Paris	1930
146	Asoka	R. Mookerji	London, Delhi	1928,55,62
147	The Age of the Nandas and Mauryas	K.A. Nikantha Sastri	Benares	1952
148	Asoka	V.A. Smith	Oxford	1920
149	Asoka and his Inscriptions	B.Barua	Calcutta	1946,55,68



S.No.	Title	Author	Publisher	Year
150	The Shakas in India	S. Chattopadhyaya	Delhi	1967
151	The 'Scythian' Period	J.E. van Lohuizen de leeuw	Leiden	1949
152	The Greeks in Bactria and India	Sir W.W. Tarn	Cambridge	1951
153	The Kushana Genealogy	B.N. Mukherjee	Calcutta	1967
154	The Dynasty Arts of the Kushanas	J.M. Rosenfeld	Berkeley	1967
155	'Recent Studies Involving the Date of Kanishka', <i>Artibus Asiae</i> 33-34	A.C. Soper		1971,72
156	Sculptures from Amaravati in the British Museum	D. Barrett	London	1954
157	'On the Development of Early Buddhist Art in India', <i>Art Bulletin</i> 40, no 2	W. Spink		1958
158	'An unfinished Chaitya Hall: Junnar Manmodi 39', <i>Ars Orientalis</i> 8	J. Williams		1970
159	Ancient India as Described by Megasthenes and Arrian	J.W. McCrindle	Calcutta	1877
160	A Guide to the Karla Caves	Barrett	Bombay	1957
161	The Stupa of Bharhut	A. Cunningham	London	1879
162	The Bhilsa Topes	A. Cunningham	London	1854
163	Early Buddhist Rock Temples, A Chronological Survey	V. Dehejia	London	1972
164	'The Rock cut caves of Pitalkhora in the Deccan', <i>Ancient India</i> 15	M.N. Deshpande		1959
165	Cave Temples of India	J. Burgess and J. Fergusson	London	1880
166	'The Lomas Rishi: Another Look', <i>Archives of Asian Art</i> 28	J.C. Huntington		1974,75
167	Buddhist Cave Temples of India	O.C. Kail	Bombay	1975
168	The Monuments of Sanchi	Sir J. Marshall and A. Foucher	Delhi	1955
169	Buddhist Monuments and Sanchi	Mitra	Delhi	1965
170	Ajanta	Mitra	Delhi	1956



S.No.	Title	Author	Publisher	Year
171	Udayagiri and Khandagiri	Mitra	Delhi	1960
172	The Origin and Development of Stupa Architecture in India	S. Panth	Varanesi	1976
173	Architecture of Bengal	S.K. Saraswati	Calcutta	1976
174	The Temples of Bengal	G. Mitchell		
175	Bengal Temples	B.K. Datta	Delhi	1975
176	'Bengal Brick Temples', S.I.T.A.	K. Fischer		
177	Kashmir, Hindu, Buddhist and Muslim Architecture	M. Kaul	Delhi	1971
178	Pandrethan, Avantipur and Martand (A.S.I.)	D. Mitra	Delhi	1977
179	'The Architecture and Organization of Kerala Style Hindu Temples', Anthropos 76	W.A. Noble		1981
180	An Architectural Survey of Temples in Kerala (A.S.I.)	H. Sarkar	Delhi	1978
181	Temple Architecture in Kerala	K.V. Soundara Rajan	Trivendrum	1974
182	The Maitraka and Saindhava Temples of Gujarat	J.M. Nanavati and M.A. Dhaky	Ascona (Artibus Asiae)	1969
183	'Phamsana in Western India', Artibus Asiae 38	M.W. Meister		1976
184	The Art of the Pallavas	O.C. Gangoly	Calcutta	1957
185	Mahabalipuram studies	M. Lockwood, G. Siromoney and P. Dayanandan	Madras	1974
186	Pallava Architecture Part 1 (Early Period)	A.H. Longhurst	Simla	1924
187	Pallava Architecture Part 2 (Mamalla Period)	A.H. Longhurst	Calcutta	1928
188	Pallava Architecture Part 3 (Rajasimha Period)	A.H. Longhurst	Calcutta	1930
189	'The Southern Indian Temple style, Part One: An Architectural Analysis of the Pallava Temples', AARP 10	G. Mitchell		1976



S.No.	Title	Author	Publisher	Year
190	Art and Culture of Tamil Nadu	R. Nagaswamy	Delhi	1972
191	Pallava Architecture (A.S.I.)	A. Rae	Madras	1909
192	Cave Temples of Pallavas (A.S.I.)	K.R. Srinivasan	Delhi	1964
193	'The Pallava Architecture of south India', Ancient India 14	K.R. Srinivasan		1958
194	The Dharmaraja Ratha and its Sculpture, Mahabalipuram	K.R. Srinivasan	Delhi	1975
195	'Temples of the Later Pallavas', S.I.T.A.	K.R. Srinivasan		
196	A Guide to the Pattadakal Temples	A.N. Annigery	Dharwar	1961
197	'The Mahakuta Pillar and its Temples', Artibus Asiae 41	C.R. Bolon		1979
198	'The Temples of Alampur', Journal of Indian history 39	M. Rama Rao		1969
199	Alampur	P.R. Ramachandra Rao	Hyderabad	1977
200	Early Chola Temple	S.R. Balasubramanyam	Bombay	1971
201	Middle Chola Temple	S.R. Balasubramanyam	Faridabad	1975
202	Late Chola Temple	S.R. Balasubramanyam	Faridabad	1979
203	'Sri Vismangalesvar Temple of Turaiyur', S.I.T.A.	S.R. Balasubramanyam		
204	Early Chola Architecture and Sculpture	D. Barrett	London	1974
205	'South Indian Temple Bases', Oriental Art 3	J.C. Harle		1957
206	'Early Chola Temple at Pullamangai', Oriental Art 4	J.C. Harle		1958
207	Temple Gateways of South India	J.C. Harle	Oxford	1963
208	Gangaikondacholapuram	R. Nagaswamy	Madras	1970
209	The City of the Cosmic Dance: Chidambaram	B. Natarajan	Delhi	1974



S.No.	Title	Author	Publisher	Year
210	The Kampaharesvara Temple at Tribhuvanam	H. Sarkar	Madras	1974
211	The Chola Temples, Tanjavur, Gangaikonda-cholapuram and Darasuram	C. Sivaramamurti	Delhi	1960
212	'Early Pandya, Muttaraiyar and Irukkuvel Architecture', S.I.T.A.	K.V. Soundara Rajan		
213	Temples of North India; 'Bhumija Temple', S.I.T.A.	K. Deva		
214	'The Genesis and Development of Maru-Gurjara Temple Architecture', S.I.T.A.	M.A. Dhaky		
215	The Western Indian Jaina Temples	Shah		
216	Aspects of Jaina Art	Dhaky		
217	Rajput Architecture	G.S. Ghurye	Bombay	1968
218	'The Post-Gupta style in Indian Temple Architecture and Sculpture', Journal of the Royal Society of Art, 5253	J.C. Harle		1977
219	Ancient Cities and Towns of Rajasthan	K.C. Jain	Delhi	1972
220	Jain Temples of Central India	Shah		
221	'Phamsana in Western India', Artibus Asiae, XXXVIII			1976
222	Temples of Rajasthan	H.B. Pal	Jaipur	1969
223	'The Vastuvidya of Visvakarma', S.I.T.A.	P.O. Sompura		
224	The Temples of Osian, (A.S.I. 1908-09)	D.R. Bhandarkar	Calcutta	1912
225	Art of Osian Temples	A. Kalia	Delhi	1982
226	Architectural Antiquities of Northern Gujarat (A.S.I.)	J. Burgess and H. Cousens	London	1903
227	Somanatha (A.S.I.)	H. Cousens	Calcutta	1931
228	'The Chronology of the Solanki temples of Gujarat', Journal of the Madhya Pradesh Itihasa Parishad 3	M.A. Dhaky		1961



S.No.	Title	Author	Publisher	Year
229	The Riddle of the Temple of Somanatha	H.P. Shastri	Varanesi	1974
230	Homage to Khajuraho	M.R. Anand, C. Fabri, S. Kramrisch	Bombay	1962
231	'The Kaula-Kapalika Cults at Khajuraho', Lalit Kala 1-2	P. Chandra		1955,56
232	Khajuraho	K. Deva	Delhi	1980
233	Immortal Khajuraho	K. Lal	Delhi	1967
234	The Art of Khajuraho	R. Nath	Delhi	1980
235	Khajuraho, A Study in the Cultural Conditions of Chandella Society	V. Prakash	Bombay	1967
236	New Light on the Sun Temple of Konarak	Boner and Sharma	Varanesi	1974
237	Early Stone Temples of Orissa	V. Dahejia	Delhi	1979
238	'Propitious-Apotropaic Eroticism in the Art of Orissa', Artibus Asiae 37	T.E. Donaldson		1975
239	Orissan Sculpture and Architecture	O.C. Gangoly	Calcutta	1956
240	Miracle of Konarak	K. Lal	Delhi	1967
241	Temples and Sculptures of Bhubaneswar	K. Lal	Delhi	1970
242	Bhubaneswar	D. Mitra	Delhi	1966
243	Konarak	D. Mitra	Delhi	1968
244	Archaeological Remains at Bhubaneswar	K.C. Panigrahi	Bombay	1961
245	Chalukyan Architecture of the Kanarese Districts (A.S.I.)	H. Cousens	Calcutta	1962
246	Mediaeval Temples of the Dakhan	H. Cousens		
247	The Indian Temple Forms in Karnata Inscriptions and Architecture	M.A. Dhaky	Delhi	1977
248	Masterpieces of Hoysala Art: Halebid, Belur and Somnathpur	S.K. Maity	Bombay	1978



S.No.	Title	Author	Publisher	Year
249	A Guide to Halebid	L. Narasimhachar	Mysore	1950
250	The Kesava Temple at Somnathpur	R. Narasimhachar	Bangalore	1917
251	The Kesava Temple at Belur	R. Narasimhachar	Bangalore	1919
252	The Laxmidevi Temple at Dodda-Gaddavalli	R. Narasimhachar	Bangalore	1919
253	Chalukyan Architecture	A. Rea	Madras	1896
254	Temples of Telingana	M.R. Sarma	Hyderabad	1972
255	'Hoysala Temple Architecture', The Hoysala Dynasty (ed. Sheik Ali)	M. Seshadri	Mysore	1972
256	'Main Trends in the Hoysala Temple Style', The Hoysala Dynasty (ed. Sheik Ali)	K.V. Soundara Rajan	Mysore	1972
257	Early Temple Architecture in Karnataka and its Ramification	K.V. Soundara Rajan	Dharwar	1969
258	Historic Landmarks of the Deccan	T.W. Haig	Allahabad	1907
259	'Jaisalmer, India: Morphology of a Desert Settlement', Architecture and Urbanism 8	K. Jain		1986
260	'Daulatabad: Road to Islamic Archaeology in India', World Archaeology XIV	M.S. Mate		1983
261	South Indian Studies (I-II)	R. Nagaswamy	Madras	1978,79
262	Rise of Maratha Power	M.G. Ranade	Bombay	1900
263	Glimpses of Deccan History	M.R. Rao	Bombay	1951
264	Mediaeval History of the Deccan	S.K. Sinha	Hyderabad	1964
265	The Early History of the Deccan (2 Vols.)	G. Yazdani	London	1960
266	'The Delhi Sultanate' in Majumdar History	Khan, Nath, Reuther, Wetzel and S.K. Saraswati		
267	The Archaeological and Monumental Remains of Delhi	S. Carr	Calcutta	1876
268	The Architecture of Ancient Delhi	H.H. Cole	London	1884
269	Delhi Past and Present	H.C. Fanshawe	London	1902

S.No.	Title	Author	Publisher	Year
270	The Seven cities of Delhi	G.R. Hearn	London	1906
271	The History of the Qutub Minar	R.N. Munshi	Bombay	1911
272	Delhi: its Story and Buildings	H. Sharp	Delhi	1921
273	Delhi: A Historical Sketch	T.G.P. Spear	Bombay	1945
274	Report on the Antiquities of Aurangabad and Bidar, (A.S.I.)	J. Burgess	London	1878
275	Indian Islamic Architecture: The Deccan 1347–1686	E.S. Merklinger	Warminster	1981
276	Bidar: Its History and Monuments	G. Yazdani	Oxford	1947
277	Bijapur and its Architectural Remains, (A.S.I.)	H. Cousens	Bombay	1916
278	Bijapur: The Old Capital of the Adil Shahi kings	H. Cousens	Poona	1923
279	Antiquarian Remains in Hyderabad State	Syed Yousuf	Hyderabad	1953
280	Sri Ranganathaswamy: Le Temple de Vishnu a Srirangam	J. Auboyer	Paris	1969
281	Hampi	D. Devakunjari	Delhi	1970
282	Madurai Through the Ages	D. Devakunjari	Madras	1979
283	'The Town-Planning of Vijayanagara', AARP 14	V. Filliozat		1978
284	'The History, Social and Economic Conditions of the Vitthala Temple at Hampi', South Asian Archaeology 1981 (ed. B. Alchin)	V. Filliozat	Cambridge	1984
285	'The Grand Ruins of the Ancient City of Vijayanagara', Inside Outside XXI	J.L. Fritz		1981
286	Hampi Ruins	A.H. Longhurst	Madras	1917
287	'Vijayanagara: The Architectural Record', South Asian Studies I	G. Mitchell		1985
288	Homage of Hampi (Marg III) and Splendours of the Vijayanagara Empire: Hampi	V. Filliozat	Bombay	1981



S.No.	Title	Author	Publisher	Year
289	Vijayanagara: Progress of Research 1979–83	M.S. Nagaraja Rao	Mysore	1983,84
290	The Royal Centre at Vijayanagara: Preliminary Report	J.L. Fritz and G. Mitchel	Melbourne	1984
291	A Forgotten Empire	R. Sewell	London	1900
292	‘Vijayanagara: City of Victory’, Journal of Indian History 51	W. Spink		1973
293	‘Orchha: A City Left to the Jungle’ and ‘Assassin’s Palace at Datia’, Country Life 162,4191/2	P. Chetwode		1977
294	A Handbook of Gwalior	M.B. Garde	Gwalior	1936
295	Rajput Art and Architecture (essays on Rajput and Bundela subjects originally published in various journals between 1938 and 1961, collected and edited by J. Jain and J. Jain-Neubauer)	H. Goetz	Wiesbaden	1978
296	Der Taj Mahal in Agra	D. Brandenburg	Berlin	1969
297	The Taj Mahal	D. Carroll	New York	1972
298	The Cities of Mughal India	G. Hambly	London	1968
299	Delhi, Agra, Fathpur-Sikri	M. Hurlimann	London	1963
300	Fathpur-Sikri and its Architecture	A.B.M. Husain	Dacca	1970
301	‘The Taj Mahal in the context of East and West’, Journal of the Warburg and Courtauld Institute XXIV	R.A. Jairazbhoy		1961
302	Lahore: Its History, Architectural Remains and Antiquities	S.M. Latif	Lahore	1892
303	Imperial Agra and the Mughals	K. Majumdar	Agra	1934
304	The History of the Taj and the Buildings in its Vicinity	M. Moin-ud-din	Agra	1905
305	Lahore and its Important Monuments	W.U.K. Muhammad	Karachi	1964
306	The Immortal Taj Mahal, The Evolution of the Tomb in Mughal Architecture	R. Nath	Bombay	1972



S.No.	Title	Author	Publisher	Year
307	History of Decorative Art in Mughal Architecture	R. Nath	Delhi	1976
308	Fathpur Sikri	Saiyid A.A. Rizvi and V.J.A. Flynn	Bombay	1975
309	A Guide to the Building and Gardens, Delhi Fort	G. Sanderson	Delhi	1937
310	Agra and its Monuments	B.D. Sanwal	Bombay	1968
311	Akbar's Tomb, (A.S.I.)	E.W. Smith	Allahabad	1909
312	Gardens of the Great Mughals	C.M.V. Stuart	London	1913
313	The Art of Mughal Interior	S.C. Welch	New York	1964
314	The Story of Madras	G. Barlow	London	1921
315	Palaces of the Raj	M. Bence-Jones	London	1978
316	Churches in India	P. Thomas	Delhi	1961
317	'Monuments to Empire Builders', Architectural Review, 8	P. Chetwode		1935
318	'Calcutta Cemetery', Architectural Review, 7	R. Pearson		1957
319	'European Sepulchral Architecture in India', Indica, 12	B.B. Sharma		1975
320	'Crumbling Monuments of the Raj', Country Life, 2 September	T. Wilkinson		1976
321	Architecture of the Islamic World	George Mitchell (ed.)	London: Thames and Hudson	1978
322	The Islamic Heritage of Bengal	George Mitchell (ed.)	UNESCO	1984
323	The Forts of India	Virginia Fass	London: Collins	1986
324	Maharajah of Baroda, The Palaces of India	Gaekwad Fatehsinghrao	London: Collins	1980
325	The Strongholds of India	Sidney Toy	London: Heinemann	1957
326	The Fortified Cities of India	Sidney Toy	London: Heinemann	1965
327	India as Seen By William Finch (1608–11)	R. Nath	Jaipur: The Historical Research Documentation Programme	1990



S.No.	Title	Author	Publisher	Year
328	The Taj Mahal & Its Incarnation	R. Nath	Jaipur: The Historical Research Documentation Programme	1985
329	The New Cambridge History of India	Catherine B. Asher	Cambridge University Press	
330	Conservation of Monuments in India	A.K. Seshadri	Delhi: Book India Publishing Co.	1997
331	Concepts of Space Ancient and Modern	Kapila Vatsyayan	Delhi: Abhinav Publications	1991
332	The Ancient Cubit and Our Weights and Measures	Lieut.-General Sir Charles Warren	London: The Committee of the Palestine Exploration Fund	1903
333	The Concept of Maya	P.D. Devanandan	Calcutta: Y.M.C.A. Publishing House	1954
334	Vedic Culture	Swami Mahadevananda Giri	Calcutta: University of Calcutta	1947
335	An Introduction to the Study of Indian History	Damodar Dharmananda Kosambi	Bombay: Popular Book Depot	1956
336	Simpson's History of Architectural Development Vol. I: Ancient and Classical Architecture	Hugh Plommer	London, New York, Toronto: Longmans, Green and Co.	1956
337	Introduction to Indian Art	A. Coomaraswamy	Adyar: The Theosophical Publishing House	1956
338	The Living Thoughts of Gotama The Buddha	A. Coomaraswamy and I.B. Horner	London, Toronto, Melbourne and Sydney: Casell and Company Ltd.	1948
339	Manasara on Architecture and Sculpture: Sanskrit text with critical notes vol.3	Acharya, Prasanna Kumar	Oxford University Press; London	1932
340	Spiritual Authority and Temporal Power in the Indian Theory of Government	A. Coomaraswamy	New Haven, Connecticut: American Oriental Society	1942
341	The Brhadaranyaka Upanisad	Swami Mahadevananda Giri	Mayavati, Almora, Himalayas: Advaita Ashrama	1950
342	Brahma-Sutras	Swami Vireswarananda	Mayavati, Almora, Himalayas: Advaita Ashrama	1948



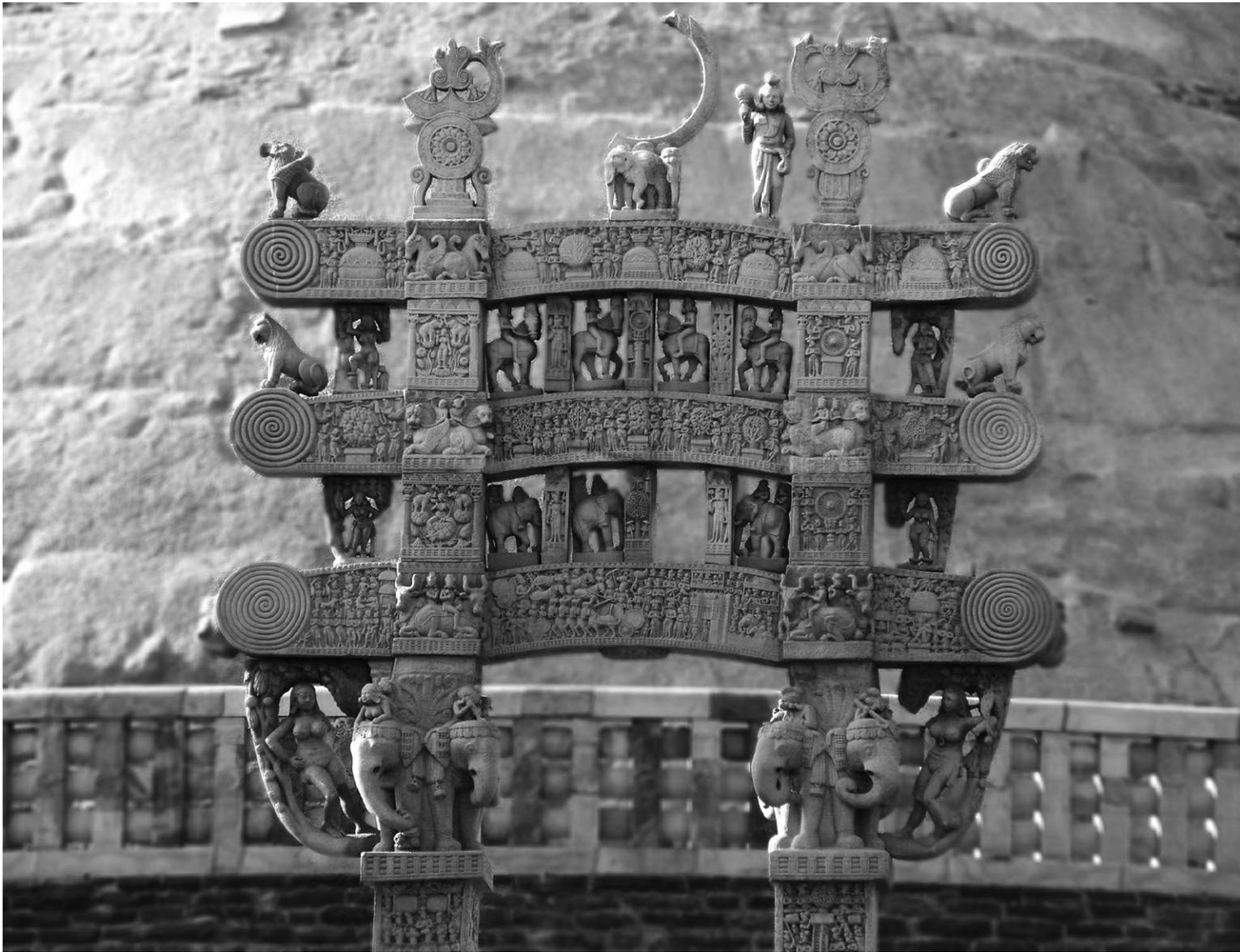
S.No.	Title	Author	Publisher	Year
343	The Spiritual Heritage of India	Swami Prabhavananda and Christopher Isherwood	London: George Allen & Unwin Ltd.	1962
344	Elements of Buddhist Iconography	A. Coomaraswamy	Cambridge: Harvard University Press	1935
345	Kama Kala	Mulk Raj anand	Geneva, Paris, New York, Karlsruhe: Nagel Publishers	1958
346	The Sacred Books of the Hindus	Major B.D. Basu	Allahabad: Panini Office, Bhuvaneswari Asrama, Bahadurganj	1920
347	The Palaces of Crete and Their Builders	Angelo Mosso	London: T. Fisher Unwin	1906
348	Ancient History of the Deccan	G. Jouveau Dubreuil	Pondicherry	1920
349	That Beauty is a State	A. Coomaraswamy	The Burlington Magazine	1915
350	Eastern Art – A quarterly	Hamilton Bell, Langdon Warner and Horace H.F. Jayne	Philadelphia: Memorial Hall, Fairmount Park	1928
351	The Indian Crafts-man	A. Coomaraswamy	London, W.C.: Probsthain & Co.	1909
352	A New Approach to the Vedas	A. Coomaraswamy	London: Luzac & Co.	1933
353	Bhartiya Vastukala ka Itihas	Krishnadutt Vajpai	Lucknow: Hindi samiti	1972
354	History of Indian and Indonesian Art	A. Coomaraswamy	Delhi: Munshiram Manoharlal	1972
355	Iconography of the Hindus, Buddhists and Jains	R.S. Gupte	Bombay: D.B. Taraporevala Sons & Co. Pvt. Ltd.	1972
356	The Arts and Crafts of India & Ceylon	A. Coomaraswamy	Delhi: Today & Tomorrow's Printers & Publishers	1913
357	The Mayamata of Mayamuni	Mahamahopadhyaya	Trivandrum: Superintendent, Government Press	1919
358	Aims and Ideals of Ancient Indian Culture	Brojasundar Ray	Calcutta: A. Roy & Co.	
359	The Kadamba Kula: A History of Ancient and Mediaeval Karnataka	George M. Moraes	Bombay: B.X. Furtado & Sons	1931



S.No.	Title	Author	Publisher	Year
360	Men and Thought in Ancient India	Dr. Radha Kumud Mookerji	Bombay: Hind Kitabs Ltd.	1957
361	Indigenous Banking in Ancient Medieval India	Brijkishore Bhargava	Bombay: D.B. Taraporevala Sons & Co. Pvt. Ltd.	
362	Iron in Ancient India	Panchanan Neogi	Calcutta: The Indian Association for the Cultivation of Science	1914
363	Preservation of National Monuments: First Report of the Curator of Ancient Monuments in India		Simla: Government Central Branch Press	1882
364	Memoirs of the Map of Hindoostan or the Moghul Empire	James Renell	London: W. Bulmer & Co.	1793
365	Ancient and Medieval India Vol II	Mrs. Manning	London: W.H. Allen & Co.	1869
366	Ancient India and Southern Indian History & Culture	Dewan Bahadur Dr. S. Krishnasvami Aiyangar	Poona: Oriental Book Agency	1941
367	Hinduism and Buddhism	A. Coomarswamy	Philosophical Library New York	
368	History of Ancient India	Rama Shankar Tripath	Delhi, Varanasi, Patna: Motilal Banarsidass	
369	The Care of Ancient Monument	G. Baldwin Brown	Cambridge: The University Press	1905
370	Conservation of Ancient Monuments		Simla: Government Central Printing Office	1907
371	Colour Decorations of Architecture	James Ward	London: Chapman and Hall, Ltd.	1913
372	The Heritage of India: Asoka	James M. Mapchail	Calcutta: The Association Press and London: Oxford University Press	
373	Ancient India and the Indian Civilization	Paul Masson-Oursel	London: Kegan Paul, Trench, Trubner & Co., Ltd.	1934
374	Ancient Engineers	L. Sprague de Camp	London: Souvenir Press	1960,62,63
375	Life in Ancient India	Adolf Kaegi	Calcutta: Susil Gupta Ltd.	1950



S.No.	Title	Author	Publisher	Year
376	Potteries in Ancient India	B.P. Sinha	Patna: The Department of Ancient Indian History & Archaeology, Patna University	1969
377	Economic Organisation in Ancient India (200 BC–200 AD)	Shyamsunder Nigam	Munshiram Manoharlal Publishers Pvt. Ltd.	1975
378	Development of Script in Ancient Kamarupa	Dr T.P. Verma	Asam Sahitya Sabha	1979
379	Daily Life in Ancient India	Jeannine Auboyer	Asia Publishing House	1961
380	Wheeler Committee Report-1965			
381	Manusmriti	Shastri, Hargovind	Varanasi: Chowkhambha Sankrit Series	1953
382	Ragavibodha of Somanatha with his own commentary viveka	Sastri, S. Subrahmanya	Madras: The Vasanta Press	1945
383	Somanatha and other mediaeval temples in Kathiawad	Cousens, Henry	Calcutta: Central Publication Branch	1931
384	Matsya Purana	Matsya	Delhi: Oriental Publishers	1972
385	The Cultural Heritage of India, Vol I, The Early Phases		Kolkata: The Ramakrishna Mission, Institute of Culture	1937; Reprinted 2004
386	The Cultural Heritage of India, Vol II, Itihas, Puranas, Dharma and other Sastras		Kolkata: The Ramakrishna Mission, Institute of Culture	1937; Reprinted 2004
387	The Cultural Heritage of India, Vol III, The Philosophies		Kolkata: The Ramakrishna Mission, Institute of Culture	1937; Reprinted 2004
388	The Cultural Heritage of India, Vol IV, The Religions		Kolkata: The Ramakrishna Mission, Institute of Culture	1937; Reprinted 2004
389	The Cultural Heritage of India, Vol V, Language and Literature		Kolkata: The Ramakrishna Mission, Institute of Culture	1937; Reprinted 2004
390	The Cultural Heritage of India, Vol VI, Science and Technology		Kolkata: The Ramakrishna Mission, Institute of Culture	1937; Reprinted 2004
391	The Complete Taj Mahal and the riverfront gardens of Agra	Prof Ebba Koch	Thames and Hudson	2012
392	Architecture of Mughal India	Catherine B Asher	Cambridge University Press	1992
393	The Tradition of Indian Architecture	GHR Tillotson	Oxford University Press	1989



*Northern Gate, Sanchi Stupa by Raveesh Vyas (CC BY-SA 2.0)/Wikimedia Commons.*

◁ CHAPTER 9 ▷

**Traditional Knowledge Systems  
of India as gleaned from literature**

Sathyabhama Badhreenath



## Abstract

The upkeep, maintenance, conservation, restoration and reuse of the monumental heritage of India, centred on the primary concept of maintaining continuity of worship, was based on sound scientific principles, as illustrated in traditional texts. These traditional texts, called the *Āgamas* (a well-structured and traditionally communicated wisdom), discuss all aspects of temple activity from the selection of a site for construction to its consecration. The theory of *kumbhabhishekam* (reconsecration) is an accepted norm in Hindu religious tenets, as continuity of worship is a core principle. According to the *Āgamas*, a ruined temple retains its sanctity; not only does it continue to exist, but, through renovation (*jirnoddharana*) and reconsecration, it can become a place of worship once more. The word *jirnoddharana* is a compound word, comprised of *jirna*, which in Sanskrit means withered or decayed, and *uddharana*, which means to restore to its original form. For the purposes of this paper, I have studied the conservation practices contained in the *Jirnoddharana dasakam*, a seminal text on the subject of conservation, dating from the end of the fourteenth century, written by Nigama-jnana Sivacharya.

## Introduction

Edifices of religious importance for Hinduism abound in every corner of India, dedicated to both pan-Indian and local deities. Some of the immense structures still attract a large number of worshippers, while other temples are in various stages of neglect, and new temples are also being constructed. The continuous and complex interaction between different religious groups has helped to keep temples alive. For a thorough understanding of the religious processes that have evolved and continue to evolve, a comprehensive and holistic study of the diverse available sources is required. To grasp the significance of the model of the Hindu temple and the key concept of maintaining continuity of worship, we must consider: the rich monumental heritage; the numerous texts in Sanskrit and in regional languages; the epigraphic sources, and traditional practices.

The emergence of Buddhism and Jainism in fifth century BCE, with their more pragmatic doctrines, challenged Brahmanical orthodoxy. In response, Brahmanism reoriented itself and reworked its traditions to ensure that it survived.

The growth of this reoriented Brahmanism during the early medieval period (sixth to ninth centuries CE) saw the evolution of different gods around the chief deities Shiva and Vishnu, where the temple also became the focus of development. Distinct styles of architecture and sculpture emerged, along with a vast body of literature.

The growth of religion and art in India was based on sound scientific principles. The *agamic* treatises (Hindu texts based on traditional knowledge) and the *Vastu Shastras* (texts on the Hindu system of architecture) provide extensive insight into, for example, how locations for temples were selected and temple structures were designed. All temples are living examples of this science.

Research into literary and epigraphic sources shed light on the principles enunciated by our forefathers on the upkeep, maintenance, conservation, restoration and reuse of our monumental heritage, based on the key concept of maintaining continuity of worship. This research forms the context in which the present paper is submitted.

## The Āgamas

The *Āgamas* are important rules. The word *agama* means a well-structured and traditionally communicated wisdom. In more detailed terms, *agama* means an ancient oral and written tradition of worship and the philosophical, psychological, ritualistic and behavioural aspects thereof. *Āgamas* prescribe the structure and architecture of the various temples, customs to be followed, rituals to be performed, and festivals to be conducted – in fact, the entire range of activities connected with the temple (Ramachandra Rao, 1993, p. 1). *Āgamas* are theological treatises and practical manuals of divine worship: they explain the external worship of gods, through idols and temples and so on. All *Āgamas* address *jnana* (knowledge); *yoga* (concentration); *kriya* (esoteric ritual), and *charya* (exoteric worship). They also provide

elaborate details concerning ontology, cosmology, devotion, meditation, philosophy of mantras (mnemonic hymns), mystic diagrams, charms and spells, temple-building, image-making, domestic observances, social rules, and public festivals. Three of the major sections of the *Āgamas* comprise the *Vaishnava* (Vishnu), *Shaiva* (Shiva) and *Shakta* (Devi) texts. *Āgamas* include tantras and mantras.

The proliferation of temple construction from the seventh century necessitated the codification of practical instruction manuals. It seems likely that these texts were based on the collective experiences of the priesthood, who translated the philosophical concepts of religion and images into less esoteric forms, and on the experiences of those artisans engaged in the construction of the temples. The coordination required by

patrons, priests and artists underscored the need for systematisation to take place. Amorphous knowledge was defined and codified and, in turn, via the long process of documentation, merged into religious practices. The rules of procedure, defined by the priests, highlight the existence of underlying unity of thought, planning and execution (Soundara Rajan, 1972, p. 4). Furthermore, beauty, utility and a central and directive communal cohesion were at the very root of such efforts (Soundara Rajan, 1972, p. 6). Artisans committed to memory the *silpas* (rules for carving images) and an authoritative textbook emerged, which the artisans followed scrupulously. Basic measurements were followed, leading to the construction of temples built with mathematical precision. Standard authorities on the *sastras* (manuals) also emphasised that artists should learn to depict images of the gods by means of spiritual contemplation of the *dhyana slokas* (meditative verses about a particular deity) ascribed to each image.

The *silpa sastras* and the *agamic* texts clarify various details concerning the temple, for example the selection of the site, rules for planning, rules regarding the sculptural forms to be installed inside the temple, the *pujas* (worship to be offered) to be performed, and the kind of food to offer to the deity enshrined within. It also includes the criteria by which a priest can be engaged by a temple for offering worship. The temple and the deity are to be sanctified by elaborate ritualistic ceremonies, endowing the image with power. This is referred to as *pranapratishta*, or infusing life into the body, and *avahana* or drawing the divine force and making it reside in the image. Only after these preliminary ceremonies have taken place, can daily worship be offered to the idols therein installed.

While details relating to construction and rituals are closely adhered to when temples are constructed, little attention is paid to their conservation and renovation. The *sastras* have independent chapters, which outline the rules and procedures that are to be followed; these place great emphasis on the quality of material necessary, and the type

of material that is to be used in different climatic zones; they also include information on the possible causes of decay and deterioration of both the buildings and the images enshrined in them.

The theory of *kumbhabhishekam* (reconsecration) is an accepted norm in Hindu religious tenets, as continuity of worship is a core principle. Such *kumbhabhishekam* ceremonies are still routinely followed in temples today where worship takes place. According to *agamic* texts, any ruined temple continues to retain its sanctity: not only does it continue to exist, but, through renovation and reconsecration, it can become a place of worship once more (Nagaswamy, 2012, p. 49).

There is one universal principle contained in these *Āgamas*: that the rules of conservation are based on ancient traditions and are applicable to all structures and buildings, without any religious bias. Indeed, they are also applicable to secular structures, such as forts and palaces. Except for some minor variations, these texts provide some basic uniform principles.<sup>1</sup>

### *Jirnoddhara Dasakam*

The architectural treatises that deal with conservation, including restoration, are generally classified as *jirnoddhara*, *navakarma*, or *anukriti*. The word *jirnoddharana* is a compound word, comprised of *jirna*, which in Sanskrit means withered or decayed, and *uddharana*, which means to restore to its original form. The seminal text on conservation/restoration, called the *Jirnoddhara Dasakam* was written by Nigama-jnana Sivacharya at the end of the fourteenth century. It seems that the text was written in the famous *Shiva shetra* (holy place) of Tiruvannamalai and refers to the *gopura* (entrance gateway) built by Sambhu Bhupati. This is now known as the Sambhu Bhupati *gopura*, probably thus named by the Sambhuvarayars, who were active in this area at around 1380, when the area was conquered by the Vijayanagara ruler, Kumara Kampanna.

1 Information received from Dr. R. Nagaswamy, former director of the State Department of Archaeology, Tamilnadu. All the texts are to be studied in detail, as many of them are available only in manuscript form. I am indebted to Assistant Professor S. Aruna Sundaram, *Shiva agama* expert, for the reading of the *Shiva agama* text.



The text is to be understood in the context of the prevailing political conditions in South India in the fourteenth century. The Mughals (Muslim conquerors from Persia and Central Asia) had invaded various parts of the south and had vandalised and terrorised the people, and pockets of the south remained under their control. There was a risk of the *sastra* and *vastu* texts becoming forgotten, hence the learned *brahmana* (author of the text) formulated a summary text, incorporating the details of the earlier texts and traditional practices appropriately, during the course of the renovation of the *gopura*. This booklet has since been classified as a *paddhati* (tradition). This text cites many *vastu*, *agam* and *puranic* texts on restoration and quotes the *gnana* (knowledge) of scholars.

After introductory verses praising the author's ruler, and invocatory verses praising Shiva (one of the triad in the Hindu pantheon), the work focuses on the restoration of temples dedicated to Shiva, and contains information collected from many *Āgamas*. It is in three parts: the first part addresses sacred space and structure; the second part discusses *linga* (the phallic representation of Shiva, usually a sculpture), which is the main image of the god in the sanctum, and the third part examines idols depicting the different manifestations of Shiva such as secondary images.

Seven types of temple restoration are mentioned, namely: (i) place; (ii) building; (iii) compound wall (*prakara*) and circumambulatory passage; (iv) temple towers; (v) halls; (vi) sub-shrines; and (vii) *vastu* such as *bhumi*.

Different types of restoration are identified for the Shiva *linga*. According to the *Shiva Āgamas*, there are six sub-categories under the aforementioned third type of restoration: (i) stone idols; (ii) metal idols; (iii) paintings; (iv) tridents; (v) *kunda* (wells); and (vi) *siddhantas* (*agam* texts).

Types of damage mentioned:

- subsidence: damage caused due to changing ground levels inside and around the sanctum, unseating the *linga*;
- rodents: holes made by rodents attracted to the sanctum by the smell of remnants from offerings;
- humidity: water settles inside the holes made by rodents, due to the regular performance of

*abhisheka* (sacred bath of the deity), resulting in constant humidity, causing the plaster to peel and so on.

Conservation measures:

- the *acarya* (priest) is to take responsibility for taking measures to protect the temple after invoking the divine spirit in the *linga* form;
- should any damage become apparent, in any part of the temple, there will be partial restoration of the damaged area only;
- any restoration is to be carried out using materials similar to those used during the original building. Stronger material may be used if the structure has developed defects in the original material, for example, stone may be used to replace brick;
- measurements are to conform with those of the original/earlier structure.

Restoration process:

- restoration of the structure is to be carried out by artisans, while other aspects of the restoration process are to be undertaken by the *acarya*. Rituals are performed to invoke the power of the main deity within a *balalinga* (temporary deity) and then restoration is started;
- the original *linga* is to be placed inside a wooden casing for protection;
- once the restoration work is complete, power is restored to the original *linga*. This is called *puṇyapratiṣṭha* (reconsecration);
- restoration of other partially or completely dilapidated sections of the temple in the *prakaras* (outer temple complex), such as the *gopuras* (entrance gateways), pillared *mantapas* (pillared halls), *parivaradevata* shrines (sub-shrines for minor deities), and *kundas* (wells), is to be carried out using the same material, using the same measurements.

Rules of restoration:

- *lingas* which remain intact can be reconsecrated;
- if a *linga* remains lost for more than twelve years, it can be replaced with a new one;



- lingas that have become worn or so old as to be unusable are to be relinquished, as per the procedure stated in the *Saiva Āgamas*;
- should it be necessary for a linga to be reconsecrated, any restoration must respect the existing linga. If the nature of the temple to be restored is unknown, the form of worship should indicate the nature of the linga: it should not be necessary to disturb the base of the mulalinga to examine and ascertain the type. This clearly emphasises the importance of minimum intrusion;
- damage to the *swayambu*, or self-manifested lingas, is not considered a defect. Defects up to certain permissible levels are to be left; however,

they should be strengthened using thin gold, silver or copper strips. Only those areas where defects are noticeable should be repaired; it is not necessary to restore the entire linga;

- where a stone, metal, clay or wooden image of an idol, saint, symbol (such as a trident), painting, or sacred text has a defect, it is to be restored using similar types of materials and the ritual procedure is to be followed.

*Jirnoddhara* is the *vastu* aspect of the *Āgamas*, and the *Jirnoddhara Dasakam* is an abridged, simplified version of the *Āgamas*. It can be considered as an abridged, easy to understand, version of the *Āgamas*.

## Conclusion

The *Jirnoddhara Dasakam* text is significant because it was written at a time when the principles of restoration were waning; an abridged version of the *Āgamas* was thus perhaps essential. The emphasis Hinduism places on continuity of worship, means that, as rules were established for the construction of temples, methods were also codified for the preservation of the buildings. To further maintain continuity of worship, rituals and maintenance came to be viewed as a part of an individual's religious responsibility, strengthened by notions of reaching heaven, or attaining the highest caste level. These rules and practices were codified, rendering them more authoritative. A holistic approach was adopted to the codification of Traditional Knowledge Systems and, as a result, the practices of the temple as a whole – from the selection of the site, the construction of the temple, methods of worship, and maintenance, to any reconsecration required in order for the edifice to preserve its sanctity – were all elaborately intertwined. This synergy safeguarded the basic concept of Hinduism: the continuity of worship. This has been amply proved in the temples where worship has continued for more than a millennium. The Traditional Knowledge System has stood the test of time.

The rules and regulations prescribed in the *Āgamas* are still widely followed today when

undertaking restoration and related works within the temples. Traditional knowledge is still passed on within families. Many of these *agamic* texts are now being revived in order to educate artisan workers of today who are interested in carrying out work within the temples: it is imperative that they use traditional skills. It is important to note that often traditional materials are prohibitively expensive and at the same time their quality is below par. Various agencies are working with craftsmen to train them correctly in traditional methods of restoration and intense efforts are also being made to use the best of the traditional materials available.

The documentation of the traditional systems is a great challenge and a number of organisations are continuously engaged in this work. Governmental and educational institutions are in the process of collecting the *Āgamas* and the Indian government has recently undertaken the sizeable mission of digitising these treatises.

On a final note, Traditional Knowledge Systems have existed in India since the very inception of temple building activity, and they cover a range of issues associated with the temple, always with the fundamental underlying principles of continuity of worship and preservation of religious sanctity. The Indian



system of conservation preceded the international birth of conservation systems by at least a thousand years.

Nowadays, a new ideology exists within the Indian psyche: thorough study and analysis

have led Indian scholars to believe that ancient systems of practice were traditions formulated after much effort, thought and application and are therefore to be considered seriously and implemented.

## References

**Ramachandra Rao, S.K. 1993.** *Art and Architecture of Indian Temples*. Bangalore, Kalpatharu Research Academy.

**Soundara Rajan, K.V. 1972.** *Indian Temple Styles*. New Delhi, Munshiram Manoharlal.

**Nagaswamy, R. 2012.** *Vedic Roots of Hindu Iconography*. New Delhi, Kaveri Publications.



*Ladakhis irrigating field by India Water Portal (CC BY-NC-SA)/Flickr.*



◊ CHAPTER 10 ◊

**Acts of merit: sustainable  
traditional practices for heritage  
management and conservation  
in Ladakh, India**

Tara Sharma



### Abstract

Traditional practices and beliefs governing the creation, maintenance and renewal of heritage stem from the specific sociocultural contexts within which communities manage their cultural and natural resources. In Ladakh, the village and its monasteries have created community-based management frameworks that have facilitated this process. This paper explores the traditional management frameworks employed in the maintenance and renewal of heritage, ranging from a household unit in the village, to larger monastic establishments, with specific reference to the region of Ladakh. Traditional practices and beliefs will be considered from a wider perspective, approaching creation, maintenance, conservation, decay and re-creation as an ongoing cycle, through a discussion of Buddhist texts relating to the fine arts (*bzo rigpa*), one of the five major sciences, and cosmology. This paper seeks to draw links between traditional and modern management systems and resolve the dichotomies that have arisen between conservators and custodians, through the recognition and acceptance of diverse values. It argues for alternative conservation paradigms to improve the understanding of Indigenous, community-based practices.

## Introduction

Traditional management and conservation systems have existed in many cultures for centuries. They are practical, time-tested and community-accepted mechanisms for the creation, maintenance, preservation and renewal of what we define as heritage (which remains a contested term), as the lines between past and present, and material and non-material, are often blurred.

In the trans-Himalayan region of Ladakh in northern India, the landscape is dotted with villages and Buddhist monasteries, nestled in mountain valleys and watered by snow-fed streams and springs. Communities here have evolved their own systems of management for both cultural and natural resources, which have

emerged from specific socio-economic and cultural contexts. Beliefs and practices have developed from a particular understanding of the physical and metaphysical landscape and, on a more subtle level, from a sacred perspective, which views creation, preservation, decay and rebirth as part of an ongoing cycle of life. These, in turn, have helped to shape the traditional maintenance and management frameworks of cultural resources. From a household within a village, to the colossal monastic complexes, management systems have ensured a sustainable use of natural resources and promoted the continued maintenance and management of both tangible and intangible community-owned cultural resources.

### Mountains, villages and households: traditional village management practices in Ladakh

Ladakh, located in the Indian trans-Himalayas, is home to cultures that have arisen out of a deep connection with their natural environment. The region is an arid, high-altitude, cold desert, which has historically been linked, through a network of high mountain passes, with the neighbouring regions of Baltistan, Kashmir, Tibet and Chinese Turkestan. The passes have served as corridors of exchange for both material goods and spiritual beliefs, helping to create an enduring culture that continues to evolve.

Settlements have arisen along the networks of rivers and springs that feed into the regions' main river, the Indus. The village is the basic unit of administration. Historically, many Buddhist monasteries have developed into settlements, and thus there is a close link between villages and monasteries.

Each village has traditionally been governed by its own administrative system, ensuring a level of social cohesion which enables the natural and cultural resources that are commonly owned

by the village to be managed effectively. To be included as a member of a village, a person must belong to either a *khangba* (big house) or *khangu* (little house): these forms of households represent stages in the developmental cycle of a family, or of a group of interrelated households (Srinivas, 1997). When the oldest son marries, he takes over the *khangba* and the family properties, while his unmarried siblings and parents move into the *khangu*. The *khangba* forms the basic unit of village organisation, and all agricultural lands, livestock and household goods are managed by the *khangba*. Village obligations and water rights are also performed by the *khangba*, including protecting the fields from livestock, and hosting ritual events and annual festivals, such as Losar (New Year), which are known as *tral* (village taxes) (Pirie, 2007). In village meetings, each *khangba* is represented by at least one member. In the village of Kyagar, for example, eighteen *khangba* households are said to have been the original inhabitants, and the headman is nominated from



each of these *khangba* in turn (Dolma, 2015). The *khangu* is associated with the *khangba*, performing certain village duties and is, nowadays, also represented at village meetings.

The *khangba*, and its associated *khangu*, are grouped into a number of networks, significant among which is the *phaspun*, an association of three to ten households worshipping the same family deity, *pha lha*. The *phaspun* comes together at life cycle events, i.e. at births, marriages and deaths, when it takes care of all the necessary duties (Srinivas, 1997). During the *srub lha* (the ritual to mark harvest), the sickle is taken from the house to the fields where *chang* (fermented barley beer)

is ceremonially poured into the main water channel of the fields, as an act of consecration. Grass is then cut from the field, using the sickle, and woven into a ring, which is then hung on the main pillar of the house: symbolically the dwelling place

of the *pha lha*. The *phaspun* reaffirm their solidarity at feasts, hosted by each member of the *phaspun* at this time (Srinivas, 1997). The common burial chamber (*spur khang*), owned by each *phaspun*, is also maintained by the group.

The traditional village administration is headed by the *goba* (headman) and its members are nominated, on rotation, from each *khangba*. The *goba* is the traditional village representative, who organises meetings, ensures everyone is aware of the directions given by the *onpo* (astrologer) concerning the timings for agricultural events, and is responsible for settling disputes. It is not an elected post, but functions as a village tax or duty, which rotates between all the *khangba* (Pirie, 2011). The administration oversees development works in the village, and organises the repair, or construction, of community-owned properties, such as irrigation networks, *chorten* (domed structures that normally contain relics and offerings), *mani* walls (walls over which *mani* stones are placed bearing the mystic chant, *Om Mani Padme hum*) and *lha-khang*



Figure 1

Villagers, under the supervision of the *goba*, repair an ancient *mani* wall in the Sakti Valley.

(temples) in Buddhist hamlets, it also coordinates festivals and rituals, including the annual new year festivities such as the recitation of the *chos* (religious scriptures), and the rituals for the deity that protects the village (*lha*) (see Figure 1).

The layers of the management system that exist between the village and the *khangba* can be understood through the traditional water management system in the village. Water is a precious resource in the arid desert of Ladakh and, by necessity, must be carefully managed and equitably distributed. Once the snow begins to melt in the spring, it feeds the streams (*togpo*), which flow through several villages and are connected by a mother channel (*ma yur*). From the *ma yur*, a network of different channels carries the water to the fields. The amount of winter snow indicates the anticipated supply of water in the summer, which further determines whether marginal fields should be sown or not. In the spring, if the weather is cold and cloudy, it delays the melting of the snow, and, subsequently, also delays the ploughing and sowing. The beginning of the agricultural season commences with the *tsa – ka* (opening the mouth of the earth), the date for which is fixed by the village *onpo*. The schedule for cultivation, the construction of irrigation channels and their repair are all decided at this time, and members from each *khangba* must take part in these tasks. The water supplies to individual *khangba* are supervised by the *chhur pon* (lord of water), who is officially selected by the villagers, and must have a thorough understanding of the villages' irrigation system. The *chhur pon* distributes water according to a rota system and monitors the activities of all farmers. Each farmer knows when his turn for irrigation will be and when the control sluice (*ska*) will release water for his field. In large villages, farmers form groups known as *schbu-cho*, with each group having water rights according to a traditional distribution system documented in the land records, known as *bandobast* (the distribution system). In smaller villages, water distribution is arranged according to *khangba* households. In some villages, water is stored in a *dzing* (pond), from where it is diverted to the *yura* (irrigation channels). In the spring, the ponds are desilted and members from each *khangba* collectively participate in this operation (Angchok and Singh, 2006).

The *goba*-member system is now being aided by committees, or *tsogspa*, usually legally registered under Indian law, who help to liaise with authorities for the provision of services and development works. With the introduction of the national *panchayat* system (decentralised, local self-governance system), a new tier of administration has been inserted. The *sarpanch* is a democratically-elected leader within each village and, today, is the official channel through which funds are disbursed from the Government of India, under the decentralisation of power, through the *Panchayati Raj* system. Ideally, the *goba* and *sarpanch* will work together for the welfare of the village. In reality, this may not always be so, and, with the establishment of *tsogspa*, who also raise and receive funds through NGOs and government schemes, there are multiple layers of authority, which must be carefully negotiated to implement conservation programmes for village properties.

Within each village, there may be one or more *lha khang* (temple), in addition to *chorten* (a structure that serves as a receptacle of offerings that include relics of Buddhist monks), *mani* walls, *rigsum gonbo* (a row of three *chorten*, symbolising the three Buddhist deities, Manjushri, Avalokitesvara and Vajrapani, believed to protect a village or house from evil forces and misfortune), *lhato* (altars to protector-deities), *lubang* (altars to underworld deities, *lhu*), and village sacred trees, all of which are maintained by the village. Maintenance of village temples is carried out by each Buddhist community, who periodically repair mud rooves, whitewash temple walls, and, in more elaborate instances, carry out major construction works to repair or enlarge existing temples, commission new images, or repaint damaged murals. Stupas are whitewashed on an annual auspicious day. The repair and renewal of sacred architecture has hitherto largely been organised by the *goba* system outlined above, with villagers donating materials or volunteering labour. Today, however, we are witnessing significant change, as young people from villages feel increasingly compelled to migrate out to the city, or even further afield across India, for better educational and job opportunities, leaving these family obligations to the elders. It remains to be seen how the system will adapt to these changes.



The introduction of heritage preservation organisations is another element of change that needs to be taken into account. Over the past few decades, local, national and international organisations have implemented conservation programmes, particularly for village temples and stupas. Permission to work on these temples must be sought from the monastic body under whose charge the temple falls, as well as from the village committee. Funds are raised externally,

and conservators and architects work during the brief summer months to implement conservation programmes. The conservation approach adopted is quite distinct from the maintenance and renewal programmes implemented by the community, and it is here where conservation decisions need to be carefully negotiated to protect the diverse values recognised by both custodians and conservators, some of which will be discussed below.

## Traditional Management Systems for Buddhist monasteries

The monasteries have an elaborate system for the maintenance of their monastic properties and land. The *gonpas* (monasteries) are centres of religious authority for Buddhist communities across Ladakh, and are the seat of different orders, such as the *Gelugs*, *Kargyud*, *Nyingma* and *Sakya*. Each principal monastery has its own management framework, within which monastic properties and lands are managed, novices are educated, and the ritual functions of the monastery are carried out. The monastery is headed by a Rinpoche, a reincarnation of the founding lama, and all of the major activities of the *gonpa* are carried out under his guidance, including the construction of temples and facilities for the monks, and the commissioning of religious statues, wall paintings, and *thangkas* (painted scrolls used in religious practice). The *Rinpoche* appoints a *chhagzod* (manager), who is responsible for managing both the religious and administrative affairs of the *gonpa* under the guidance of the Rinpoche. The *chhagzod* oversees both the economic and religious duties of the monastery, ranging from the monitoring of construction works, to the maintenance of movable and immovable properties and religious functions. When the *chhagzod* completes his tenure, he hands over his responsibilities to his successor, during which time the roster of movable and immovable properties owned by the *gonpa* are reviewed. This traditional inventory provides a valuable record of the sacred objects and properties owned by the *gonpa*. The *lo pon* is the chief lama of the *sangha* and his role is to invoke the deities for the various

major rituals performed in the *gonpa*. Monks are appointed to various offices to fulfil the religious and administrative functions of the monastery. The sacred ritual paraphernalia including *thangkas*, statues, masks and ritual costumes for the masked dances, and other ritual objects, are maintained by the *don yer* (a monk who maintains the ritual costumes). The *um zad* is the monk charged with performing all the rituals and *pujas* within the *gonpa* as well as supervising the teaching of the young novices; he is supported by the *u chhang* (assistant monk) in his absence. The masked dances are held under the guidance of the *Chhamspon-chheva* monk, and his role is pivotal in the annual masked dance performed during the festival called *Hemis Tsechu* (Rigzen, 2003) (see Figure 2).

The administrative functions of the monastery are managed by a separate hierarchy, headed by the *nyer chhen*, who is responsible for the property owned by the *gonpa* and acts on the instructions of the *chhagzod*. He also maintains records of the properties owned by the *gonpa*. *Gonpas* own land and livestock across Ladakh, donated to them by patrons and laity. The *jur yer* visits villages where the monasteries own land to collect income generated from the leasing of agricultural lands, forest properties or livestock. The income (often in kind) is handed over to the *nyer chhen*. He is aided in his task by the *lung sung* who is responsible for the willow and poplar groves owned by the monastery; the *chhun pa*, who looks after the fields and orchards; and the *kor pon*, who is in charge of the herds of yak and goats that are led to pasture

by nomads in the summer. In addition, monks are responsible for organising meals for the *sangha*, organising water (before the introduction of piped water, water had to be carried up from nearby springs and streams by hand), and fire wood, etc. (Rigzen, 2003).

The primary focus of the *gonpa* remains spiritual, with a multitude of temples and assembly halls, where daily prayers, special *puja* rituals and monastic festivals are held. Pilgrims from villages across Ladakh, joined today by tourists, visit the temples to seek blessings, or, in the case of the tourists, simply to view the monastery's splendid sacred art, displayed in wall paintings, statues, thangkas and ritual objects created many centuries ago, which continue to be commissioned by the monastery, as the need arises.

The creation of sacred art continues to this day, through centres of learning, such as the Central Institute of Buddhist Studies in Leh, with branches in almost all major monastic centres. Fine arts have never been seen in isolation from other streams of learning. For a Buddhist, knowledge is to be seen in its wider context, and therefore includes the five major classical forms of fine arts (*bzo rigpa*), inner knowledge (*nang rigpa*), logic (*gtan tshigs rig pa*), language (*sgra rig pa*) and medicine (*gso ba rig pa*). To this were added the five minor forms, which included poetry (*snyan ngag*), prosody (*sdeb sbyor*), synonyms (*mngon brjod*), drama (*zlos gar*),



and astrology and divination (*skar tsis*). Tibetan translators inherited this rubric of the five forms of knowledge from the Sanskrit treatises on Indian Buddhism as early as the ninth century (Schaeffer, 2011).

The fine arts (*bzo rigpa*) stem from a specific Buddhist perspective, which views creation as part of an ongoing cycle of life, where the material form is just one facet of sacred art. Before exploring the texts, it helps to understand this perspective and the context within which the texts were written. The following section is based on discussions with Buddhist artists and monks in Ladakh, and preliminary readings of Buddhist texts related to fine arts and cosmology.



Figure 2

Monks performing sacred dances at the Hemis Tsechu festival in 2004. Prior to each festival, the monks undergo rigorous training under the supervision of the *Chamspun Chevva* monk.

## Creation within the Buddhist perspective

The interconnectedness of diverse fields of knowledge became evident in a discussion between senior monks, astrologers and artists at Chemday monastery, during a workshop on astrology in 2014. While discussing the genesis of astrology and the arts, a senior monk recounted the Buddhist

legends of the creation of the universe found in Vasubandhu's *Abhidharmakośabhāṣyam*, one of several Buddhist schools of thought. Vasubandhu describes the four stages a world system undergoes: cycles of formation, abiding (i.e. existence), destruction and vacuity (i.e. return to source).



After the age of vacuity from the previous age, winds arose from the ten directions and churned the atmosphere, causing clouds to develop (Pruden, 1991). Schools of thought differ on whether the galactic seeds that remain from the destruction of a previous world system give birth to the new world (Kalachakra Tantra), coalescing to form new planets through the interplay of the five material elements, or whether the seeds are contained in the primordial water itself (Vasubandhu's *Abhidharmakośabhāṣyam*). With the churning, the clouds burst into rain, forming a huge ocean. The churning of the ocean resulted in the creation of the nine mountains, with Mount Meru in the centre. Through the constant process of churning, the oceans, rivers, lakes and lands were created (Kongtrul, 2013).

The lowest category of beings reside underground, and below Mount Meru, and the superior beings reside above ground, around Meru, while the realm of the gods is located above the summit of Meru. In local beliefs, this is explained metaphorically through the three realms of *lha yul* (land of gods), *bstan yul* (land of terrestrial beings and demons) and *lhu yul* (land of subterranean guardian deities). Symbols of these three deities can be found scattered across the landscape of

Ladakh, reaffirming the close links between nature and cultural beliefs. Mountain altars to specific protector-deities, or *lha*, can be often be found perched precariously on cliff tops, while red markings on the exterior whitewashed walls of houses ward off *bstan* (a malevolent spirit inhabiting a locality that sometimes enters the body of a person, causing serious illness) and small altars, or *lhu bangs*, particularly on pastoral lands by water sources, to placate the underworld guardians or *lhu*. Equally, spirits residing in trees and sacred trees (*lha shings*) are easily identified in many villages, where offerings of *khadags* (scarves) are tied to tree branches. (Angchok and Singh, 2006). The physical elements that mark these realms are all carefully maintained by the community, through a rich tapestry of ritual practices and beliefs within the village management framework outlined above.

Within these realms, the cycles of formation, abiding, destruction and vacuity continue to play out. Tangible sacred art and architecture reflect these cycles, as processes of creation (formation), maintenance and preservation (abiding), decay and dismantling (destruction), and, finally, spiritual renewal (vacuity). The traditional artist, trained in fine arts, was well-versed in this.

## The sacred fine arts (*bzo rigpa*): traditions and conservation

Texts relating to fine arts (Sanskrit: *silpa*, Tibetan: *bzo rigpa*) can be found in the *Tengyur*, the translated treatises of works written by Indian masters. The third section of the *Tengyur* encompasses the *sutras* (*mdo*) and includes the following four works on image-making (painting/sculpture) (Goswamy and Dahmen-Dallapiccola, 1976).

- *Daçatālananyagrodhaparimandalabuddharatimalakṣhananāma*: On the Essentials of the Plastic Representation of the Buddha, Comparable to the ten span wide Nyagrodha tree. [The Nyagrodha tree (Banyan tree) is said to correspond to the proportions of an image

of the Buddha, springing from the fact that its branches were well proportioned]

- *Sambuddhabhāṣhitapratimalakṣhanavivāranāma*: Sambuddhas commentary on the proportion of (the Buddha) statue
- *Citralakṣaṇa*: Theory of painting
- *Pratimāmānalakṣhanām*: Theory of proportions of statues

English translations are available for the latter two, as far as I am aware. The *Citralakṣaṇa* is said to be an older text than the *Pratimāmānalakṣhanām* and is an early medieval Tibetan translation of an original Sanskrit text, thought to have been



written in the seventh century CE, making it one of the oldest treatises on painting. It collates data from three sources: Nagnajit for the first chapter, Vishwakarma for the second, and Prahlada for the third (Goswamy and Dahmen-Dallapiccola, 1976). The author of the *Pratimāmānalakṣhanām* is mentioned at the end of the Tibetan text, which calls the work Ātreya-tilaka ascribing it to one of seven great sages of India, Atreya (a descendant of Vishwakarma). Both of these crucial texts lay down the principles for creating sacred images and, together with later texts, such as the *Chitrasūtra* (Khanda III of the Viṣṇudharmottara Pūrana), the *Aparajitaprabhā*, *Mānasollāsa*, *Samarāṅgaṇasūtradhāra*, *Māyamātam*, Śilparatnakośa and Śilpaprakāśa, provide the theoretical frameworks for sacred arts in India.

Both the *Citralakṣaṇa* and the *Pratimāmānalakṣhanām* provide the spiritual and material framework for artists creating sacred images (painting or sculptures) and dwell at length on the proportions and measurements required to depict the sacred pantheon. This keen attention to detail leaves little margin for error for the correct portrayal of the pantheon of deities. As the *Citralakṣaṇa* states, “An atom, the point of a hair, a nit, a louse, a barley grain and a finger grow through progressive multiplication with the number eight as will be shown exactly” and continues by detailing the measurements to be followed (Goswamy and Dahmen-Dallapiccola, 1976, p. 80). This concept, as highlighted by Gelong Konchok Phandey during his reading of the *sutra*, enables artists to be able to recreate or repaint missing elements in a statue or painting based on their traditional knowledge of the texts.

A discussion with the renowned painter, the late Tsering Angdus Olthangpa, (in June 2014) highlights how sacred art is perceived, and the training that artists must undergo before they can begin creating sacred art. Tsering Angdus learnt his art from his master, Deba Pasang of Narthang, in the Tsang province of southwestern Tibet. He and his disciples follow the Menri style of the Tsang School, which was developed in the fifteenth century by Manla Dondrub, with whom Tsering Angdus believes he has a karmic connection. Great emphasis is placed on the use of the correct iconometry and drawings. In the early 1980s, the artist and his disciples painted

the Guru Lhakhang in Chemday monastery, described by one author as the finest tantric figures to be seen in Ladakh (Lo Bue, 2011). Describing the traits of a successful artist, Tsering Angdus reveals how, in the past, an artist would sit and meditate on the attributes of the deity being portrayed by him in the room where the paintings were being executed, before commencing work. The artist would carefully prepare the pigments (a task, which in the past was carried out by the artist, but which has been replaced today by the use of modern synthetic paints) and he would have had a thorough knowledge on the correct iconography and iconometry of the scenes being painted. The value of older paintings is thus seen in terms of the spiritual intent of both the patron and artist, and also, as stated by Dzongsar Ngari Chödje Rinpoche, in terms of the accuracy of the iconography and, more importantly, the spiritual value of the images, as they were blessed and consecrated by those who possessed immense energy, which they infused into their paintings, which can still be felt (Rinpoche, 2003). The painting of the eyes was the final and paramount act, and its significance is noted in the *Citralakṣaṇa*: “When one has painted the eyes of the gods the wellbeing of the kings and of all beings shall increase” (Goswamy and Dahmen-Dallapiccola, 1976, p. 84), and again, “He who has painted such a face shall always gain earthly rewards” (Goswamy and Dahmen-Dallapiccola, 1976, p. 86). The painting of a sacred image is not a routine task, with a prescribed formula of proportions and measurements, but a spiritual, aesthetic portrayal of the artist’s intent.

The deity could refuse to reside in an image if it was incorrectly portrayed at the time of consecration, or if the artist was not well attended by the patron (the patron commissioning the image was required to cater to the needs of the artist). Quoting from the *Tantra of Consecration*, the nineteenth century Tibetan scholar and author of the encyclopaedic *Treasury of Knowledge*, Jamgön Kongtrul Lodrö Tayé writes:

{ [...] the being of pristine cognition (*jñānasattva*) will not enter (the image of) a deity fashioned by an artist who is displeased. At the start of the consecration the artist should be pleased. (Kongtrul, 2012, p. 185)



The author further clarifies that the *jñānasattva* will not enter an image that is imperfectly created and in such cases only negativity will ensue. Even good deeds carried out in a place where such an image is enshrined will diminish and such places are to be abandoned in favour of purer locations (Kongtrul, 2012).

This quest to ensure perfection of the sacred image in order for it to be worthy of worship is also raised during discussions between conservators and monks on the repainting of decayed wall paintings, when significant elements of iconography are missing from damaged figures.

For centuries, historic wall paintings in temples have been worshipped; however, with the burning of lamps within the temples (a practice that has now shifted to lamp houses situated outside the temples), layers of soot and dust have obscured the painted surfaces. This has sometimes been exacerbated by water seepage, given the increasing precipitation in the region, leading, in some instances, to extensive loss of the painted figures of spiritual leaders forming the lineage of the sect, Buddhas, Bodhisattvas and guardian deities. The tradition of repainting has been practised by Buddhist artists for centuries. As highlighted by the monks and the *chagzod* (manager) of Chemday monastery at a discussion we had (in October 2015), incomplete images are considered distracting, and are thus thought to effect the correct practice of rituals and meditation in the temples.

The procedure for the conservation of temple wall paintings, particularly when the temples are still being used for worship, is often carefully negotiated between conservators and custodians. Formal conservation training in India, and elsewhere, focusses largely on material science and the authenticity of historical style, i.e. the tangible dimensions of the painting. Most conservators do not encourage the repainting of damaged murals, and, where it is negotiated, concern remains as to the authenticity of style and pigments. For custodians and Buddhists, correct iconography is paramount, for which the spiritual and artistic training of the traditional artist is essential, as highlighted above by Tsering Angdus. The non-material remains a challenge for negotiating conservation decisions about living sacred ritual

art, where understanding of heritage remains firmly rooted in the material.

The tradition of painting over, or repainting, damaged wall paintings is not new. A senior disciple of Tsering Angdus shared his experience of repainting the damaged wall paintings of an assembly hall in one of Ladakh's well-known monasteries. He noted that the wall paintings had been repainted a few times in the past, as he had found evidence that the original outlines of the figures had been amended. His brief was to replace the missing colours, but not to change the style or composition of the original artist. In other instances, an entirely new painting in the individual style of a contemporary artist might be commissioned by a patron. In all cases, a strict adherence to the texts is expected, along with the correct use of iconography and spiritual requirements.

Where temples or ritual objects are no longer in use for worship, originals are often left to deteriorate. The acceptance of material decay as part of the life cycle of an object is also seen in cases where damaged painted scrolls (thangkas) and manuscripts are placed inside a collapsed stupa or immersed in the river after deconsecration, as part of the ongoing cycle of formation, abiding, destruction and vacuity mentioned above.

Texts such as the *Pratimāmānalakṣhanām* clearly demonstrate the acceptance of the material life cycle of a sacred image, through the cycle of creation, decay and rebirth, for example when the *jñānasattva* is re-enshrined within a new image. The problems arising from the worship of a faulty, worn out or dilapidated image are clearly indicated. It states:

The image of a goddess, established or being established, if it be burnt, worn out, broken or split up will always be faulty. A burnt idol brings shortage of rain, a worn out one decreases wealth. A broken image forebodes destruction in the family and a split up one, war. Whether it be an idol a linga or mātragaṇa goddesses, they should be given farewell according to the usual ceremonial rites. (Jugnu, 2013, p. 40)

The text then prescribes the methods by which, after an image is deconsecrated, the material object should be disposed:



Having given flower offering, incense, food offerings, oblations and clothes accompanied with sacrificial rites, the ceremony of the propitiatory water accompanied by mantras should be gone through. A rope should be prepared according to the prescribed rules either of hair or munja grass or silk or linen. Having tied the worn-out image on the hump of a bull, it should be carried. If the image is of stone, (it should be carried) to deep waters in a holy place or to a confluence of rivers and be thrown therein. If one's welfare is desired, an image of gold or silver or copper or brass, should be melted in fire. If the image is made of wood, it should be clothed with a new

cloth. Having besmeared it with ghee and honey, it should be given into the burning fire. If the image is of stone or of clay, having dug the ground up to the head, it should be put there and filled over. (Jugnu, 2013, pp. 41–42)

The section concludes with the benefits of such *jirnodhar*, stating that, “the raising and caring of the old image should be done by a great man who is glorified in the world of heavenly deities for thousands of yugas”. The *jñānasattva* is then re-enshrined into the newly commissioned image during a consecration ceremony (Jugnu, 2013).

## Conclusion

From the macrocosm of the world system to the microcosm of a sacred statue or painting, the four stages of formation, abiding, destruction and vacuity are inherent in traditional conservation and management beliefs and practices. The stage of abiding for the *jñānasattva* is made possible through the physical acts of maintenance and repair carried out by both lay and monastic communities, while, through the ritual of *jirnodhar*, it moves from a state of destruction to vacuity, before being consecrated in a new form.

Traditional management and conservation practices are born from specific contexts, as has been highlighted above. These, in turn, are closely linked to the recognised values in these resources. Indeed, ancient texts governing the world of sacred

Indian art and architecture have long-recognised these diverse values. Further research into these texts and their application within communities is needed to gain a better understanding of these indigenous traditions in the context of contemporary conservation practices.

The application of traditional maintenance and renewal practices to modern conservation practices is particularly enriching for today's heritage discourse, and is gradually gaining recognition. As we navigate these new terrains in heritage discourse, it is critical that flexible community-based heritage approaches are further developed, allowing space for new conservation and management paradigms to emerge.



## References

- Angchok, D. & Singh, P. 2006. Traditional irrigation and water distribution system in Ladakh. *Indian Journal of Traditional Knowledge*, 5(3): 397–402.
- Lo Bue, E. 2011. Lives and Works of Traditional Buddhist Artists in 20th century Ladakh: A Preliminary Account. In J. Bray, ed. *Ladakhi Histories Local and Regional Perspectives*. Dharamshala, Library of Tibetan Works and Archives.
- Goswamy, B.N. & Dahmen-Dallapiccola, A.L., translated. 1976. *An Early Indian Document of Indian Art – The Chitralaksana of Nagnajit* from the German translation of the *Chitralaksana* by Laufer, B., based on the Tibetan *Tengyur*. Delhi, Manohar.
- Jugnu, S.K. ed. and translated. 2013. *Atreya Tilakam An Indian Treatise about the Principles of Image Making*. Delhi, Parimal Publications.
- Kongtrul, J. 2013. *Treasury of Knowledge – Myriad Worlds*. [Koñ-sprul Blo-gros-mtha-yas, 1813–1899. (Śes bya mtha yas pai rgya mtsho. English Selections)]. Translated by Kalu Rinpoche Translation Group under the direction of Ven Bokar Rinpoche, Boston/London, Snow Lion Publications.
- Kongtrul, J. 2012. *Treasury of Knowledge – Indo Tibetan Classical Learning and Buddhist Phenomenology*. [Koñ-sprul Blo-gros-mtha-yas, 1813–1899. (Śes bya mtha yas pai rgya mtsho. English Selections)]. Translated and annotated by Gyurme Dorje, Boston/London, Snow Lion Publications.
- Pirie, F. 2007. *Peace and Conflict in Ladakh – The construction of a fragile web of order*. Leiden, Brill.
- Pirie, F. 2011. The Impermanence of Power: Village Politics in Ladakh, Tibet and Nepal. In J. Bray, ed. *Ladakhi Histories Local and Regional Perspectives*. Dharamshala, Library of Tibetan Works and Archives.
- Pruden, L.M., English translation. 1991. *Abhidharmakośabhāṣyam of Vasubandhu Vol II*, from the French translation by de la Vallée Poussin, L. Berkeley, Asian Humanities Press.
- Rigzen, B. T. 2003. Tradition of Gonpas in Ladakh and its Management. Paper presented at the Working Group Meeting on “Restoration and Conservation of Monastic Heritage of the Himalayan Region”, October 2003, Delhi, organised by UNESCO/NIRLAC in collaboration with the National Museum (unpublished).
- Rinpoche, D. N. C. 2003. (untitled) paper presented at the Working Group Meeting on “Restoration and Conservation of Monastic Heritage of the Himalayan Region”, October 2003, Delhi, organised by UNESCO/NIRLAC in collaboration with the National Museum (unpublished).
- Schaeffer, K.R. 2011. New Scholarship in Tibet 1650–1700. In S. Pollock, ed. *Forms of Knowledge in Early Modern Asia – Explorations in the Intellectual History of India and Tibet 1500–1800*. Durham, NC, Duke University Press.
- Srinivas, S. 1997. The Household Integration and Exchange: Buddhists and Muslims in Nubra Valley. In H. Osmaston & N. Tsering, eds. *Recent Research on Ladakh 6 Proceedings of the Sixth International Colloquium on Ladakh Leh 1993*. Delhi, Motilal Banarsidass Publishers Pvt Ltd.



*Ladakj, India by MartinPosta (CC0)/Pixabay.*



**Benefits of  
Traditional Knowledge Systems**

◁ CHAPTER II ▷

**Traditional Knowledge Systems  
for reducing disaster risk and  
building resilience in India**

Rohit Jigyasu



## Abstract

Not only has cultural heritage become increasingly exposed to disasters, such as earthquakes, floods, cyclones, wild fires, but the frequency and intensity of these disasters has also been exacerbated due to climate change. Significant innovations have occurred in developing state-of-the-art techniques and formal management structures to mitigate the impact of the risks posed by these natural disasters. Additionally, sophisticated design and planning solutions have been conceived for post-disaster reconstruction work, seeking to reduce the likelihood of people being affected by future disasters (or their vulnerability to future disasters). However, in the pursuit of growth and development, the Traditional Knowledge Systems that have contributed towards disaster-risk reduction and the building of community resilience are often overlooked, thereby adversely affecting the long-term sustainability of these initiatives. In fact, in many instances, loss of these knowledge systems contributes towards increasing the susceptibility of communities to disasters. Based on specific case studies from the South Asian region, this paper will illustrate the capacity of traditional knowledge to deal with disasters, through indigenous building design, planning, construction and management systems. Examples will demonstrate how this knowledge has evolved over the course of time through trial and error. This paper will also address the reasons for the increasing loss of this traditional knowledge and the impact of this loss on the physical, social and economic security of the region. The paper will conclude by suggesting ways of integrating traditional knowledge with contemporary knowledge to reduce the risk of disasters and the impact of disasters on cultural heritage sites.

## Introduction

Disasters are no longer viewed as isolated catastrophic events merely resulting from one-off natural hazards, such as earthquakes, floods and cyclones. The current perspective is to seek to recognise the complex relationship between disasters and development. The Hyogo Framework for Action 2005–2015 (*International Strategy for Disaster Reduction, 2005*) resolved to ensure a more effective integration of disaster-risk considerations into sustainable development policies and planning at all levels.

In order to achieve these objectives, the fundamental importance of the transmission of traditional technology, skills, and local knowledge systems, together with the conservation of cultural heritage has been recognised, thereby also

emphasising the proactive role cultural heritage can play during the prevention, response and recovery phases of disaster management (*UNESCO et al., 2005*). Indeed, Traditional Knowledge Systems, embedded within cultural heritage, as have evolved over time through trial and error, can play a significant role in disaster prevention and mitigation, thus contributing to more sustainable development. Such local knowledge, skills and customs often enable communities to better equip themselves to face natural hazards (*UNISDR, 2013*).

This paper<sup>1</sup> will explore the scope and features of traditional disaster mitigation knowledge, and analyse its present status and potential future role, through the use of several case studies from the South Asian region.

## Traditional knowledge for earthquake mitigation in Kashmir and Gujarat in India

### The impact of the earthquakes

According to official figures, the Northern Kashmir earthquake that took place on 8 October 2009, killed more than 87 000 in Pakistan and 1 300 in India, and also injured many. The devastating earthquake that struck the Kutch region of Gujarat in India on 26 January 2001 killed 20 083 people and injured 166 836.

In both cases, most structures, whether modern or traditional, suffered extensive damage, causing great loss of life. Many modern Reinforced Cement Concrete (RCC) constructions, which were largely perceived to be stronger in comparison to traditional structures, were of extremely poor quality. In Kashmir, it was found that many of these constructions did not even follow the

basic rules of RCC construction. In many cases, roof slabs had not been placed correctly on the roof beams. Rather, they were cast on top of two or three layers of brick, and placed over the beams, and, in some constructions, these beams were not level (*Jigyasu, 2013*). In other cases, the roof slabs were virtually without reinforcement bars, whilst the layers of mud placed on top of the slabs for terracing increased the vertical load. As a result, the slabs simply cracked and collapsed like a pack of cards when the impact of the earthquake hit. Even the columns were inadequately reinforced in many structures. There were instances where RCC beams that were resting on columns made of slender brick piers simply gave way due to the lateral impact of earthquake.

1 This paper is an adaptation of a research paper published by the author at the *Creative Space (CS) Journal of Chitkara University*, volume 1, no.1 (July 2013). This modified version has been republished with permission from *Creative Space*. The original can be found at <http://dspace.chitkara.edu.in/jspui/handle/1/18>



Most of the traditional structures also did not perform well due to the poor quality of the stone masonry. Although many of the stone walls were clad with well laid-out stone courses, their inner cores were built of random rubble masonry laid in poor-quality mud mortar. Due to improper bonding and the absence of key stones, these walls simply collapsed when the earthquake struck. Inadequate perpendicular wall corner joints were also one of the reasons these buildings sustained such damage. In historical structures with sloping roofs, free-standing gable walls were not able to withstand the lateral forces of the earthquake and simply collapsed, causing substantial damage.

Incompatible structural and material additions were another major reason for the extensive building damage, as they caused the buildings to lose their structural integrity. For example, in several structures originally made by using load-bearing stone walls, the upper floors had been added using RCC. As a result, these structures just collapsed like a house of cards due to the earthquake.

Needless to say, lack of knowledge and poor workmanship were the main reasons for such extensive damage of both the modern RCC and the traditional stone constructions. Strikingly similar issues were also observed in Gujarat, pointing towards a poor building culture in both the regions prior to the earthquakes. One wonders whether any traditional building knowledge for earthquake mitigation existed, and if indeed it did exist, what were the reasons for its loss or decline?

### **The earthquake survivors – repositories of Traditional Knowledge Systems**

Upon closer inspection, we discover several examples of traditional constructions that did survive the devastating earthquakes, owing to their earthquake-safe construction systems and features.

The vernacular structures built using the local Kashmiri building techniques of *taq* (timber-laced masonry bearing wall) and *dhajji dewari* (timber frame with masonry infill) performed much better than many poorly-built modern structures, and their strength prevented loss of life.

Additionally, several traditional constructions that employed the use of proper stone masonry with key stones and well-designed arches and retaining walls at the corners performed well against

the earthquake. Other earthquake-safe features found in several traditional constructions in the earthquake-affected Poonch region of Kashmir include: ceilings with joists resting on wooden bands that run around all of the walls; well-designed trusses; tongue and groove joinery; and balconies resting on projecting wooden joists. In other constructions, extensive use of wood on the upper floor (in the form of wall panelling, balconies and staircases, for example) significantly reduced the weight, when compared with the RCC structures, and the earthquake performance of these structures was enhanced as a result (Jigyasu, 2013).

Such earthquake-safe construction systems have also been found in Gujarat. The typical traditional dwellings of the Kutch region, called *bhungas* in the local language, are able to resist the lateral forces of earthquakes because of their circular form. Moreover, wattle and daub constructions, especially those where wood has been used as wall reinforcement, have also proved to be very effective. In fact, all these factors have played an important role in the evolution of vernacular architecture everywhere.

In Gujarat, many structures built prior to the 1950s had floor joists that extended through the rubble stone walls to support the balconies. These are more effective at stabilising the walls than joists which terminate at the edge of walls, and therefore performed much better against the 2001 earthquake (Langenbach, 2001). In fact, in Anjar, this kind of structure was used in one of the few buildings left standing amidst the debris of collapsed houses.

Some traditional constructions that employed wooden frames with masonry infill also performed well against the lateral forces of the earthquake, due to their capacity to dissipate the earthquake's force. Several earthquake-safe features are also to be found in many traditional constructions, such as tie beams, knee bracing, and tongue and groove joinery.

Last but not least, Traditional Management Systems have embedded coping mechanisms that help during disaster situations. In Gujarat, local community networks and religious and philanthropic institutional structures played a significant role in supporting post-disaster recovery efforts (Jigyasu, 2013).

Based on the above findings, we can safely conclude that Traditional Knowledge Systems



for earthquake mitigation and recovery did exist in the earthquake-prone Kashmir and Gujarat regions, although in most cases these have largely disappeared or regressed due, *inter alia*, to a lack

of maintenance, incompatible modification work, and poor workmanship, largely a result of the development process, which though worth investigating, is outside the scope of this paper.

## Traditional knowledge in water-related heritage

Water-related heritage – both tangible and intangible – also has a proactive role to play in building the resilience of communities and saving lives and properties. There are countless examples to illustrate this.

The intricate relationship between water and heritage has also determined how people have managed the disaster risks posed by floods, to which they are frequently exposed. This is achieved not only by resisting the forces of nature through technical interventions, such as the construction of embankments along rivers, but also by adapting the living patterns of communities around these regularly occurring phenomena. Let us take the case of Majuli in Assam, India, which is believed to be the largest river island in the world, with a unique local ecology, and prone to annual flooding from the mighty Brahmaputra River when it swells during the summer months.

### Majuli

The vernacular housing in the area, using bamboo constructed on stilts, has evolved in response to local environmental factors, notably the floods that inundate the island on a regular basis. The light bamboo structures enable easy dismantling and relocation, should the area be affected by floods. Moreover, the nature of the material and joinery allows the structures to retain an element of flexibility, which is especially useful in the event of an earthquake to which this region is also highly prone. Additionally, the traditional settlement pattern in the area is such that the locations of structures, roads and bridges are readjusted according to the flooding pattern every year (UNISDR, 2013).

The example of Majuli demonstrates the remarkable capacity of traditional technology to adapt to the nature of hazards and develop a harmonising living relationship with them,

rather than simply resisting them. Such wisdom is also seen in many coastal communities, which, over the centuries, have not only developed the capacity to predict natural hazards, but are also better equipped to deal with them. In fact, when traditional skills and practices are sustained, they can contribute to the rebuilding of resilient communities after disasters. When traditional wisdom is abandoned, people are at most risk, as they consider that they can control nature instead of learning to live with it.

The case of Majuli Island is a key example of the importance of the application of traditional knowledge. However, abandonment of this practice in favour of more permanent reinforced concrete framed structures is exposing people to greater flood risks. Another example of the loss of traditional knowledge is seen at the World Heritage Site of Ayutthaya in Thailand, where many traditional canals and watergates have fallen into disuse, thereby restricting the water drainage capacity in the event of heavy rainfall. Local craftspeople can rebuild shelters using local knowledge and resources, and salvage and re-use materials from collapsed structures. This not only helps the community to reduce external dependencies, but also provides livelihoods for those living in the area, which are crucial for sustainable recovery in the long-term. Water-related cultural heritage assets thus make optimum use of locally-available resources and fulfil the sociocultural needs of communities (UNISDR, 2013).

Traditional water systems not only demonstrate the wisdom of the past that has evolved through trial and error, but they also have a great potential for emergency response following disaster. For example, the traditional system of *hitis* (stone water spouts) located in the dense historic urban fabric of the Kathmandu Valley in Nepal, or the



wells and *tankas* (traditional water storage tanks) in the historic walled city of Ahmedabad in India, have great potential to serve as important sources of water supply during emergency situations, especially when one cannot rely on the municipal water system, which often draws water through

pumps operated by electricity. One can also find examples of indigenous warning systems amongst communities for predicting hydro meteorological hazard events. Their usefulness should also be explored in the light of varying rainfall patterns, due to various factors, including climate change.

## Traditional knowledge in urban heritage: the case of Kathmandu Valley, Nepal

Nepal was struck by devastating earthquakes on 25 April and 12 May 2015. There are several examples of an historical urban fabric, characterised by a series of interconnected courtyards, helping residents to escape from densely inhabited areas in an emergency, such as the historic settlements in Kathmandu which were recently struck by devastating earthquakes (Jigyasu, 2015). Moreover, these traditional settlements have well-established networks of rest places (*patis*) and water sources, including wells, stone water spouts (*bitis*), water tanks and ponds that are strategically located in open squares, at street junctions and at the entrance to villages. These serve as places for settlers and visitors to carry out daily activities. In the event of a disaster, these resting places can also be used for sheltering the injured, while water sources used for drinking can also double as local fire hydrants.

These public places, typically used for community gatherings, the playing of traditional music, or simply as meeting places, also help to maintain a rapport among local people, which helps when a disaster strikes. In this way, tangible attributes bearing intangible attributes and expressing social values have the potential to enhance cooperation among residents during a crisis and may well serve as sites for disaster preparation training.

The Traditional Management System of *guthi* in the Kathmandu Valley has resulted in communities managing land as a collective asset and using its agricultural output for social and cultural activities, and also as a source of sustainable livelihood. The collective economic resources generated through the *guthi* system have also been used to provide support to communities in post-disaster situations.

## The nature and scope of traditional knowledge for disaster mitigation

In the light of the above discussion, the next step is to look into the scope and nature of Traditional Knowledge Systems.

Such systems are typically developed locally, are under local control and use low levels of technology. Many also lack bureaucratic organisation. The main channels of communication for this knowledge are traditional performing arts (or folk media), Indigenous organisations, deliberate instruction (child rearing, traditional

schooling and apprenticeship), and unstructured channels, such as conversations at markets and in the fields, written and memorised records, and direct observation (Jigyasu, 2013). This clearly demonstrates that traditional knowledge encompasses the whole cultural context. Paul Sillitoe (1998, p. 123) describes traditional knowledge as, “by definition interdisciplinary; local people think of and manage their general environment as a whole system”. Moreover it is experience-laden,



practice oriented and culturally embedded, and thus more holistically oriented.

Regarding disaster mitigation, indigenous coping skills and capacities, which can be physical, social, economic and institutional, are also an inherent part of traditional knowledge systems, and during disaster situations they can become

collective instruments for organising action on behalf of the disaster victims. Coping skills and capacities are those internal social structures that exist in every society that can help individuals and families through difficult periods by becoming collective instruments for organising action on behalf of the victims.

## Challenges confronting traditional knowledge in the present context

### **The case of post-earthquake reconstruction in Kashmir**

Following the recent earthquake in Kashmir, it was found that, in most instances, traditional constructions, which had in fact performed better against the earthquakes, were abandoned by their owners due to the prevalent perception that traditional buildings were old and outdated and therefore unsafe and not suitable for habitation. Many of these structures were also on the verge of demolition, to be replaced by modern reconstructions. In the absence of any proper technical assistance, people started rebuilding on their own, using whatever resources were available, including compensation money that was provided by the Pakistani Government. Not many realised that the main problem did not lie with use of stone but the way it was being used (Jigyasu, 2013).

Ironically, the new constructions built after the earthquake were even poorer than before, because, with no technical assistance forthcoming, people were left with no option but to try to put a roof above their heads as soon as possible. Moreover, these new constructions were observed to be unsustainable in terms of available skills and resources. Stone is a locally-available material and is part of local building culture. Replacing stone with concrete is economically unviable for the far-flung villages located in a difficult terrain. As a result, people started rebuilding in stone, without employing earthquake-safe practices.

Another of the reasons for poor construction practices was the unavailability of trained local engineers and masons. In fact, most of the reconstruction was undertaken by masons from Bihar, who were not familiar with local building techniques.

### **The case of post-earthquake reconstruction in Gujarat**

Following the 2001 earthquake in Gujarat, the villagers were left with two options – either to opt for the financial compensation offered by the Indian Government, or to allow the donor agencies to take over fully-fledged reconstruction. The majority of people chose financial compensation and expressed their desire to undertake the rebuilding work on their own (Jigyasu, 2002). As a consequence, many NGOs came forward to help local communities to decide the design layout and structural system of the new constructions. Most of them promoted self-help construction by providing the beneficiaries with construction materials, such as wood, bamboo spreadsheets, concrete blocks, and reinforcement bars, according to the structural design advocated by the NGO concerned. Local communities were involved in providing labour for tasks such as curing and block-laying. Junior engineers were hired from other areas to coordinate the construction activity. As part of a public-private partnership policy, the Indian Government subsidised the



provision of building materials (Jigyasu, 2002; Jigyasu, 2013).

While such an owner-driven approach was a priority for the government, fully-fledged adoption of villages was also undertaken in some villages by donor agencies through contractor-driven reconstruction programmes. In these villages, the labour force was essentially hired from outside and local villagers had no say or role in the reconstruction process. In many of these villages, city-like grid-iron layouts and government-imposed criteria for house sizes took the place of traditional spatial planning and design, raising the issue of cultural incompatibility, as traditional villages had organic cluster-based layout.

In some villages, traditional circular structures (*bhungas*) were rebuilt, using the same form, but with different local materials and technology, also raising issues related to their authenticity and sustainability.

In addition to modern techniques, some NGOs also explored various options for alternative design and technology for earthquake resistant construction. A consortium of NGOs promoted the construction of structures using precast compressed soil blocks with or without an interlocking dry stacked masonry system, ring reinforcement or wooden rafters. It has also set up a laboratory to experiment and test new technologies (Jigyasu, 2002; Jigyasu, 2013). However, such alternative methods also require strict quality control and proper curing (hydration in order to maintain necessary moisture and temperature

conditions). During the construction phase, the particular NGO concerned took care of this, but since these techniques were not based on traditional knowledge and required proper curing (a difficult proposition in a drought-prone area), there were questions as to how these could be internalised within the local community once the organisations left. Whether such techniques would take root within the building culture of the area was highly doubtful.

No matter how NGOs and, to some extent, the government, facilitated reconstruction, earthquake-safe features were not employed in many self-help constructions, thanks to a general ignorance in their regard. The situation in Gujarat is strikingly similar to the situation in Kashmir.

Repairs that were carried out incorrectly can be seen everywhere. People filled in cracks running through the wall thickness with cement grout and then moved back into their houses. There were some difficulties in implementing the strengthening and retrofitting programme because of prevailing misconceptions against traditional buildings, which discouraged people from adopting these measures. Moreover, decision-makers seemed to want to prioritise the number of new houses being reconstructed. Traditional structures were also pulled down, even when still standing, in order to make way for modern structures, especially in historic towns such as Anjar, Bhuj and Morbi. Ironically, in most cases, the new structures were not better, thanks to poor workmanship and disproportionate costs.

## The underlying reasons for the loss of, or decline in, local knowledge

The key issue here, therefore, is the loss of, or decline in, traditional building systems over the last few decades. This made the buildings vulnerable to disasters in the first place, and reinforced, and in some cases even increased, the existing vulnerability during post-disaster reconstruction. The underlying

reasons for this loss or decline therefore need to be explored.

First, economic considerations influenced owners' choices of materials and lowered specifications before and after the disaster. For example, wood was one of the primary building materials for housing in several earthquake-prone



regions and its combination with stone masonry ensured better seismic performance. However, wood slowly became unaffordable and people thus started to alter their structures, which, in many cases made them more vulnerable to earthquakes. For example, in the Kutch region of Gujarat and in the Poonch region of Jammu and Kashmir, the walls extended to over 4.5 metres in unbraced height, simply to support the ridge of the roof, avoiding the use of the wood necessary to build a roof truss. In many instances, sophisticated joinery using tongue and groove joints was also replaced with nails, which could easily give way in the event of an earthquake.

Second, overriding opinion favoured the use of new materials, such as cement, while looking down on the traditional use of mud, which was perceived as weak and outdated. Needless to say, the introduction of new materials and techniques required specifications that were not feasible in many earthquake-prone regions due to the unavailability of resources, or the geographical restrictions. For example, appropriate curing of concrete is virtually impossible in the drought-prone regions of Kutch. Moreover, the poor economic situation also forced people to make compromises in their constructions.

Third, as new materials were introduced, the traditional materials, which provided such strength in withstanding the lateral forces of earthquakes, were not reinforced with like materials. Materials such as brick and concrete, which were introduced later in some regions, were randomly combined with traditional materials, such as stone and wood, even in post-earthquake reconstructions, thereby affecting the structural integrity and adversely affecting the seismic performance of the buildings concerned.

Last but not least, with changes to the materials and techniques, traditional craftsmen found themselves unable to use their skills. For example, local masons, who were skilled in shaping and laying stones, were not trained to build and repair brick and concrete constructions. They found themselves unable to use new materials; but in addition, their knowledge of traditional stone masonry had also declined to a considerable extent, primarily due to a lack of demand (again linked to general misconceptions about traditional constructions) over the previous few decades, forcing them into other occupations. Therefore, successive generations were not able to learn masonry skills from the masters. Even those who could afford modern RCC constructions were not able to afford the level of workmanship required, due to the lack of a skilled workforce. The extensive use of outside craftsmen, unfamiliar with traditional construction practices, both before and after the earthquake, has made matters more complicated.

Also, most outside post-earthquake interventions view earthquake resistant technology as a packaged product for fast duplication and transfer. Ironically, Traditional Knowledge Systems are also in danger of falling into the same trap if they are devoid of continuity and evolution. This issue will be looked at more closely in the next section.

It is not wrong to conclude that traditional knowledge has been lost, or is in decline, mainly because its process of evolution has been disrupted, thereby putting a stop to the creative search for solutions through continuous trial and error. In fact, this evolutionary process is what defines the true essence of traditional knowledge.

## Critical challenges for mainstreaming traditional knowledge

### Heritage – elitist or inclusive?

The predominant opinion among professionals and the local community is that cultural heritage

is limited only to a select group of monuments or objects, and in that sense is elitist. Therefore, cultural heritage concerns in disaster management



are seen as secondary, with the understandable logic that concern for saving lives and livelihoods should take precedence over the preservation of cultural heritage.

However, the scope of cultural heritage has extended far beyond select monuments, or groups of buildings or objects, to include vernacular houses, historic urban areas, cultural landscapes and even the intangible dimensions of living heritage, such as skills and cultural practices. This expanded scope of heritage needs to be integrated within various development and disaster risk management sectors, through the redefinition and repackaging of heritage concerns, achieved through the regeneration of traditional livelihoods, ecological planning and sustainable development.

#### **Recovering the scientific aspects of traditional knowledge and vice versa**

According to Schmuck-Widmann (2001), artificial boundaries are generally created between traditional knowledge and formalised scientific knowledge. However, Richards (1985) rightly emphasises that experimentation is an important aspect of traditional knowledge, and thus makes the claim that traditional knowledge is scientific. According to him, such experimentation is undertaken by local people and therefore it embodies place-specific experience.

Flavier (1995) reached the same conclusion, stating that traditional information systems are dynamic and continually influenced by internal creativity and experimentation, as well as by contact with external systems. This continuous process of experimentation, innovation and adaptation enables traditional knowledge to blend with science and technology.

Therefore, rather than categorising traditional and scientific knowledge into mutually exclusive domains, attempts should be made to recover the scientific aspects of traditional knowledge and the traditional aspects of scientific knowledge. While the former would allow Traditional Knowledge Systems to be understood by professionals, the

latter would demand that larger scientific concepts be translated into modes of communication that could be understood at a local level. This process of rediscovering, recovering, encoding and decoding is an organised scientific activity in itself.

#### **Replacing, reviving or evolving?**

Critical choices need to be made regarding the basic philosophy governing post-disaster interventions and the role of traditional knowledge in developing these. Should we restore Traditional Knowledge Systems to exactly how they would have existed in their prime? Or should we attempt to revive their essence, by bringing back the creative process of evolution, which responds to changing needs and accounts for constraints as well as aspirations, while at the same time maintaining a local sense of identity and building on the accumulated experiences of the past? The latter seems to be the obvious choice if we wish cultural heritage to play a proactive role in disaster mitigation and recovery.

If we want to protect cultural heritage in post-disaster situations, we must prevent it from being replaced by seemingly modern, but culturally, climatically and economically unsustainable reconstruction work. This requires us to address post-disaster rehabilitation in two ways. First, by developing workable alternatives for the repair and retrofitting of traditional and historic structures, which may have been damaged but have not collapsed, rather than automatically employing standard engineering recipes and design packages (in cases where this is a feasible option). Second, by engaging in a process of culturally-sensitive reconstruction, which builds on the accumulated knowledge of the past and fosters local identity, while at the same time addresses new needs and aspirations, including those concerning seismic safety. This may also require lowering the earthquake-safe thresholds by establishing optimum acceptable standards for managing risks in response to local constraints and opportunities. Last but not least, this would require real community engagement through empowerment and not merely the rhetoric of participation.

## Conclusion: towards recognising traditional knowledge as a source of resilience

Although cultural heritage is increasingly vulnerable when disasters strike, it should not be seen merely as a passive victim. In the face of disasters, traditional communities in historic areas have the capacity to contribute to the development of resilient features within urban environments, which, intentionally or unintentionally, assist in prevention and mitigation, emergency response and recovery (Jigyasu, 2016).

As explained through the examples above, cultural heritage is a repository of traditional knowledge in disaster mitigation accrued over generations through trial and error. Additionally, Traditional Management Systems have tremendous potential to enable collective action for post-disaster recovery. As a rich expression of heritage, they are also a powerful means to help victims recover from the psychological impact of disaster. In such situations, people search desperately for identity and confidence. Traditional social and religious networks that provide mutual support and access to collective assets, are an extremely effective coping mechanism for community members (UNISDR, 2013).

Intangible heritage also plays an important role in the sustainable recovery and rehabilitation of communities following a disaster. There are

many examples to demonstrate that successful reconstruction projects have taken local building traditions and ways of life into consideration through a deeper engagement with communities. Yet, although the positive role of heritage must be valued, it should not be discounted that many cultural beliefs and practices result in a fatalistic approach to interpreting disasters, such as declaring them “God’s Will” with the consequence that no proactive measures are undertaken to reduce disaster risks. Many heritage structures and urban areas are also vulnerable due to inherent defects in their design and construction, or to the additions and alterations made to them over time (Jigyasu, 2015).

The recently adopted Sendai Framework for Disaster Risk Reduction (UNISDR, 2015) clearly recognises culture as a key dimension for disaster risk reduction, together with the need to protect and draw on heritage as an asset for resilience. The challenge is to implement the policies contained in this framework, which will require considerable capacity building at international, national and local levels and the establishment of the necessary institutional mechanisms, complemented by data collection and monitoring (Dean and Boccardi, 2015). It is high time that these well-articulated policies were put into tangible action on the ground.



## References

- Dean, M. & Boccardi, G. 2015. Sendai Implications for Culture and Heritage. *Crisis Response Journal*, 10(4): 54.
- Flavier, J.M. 1995. The regional program for the promotion of indigenous knowledge in Asia. In D.M. Warren, L.J. Slikkerveer, & D. Brokensha, eds. *The Cultural Dimension of Development: Indigenous Knowledge Systems*, pp. 479–487. London, Intermediate Technology Publications.
- International Strategy for Disaster Reduction. 2005. Hyogo Framework for Action 2005–2015: Building the Resilience of Nations and Communities to Disasters, World Conference on Disaster Reduction (WCDR), 18–22 January 2005, Kobe, Japan [online]. Kobe. [Cited 7 November 2017]. [www.unisdr.org/2005/wcdr/intergover/official-doc/L-docs/Hyogo-framework-for-action-english.pdf](http://www.unisdr.org/2005/wcdr/intergover/official-doc/L-docs/Hyogo-framework-for-action-english.pdf)
- Jigyasu, R. 2002. *Reducing Disaster Vulnerability through Local Knowledge and Capacity*. Department of Urban Design and Planning, Norwegian University of Science and Technology. (PhD dissertation)
- Jigyasu, R. 2013. Using Traditional Knowledge Systems for Post-disaster Reconstruction – Issues and Challenges following Gujarat and Kashmir Earthquakes, *Creative Space* (CS), 1(1): 1–17. [Cited 7 November 2017]. <http://dspace.chitkara.edu.in/jspui/handle/1/18>
- Jigyasu, R. 2015. Building Resilience by Reducing Disaster Risks to Cultural Heritage. In *PreventionWeb* [online]. Geneva. [Cited 7 August 2016]. [www.preventionweb.net/experts/guest/collection/44401](http://www.preventionweb.net/experts/guest/collection/44401)
- Jigyasu R. 2016. Reducing Disaster Risks to Urban Cultural Heritage: Global Challenges and Opportunities. *Journal of Heritage Management*, 1(1): 59–67. <https://doi.org/10.1177%2F2455929616649476>
- Langenbach, R. 2001. A Rich Heritage Lost: The Bhuj, India, Earthquake. *Cultural Resource Management Magazine*, 24 (8):33–34 [online]. US National Park Service. [Cited 7 August 2017]. [www.conservationtech.com/RL's%20resume&%20pub's/RL-publications/Eq-pubs/01-CRM-Bhuj.pdf](http://www.conservationtech.com/RL's%20resume&%20pub's/RL-publications/Eq-pubs/01-CRM-Bhuj.pdf)
- Richards, P. 1985. *Indigenous Agricultural Revolution; Ecology and Food Production in West Africa*. London, Hutchinson.
- Schmuck-Widmann, H. 2001. *Facing the Jamuna River: Indigenous and Engineering Knowledge in Bangladesh*. Dhaka, Bangladesh Resource Centre for Indigenous Knowledge.
- Sillitoe, P. 1998. Globalizing Indigenous Knowledge. In A. Bicker, J. Pottier, & P. Sillitoe, eds. *Participating in Development: Approaches to Indigenous Knowledge*, ASA Monographs 39, pp. 108–138. London, Routledge.
- UNESCO, ICCROM, & Agency for Cultural Affairs of Japan. 2005. *Recommendations of “UNESCO-ICCROM-Agency for Cultural Affairs of Japan: Thematic Meeting on Cultural Heritage Risk Management”*, World Conference on Disaster Reduction (WCDR), 18–22 January 2005, Kobe, Japan.
- UNISDR (United Nations Office for Disaster Risk Reduction). 2013. Heritage and Resilience: Issues and Opportunities for Reducing Disaster Risk, Background paper prepared for the 4th Session of the Global Platform for Disaster Risk Reduction, Geneva, 19–23 May 2013 [online]. Geneva. [Cited 12 August 2015]. [www.unisdr.org/we/inform/publications/33189](http://www.unisdr.org/we/inform/publications/33189)
- UNISDR (United Nations Office for Disaster Risk Reduction). 2015. Sendai Framework for Disaster Risk Reduction [online]. Geneva. [Cited 12 August 2017]. [www.unisdr.org/we/coordinate/sendai-framework](http://www.unisdr.org/we/coordinate/sendai-framework)

◊ CHAPTER 12 ◊

**Ensuring cultural continuity  
in the face of the recurrent  
earthquakes in Nepal**

Anie Joshi and Kai Weise



## Abstract

The living heritage of Kathmandu Valley has been threatened time and again by earthquakes. Yet, despite the massive destruction caused by recurrent earthquakes, the living heritage of Kathmandu Valley has managed to survive. Traditional belief systems are preserved within the community, ensuring continuity of heritage in the face of changing circumstances. The spirit and the function of the place are core to these beliefs. The material structure is adapted and renewed accordingly. The present paper elaborates the concept of cultural continuity through cyclical renewal. Examples of the restoration and reconstruction of various heritage structures after the 1934 earthquake in the Kathmandu Valley will be analysed. The renewal process of these heritage structures expresses the continuity in the value system, while retaining the identity of place. This paper further examines the rehabilitation planning processes proposed for heritage sites after the destruction caused by the April 2015 earthquake in Nepal, which would ensure that the cultural continuity is taken into account, for example by planning for regular maintenance as well as for the performance of traditional rituals.



## Introduction: living heritage, traditional community and cultural continuity

Living heritage is the continued expression of cultural and religious practices by an Indigenous community. It is the entire process of the interpretation of traditional beliefs and values and their incorporation into cultural activities and rituals, where the material heritage is only their physical expression. It is a dynamic process, where social and cultural values are identified, negotiated, rejected and affirmed (Smith and Waterton, 2009). When material heritage loses its link with its traditional use and users, it is no longer considered to be living heritage.

The Kathmandu Valley is an example of the amalgamation of such practices, as performed by the Indigenous Newar people. An analysis of how the Newar people have intertwined religious beliefs with social needs and then interpreted these into their cultural activities provides rich insight into understanding the living heritage of the region. For example, the community of Patan, now a large urban centre, was traditionally an agricultural-based community, and they still perform the chariot festival in honour of Rato Macchindranath the rain god, today, shortly before the monsoon season, to ensure a good harvest. Although the size of the farming community has decreased dramatically over previous decades, the whole community continues to participate in the festival, because of the significance of the rains. Here, the value lies in understanding the importance of the rains for better agricultural production and how the cyclical, annual character of the chariot festival has ensured the continuity of this cultural practice, even within the non-farming community of Patan. The entire process of the festival requires strong community participation, from the rebuilding of the chariot each year, to the ritual performance of pulling the chariot along the procession route.

Each year, the chariot is reassembled by the Barahi and Yawal clans. Most of the main structural wooden elements of the chariot are reused, whereas new ropes are used to tie and hold together the 19 metre high chariot (Figure 1). To ensure that these activities are managed successfully and that the places in which they take place are maintained, various socio-religious groups called *guthis* have been established. More specifically, the traditional belief system inherited by the



Figure 1

The rebuilding of the Rato Machindranath chariot in Pulchowk, Patan. The traditional skill of chariot building has been passed down to the younger generation with this yearly ritual.





Newar community of the Kathmandu Valley has largely been sustained by these socio-religious groups since the Licchavi period (fifth–eighth century CE). Later, they came to be formally regulated by society, with the establishment of *guthis* by the Newars during the Malla period (thirteenth–eighteenth century CE). A *guthi* is a self-sustaining social system, which generates its revenue from land donated by its founders. The *guthi* reflects a culture that places religion at the heart of its activities. The religious services and social functions that crisscrossed through people's daily lives, made the *guthi* an integral part of the Newar social structure, allowing it to play a crucial role in the preservation of artefacts and monuments (Amatya, 1999, 2007).

The traditional community of Kathmandu Valley anticipated the need to create a regulatory body for long-term heritage management, to be coordinated through local community groups. This community-driven approach, with minimal administrative costs and a high level of community participation also helped to ensure a sense of ownership over this heritage. Based on the notions of ownership and management, there were three types of *guthis*: family *guthis*, private community *guthis*, and public *guthis*. Family *guthis* were managed by individual families, whereas in private community *guthis*, members from several families participated. Public *guthis* involved the participation of wider social groups. *Guthi* members were responsible for the preservation of social, religious and cultural traditions and activities, by ensuring the continuity of rituals and ceremonies, and also for the maintenance of the monuments, buildings and infrastructures required for these activities.

Most of the festivals celebrated in the Valley involve ritual performances carried out in temples and public squares, requiring ongoing care and maintenance. Traditionally, *guthis* established at

local level through community participation, ensured the conservation of both intangible and tangible heritage. Documentation of traditional building and restoration techniques was not required, given the onsite knowledge transmission of these skills. However, the record of the dates of major restoration was always considered important and therefore noted.

The local craftsmen, who built these heritage structures, have the best understanding of the techniques and materials used. They consider regular maintenance and cyclical renewal, such as the complete restoration of temple roof, very important. The concept of traditional construction technology lies in the possibility of partial or complete renewal. The construction system is reversible, and is done in such a way that each of the elements can be replaced, one by one, without impacting the structural stability of the structure as a whole. Cyclical renewal is crucial to ensure the stability of the structures, which are made of natural materials, such as brick and timber, which are thus subject to the natural processes of decay, especially under certain conditions such as humidity. This need is further intensified, given the recurrent earthquakes that have taken place at regular intervals of 80 to 100 years in Nepal (Figure 2).

The traditional conservation and restoration system in the Valley has never followed a rigid framework, but has always been based more on learning from past experiences. As value lies more in the identity of the place and the associated ritual functions, the original material and architectural features have never been an issue for the community, who are the custodians and the users of this living heritage. Conservation and restoration have been based more on the need to adapt to changing circumstances in order to keep heritage alive, considered the main priority for the community.

## Changes in heritage management in modern times

Despite the *guthis* functioning well for centuries, a change in the *guthi* system was initiated after the unification of Nepal by Prithvi Narayan Shah in 1769, and also in the nineteenth century, with the

influx of political, social and economic change. A committee named Guthi Janch Kachahari (the Guthi Inspection Agency) was formed to inspect all *guthi* activities. The Chhenbhadel office

was established at central government level to inspect the renovation and restoration of monuments. These were the administrative mechanisms formed to inspect the way *guthis* were run and to take action against the misuse of *guthi* lands or *guthi* funds, which were managed by the *guthi* members.

The *guthi* system thus underwent radical change during the Rana period (nineteenth and twentieth centuries), as it became institutionalised, under the establishment of several central government agencies. The Guthi Janch Kachahari was replaced by the Guthi Bandobasta Adda (Guthi Management Office), which went on to play a central role in maintaining the records of *guthi* lands and coordinating other agencies. Other agencies were involved in revenue collection, receiving donations, and the inspection and supervision of *guthis*. The Guthi Bandobasta Adda later extended its functions and became directly involved in the restoration and repair of monuments, with its own treasury and office to keep track of its accounts. As a consequence, the roles of the original *guthi* members were reduced,

and the direct involvement of the community in the upkeep of the heritage lessened gradually as a result, raising questions about the community ownership of heritage.

Following the establishment of the Department of Archaeology (DoA) between 1952 and 1953, the Ancient Monuments Preservation Act of 1956 (amended in 2013) was promulgated “to maintain peace and order by preserving the ancient monuments and by controlling the trade in archaeological objects as well as the excavation of the place of ancient monuments and by acquiring and preserving ancient monuments and archaeological, historical or artistic objects” (Government of Nepal, 1956/2013, Preamble). Under the Ancient Monument Preservation Act, a modern conservation approach was introduced to Nepal, both in terms of management and techniques.

*Guthi* land was nationalised through the Land Reform Act of 1964. Further, in 1976, the Guthi



Figure 2

Roof restoration work being carried out in one of the rest houses in Patan.





Sansthan (Guthi Corporation) was established by the Nepalese Government, pursuant to the Guthi Sansthan Act. These two pieces of legislation dramatically changed the autonomous status of the *guthis* and limited their role within the performance of rituals, placing the administration and management of activities under the control of the Guthi Corporation.

The entire *guthi* system was reorganised in 1961, with the intention of making the system more

efficient and increasing revenue by establishing a centralised system for controlling resources. However, paradoxically, income from *guthi* land was reduced to such an extent that it was no longer possible to continue the performance of all the traditional rituals or to carry out the restoration work, due to the high administrative costs of the Corporation. The administrative costs of the original *guthi* system were

clearly much lower, meaning that they were able to carry out all of their activities and restoration work with the same funds. Later, the encroachment and illegal sale of *guthi* land as a result of high land prices, a failure to adjust taxes to inflation, increased overheads, and increased expenses for the special materials and labour required for festivals, led to the ineffectual financial management of the Guthi Corporation, which directly affected heritage conservation in Kathmandu Valley.

The first major repair work undertaken by the DoA was on Kasthamandap in Kathmandu. The work on Kasthamandap was a joint undertaking between the DoA and the Guthi Sansthan, where the Guthi Sansthan provided all the funding for the repair works. Later, in 1967, the establishment of the Guthi – Jirnodhar Tatha Nirman Samiti and its collaboration with the DoA provided much leverage for conservation works (Banerjee, 1977, p. 20). Legislation determined the Department of Archaeology to be the authoritative body to introduce relevant measures to protect cultural heritage. It was directly involved in the conservation, maintenance and restoration of ancient public monuments. This highly legalistic

and structured approach is often unfavourable to community participation and the implementation of traditional conservation systems.

Nepal received international attention during the late 1960s with various external experts advising on conservation planning. In the 1970s, with the provision of international funding, a number of restoration works were carried out, based on international developments. In 1978, Nepal ratified the 1972 UNESCO Convention Concerning the Protection of the World Cultural and Natural Heritage. The Convention (UNESCO, 1972) held that “cultural or natural heritage are of outstanding interest and therefore need to be preserved as part of the world heritage of mankind as a whole [and] in view of the magnitude and gravity of the new dangers threatening them, 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”.

This brought with it an entirely new set of principles that defined the approach towards the management of heritage, considered to be of great significance. Kathmandu Valley was inscribed on the UNESCO World Heritage List in 1979 (UNESCO World Heritage Centre, 1979), as a single site composed of seven monument zones: the three durbar squares of Kathmandu (Hanuman Dhoka); Patan and Bhaktapur along with the two Buddhist stupa complexes of Baudhdhanath and Swayambhu, and the two Hindu temple complexes of Pashupati and Changu Narayan. The nomination dossier included long lists of monuments for each monument zone, together with their particular state of conservation, with only a passing reference made to the natural setting and the urban context.

This misconception of heritage protection as addressing individual

 **Figure 3**  
The *shikhara*-style Fasi Dega in Bhaktapur Durbar square which was reconstructed with a stucco plaster structure to house the sanctum on its original plinth, was again levelled during the 2015 earthquake.



monuments led to Kathmandu Valley being placed on the UNESCO List of World Heritage in Danger in 2003, due to uncontrolled urbanisation and significant loss of historic urban fabric. With the redefinition of boundaries and the Integrated Management Plan adopted by the cabinet of the Government of Nepal in 2007 (Department of Archaeology, 2007), Kathmandu Valley Heritage Property was removed from the danger list. The Integrated Management Plan

focused on the devolution of authority to local government and site managers. The Coordinative Working Committee was established to ensure regular interaction between the Department of Archaeology, local government authorities and the site managers. This was partially to correct previous centralisation initiatives, which clearly demonstrated that central government authorities are not able to communicate with communities, and that it is essential to ensure





that communities participate in conserving their own heritage.

Leading up to the earthquake, the Integrated Management Plan was in the process of being reviewed and amended, as is required every five years. The review process was carried out over two years with on-site community meetings. One of the most important components of the revised

document was the section on the need to prepare a disaster risk management plan for heritage sites. Although the plan was not yet established, the discussions brought awareness of this issue. The Coordinative Working Committee proved to be essential in the response to the extensive destruction caused to the monument zones by the earthquake that struck in April 2015.

## Adaptation in restoration and rebuilding after the recurring earthquakes

Nepal has suffered from recurrent earthquakes, and communities have approached reconstruction in their aftermath in various ways. Two significant earthquakes in the last century (in 1934 and 2015) offered important insights into the suitability of heritage management approaches and the potential contribution of a renewed *guthi* system.

The 1934 earthquake caused colossal damage to monuments, government offices and private houses in Kathmandu Valley. During the reconstruction phase, the Rana government prioritised the reconstruction of private houses and government offices while the restoration and rebuilding of monuments such as temples and rest houses were scheduled for later (Rana, 1935). The *guthis* were not in a sound financial position to be able to restore all the monuments, since income from the land had been greatly reduced due to the taxation system introduced during the Rana period. However, some of the monuments were restored and rebuilt to their original form, whereas others were rebuilt on a modest scale, employing contemporary architecture styles and modern building materials. There was a lack of materials, skilled craftsmen and funding to enable immediate reconstruction of all the monuments. There are examples of many tiered temples and *shikharas* (mountain peaks – the tower rising above a sacred chamber) being modestly restored, using a dome-shaped structure that was prevalent during the Rana period. There is only limited documentation on the monuments that collapsed during the 1934

earthquake and were later reconstructed. The impact of this historic earthquake is still evident, however, in the transitional architectural features of the monuments in the Valley.

Seven monuments were listed as having completely collapsed during the 1934 earthquake in Bhaktapur (Rana, 1935). The Fasi Dega Temple, dedicated to Shiva and constructed in 1657, was one of them. The *shikhara*-style temple completely collapsed, leaving only the stepped base of the original structure remaining, guarded by three pairs of animals. A dome-shaped shrine was built on top of the original plinth during the reconstruction in order to house the sanctum. This modest reconstruction must have been the product of limited budget allocation. The 2015 earthquake caused the structure to collapse once again, although the stepped plinth is still intact. Similarly, in Patan, Bhai Dega, the three-tiered pagoda temple, also dedicated to Shiva and constructed in 1678, collapsed too during the 1934 earthquake. A domed structure in stucco plaster was built to house the sanctum, rather than rebuilding the highly decorated pagoda temple (Figures 3 and 4).

The temples were partially reconstructed after the 1934 earthquake. Specifically, the *shikhara* Temple of Uma Maheswor in Swotha was partially reconstructed after the 1934 earthquake, retaining its two original floors, constructed in stone with a final floor added, with a dome-shaped design. Similarly, nearby, the Krishna Temple retained its

original ground floor, which was a stone *shikhara*, and later a dome-shaped upper section and roof were added. The Lakshmi Narayan Temple in Hanuman Dhokha Durbar Square is another example of a partial restoration that was carried out without taking into account the original architectural features. There are also examples of temples that were never reconstructed after the 1934 earthquake, such as the Hari Shankhar Temple in Bhaktapur Durbar Square. This highly decorated three-tiered temple, as documented in early photographs, collapsed completely and only the two lions guarding the entrance remain.

Such hasty interventions carried out after the 1934 earthquake have been questioned time and again for their architectural features as well as their impact on the surrounding urban environment of the Valley. The reconstruction of the temples, such as Bhai Dega in Patan and Fasi Dega in Bhaktapur, was already being planned before the 2015 earthquake: according to the Ancient Monument Preservation Act, any structure that is 100 years

old or more is a classified monument to be protected by the Department of Archaeology. Therefore, if these reconstructed (after the 1934 earthquake) temples were to survive another 17 years or so, they would be considered classified monuments and be protected by the Ancient Monument Preservation Act. The question is: is this reconstruction work part of the history of the monuments that needs to be preserved, or should these monuments be restored back to their original form? This question demonstrates the need for better planning and clarity in relation to the reconstruction of the collapsed monuments after the 2015 earthquake. Adaptation might be necessary, due to the changing circumstances, but any adaptation must lead to improvements. Along with the physical restoration of the monuments, it is critical to consider the safeguarding of traditional skills and techniques, and how to revive community



Figure 4

The remains of the Hari Shankar Temple today; the temple was never reconstructed after the 1934 earthquake.





participation and restore the activities and rituals associated with each of these monuments.

We have seen that the 2015 earthquake, which struck 81 years after the previous great earthquake, has had a significant impact on the tangible heritage of the Kathmandu Valley. Damage to most of the monuments that were reconstructed after the 1934 earthquake and restored in the last 40 years was minimal, with few exceptions. This indicates the importance of regular maintenance and cyclical renewal of the monuments. There are examples of temples with minimal damage, where recent restoration work has been carried out using traditional techniques with minimal use of modern materials. Equally, there are examples of recent restoration work employing modern technology, such as concrete ring beams, which has failed to resist the earthquake, although the technology was designed and installed to be earthquake resistant.

The Radha Krishna Temple in Swotha Patan was reconstructed in 1992 using newly engineered materials to strengthen its structure and make it seismically resistant. The major alteration made to the traditional system was the addition of concrete ring beams, which were inserted between the traditional wooden runner beams to strengthen the monument. However, the temple collapsed, and the entire roof fell apart. There is a dire need for research into the impact of the use of modern materials in traditional construction systems. Traditional conservation and restoration work have always been open to adaptation, taking into account the possibility of reversibility in order to facilitate regular renewal and easy maintenance (Figure 5).

The 2015 earthquake has thus also highlighted the importance of the role of safeguarding traditional knowledge and skills.

## Ensuring cultural continuity post-earthquakes

The continued use of monuments, despite their change in form and the change in their architectural features post-earthquake, is proof that the spiritual value of the monuments is more important than their physical manifestation. It is the link between the monuments and the user community that gives the monuments life and meaning. If the community is successful in retaining the intangible aspects associated with a monument, despite its destruction during an earthquake, the restoration of the monument is assured, as was seen in the wake of the 1934 earthquake.

Throughout history, the built heritage of Kathmandu Valley has faced destruction by the forces of nature on a regular basis. The living heritage of the Valley has persisted, however, and has become increasingly more resilient thanks to lessons learned over time. The close link between the community and the environment has enabled the implementation of a system of cyclical renewal, helping buildings to last. Even in cases where the fabric of a monument has been severely affected, the reestablishment of the associated community

can ensure the safeguarding of the monument, rendering it resilient to natural hazards, weathering, rot and infestation. The cycle of destruction and renewal should be accepted as an integral characteristic of the heritage creation process. The significance of heritage, therefore, does not lie purely in the material; as long as the community has the capacity and the motivation, the continuity of their cultural heritage is also possible (Weise, 2015a, 2015b; Tunprawat, 2009).

Prior to the nationalisation of the *guthis*, the community formed *guthis* to ensure the performance of all the tangible and intangible activities related to the community's monuments. This led to the communal ownership of heritage and assured the transmission of traditional skills and knowledge to the next generation. The revival of the *guthis* would be ideal, where possible; if not, at least the formation of a steering committee and the active participation of community groups in the restoration and the long-term maintenance of the monuments and in the conduct of the traditional rituals should be considered.

## Conclusion

The link between a local community and its heritage is the essence of living heritage. It not only ensures the transmission of cultural and religious values to the next generation, but also the transmission of the values of traditional construction knowledge. As a result of changing social, economic and political circumstances, and the impact of international influences on heritage conservation, this link has been in jeopardy since the second half of the twentieth century. The shift that has taken place in the heritage management system in the region, from a community-based bottom-up approach (in particular, the *guthi* system), to a legislative top-down approach between the last two major earthquakes, might have a serious impact on the continuity of living heritage in Kathmandu Valley. The strong community sense of value and involvement in preserving heritage, which had gradually declined over the

past few decades, saw a resurgence in response to the destruction caused by the 2015 earthquake. This strength of community involvement must be valued and encouraged by the legislative bodies, through their integration into the overall restoration and rehabilitation of the living heritage of the Valley. The approach towards the management of heritage, where the link between the community and the monument has been disrupted, is completely different from the conservation of living heritage. The proper planning of heritage rehabilitation and rebuilding, taking its living aspect into consideration, remains crucial after the 2015 earthquake, in order to develop guidelines



Figure 5

The Radha Krishna Temple in Swatha Patan, which was restored in 1992 using modern techniques, collapsed in the 2015 earthquake. The modern restoration intervention had led to more destruction.





that recognise the value of the management of the heritage of Kathmandu Valley. The contribution of self-managed community groups such as *guthis*, to the maintenance and renewal of cultural heritage

also merits study, as well as how such groups might be successfully integrated into more conventional, expert-based heritage management systems for the benefit of both heritage and community.

## References

- Amatya, S. 1999 [1991]. *Art and culture of Nepal: My experience with the world heritage sites of the Kathmandu Valley*. Kathmandu, Vajra publications.
- Amatya, S. 2007. *Monuments and conservation in Nepal: My experience with the world heritage sites of the Kathmandu Valley*. Kathmandu, Vajra publications.
- Banerjee, N.R. 1977. Principles of conservation of ancient monuments with special reference to Nepal, *Ancient Nepal*, number 40.
- Department of Archaeology, Nepal Ministry of Culture, Tourism and Civil Aviation. 2007. *Kathmandu Valley World Heritage Site Integrated Management Framework* [online]. Paris. [Cited 9 June 2019]. <https://unesdoc.unesco.org/ark:/48223/pf0000221192>
- Government of Nepal. 1956/2013. *Ancient Monument Preservation Act* [online]. Nepal Law Commission, Kathmandu. [Cited 9 June 2019]. [www.lawcommission.gov.np/en/?s=Ancient+Monument+Preservation+Act&post\\_type=post](http://www.lawcommission.gov.np/en/?s=Ancient+Monument+Preservation+Act&post_type=post)
- Rana, B. S. JB. 1935. *The great earthquake of Nepal 1990 BS (1934 AD)*.
- Smith, L. & Waterton, E. 2009. *Heritage, Communities and Archaeology*. London, Gerald Duckworth & Co. Ltd.
- Tunprawat, P. 2009. *Managing living heritage sites in mainland Southeast Asia*. Department of Archaeology, Silpakorn University, Thailand. (PhD dissertation). [Cited 4 November 2017]. [www.thapra.lib.su.ac.th/objects/thesis/fulltext/thapra/Patcharawee\\_Tunprawat\\_Doctor/Fulltext.pdf](http://www.thapra.lib.su.ac.th/objects/thesis/fulltext/thapra/Patcharawee_Tunprawat_Doctor/Fulltext.pdf)
- UNESCO World Heritage Centre. 1972. *Basic Texts of the 1972 World Heritage Convention 2005 Edition* [online]. Paris. [Cited 9 June 2019]. <http://whc.unesco.org/uploads/activities/documents/activity-562-4.pdf>
- UNESCO World Heritage Centre. 1979. *Kathmandu Valley* [online]. Paris. [Cited 9 June 2019]. <https://whc.unesco.org/en/list/121>
- Weise, K. ed. 2015a. *Revisiting Kathmandu: Safeguarding Living Urban Heritage, International Symposium, Kathmandu Valley 25–29 November 2013*. Kathmandu, UNESCO.
- Weise, K. 2015b. Conserving Continuity. *Himal Southasian*, 2 September 2015. <http://himalmag.com/heritage-sites-earthquake-nepal>

◁ CHAPTER 13 ▷

**The adaptability of Traditional  
Knowledge Systems to  
modern management in Japan:  
restoration, energy efficiency,  
and disaster prevention**

Akiko Umezu



## Abstract

Traditional buildings change constantly. Specifically, the physical appearance of a traditional building is subject to its geographical location, climate, the social status of the village where it is located, and the changing nature of society. Traditional buildings, and building complexes, welcome and adjust to transformation, gradually incorporating the changes to form a Traditional Knowledge System. Japanese traditional buildings are no exception. The diversity of climatic conditions and the rich natural heritage of Japan facilitate the use of natural materials for both new construction and restoration work. It is also important to note that natural disasters occur frequently in Japan, and people thus have to apply Traditional Knowledge Systems and building techniques in order to overcome these disasters, and sometimes even revise these traditional tools and techniques in an attempt to prevent future disasters. Therefore, Traditional Knowledge Systems are of particular importance as a living dimension within heritage management because they play a vital role in conveying, expressing and sustaining local history. In this paper, the Traditional Knowledge Systems currently being implemented within the Preservation Districts – the areas designated for the preservation of Groups of Traditional Buildings – will be introduced from three different, but interlinked, perspectives: restoration, energy efficiency and disaster prevention. These three different perspectives promote the discussion of a wide range of issues, such as sources for recording knowledge, restoration methods, building materials, crafts and craftsmanship, disaster mitigation, and the applicability and adaptability of Traditional Knowledge Systems to contemporary contexts.



## Introduction: the conservation of traditional buildings in Japan

The conservation of traditional buildings has reached an equilibrium, consolidating a variety of factors, and adjusting, over time, to social, economic and cultural transformations. Villages comprising traditional buildings thus embody Traditional Knowledge Systems. These knowledge systems have gradually developed on-site. In order to ensure the conservation of traditional buildings, it is important to understand the ways in which the local community has adjusted to its circumstances, as provides useful information for the adaptability and applicability of local traditions for the present and the future.

The Japanese government has taken measures for the conservation of its traditional buildings, pursuant to the Law for the Protection of Cultural Properties 1950 (amended in 2007). The law classified items designated as Cultural Property into six categories: tangible, intangible, folk, monuments, cultural landscapes, and groups of traditional buildings. Groups of Traditional Buildings are defined as “those that have high values and form historic scenery together with their surroundings” (article 2). The first measure has been to evaluate the individual, intrinsic value of each of the buildings, and to protect their original construction materials, as carriers of this intrinsic value. There are robust legal restrictions against alterations, and, in some cases, conversions and additions that are considered unsuitable will be removed during restoration work. The second measure has been to evaluate traditional buildings as groups, also taking their surroundings into account. This involves the analysis of the integrity and authenticity of the landscape, the setting, and the traditional pattern of the roads. In this case, a conservation area is established during the town planning stage as a Preservation District. The local government decides the area that will form the Preservation District, and this will include groups of traditional buildings with the same features, together with their surroundings. The local government is then able to request

that the Japanese Government qualify the area as an “important preservation district of groups of traditional buildings”. Once the area has been designated as a Preservation District, the national government is able to offer technical and financial support to the local government.

To evaluate groups of traditional buildings as cultural properties in accordance with the law, scientific research is required to assess their historical, architectural and environmental value. Although a detailed discussion of the research methodology required is beyond the scope of this paper, the inclusion of the following points provides a deeper understanding of the arguments (Miyamoto, 2000).

First, the preservation of traditional buildings does not mean protecting them as though they were outdoor museums. It is important not only that individual buildings are preserved, but also that the support system for those buildings and their environment is maintained. Understanding local communities and establishing community cooperation is vital for the conservation of villages and traditional buildings for the future. Historical research generally studies how particular villages came to be established and how the villages have changed to date. This provides an insight into the individual character and attributes of the village that require preservation, and the main features and background to the transformations that have been carried out. It is also important to study the historical record of the disasters that have taken place in order to understand how the village has transformed, as catastrophic disasters, including fire, landslides, flooding and earthquakes, have often caused villages to undergo drastic change.

Second, architectural research examines the setting of traditional buildings, which is highly significant for the delineation of Preservation Districts. Within a Preservation District, non-traditional façades should be altered to harmonise with neighbouring traditional buildings, and new



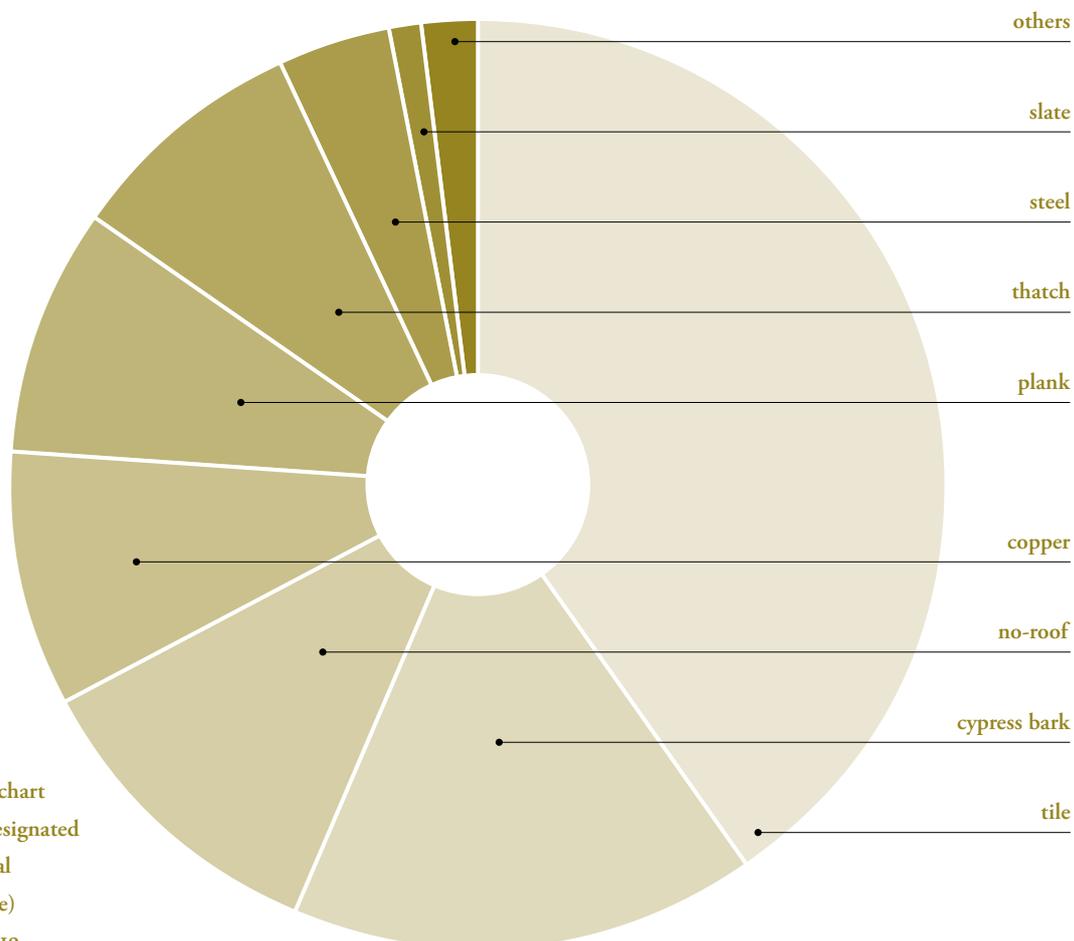
constructions also must be designed in harmony with their surroundings. Architectural research is thus indispensable, not only for selection of which traditional buildings are to be conserved, but also for the creation of guidelines to help ensure harmony between buildings and the landscape.

Third, a survey of the landscape: the setting and allocation of property lots differ in each village for a variety of reasons. For example, a mountainous area surrounding a village can protect that village from landslides and strong winds and serve as a supply source for construction materials. It is crucial that the location of a village is also analysed in relation to local livelihoods.

The outcome of the research must be shared with local communities, so that they understand their own values and attributes. The understanding

and support of the local community are crucial for the conservation of traditional buildings. Guidelines do not need to be fixed, because this system accepts the evolution of living heritage. Sometimes a new building design can be introduced as long as it is in harmony with the surroundings. Creating a consensus with the local community requires much time but is critical for the conservation of the traditional buildings.

At the outset, the movement to conserve traditional buildings might have sprung out of some romantic interest. Today, people have realised that it is a tool to strengthen communal pride, and are increasingly aware that traditional buildings are a rich source for Traditional Knowledge Systems, providing key information about how to cope with the change. The preservation of traditional buildings benefits Japanese society as a whole.



 **Figure 1**  
Roof material pie chart  
from nationally designated  
Important Cultural  
Property (structure)  
as of 1 October 2019.



## Restoration: building materials

The Japanese climate varies from region to region, but a temperate climate and high humidity are common. Almost 70 percent of Japanese land is forested and mountainous, which means that most areas are not considered suitable for human settlement. Coastal areas have high population densities, while mountainous areas have only a scattering of villages. People living in mountainous areas have always had difficulty obtaining building materials from areas further away than their local forests or neighbouring villages. It is thus important for them to find the simplest and cheapest way of obtaining materials. Most material used for construction and maintenance is organic: wood and earth and so on.

### Main structures

Almost all Japanese traditional buildings are built of wood (Itoh, 2003). Nowadays, only small private residences are built using timber frames. Trees are ubiquitous, and their ease of planting means that timber-building has become part of Japanese culture. Wood species differ according to location: Japanese red or black pine, Japanese cedar, Japanese cypress and chestnut are widely used for construction. There are many advantages of building using timber frames in Japan. In a high-humidity environment, wood has proved to be resistant. Timber frames also make it easy to make windows for ventilation. Above all, wood is readily available, and so domestic timber can be used. However, recently, most wood has been imported from abroad, as it is cheaper to do so. This is a serious issue for Japanese construction and restoration work.

### Roof materials

Roofs are always exposed to the outside and are thus exposed to damage from the rain and strong and cold winds. Periodic restoration work is therefore necessary to keep the fundamental framework in good

condition. Thatched roofs are widespread and are fitted using different techniques in different regions. Roof materials are the best indicators of a region's climate and its flora (Table 1).

- Thatch: thatched roofs were one of the most widely used types of roofing for traditional buildings up until the early twentieth century, especially in mountainous areas. Archaeological remains indicate that thatched roofs in fact date back to Japanese pre-history. In Japan, straw roof remains are found even at pre-historic settlements. Before the sixth century CE, when tiles were imported from China, it is considered that most buildings were thatched. It can thus be said that thatch has long been ubiquitous. Thatching materials, such as reed, straw or similar material, can be harvested easily, for example, from neighbouring rice fields. Roofing is a highly demanding task, and, as a result, generally, the whole village helps each household in turn. The cycle for re-roofing is approximately every 30 to 40 years. Traditional villages usually have a strong community bond, providing each other with much mutual help, including with roofing work. The Shirakawa Village in Gifu Prefecture, inscribed on the World Heritage List in 1995 as



**Figure 2**  
Roofing with cypress bark.





one of the Historic Villages of Shirakawa-go and Gokayama is a good example of a traditional way of life that is perfectly adapted to the changing social and economic environment. It is so remote and isolated that local community members must cooperate when roofing work is needed. The local community continues to try to maintain its traditions in a series of activities, which includes roofing. Without mutual collaboration, it would also be difficult to pass on thatched roofing and maintenance skills to the next generation.

- Wooden planks and boards. Planks and boards, made of various types of wood, have also been used as roofing materials since the medieval era. Indeed, wooden and thatched roofs dominated, until the more recent use of tiles became more popular. Wooden roofs were often used for town houses and for temples built within towns. In most cases, water-resistant wood with a pronounced grain, such as Japanese cypress, Japanese false cypress and cedar was used, because it is easy to shape (Figure 1). Roofs made of planks and wooden boards have different names, depending on their thickness, length, and wood type.
- Planks and wooden boards are suitable for the Japanese climate as long as water-resistant wood is used. They are highly flammable, however. Planks and boards are gradually being replaced with non-flammable tiles, for safety reasons. The Building Standards Law now prohibits the use of flammable materials in roofing and it has become easy to buy factory-made tiles. Furthermore, skilled carpenters are not required to construct roofs made of tiles.
- Tiles: clay tiles are said to have been introduced with the Buddhist culture in around the sixth century. Clay tiles were only used for prestigious buildings at first, such as for the main hall of Buddhist temples, and in palaces and castles. The tiles are water- and fire-resistant. Clay is also highly durable when compared with other organic materials. After fires, local governors would often order tiles to be used instead of organic flammable materials. Cold-resistant metal tiles were predominantly used in cold regions. However, since World War II, tiles made of clay have been most widely used.
- Hiwada (Japanese cypress bark): the Hiwada roof is unique to Japanese architecture. Hiwada roofs comprise tier upon tier of cypress bark, forming a sleek shape. It has generally been used for prestigious buildings (such as Shinto shrines, main Buddhist temples, aristocratic residences and army facilities), because of the elaborate techniques required. An established system of professionals exists for the installation of cypress bark roofs. Motokawa-shi, a Hiwada expert, chose and peeled the bark from the best cypress trees, which were about 70 years old. After cutting sections of a certain length and drying those sections out to use as roofing material, the roof carpenter fixes them together layer by layer, using bamboo nails. Hiwada employs only organic material. As with thatched or other organic roofs, Hiwada also requires periodic maintenance. The Japanese cypress tree is considered an ideal building material, on account of its properties: it is easy to machine, light, straight and durable. As described above, not only are the trunks used from Japanese cypress trees, but also the bark. In the past, cypress trees grew locally, but nowadays big trees are sometimes imported from abroad.

## Energy efficiency

### Ventilation

The big windows and long eaves in traditional Japanese houses are practical for ventilation purposes, for keeping houses cooler in summer, for helping to keep out the humidity and moisture, and to protect

from decay. According to the well-known book on the essence of life *Tsurezuregusa*, written by Japanese monk Yoshida Kenko in the fourteenth century, it is important to build houses having the summer period in mind. This opinion has been widely held by the



Japanese for a long time. Traditional layouts are also important for ensuring efficient ventilation and keeping buildings dry. The rooms inside traditional houses are divided with sliding paper doors, called *fusuma* or *shoji*, providing ventilation, unlike rigid walls. This feature also allows for flexible use of the buildings. Thick mud plaster is also used for the external walls to keep the heat inside in cold regions, while big windows are integrated into the walls in hot regions. The thickness of mud plaster also helps to keep the temperature consistent.

Techniques were employed to ensure ventilation for town houses. The courtyard is one example. A town house generally comprises a main building and some store houses within premises that are long and narrow. The courtyard is sandwiched with buildings front and back: the main residence or store house is located on the road side, with the courtyard behind. Town houses have been built close to one another, and sometimes neighbours share a wall. In this case,

there is no ventilation space between houses, so the courtyard serves as a useful space to create ventilation and allow sunlight into the house facing the courtyard.

#### **Building orientation**

The orientation of buildings is an important convention in traditional villages. If there are no restrictions as to land use, the main room will face south, in order to let the sun shine in in winter. However, town houses are generally squeezed into narrow spaces, in which case orientation is decided according to the space allowed. Land lots are usually narrow and long. A tax was levied in accordance with the width of the street-side of the premises. As a result, premises became long and narrow.

Town house plans usually indicate that houses that face each other across the street are bilaterally symmetrical.



**Figure 2**

Each house has own pond to catch melting snow.





### Pitched roof

Most traditional building roofs are gable-shaped. Gable roofs leave room for a mass of air that enables temperature control. Due to the mass of air, the temperature of the living space remains moderate throughout the whole year. Before electricity or gas became ubiquitous, many houses had a sunken hearth, and the heat of

hearth would keep the thatch dry, while the smoke from the hearth would fumigate the thatch.

In areas prone to heavy snowfall, gable roofs are also constructed and fitted to cope with significant snowfall, and space is left between neighbours' hanging eaves. In these areas, a small pond is also positioned under the long-hanging gable eaves to catch the melting snow (Figure 2).

## Disaster mitigation/prevention

### Fire

Fire is the most frequent disaster to occur in Japan, causing substantial damage to Japanese traditional buildings. When fires break out, changes to the architectural design of houses and other buildings occur in order to improve fireproofing and fire-resistance. Often, in the wake of a fire, roofing material is changed during restoration work, from flammable materials to fire-resistant tiles. Additionally, fireproof sidewalls are sometimes installed to prevent flames from spreading to neighbouring houses. Thick plaster walls and brick walls protect from the heat of fire and are effective for preventing the spread of fire but are costly and so have not become widespread. Store houses are made of plaster in order to protect precious food stock. Groups of store houses also act as firewalls.

In the case of Gujyo-Hachiman City, in Gifu Prefecture, the existing water channels and rivers have been improved for water supply use. The installation of sufficient water reservoirs for firefighting has also been encouraged; for efficiency, existing water reservoirs have been restored for this purpose. Every village and town has taken at least some steps for disaster preparation. Thus, we see the importance of researching the history of disasters, and preventative countermeasures (Japanese Institution for Folklore Architecture, 2001; Gujyo Hachiman Board of Education and Gujyo City, 2010).

### Earthquakes

Japan is an earthquake-prone country, and, as a result, column-and-beam structures are

widespread. There are many earthquake disaster preparation measures in place, but there is not an effective measure to prevent or mitigate damage from fires caused by earthquake tremors.

Fire prevention and earthquake damage mitigation measures sometimes conflict. For example, light-weight roofs are better in terms of earthquake damage mitigation, but tiles are more fire-resistant. Thick plaster walls help to protect against the spread of fire but are easily damaged in earthquakes.

### Flooding

Villages called *waju* are a type of village where the land-level is below the water-level. *Waju* are generally located at the estuary of large rivers and are surrounded by dykes. The dykes have not always been strong enough to prevent flooding. The villagers have therefore built a mound to provide an evacuation point: when the dykes break, they run to this mound for safety. The mound is called *jomei-dan*, which means mound for saving lives.

Wealthy families build their store houses on higher ground to keep precious goods safe from flood damage. People who live in flood prone areas have small boats, called *mizufune*, to help them evacuate (Japanese Institution for Folklore Architecture, 2001). Nowadays, as dams and dykes are well-maintained, people forget about Traditional Knowledge Systems. However, such dams or dykes are not always safe, and Traditional Knowledge Systems should not be forgotten.

**Typhoons**

Okinawa Prefecture, the southernmost prefecture of Japan, is exposed to typhoons throughout almost the whole year and struggles with heavy rains and strong winds. The winds in particular, cause serious damage. Most traditional houses are single-storey and surrounded by stone or concrete block walls to protect them from strong winds. In the case of Tonaki Island of Okinawa Prefecture, house foundations are dug to a depth of approximately

one metre below road-level, with the result that houses are set into the ground and are more protected from the power of the wind. When it rains heavily, rainwater filters easily through porous coral walls instead of pooling inside buildings. It might be considered reasonable to use coral in tropical climates; yet, as it is now prohibited to remove coral from coral reefs, concrete is used instead. As a result, machines are needed to pump water away after heavy rain.

## New challenges for the applicability and adaptability of traditional knowledge

**Current building regulations**

There are many advantages to Traditional Knowledge Systems, and yet many traditional buildings have been abandoned without considering those advantages. Traditional knowledge can only exist within the framework of the conservation of cultural properties, as protected by the law or bylaws. The number of cultural properties is so limited that it is now difficult to comprehend the applicability and adaptability of Traditional Knowledge Systems.

In addition, current building regulations cater only for new construction work, and do not cater fully for existing buildings. When an existing building seeks to conform to current regulations, safety standards must meet today's requirements. However, it is difficult to prove the safety of traditional buildings, and, even where it is possible, it is costly to obtain the required certificates. Furthermore, traditional knowledge might be effective where buildings are in a good condition; however, the majority of existing buildings are in a poor condition.

**Reviving social systems in support of Traditional Knowledge Systems**

The failure of social systems to support Traditional Knowledge Systems makes it difficult to apply

and adapt Traditional Knowledge Systems to the present social system. In fact, there are few craftsmen and artisans who are able to build or repair traditional buildings: the fewer the skilled craftsmen and artisans, the less the chance that traditional buildings will be repaired or maintained. The cost of materials is higher than before, and owners are reluctant to carry out frequent maintenance work, impacting the condition of buildings in the long-term, and leading to their eventual abandonment. Unless social systems are implemented to support Traditional Knowledge Systems and traditional skills, it will become increasingly difficult to consider the adaptability and applicability of Traditional Knowledge Systems in the future.

**Changing social behaviour**

Lastly, from a long-term, broader perspective, we see that it is necessary to try to change the notion that "new buildings are better than old – or rather traditional – buildings". The integration of heritage values and scientific evidence of the safety of traditional buildings, or proven retrofitting measures, are all crucial now.



## References

- Itoh, T. 2003.** Architectural Development of the Japanese House and Wood Species Used for Construction. Training Course on the “Conservation of Wooden Structures in Asia and the Pacific”, 16 October–14 November 2002, Nara, Japan, Cultural Heritage Protection Cooperation Office, Asia/Pacific Cultural Centre for UNESCO: 25–30.
- Gujyo Hachiman Board of Education and Gujyo City. 2010.** *Research Report on the conservation of Gujyohachiman Kitamach group of traditional buildings.* Gujyo City, Japan.
- Miyamoto, M. 2000–09.** Special issues on conservation of historic village and community design (machizukuri) – Commemoration of the 25-year history of the preservation of groups of traditional buildings and the future, the present situation of preservation system. In Agency for Cultural Affairs, eds. *Cultural Properties*, pp. 13–19. Daiichi-hoki, Government of Japan.
- Japanese Institution for Folklore Architecture, ed. 2001.** *Minzoku Kenchiku Dai Jiten (Encyclopaedia of Folklore Architectures).* Japan, Kashiwa Shobo.

◁ CHAPTER 14 ▷

**Harnessing traditional knowledge  
at Ayutthaya, Thailand: resilience  
and sustainable development**

Hatthaya Siriphatthanakun



## Abstract

The Historic City of Ayutthaya, a UNESCO World Heritage Site, was the administrative centre of Siam Kingdom until it was attacked and burned into ground in 1767. Ayutthaya was designed using a grid-planning system. The water management system of the city took advantage of its location at the confluence of three rivers: it was technologically advanced and could be considered unique in the world, consisting of a whole complex of structures, such as canals, the city moat, the city wall, and water gates. Scholars have proposed studying how the water system was controlled and managed for the irrigation, drainage, transportation and ritual needs of the city during the Ayutthaya period (1350–1767). However, scientific research on the water management of Ayutthaya is still very limited. Apart from archaeological studies, the cartographic data of Ayutthaya and its historical documents are crucial sources of information. The present paper explores the traditional water management system of Ayutthaya, through the interpretation of old maps, drawings and pictures of Ayutthaya, as well as other historical documents. The traditional water management system is seen from different perspectives: the selection of the city's location, city planning, its canalisation, hydrological engineering, architecture, and the traditional way of life on a flood plain. Subsequently, this paper seeks to demonstrate the potential contribution of the traditional water management system to the resilience of Ayutthaya and to the sustainable development of the region as a whole.



## Introduction

According to official historical documents, Ayutthaya has long been recognised as the former administrative centre, or capital city, of Siam Kingdom. It was established in 1350, but it is still unclear when the city was encircled by rivers and water channels, positioning it as an island, which led to Ayutthaya also being called Ayutthaya City Island or Koh Muang. The city stood for 417 years as the capital city of the kingdom before it was destroyed and burned to the ground during the battle between Siam and Burma in 1767. According to historical documents and archaeological studies, bricks from the ruins of the city were used to build the forts and city walls of the latter capital city, Bangkok. During the reign of King Rama IV (1851–1868), some of the ruins, particularly of the palaces, temples and religious buildings, were restored or reconstructed, and thus the reconstruction process began (Siriphatthanakun, 2014).

At present, the City Island remains an archaeological site within a contemporary town. It comprises the ruins of temples, palaces, city wall and forts, with only limited numbers of residential areas and houses. Some temples were reconstructed to serve the towns that have been rebuilt. According to archaeological studies, it is claimed that the Ou Thong Road, which circles the City Island, was built on the remains of the city wall.

In 2011 the central plain of Thailand and the Chao Phraya River delta plain, in particular, suffered a catastrophic flood. Ayutthaya City Island, including the Historic City and World Heritage Site of Ayutthaya (UNESCO World Heritage

Centre, 1991), was severely affected. The events of 2011 prompted discussions and proposals for flood protection and flood mitigation measures to be planned and implemented. These discussions highlighted the significance of Ayutthaya's traditional water management system:

The scheme took maximum advantage of the city's position in the midst of three rivers and had a hydraulic system for water management which was technologically extremely advanced and unique in the world.

(UNESCO World Heritage Centre, 2015)

The impact of natural hazards on Ayutthaya, particularly from flooding, has not been recorded in any historical documents, although the above-mentioned knowledge in relation to traditional water management has been documented. However, the information drawn from existing studies and research into archaeological remains, cartographic data, drawings, historical documents and local oral history remains limited.

This paper therefore aims to explore traditional water knowledge management in the Ayutthaya period, through the available evidence such as the city's location, city planning, and its canalisation, hydrological engineering, and architecture. It will also discuss intangible aspects relating to water, such as the living traditions which have played a crucial role in shaping the city. This paper will conclude by addressing the challenges for adopting and/or adapting traditional knowledge to present day circumstances to increase the city's resilience.

## Location: understanding nature

According to the topographical study on the southern basin of the central plain of Thailand, carried out by Takaya (1969), the lower central plain of Thailand measures 500 kilometres from north to south, and 100 kilometres from east to west. Takaya claims that the central plain of Thailand can be divided into three parts. The northern part

of the central plain is a water catchment area of three rivers running from the north. The plain lies between 25 and 100 metres above sea level. The second part of the central plain is the area surrounding Nakhonsawas Province, where the three rivers from the north merge and become the Chao Phraya River. The third part of the



central plain, known as the lower Chao Phraya delta plain, where Ayutthaya and Bangkok are located, consisted of the old barrier islands, laid in an east-west direction when this part of the central plain was still a shallow sea.

Hutangkura (2014) agrees with Takaya that archaeological and geological studies show that marine regression occurred in around 4000 BCE, causing the shoreline to move southwards to the present level. At this time, the settlement known as Ayodhaya Sriramthepnakorn, which became the Kingdom of Ayutthaya, was mentioned for the first time in history. Ancient settlements were already situated around the central plain of Thailand (Wongted, 2007), dating back to the Dvaravati period of around 800 CE. In addition, Tanabe (1975) refers to Takaya, stating that the lower part of the Chao Phraya delta, running from Ayutthaya to the Gulf of Thailand is low-lying, flat terrain, less than five metres above sea level. However, it is unclear whether Ayutthaya was established earlier than 1350 (Chumsai Na Ayutthaya, 1986), since the scientific studies are very limited.

Given the location and landscape of Ayutthaya, as discussed above, it is clear that in the Ayutthaya period, people knew how to select land to settle on, and how to survive natural disasters, and even how to benefit from natural

phenomena. The area formerly comprising the old barrier islands was chosen for settling purposes, as it is higher than other areas, and because the sediment makes the area fertile, which is important for an agriculture-based society. Tanabe (1975) states that, given the topographic conditions of this area, which is approximately one metre above sea level, the flood water is deep enough to cultivate rice and ensure quick drainage. The rice plantations were developed using flood water. At that time, the central plain of Thailand became the rice bowl of the country, Ayutthaya included.

Furthermore, Ayutthaya is situated in the middle of the Chao Phraya, Lopburi and Pha Sak rivers. The three rivers run from the north and encircle the city, and then meet and merge together as Chao Phraya river, which flows southwards to Bangkok. From the Second Phase of the Master Plan for Conservation and Development of the Historic City of Ayutthaya, carried out by the Fine Arts Department (2010), we see from the straight-lines of the water channel connecting these three rivers, that the channel was man-made. As a result, the city was positioned as an island, as mentioned above. Several historians and scholars have argued that this demonstrates that there was knowledge of how to exploit natural resources in order to build a protection system for the city.

## City planning: building an amphibious city

Ayutthaya has been called a water city. However, the city planning indicates that it may be better to call it an amphibious city. The Royal Chronicle of Rattanakosin contains evidence to show that the city plan for Bangkok was based upon the city plan for Ayutthaya. As the capital of a restored kingdom, the city plan for Bangkok was modelled on the urban design and architectural layout of Ayutthaya: for example, the locations of the royal palace, the second palace of the king and the royal grounds were the same. It has been noted that the official name of Bangkok in Thai retains the word Ayutthaya. It can therefore be said that the city planning traditions, beliefs, rituals and ceremonies of Ayutthaya can be learned from those

held during the early Rattakosin (Bangkok) period, as still practised or already documented.

According to the war strategy treatise written in the Ayutthaya period, which was still in use in the Rattanakosin period, the site selection for founding the city and its major components were adapted to fit the new location. The concept of *Naga Nam* applies to cities surrounded by water or rivers: it specifically states that, in such cases, the city should be built in the shape of the stomach of a *Naga* – a snake goddess – likely to be an oxbow shape, interpreted as a bend in the watercourse. Furthermore, building the city on a riverbank facilitates transportation, when land transportation is not possible.



Chumsai Na Ayutthaya (1986) claimed that, before Ayutthaya was established as the administrative centre of Siam Kingdom in 1350, a settlement already existed on this land because a large temple, named Wat Phanacherng had been built on the site at least 23 years prior to the establishment of Ayutthaya. A number of scholars, led by Phumisak (1983), also believe that the earlier settlement was perhaps Ayodhya, located to the east of the City Island, where the remains of many temples can clearly be seen. Chumsai Na Ayutthaya (1986) also argues that the city design changed over time; as the water channels were often shallow, so new water channels were dug. During the earlier period of Ayutthaya, prior to 1498 when the canal enlargement was mentioned for the first time in the Ayutthaya Chronicle (Walliphodom, 2000), water channels were fashioned through the natural course of the water flow, and, later, the linear water channels were created instead. Further study is thus needed to research how knowledge of city planning in Ayutthaya developed, and whether it derived its layout from previous settlements in the same area, or from other civilisations, which had already been built, such as Angkor (Engelhardt, 1995; Peou, 2014; Piemmettawat, 2015).

As for the road and canal system, it is evident that the city was designed to keep the water at a certain level during the dry season, and to drain the water efficiently in flood periods. Based on the study of Phraya Boranratchathanin's map and Vingboons's maps, named *Afbeldinge der stad Iudiad Hoofst des Choonincrick Siam* and *Iudia*, Chumsai Na Ayutthaya explains that Ayutthaya City Island, in its golden period, was surrounded by a city wall, which was 12 kilometres long, with

100 city gates. Inside the city wall, 20 water gates were constructed to facilitate boat transportation, while the canals in the city were 56.4 kilometres long in total. There were 28 brick bridges built in an architectural style similar to the remains of the bridge found in Lopburi, another main city from same period as Ayutthaya. The maps indicate that the major canals were laid from north to south, while the sub-canals were built from east to west. The canals formed a grid system in the city. Some roads were also built in parallel to the major canals. Notably, the royal palace, identified in several maps, was located in the north of the city and close to the river.

Although known as the amphibious city, Keamfer's map shows that Ayutthaya also had many roads, built in a grid pattern. The main road was 10 metres wide: it was used during royal processions and was once used to receive a message from King Louis XIV. Horses and elephants were used for land transportation at that time. Historical documents show that public ports were found in 22 districts for water transportation. There were four water markets and 30 markets on land. The city was divided into various districts, according to land-use criteria (Chumsai Na Ayutthaya, 1986). Many old maps demonstrate that foreigner settlements were located outside of the city wall, made of timber and brick, with lime plastering, and surrounded by moats. The settlements were arranged by countries. In addition, this planning system also reflected the political, economic and social structure of the Ayutthaya period. Thus, it can also be stated that the roads also played a crucial role in terms of providing transportation in the city, as well as the canals.

## Hydrological engineering: controlling the water

The hydrological engineering of the Ayutthaya period has also been recognised the world over, as mentioned in the statement of Outstanding Universal Value of the Historic City of Ayutthaya included in the World Heritage List. It can be seen that people at that time understood the nature of water and how to harness its power. For example,

they demonstrated that they knew how to dig water channels that formed a short-cut in order to ensure faster drainage.

Furthermore, they used their expertise in hydrology, said to have been passed on from one generation to another, to widen canals in order to reduce hydraulic force and erosion.



Vandenberg (2009) explains that, at the beginning of the twentieth century, Phraya Boran Rachathanin was ordered to carry out a field survey and to draw a map of Ayutthaya, which subsequently became a baseline map for the study of the city of Ayutthaya and was reconstructed by Chumsai Na Ayutthaya. After the fall of Ayutthaya in 1767, although the city was deserted, it is believed that much of the infrastructure remained intact, even when the restoration of Chandra Kasem Palace, the foremost palace of the Ayutthaya Period, began in 1816. It is therefore presumed that, when the field survey was carried out by Phraya Boran Rachathanin, the condition and remains of the city had not altered significantly since 1767. This idea is supported by the photos taken between 1868 and 1946. Vandenberg

(2010a) also claims that *The Royal Chronicle* shows that Phraya Boran Rachathanin was also assigned by King Rama V to investigate the collapse of the embankment in front of Chandra Kasem Palace, at the junction of New Lopburi, Pasak River and Hau Ro Canal, where the hydrological flow was extremely violent. He proposed that a new water channel be dug, and that the old ones should be widened in order to slow down the velocity of the river and decrease erosion. Phraya Boran Rachathanin implemented existing, traditional knowledge for this project. Yet, the project was not completed, and the attempt to stop the erosion failed. Though the reasons for this failure are not clear, this example may suggest that in some cases traditional knowledge may not work due to several factors.

## Canalisation: transportation and city expansion

It is clear that the people living in the Ayutthaya period gained expertise in canalisation in order to provide themselves with better transportation and expand the settlement. Vandenberg (2009) explains that Kaempfer's map, which was the result of his journey from Batavia to Siam in 1690, was the most accurate. The map shows that the city was already encircled by rivers and man-made water channels, which also served as a moat for the city. It can also be seen from the map that there were four main canals flowing from the north to the south, while there was only one main canal flowing from the east to the west, which probably also connected the water channels outside the city from the east to the west. It seems likely that the canals flowing from the north to the south were man-made because they were straight and direct, unlike a natural water course, which meanders. These canals were built to connect the drainage system from inside the city to the Chao Phraya river then to the gulf of Thailand.

According to Vingboons's map, which is useful for building identification, the location of some of the structures related to water management requires discussion, since Chumsai Na Ayutthaya's explanation has not been upheld by physical evidence. Firstly, water gates stand like gateways over every canal junction in the city, as well as over

the city moats and rivers. Secondly, temporary weirs were built. Chumsai Na Ayutthaya (1986) explains that, during the dry season, temporary weirs were built at the inlet and outlet of the canals, so as to collect water and then control the water-levels during the dry season, so that the transportation system could still function and people could still use the water. Phengtako (2015) states that a water supply system was found for domestic use, comprising terracotta water pipes, water wheels and water tanks. From his archaeological excavation, the remains of terracotta water pipes were discovered underground, while the remains of a water tank can still be seen near the royal palace, and features on one of the old maps. No physical remains or evidence of the waterwheels have been found to date, but, theoretically, they had to be situated in the rivers and canals to move the water up to the water tank and allow the water to flow down to the city (Phengtako, 2015).

The Historical Archives Archdiocese of Bangkok (Anonymous, 2016) claims that several canals were dug within the City Island. They ran from the north to the south, in parallel to the Kur Na canal, which was dug to connect the Lopburi and Pa Sak rivers. These canals were mainly used as domestic



transportation and drainage systems. As a result, many bridges were built across the canals. These bridges were made of various kinds of material, including wooden bridges, arched brick bridges that allowed boats to pass through, and a laterite bridge for elephants. The soil from canal-digging was added to both sides of the canals, creating an earthen dyke, running in parallel to the canals. The canals were approximately 4 to 6 metres wide. It was recorded that the roads were made of brick.

Tanabe (1975) states that the canals dug during the Ayutthaya period can be categorised into three types. The first type was the city moat canal, which encircled the city. It served the city mainly for military and transportation purposes. However, it is evident that, during the dry season, the water from the city moat was mostly used for domestic water supplies, since the remains of the water tank were found at the mouth of one of the canals inside the city.

The second type of canal were short-cut canals, which aimed to improve transportation along the

Chao Phraya river, especially between Ayutthaya and the Gulf of Thailand, given the development of foreign and domestic trade from the sixteenth century onwards. According to Tanabe (1975), during the Ayutthaya period, at least 10 short-cut canals were created. It has been noted that the re-canalisation carried out to create this type of canal is most obvious from the lower part of the Chao Phraya river, where Patumthani is now located.

The third and last type was transverse canals, which were constructed across the barren coastal area to connect the administrative centre with the border areas to the East and the West. Two examples of transverse canals are the Samrong canal, which runs from the east bank of the Chao Phraya river to the Bangpakong river, and the Mahachai canal, which flows from the west bank of the Chao Phraya river to the Tha Chin river. These two canals were not dug within Ayutthaya City Island, but they demonstrate the water management system knowledge of the Ayutthaya period. Moreover, they are still in use today.

## Living with flooding: living traditions and architecture

It is generally taught in schools that the weather in Thailand comprises three seasons: winter, summer and the rainy season. These three seasons are differentiated by temperature and precipitation statistics, without taking the sociocultural aspects of human behaviour, or adaptation into account. However, according to the *Thawathossamas* (a poem written in the early Ayutthaya period) (Anonymous, 2017), it can be claimed that there were two main seasons in the kingdom: the dry season and the flood season. *Thawathossamat* means twelve months. The poem describes the monthly customs and life-cycle of people over the course of a year, focusing on the upper classes, since it mentions royal ceremonies and rituals in particular. It also demonstrates the knowledge employed by people in the past to prepare for each season. For example, the poem mentions that, in the twelfth month – corresponding to November in today's calendar – which is late monsoon season, when the flood-level is at its highest, there was a ritual to chase the water

away and to pray for forgiveness from the River God (Wongted, 2011).

The poem also provides an insight into how people in the past adapted their lives to the dry and flood seasons, through the architectural features of their houses. According to La Loubère, who came to Ayutthaya from 1687 to 1688, the houses of the people of Ayutthaya were made of timber, and the floors of the houses were raised higher than water-level, while boats were considered the standard vehicle. As is well-known, Thai timber house structures are prefabricated. Therefore, they can be detached and moved and reassembled in another place.

Other kinds of houses, called inhabited boats, can be seen from the drawings by Kaempfer. Similarly, Vingboons's map shows that the rafting houses were gathered in numbers outside the city wall to the south of the city, known today as Phom Phet. According to historical documents, this area was perhaps also the commercial area,



as well as a city port for foreigners and traders. In addition, the large amount of water from the upper area of the Chao Phraya river during flooding season was controlled and diverted to the surrounding flood plain areas. After the fall of Ayutthaya, this way of life continued during the early Rattanakosin period, starting in 1782, as can be seen from old photographs, taken at around the turn of the twentieth century (1868–1910). It disappeared when the main form of transportation changed from canals to roads in the second half of the twentieth century, while flood plain areas have become industrial estates and housing development areas.

Chumsai Na Ayutthaya (1986) also argues that, in Southeast Asia, including the central plain of Thailand, the nature of the wooden architecture on stilts demonstrates a water-based settlement, and also perhaps an agricultural society. Nowadays, this form of architecture is known as a Thai house. The floor level is higher than flooding-level, while the boat is the main form of transportation during this season, which comes after harvest time. During the dry season, people keep their boats on

the ground floor with their livestock. This living tradition has probably survived from the old days, and this architectural style can still be found in the central part of Thailand today, although it is rare.

In addition, there is another form of water-based architecture which has disappeared since the main mode of transportation has changed. From the Vingboons's map, many rafting or floating houses are seen gathering at the front port. Similarly, the old photo taken at Ta Tien in a market near to the royal palace in Bangkok shows the floating houses that were then developed into houses on stilts, after the waves caused by approaching engine boats became too severe (Wallipodom, 2000). According to historical documents, the people who lived in rafting house were merchants. Until the arrival of long-tail boats with engines and big transportation boats in the early twentieth century, the people lived in boat houses that could be moved anywhere. At present, floating settlements in Thailand are very rare, and those that remain have deteriorated to such an extent that they have become illegal under the Marine Department's legislation framework.

## Conclusion: challenges for resilience and sustainable development

Since the restoration of Chantira Kasem Palace in 1816, and the resettlement of Ayutthaya City Island during the reign of King Rama V (1868–1910), the city has developed and expanded. At present, the City Island can be described as having two characters.

The first is an archaeological complex mainly comprising the ruins of the royal palace and temples. The complex was registered as Ayutthaya Historical Park in 1976, having previously been declared a protected area by the Act of Ancient Monuments, Antiques, Objects of Art and National Museums in 1961 (amended in 1992), and, as such, was registered as a national monument in 1997. In 1991 Ayutthaya Historical Park was inscribed on the UNESCO World Heritage List. This area

falls under the administration of the Fine Arts Department within the Ministry of Culture. In 1995, the Master Plan for the Development and Conservation of the Historic City of Ayutthaya was adopted and is now being revised. The City Island has been strongly protected since then.

The second, as seen throughout the rest of the City Island, constitutes an area that has been restored after the battle between Siam and Burma in 1767. The database of the Department of Local Administration within the Ministry of Interior shows that, as of 2015, the registered population of the City Island is 53 290. Since nearly half of the City Island is World Heritage property, the economic and social character found in the City Island seems to be largely related to tourism.



Small hotels, guest houses and restaurants are seen among the contemporary residential and commercial areas, which include houses, local markets, schools, religious places and other modern services. The physical character of the city, beyond the Historical Park, is a mixture of buildings from different periods and a mixture of traditional and vernacular architectures. Most Buddhist temples have been built in a classical Thai architectural style, deriving from Ayutthaya architecture. In addition, Christian churches and Muslim mosques have also been built. The Ayutthaya Municipality is the local authority in charge of this part of the City Island, but it must also seek approval from the director-general of the Fine Arts Department (2012) for any alterations, adaptations, extensions, and facility developments that might affect the ancient monuments, pursuant to the 1961 Act, which protects the Island as a national monument, as discussed above.

Examples of proposed alterations include the installation of lighting posts along the street, and the levelling of the road running around the city, which is located on the ruins of the city wall, as proposed by Ayutthaya municipality. A further example is the flood protection system proposed by the Public Works and Urban Planning Department. Smaller development work, such as the building of shops and houses close to the Historical Park also requires permission.

The whole Chao Phraya river basin, including Ayutthaya, was affected by a catastrophic flood in 2011. The total loss was extremely high because all the industrial estates (special areas for industrial investment, covered by floods in the past) located in Ayutthaya were seriously impacted. In fact, before 2011, there were several severe floods in the area. As a result, flooding protection structures

such as higher embankments, dykes, water gates and dams were built in upstream areas, with the aim of protecting the flood plain areas from water during flooding season. Therefore, in order to face the impact of the 2011 flood, traditional water management systems were proposed because of their proven efficiency during past floods.

However, the above discussion shows that the traditional water management system of Ayutthaya needs further study from a wide range of scientific, archaeological, historical, architectural and hydrological perspectives. The adaptation and application of this knowledge to flood mitigation and other development interventions is challenging, particularly because the environment and the culture have changed and continue to change. For example, the City Island's canals have now become residential areas. Each of the industrial estates affected by the flood in 2011 have already had large-scale dykes built around them in order to protect them from the next flood. This has in fact reduced the flood plain areas, prompting questions as to where the water should go should there be another flood. Moreover, in order to understand the water management system fully, not only the city, but the whole river basin from upstream to downstream, needs to be studied. Similarly, for the traditional water management system to be adapted and applied, the whole area needs to be taken into account.

One of the biggest challenges to fully understanding the traditional water management system of Ayutthaya remains its implementation within an ever-changing environment. As Vandenberg states, "The river of yesterday is not the same as the river of today. The river of this moment is not going to be the same as the river of the next moment" (Vandenberg, 2010b).

## References

- Anonymous.** 2016. Boats of Siamese. In: *The Historical Archives Archdiocese of Bangkok*, 11 October 2016 [online]. Bangkok. [Cited 21 November 2017]. <http://catholichaab.com/main/index.php/research-and-study/research-and-study/1412-2016-10-11-04-08-12>
- Anonymous.** 2017. Thawathossamas. In: *Thai literature in the early Ayutthaya period* [online]. Bangkok. [Cited 17 November 2017]. <https://sites.google.com/site/wannakhadeethaigz/kholng-thwaths-mas>
- Chumsai Na Ayutthaya, S.** 1986. *Water: The Origin of Thai Culture*. Bangkok, Thaiwattanapanit Ltd.
- Engelhardt, R.** 1995. Two Thousand Years of Engineering Genius on the Angkor Plain. *Expenditure*, 37(3): 18–30.
- Fine Arts Department.** 2010. *The Second Phase of Master Plan (amended in 2010) of the Historic City of Ayutthaya Conservation and Development Project* (unpublished).
- Fine Arts Department.** 2012. *Inclusion Report of Academic Seminar on the Survey, Design and Conservation Planning for the Ancient Monuments being Affected by Flood* (unpublished).
- Hutangkura, T.** 2014. A New Interpretation of the Boundary of Dvdravati Shoreline on the Lower Central Plain in Evidence Review and New Interpretation. *Damrong Journal*, 13(1): 11–44. [www.damrong-journal.su.ac.th/index.php?page=view\\_article&article\\_id=65](http://www.damrong-journal.su.ac.th/index.php?page=view_article&article_id=65)
- Phengtako, P.** 2015. The Irrigation System in Ayutthaya's Ancient Palace. In: *Ayutthaya Studies* [online]. Bangkok. [Cited 15 August 2015]. [www.ayutthayastudies.aru.ac.th/content/view/568/110](http://www.ayutthayastudies.aru.ac.th/content/view/568/110)
- Peou, H.** 2014. Sacred Water: Rediscovering the ancient hydraulic system of Angkor and traditional knowledge of water management and engineering systems. *International Journal of Intangible Heritage*, 9: 17–25.
- Piemmettawat, P.** 2015. *Siam: Through the Lens of John Thompson 1865–66 including Angkor and Coastal China*. Bangkok, River Books Press Ltd.
- Phumisak, C.** 1983. *Thai Chophraya Riverine Society before the Ayutthaya Period* (in Thai). Bangkok, Mai-ngam Publishing.
- Siriphatthanakun, H.** 2014. Disaster Risk Management for the Historic City of Ayutthaya. In *Proceeding of UNESCO Chair Programme on Cultural Heritage and Risk Management, International Training Course on Disaster Risk Management of Cultural heritage*, pp. 60–69. Kyoto: Institute of Disaster Risk Mitigation for Urban Cultural Heritage, Ritsumeikan University.
- Takaya, Y.** 1969. Topographical Analysis of the Southern Basin of the Central Plain, Thailand. *Tonan Ajia Kenkyu* (The Southeast Asian Studies) 7(3). <https://repository.kulib.kyoto-u.ac.jp/dspace/bitstream/2433/55586/1/KJ00000133939.pdf>
- Tanabe, S.** 1975. *Geography of the Canal System in the Chao Phraya River Delta; From the Ayutthaya period to the fourth reign of the Ratanakosin dynasty* [online]. Bangkok, The Siam Society. [Cited 9 June 2019]. [www.siamese-heritage.org/jsspdf/1971/JSS\\_065\\_2d\\_Tanabe\\_HistoricalGeographyOfCanalSysemInChaoPhrayaRiverDelta.pdf](http://www.siamese-heritage.org/jsspdf/1971/JSS_065_2d_Tanabe_HistoricalGeographyOfCanalSysemInChaoPhrayaRiverDelta.pdf)
- UNESCO World Heritage Centre.** 1991. *Historic City of Ayutthaya* [online]. Paris. [Cited 15 August 2015]. <http://whc.unesco.org/en/list/576>
- UNESCO World Heritage Centre,** 2015. *Historic City of Ayutthaya State of Conservation* [online]. Paris. [Cited 15 August 2015]. <http://whc.unesco.org/en/soc/3319>
- Vandenberg, T.** 2009. Mapping Judea: A Cartographic Exercise. In: *Ayutthaya Historical Research* [online]. [Cited 21 November 2017]. [www.ayutthaya-history.com/Essays\\_MappingJudea.html](http://www.ayutthaya-history.com/Essays_MappingJudea.html)
- Vandenberg, T.** 2010a. The Quest for the Holy Water: Ayutthaya's Ever-changing Waterways. In: *Ayutthaya Historical Research* [online]. [Cited 15 November 2015]. [www.ayutthaya-history.com/Essays.html](http://www.ayutthaya-history.com/Essays.html)



Vandenberg, T. 2010b. The Quest for the Holy Water: Ayutthaya's Ever-changing waterways, Sequel 1. *Ayutthaya Historical Research* [online]. [Cited 15 November 2015]. [www.ayutthaya-history.com/Essays\\_WaterwaysII.html](http://www.ayutthaya-history.com/Essays_WaterwaysII.html)

Wallipodom, S. 2000. Chao Phraya Society: Development and Change (in Thai). In *Proceeding of International Conference: the Chao Phraya Delta: Historical Development Dynamics and Challenges of Thailand's Rice Bowl* [online]. Bangkok. [Cited 21 November 2017]. [http://horizon.documentation.ird.fr/exl-doc/pleins\\_textes/divers15-09/010024645.pdf](http://horizon.documentation.ird.fr/exl-doc/pleins_textes/divers15-09/010024645.pdf)

Wongted, S. 2007. *Historical Map (Siam) Thailand*. Nonthaburi, Office of National Commission of Culture, Ministry of Culture.

Wongted, S. 2011. *Where the Royal Barges and the Royal Procession came from?* (in Thai) Bangkok, Post Publishing.

D

Reconciling Traditional Knowledge  
Systems and conventional  
management systems



◁ CHAPTER 15 ▷

**Towards a framework for analysing  
the applicability and adaptability  
of Traditional Knowledge  
Systems in heritage management:  
case studies from Nepal**

Neel Kamal Chapagain



## Abstract

It is broadly accepted that Traditional Knowledge Systems (TKS) should be integrated into modern heritage management practices, both in terms of theoretical frameworks, as well as management practices. However, this rarely happens in practice because integration of TKS into Modern Knowledge Systems (MKS) requires an objective analysis of the two systems in order to find areas of convergence and divergence. When faced with such a lack of clarity, governments and institutions tend to create policies that simply adopt MKS, as they are considered to represent the modern and latest ways of doing things. In cases where TKS are used, they are commonly adapted to fit into MKS frameworks instead. This raises the question of how TKS are to be applied in contemporary heritage management. This paper proposes a conceptual framework in order to be able to carry out an objective study of both TKS and MKS for any given heritage management issue, and find areas of overlap, but also reveal where there are gaps. It is suggested that such a framework will provide a means to articulate where TKS and MKS converge, thus uncovering directly applicable and congruent concepts, as well as exposing other areas where there may be different proportions of convergence or divergence, thus indicating where a balance needs to be struck between TKS and MKS to arrive at a desirable adaptation. The paper discusses the *guthi* system in the Kathmandu Valley and local building knowledge in the Upper Mustang region, to elaborate how the proposed framework may facilitate the framing of policy and practice.



## Introduction

The passing of the Ancient Monuments Preservation Act in 1956 (Government of Nepal, 1956), along with the establishment of the Department of Archaeology (Department of Archaeology, 2019) in 1953, marked the beginning of institutionalised heritage conservation and protection practices in modern Nepal. The management of many of these heritage practices would previously have been carried out under a traditional system called *guthi*. Subsequently, after the creation of the Department of Archaeology (its jurisdiction defined by the Ancient Monuments Preservation Act), a Guthi Corporation was set up under the Guthi Management Act of 1964 (Government of Nepal, 1964). Although introduced with good intentions, these new systems were established to replace the majority of the traditional heritage management systems. For example, the traditional *guthi* system in the Kathmandu Valley was sidelined in this process, with serious consequences for the traditional management systems associated with the majority of the public monuments and buildings of the Kathmandu Valley. In the chronological sequence of development that followed, the modern education system emerged, changing the way architecture and engineering were taught; this modern system again ignored the traditional means of understanding the built environment and how it should be managed. Traditional discourse and skills were overshadowed by the introduction of the modern education system and the chain of transmission of knowledge that had been passed down from generation to

generation was broken. Moreover, ignorance of traditional building techniques, artisanship and crafts in the modern educational curriculum in relation to engineering and architecture means that it is held that knowledge is only that which is quantifiable and verifiable using scientific formula and readily available charts and indexes. For example, texts and oral knowledge relating to the traditional timber construction systems of Kathmandu's monuments are currently being ignored in the wake of imported modern knowledge. This is a pertinent question in the post-earthquake recovery and rebuilding process, where many architects and engineers involved in heritage conservation tend to share the opinion that traditional structures need to be strengthened using cement, steel, or similar modern materials, instead of following the philosophy of traditional construction systems, and the management framework that would be required to maintain these structures. Similarly, there are other knowledge systems in other parts of Nepal – Upper Mustang as discussed below – that are also being ignored to pave the way for modern systems. These are just a few examples, demonstrating the current disregard of rich knowledge systems and indigenous management systems and struggle to maintain and restore the heritage of Nepal. Drawing upon such cases, this paper will suggest a framework for strategic decision-making analysis with regard to the applicability and adaptability of both Traditional Knowledge Systems (TKS) and Modern Knowledge Systems (MKS).

## Understanding knowledge as an ecosystem

Knowledge systems are more than simply knowledge. A knowledge system is a process in which multiple stakeholders participate to formulate knowledge: to examine, apply, validate, and, in some cases, ensure that the knowledge is created and instilled. If such systems exist with an Indigenous community, or if a community has been following a certain type

of knowledge system for a long time, these may be called Traditional Knowledge Systems (TKS) or Indigenous Knowledge Systems (IKS). In most cases, a TKS or IKS may have existed only through the oral transmission of ideas and practices, as opposed to the written, or other forms, of recorded communication that are more familiar to us today.



Specific knowledge is just a product of a particular knowledge system – which is a process. TKS and MKS are not necessarily always different from each other, particularly if a society has continued to employ its TKS in contemporary times. This paper focuses on situations where TKS have fallen into disuse for any reason and are seen as a contradiction to MKS. Therefore, in this paper I will compare and contrast TKS and MKS to discuss the applicability and adaptability of both TKS and MKS within a heritage management context.

Ideally, TKS would be holistic in nature, consisting of multiple knowledge systems – similar to the modern disciplines with which we are familiar today. Such multiple knowledge systems form parts of an ecosystem, which I would call the ecosystem of knowledge systems. It is important to understand and use all specific knowledge systems, keeping in mind that different knowledge systems may compliment each other within the ecosystem. Where knowledge systems tend to operate in isolation, their collective strength and potential may be lost, although this does not have to be the case. For example, even if we look at modern scientific knowledge systems, we see that they also support and integrate each other, i.e. natural sciences enhance the understanding of astronomy and health sciences, and so on.

TKS, thanks to their collaborative and participatory evolutionary processes, tend to be adaptive in nature, hence generation upon generation utilise TKS to suit the changing contexts. The nature and pace of adaptation may be slow but steady. Today, however, when we discuss adaptability, we may be referring to change of a different nature and faster pace (to achieve adaptation). This is where the question of applicability and adaptability arises – not just with regard to TKS *per se* but also to their products. The foundation of heritage creation, as provided by TKS, must be understood, and it is vital that this is integrated in the framework and processes of heritage management. In doing so, it is also important to analyse the contemporary sociopolitical and economic contexts within which TKS and MKS operate. This is where adaptability comes into play, as, often, through adaptability, we may be exploring the feasibility of TKS and MKS working together. This implies that the questions

of adaptability and applicability also depend on the stakeholders involved in the TKS and MKS, and how they relate to each other. Modes of adaptation may depend on specific groups of stakeholders within the context of a specific time and space. Different groups of stakeholders may also have their own preferences for either TKS or MKS, and their preferences may also shift, depending on the particular case. For example, if a heritage structure within a community is restored, for a contemporary purpose, as a collaborative project between both global and local stakeholders, it may so happen that local stakeholders might wish to modernise, as they may aspire to be comparable to other globally-promoted sites. The vision of global experts, however, may be to romanticise the local system, and seek to create what is considered authentic. Here, adaptability depends on the negotiation between the two interest groups – both are aspiring to adopt the other's knowledge system. However, in some other cases, the basis for negotiation may be the opposite, with each group trying instead to reinforce their own knowledge systems.

It is crucial to understand these dynamics prior to applying, or attempting to integrate, TKS within any heritage management framework. While TKS evolve over time, the pace of their evolution may be vastly different in each case. While seeking ways to facilitate such evolution, the process of adaptation should not lose the core essence of the TKS. This can happen only through a logical interaction and collaboration between specialists (who could be outsiders) and the bearers of TKS. This interaction and collaboration is for the most part, only possible up to the extent that the respective knowledge systems of those negotiating overlap or intersect. However, if, fundamentally, the knowledge systems involved do not inter-relate, then collaboration may only occur if one party disregards their own knowledge systems. What, then, is the scope, and what are the possible strategies for the applicability and adaptability of these knowledge systems within heritage management? To clarify the dynamics of knowledge systems and address the where and the how of applicability and adaptability, I will briefly discuss some cases observed in Nepal. In reference to these cases, I will begin the process of developing a conceptual framework.

## Case I: *guthi* Traditional Knowledge System in the Kathmandu Valley

As mentioned earlier, *guthi* systems represent a key Traditional Knowledge System for heritage management in the Kathmandu Valley. *Guthi* is a significant term for many Newar communities in the Kathmandu Valley, as it represents their community ties, and their rights and responsibilities – both individually and collectively – as it constitutes a peer group which shares, cares and celebrates common feasts and festivals; a life-long support system; a common resource that sustains various community initiatives economically; and a binding mechanism for both the tangible and intangible heritage of Newars. A member of a *guthi* is called a *guthiyar*, and, for a *guthiyar*, the *guthi* may feature as a priority in their everyday life. For example, in our college days, many of my fellow Newar colleagues (who would be *guthiyar* in at least one *guthi*) would drop other activities, to ensure that they did not miss *guthi* functions or meetings. *Guthiyars* are required to participate in decision-making meetings, annual festivals, rituals, such as those associated with a death in the family of a fellow *guthiyar*, or in specific tasks, such as assisting with the cleaning of the collective shrine. Therefore, *guthi* has multiple meanings: it is a community institution, a social group, a social responsibility, a cooperative arrangement, and so on. For the most part, *guthis* have a defined membership base, as well as clear expectations from their *guthiyars* in terms of the responsibilities they must undertake.

*Guthis* exist at various levels, from family *guthis* to small community *guthis*, and also state-established *guthis* (in history, the state would have been represented by royalty or by noble families). Prior to 1950, there were some state-driven accountability systems, where *guthis* were required to pay taxes and report their resources to a specially-designated tax-collecting office. It is important to note that there were many collecting offices, and not one central office. However, generally speaking there was no direct control by the government over the *guthis*. After the 1950s,

there was an attempt to incorporate *guthi* resources into the state system, mostly for revenue control. However, in 1964, the Guthi Sansthan Act was passed to ensure that neither *guthis*, nor their resources could be counted as revenue by the state; the Act stated, instead, that they were to be treated as a separate trust. For the same purpose, a Guthi Corporation ([Guthi Sansthan, 2019](#)) was created (which is still operational today), to act as an umbrella organisation for all public *guthis*. This transition heralded the centralising of decision-making, property management and responsibilities under this new institution: the Guthi Corporation. In my view, although this centralisation was carried out with good intentions, it created a disconnect with the community, which, otherwise, was the backbone of the *guthis*.

Similarly, The Ancient Monuments Preservation Act 1956 and the authority of the Department of Archaeology also restricted many *guthi* responsibilities. For example, temples or any other public building, when built, were actually a product of a *guthi*, while now they have been recognised as heritage. Sometimes, a *guthi* would have built such structures (which were later to become heritage structures), and sometimes the structure would have been built first, and a *guthi* would have been set up to maintain and manage it. A *guthi* would not only have had economic resources, but it would also have been able to ensure human resources for various activities. Therefore, different knowledge systems were integrated into this communal system. These were largely broken when the notion of heritage in relation to monuments and preservation was institutionalised and brought under the control of the newly-formed Department of Archaeology. Again, this is where an opportunity was missed to uphold and strengthen the traditional system: its core ideas and operational philosophy could have been incorporated into the written and legal institutional systems that were created when the modern nation state came into being.



Apart from the system which was both knowledge producer and heritage manager, as with the *guthi*, there were another set of knowledge systems that were more technical in nature. One example can be found in the case of traditional water spouts – called *hitis* in Newari, and *dhungedhara* in Nepali. The *hitis* were a utilitarian public service, supplying water to communities, but there were several layers to the system. The main *hitis* were fed by a system of water canals called royal canals or *rajculos*. These canals brought this important resource from springs or lakes, or wherever water was available. In recognition of the significance of this

resource, resource locations, and the water routes used – i.e. the *rajculo* system – became not merely a technical matter, but also the focus of rituals and processions, which were designed to remind people of the importance of the resource and the resource locations and routes, to prevent pollution and over-depletion. People would have been reminded and guided to perform annual maintenance rituals, often as a result of *guthi* supervision. Indeed, a technical knowledge system integrates various social and cultural systems, and these knowledge systems become an important management framework by which to manage communal heritage resources.

## Case 2: traditional building systems and traditional building knowledge systems in Upper Mustang, Nepal

Through my research (Chapagain, 2000, 2005, 2008, 2011) into the vernacular architecture and monumental architecture of the Upper Mustang region of Nepal, which is a part of the larger Tibetan cultural region, I learned of various knowledge systems embedded in the local building system. Making use of the high altitude and arid landscape, and drawing upon the locally-available resources, including diverse types of soil, they evolved a unique earth-based building construction system, where different kinds of earth obtained from different parts of the landscape could be utilised very effectively. In Mustang, particularly in Lomanthang and the surrounding areas, different names are given to different types of soils. These names refer to soil locations, or soil properties, and each has a different construction purpose. For example, floor construction would have used a system called *arka* construction, utilising a particular pebble combined with sand to produce strong flooring; roofing would have utilised a salty clay (known locally as *Chharang kisa* in Lomanthang, as it comes from the Chharang riverside). Similarly, a specific ratio mix of different clays is required to produce a smooth wall-finishing, which is comparable to cement plaster in modern construction. However, heritage

professionals and local communities, stuck in their own expertise, have tended to see only the limitations of this TKS and it is largely disregarded today. Professionals from a variety of disciplines, such as geology, forestry, water management, architecture and agriculture have attempted to explore this TKS, and have even undertaken a few initiatives, but, due to a lack of understanding of the very nature of the knowledge system, each individual area of knowledge remains within the limits of its particular discipline. As a result, when development activities take place, the only knowledge system that is available to guide the process is MKS. MKS means that construction cannot be conceived without cement and concrete; the healthcare system must provide something other than the service of a traditional *amchi* (a traditional Tibetan doctor); and education must be provided using standard textbooks, and a nationwide framework that is adopted throughout Nepal: the unique needs and context of the region of Upper Mustang are not taken into account. This has been disastrous for the region: expensive imported cement is increasingly used, with negative consequences for ecology, climatic conditions and environmental performance. This is a common phenomenon across the Tibetan region,



including in Mustang in Nepal, Ladakh in India, and in Tibet itself.

Similarly, there are certain types of grass and shrubs that grow in the highlands of the Tibetan Plateau, which are used in Upper Mustang, as an architectural component and for decoration purposes in vernacular houses. The use of such natural resources in the knowledge systems related to building construction ought not to be seen in isolation from other knowledge systems. For example, traditional medicinal practice has evolved to such an extent that an *amchi* normally has an in-depth knowledge of the plants and plant-products available in the area. In fact, *amchi* practice has proven itself to be comprehensive, well-documented ethnographically, and has been promoted at an international level. This illustrates the inter-relationship between different knowledge systems that exists within the same context, which, I would argue is important for the ecosystem of the knowledge systems.

The religious practices and philosophies are the basis of the ecosystem of knowledge systems

in Upper Mustang. From building construction to medicinal practice, the influence of monks and their practices is evident. Spiritual and psychological input must also be taken into account, especially by those working in positions of management. I would like to ask why it is not possible to analyse the rich resources of the knowledge systems that we have, and integrate them into an appropriate practice? I believe that there is a tendency, either subjectively to praise everything that is traditional, or to take a limited approach which adopts only Modern Knowledge Systems. It is my view that a framework is needed to enable an objective analysis of the pros and cons of Traditional and Modern Knowledge Systems. This analysis will then help towards developing an approach that would facilitate the evolution of management systems, which may require a different pace from that currently employed in contemporary transformation projects, without resorting to freezing knowledge and practices, or replacing TKS with MKS. The rest of this paper will focus on working towards such a framework.

## Towards a conceptual framework for the applicability and adaptability of Traditional Knowledge Systems and Modern Knowledge Systems

This framework builds upon the proposition that three major types of knowledge systems should be considered when approaching heritage management:

- A core knowledge system, dealing directly with the creation and maintenance of a particular heritage;
- Peripheral knowledge systems (in relation to this particular example), that are part of the larger ecosystem of knowledge systems in the place or community;
- A modern professional knowledge system, incorporating a core and one or more peripheral knowledge systems.

The framework suggested in Figure 1 is a schematic representation of how overlapping the TKS and

MKS (including both the core and peripheral) allows us to identify which of the attributes are easy to apply the way they are, and which ones need to be adapted. In order to do this, I suggest a few steps to be followed, as illustrated in Figure 2. These include:

- Preparatory step – articulating and comparing the relevant attributes from both TKS and MKS, and summarizing them in some measurable or comparable format (such as Table 1);
- Step 1 – creating the overlays of TKS and MKS (core and peripheral), identifying the attributes applicable for heritage management process;
- Step 2 – examining the overlays to identify the concurrence and divergence between the TKS and MKS;

- Step 3 – concluding the implications, drawing upon the framework suggested in Figure 1.

Now, I will attempt to illustrate this using the *guthi* as a case of TKS in the context of modern heritage policies and institutions in post-1950s Nepal.

It was in this period that an entirely new set of processes was created for heritage management (drawing upon a new system of knowledge and practices), which largely ignored the TKS that already existed. I would argue that the dismissal of the TKS was due to a lack of objective analysis of both TKS and MKS and the areas in which they converge. While the western model of education and institutional practices have been promoted in the name of development, indigenous knowledge

and traditional practices have been overlooked. In the heritage sector in particular, the crux of the problem since the 1950s has been that the modern legislative system in Nepal has been established in accordance with an international framework, introduced through

World Heritage mechanisms, modern educational institutions and professional bodies. An objective analytical study of the key concepts and objectives of both TKS and MKS in relation to heritage management, reveals that they have similar goals: there are significant overlaps between *guthi* and the modern frameworks for heritage management. However, there are also differences in terms of authority, the decision-making process and the perceived nature and pace of work undertaken. Once areas of convergence and divergence become apparent, it is possible to analyse where negotiation might take place.

By studying the diagram above, I will examine how *guthi* concepts are relevant to modern nation-state building processes. As mentioned above, *guthi* as an ecosystem of Traditional Knowledge Systems, containing a core knowledge system and some peripheral knowledge systems in the context of particular tasks. For example, if the task were to build a community temple, the core knowledge system would focus on the employment of artisans, resources and the framework under which the building and maintenance would be ensured. *Guthis* would make use of religious and cultural



Figure 1

A suggested framework for assessing the applicability and adaptability of TKS and MKS.

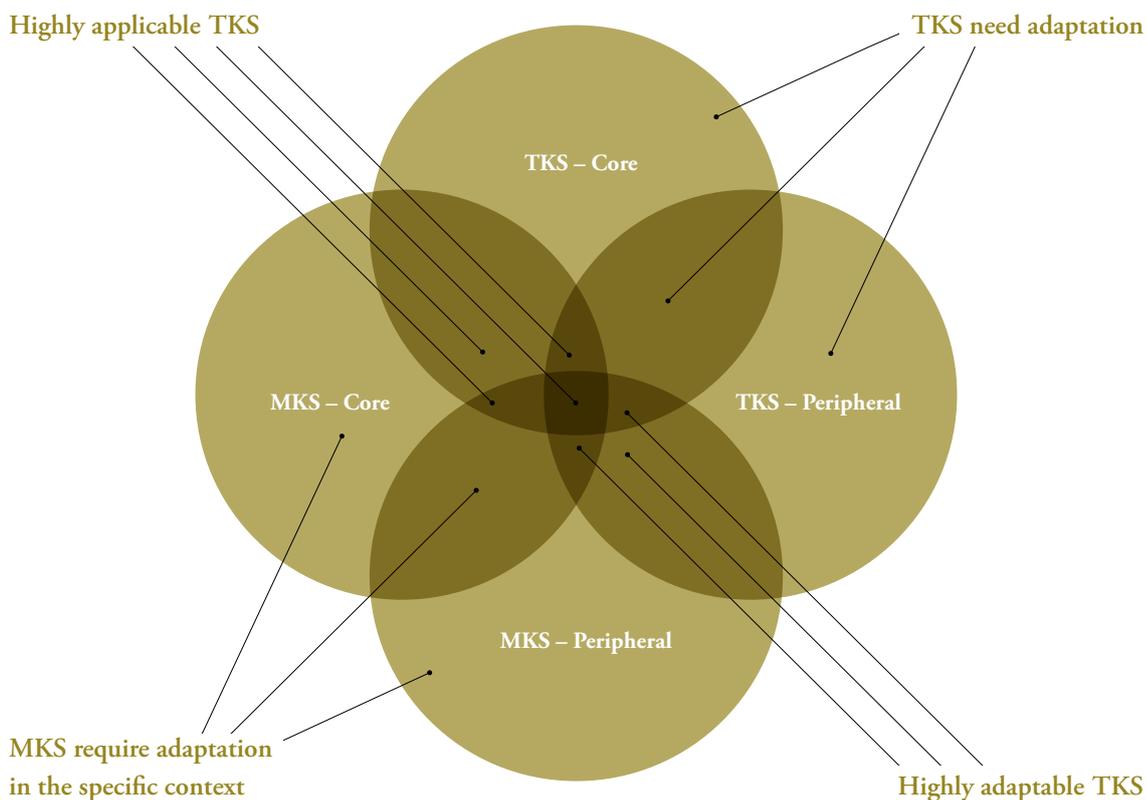




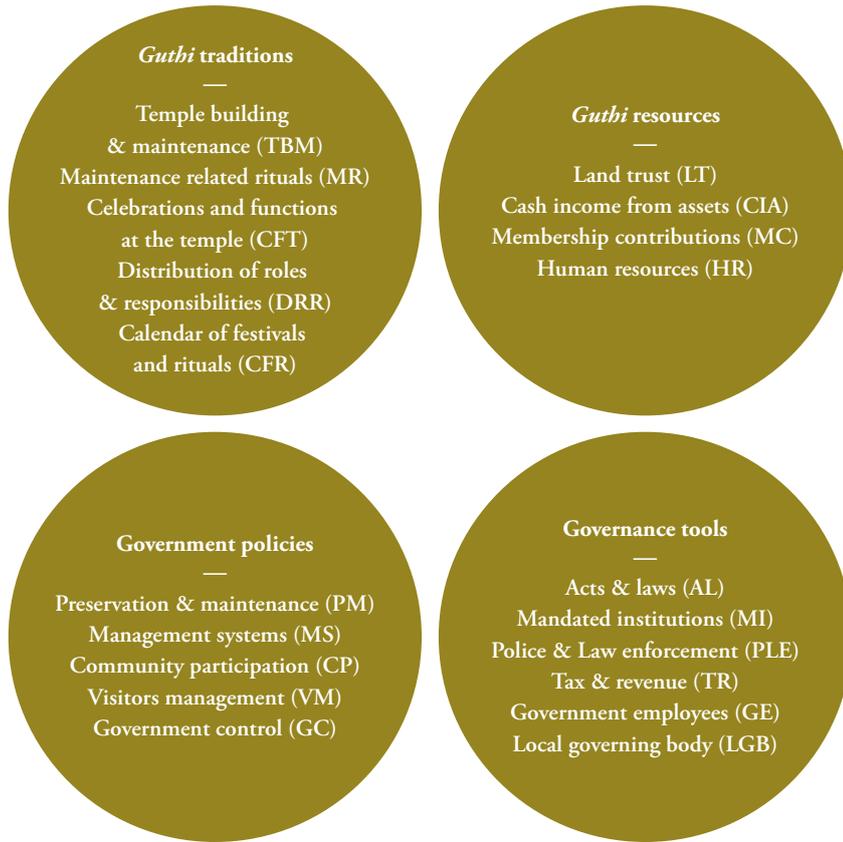
 Table 1

A brief thematic comparison of the *guthi* system (TKS) and the modern governance system (MKS) in Nepal.

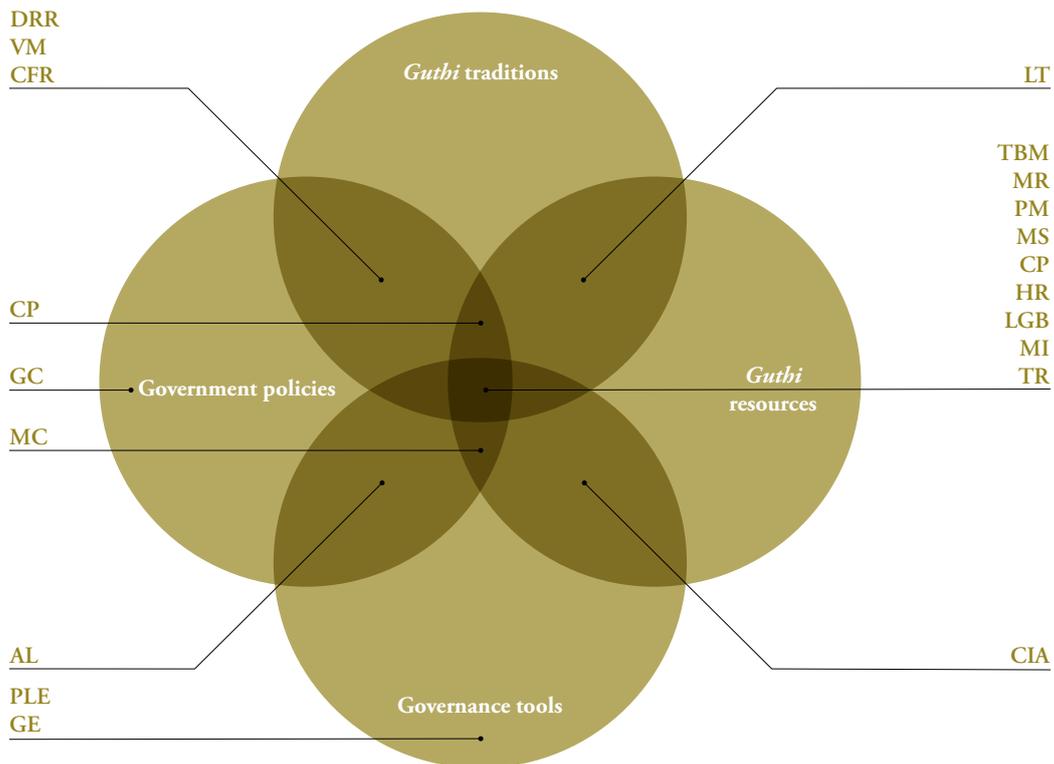
Aspect	<i>Guthi</i> System	Government System	Remarks
What	<i>Guthi</i>	Policies & Institutions	
For whom	Specific community or family	Country & regions	
By whom	A group or individual from the community or the family	Government or a designated unit within the government system	
Why	To establish and maintain what we recognise today as heritage	To protect heritage as defined by law	While a <i>guthi</i> is created for a specific structure (that qualifies today as heritage) under the care of a small/restricted community, a government agency has a larger set of issues to take care for a larger group of people
How	By the <i>guthiyars</i> , through a deed or common understanding	By government employees, as per the legal mandate	
To achieve what	Creation, operation and maintenance of cultural assets (both tangible/intangible or natural/cultural)	Preservation/conservation/ maintenance of heritage assets (along with other infrastructures, social services, and policing activities)	
By when	Ongoing basis (annual calendar)	Ongoing, but mostly within the framework of a fiscal year; also rather occasional in cases of restoration and conservation activities (in the case of heritage)	
Resources	Land and other revenue sources designated as <i>guthi</i> – resources are allocated as such at the time of <i>guthi</i> formation	Tax and government revenue (as per allocated budget)	
Outcomes	Creation, operation and maintenance of cultural assets, as part of the regular <i>guthi</i> operation	Preservation and conservation of heritage assets – as per the requirement of implementation of a specific mandate	
Monitoring & control	<i>Guthiyars</i>	Government institutions	
Role of local communities	Active role, mostly owners and beneficiaries of the heritage or construction work	Participants and beneficiaries within the legal framework	



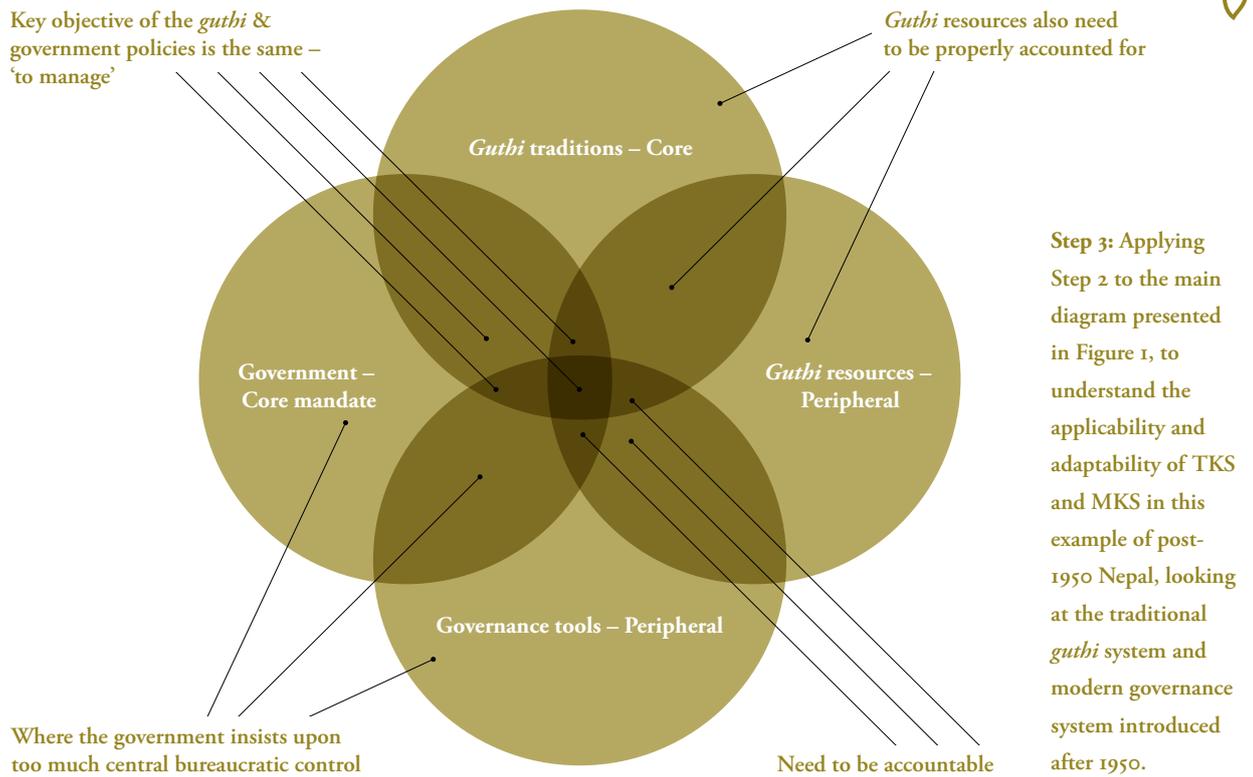
**Figure 2**  
Assessment or analysis framework for the comparison of *guthis* and the modern governance system: Steps 1,2, and 3.



**Step 1:** Listing some of the key attributes of the *guthi* (TKS) and modern governance (MKS) in Nepal post-1950.



**Step 2:** Analysing attributes in terms of their overlap, in order to identify common objectives.



functions in implementing these core tasks and would muster the workers needed from amongst members of the *guthi* community; the system of employing members would ensure that both the community and individuals within it were proactively engaged in all of these processes.

Neelam Pradhananga (2011) provides an insight into the functioning of *guthis*, by referring to a small *guthi* system in the city of Bhaktapur in the Kathmandu Valley:

Management Decisions are made after discussions with all *guthiyars*. Sometimes when a decision cannot be made, the *thakali* intervenes and determines the course of action. The *guthi* members feel that the decision-making system is democratic and inclusive. Only those involved in the *guthi* – the *guthiyars* themselves or their family members – can provide feedback on the running of the *guthi*. External members cannot intervene. Caste also plays an important role in the workings of the *guthi*. Generally, the work to be undertaken is predetermined. This is further discussed at the end-of-year gathering. However, if any work has to be undertaken throughout the year, the *thakali* is

consulted. The *guthi* does not undertake restoration work itself. The *guthi* organises for the restoration to be undertaken by those who have specialised knowledge and are involved in the trade. General maintenance of temples (removing grass, cleaning, etc.) is undertaken on *Siti Nakha*. To ensure that members attend meetings, a fine system is in place. This fine is generally a decision taken by the *thakali*. ...Any conflicts are generally resolved through open discussions between the *guthiyars*. However, in the case that the problem cannot be resolved, the *thakali* has the power to make the final decision. (Pradhananga, 2011, pp. 165–166)

The above demonstrates the existence of a common objective and the capacity for adaptability in the pursuit of this objective, including community participation, localised decision-making and the mobilisation of local resources in the context of heritage practices. Table 1 compares the (traditional) *guthi* system with a modern governance system in terms of a series of aspects. It helps to identify the areas where overlaps exist, and thus where negotiation is possible in relation to the effective implementation of both TKS and MKS. Figure 2 presents a summary



of these overlaps and gaps and suggests a sequence of steps to examine the adaptability of TKS and MKS.

Using the example of the *guthi* system, maintenance could largely be managed under the system of rituals and festivals: these form part of the peripheral knowledge systems, incorporating beliefs and traditions. Oversight of the maintenance system, primarily concerned with the preservation of the fabric of the monument, could be managed by government employees in relevant departments. Here, the TKS (*guthi* system) could have provided a more rounded approach in the specific context. Adopting a similar logical analysis, we see that a set of attributes emerges in both TKS and MKS, which may share the same objectives: these are the overlaps in the core attributes of both TKS and MKS. In implementing these core objectives, there are peripheral attributes which have some overlapping areas, but also some areas that do not overlap. The above framework implies that the overlapping attributes are those that are directly applicable, while the attributes that do not overlap need adaptation.

Between these two types of attributes, other attributes may emerge as applicable after negotiations, not applicable, or adaptable depending on the nature of individual attributes. Such analysis provides space for both TKS and MKS, rather than simply adopting the generic notion that only one or other of these knowledge systems is valid.

In the case above (Figure 2), it appears that most of the attributes of both TKS and MKS overlap, with the exception of government control in MKS. This implies that government control (instead of local control) is the primary reason for the disconnect between a *guthi* and the modern national governance system in Nepal. After most of the traditional *guthis* were brought under government control, almost all aspects of heritage management now depend on MKS, with limited acknowledgement of TKS. Although the above analysis has not been carried out extensively, it is suggestive of how the model can be employed. However, this brief analysis captures how heritage professionals have missed the role of TKS in contemporary heritage management system in Nepal.

## Conclusion

The *guthi* system in the Kathmandu Valley provides a very good illustration of the applicability of TKS within contemporary heritage management systems, although it is ironic that the *guthi* system has unfortunately largely been ignored (if not partially dismantled) during the creation of heritage management policies and institutions in the modern nation-state of Nepal. There is potential to achieve a context-based and community-driven heritage management approach, where it is possible for diverse TKS to be recognised within given contexts, and for those to be incorporated into the management process. TKS would thus have the scope to act as a guide in the understanding of heritage values, their origins and their indigenous frameworks of management. It would then also

be possible to explore the potential overlaps and discrepancies between TKS and modern heritage management principles and approaches, which are readily accessible as a result of institutional interests and the education of the professionals working in the field. Incorporating TKS into the heritage management process would also help to resolve issues in the case of living heritage sites, including those of value assessment, finding culturally and ecologically sensitive approaches to management, ensuring community participation, and, more importantly, achieving sustainability within heritage management. This paper has proposed a potential framework that explores the potential applicability and adaptability of both TKS and MKS to and within any given context.



## References

- Chapagain, N.K. 2000.** *Architectural Regionalism: The Case of Lo (Upper Mustang)*. Institute of Engineering, Department of Architecture and Urban Planning, Tribhuvan University. (B.Arch. thesis)
- Chapagain, N.K. 2005.** *Earthen Architecture of Transhimalyan Region of Nepal: Preservation and Appropriate Practice*. University of Hawaii. (Architecture doctorate dissertation)
- Chapagain, N.K. 2008.** Heritage Conservation in Nepal: Policies, Stakeholders and Challenges. *Himalayan Journal of Development and Democracy*, 3(1). <https://ejournals.unm.edu/index.php/nsc/article/view/667>
- Chapagain, N.K. 2011.** *Rethinking cultural heritage conservation at historic settlements: the case of Lomanthang, Nepal*. University of Wisconsin-Milwaukee. (PhD dissertation)
- Department of Archaeology. 2019.** Department of Archaeology [online]. Kathmandu. [Cited 11 November 2015 and 9 June 2019]. <http://doa.gov.np>
- Government of Nepal. 1956.** Ancient Monuments Preservation Act, 2013 (1956). In Nepal Law Commission [online]. Kathmandu. [Cited 9 June 2019]. [www.lawcommission.gov.np/en/archives/16886](http://www.lawcommission.gov.np/en/archives/16886)
- Government of Nepal. 1964.** *Guthi Sansthan Act* [online]. Kathmandu. [Cited 9 June 2019]. [https://countrysafeguardsystems.net/sites/default/files/Guthi%20Act\\_o.pdf](https://countrysafeguardsystems.net/sites/default/files/Guthi%20Act_o.pdf)
- Guthi Sansthan, 2019.** Guthi Corporation of Nepal [online]. Kathmandu. [Cited 11 November 2015 and 9 June 2019]. [www.guthisansthan.org.np](http://www.guthisansthan.org.np)
- Pradhananga, N. 2011.** *Integrating indigenous and modern heritage conservation practice: A case study of the guthis in Nepal*. University of Newcastle, Australia. (Ph.D. Thesis)



*Dechenphu Lhakhang by Frédéric Gloor (CC BY-NC-SA)/Flickr.*

◁ CHAPTER 16 ▷

# The Traditional Knowledge Systems of Bhutan

Pema



### Abstract

Bhutan is known around the world for its rich, unique and beautiful cultural heritage. Its tangible cultural heritage comprises a myriad of heritage buildings and sites of great historic, religious and cultural significance to the Bhutanese people. The tangible aspects of its cultural heritage are supplemented by intangible qualities which have been handed down through the generations. In the pursuit of the preservation and promotion of cultural heritage, the Traditional Knowledge System has played, and continues to play, a vital role. This paper outlines the framework of heritage conservation in Bhutan, through the presentation of the current heritage opportunities and threats, and then focuses on the Bhutanese perception of heritage and Bhutan's Traditional Management System. Finally, the adaptability of the Traditional Management System to modern conservation is considered.



## Introduction: opportunities and threats for heritage

Bhutan's historical sites and monuments date back to the seventh century when Choegyal Songtshen Gampo (the Dharma King) built Kyichu and Jampel Lhakhang. Traditional Bhutanese architecture is broadly classified into four categories:

- *dzong* are the central administrative facilities found in every region that were originally built in strategic locations such as forts. They can be described as a place where one is protected, and the mind may flourish;
- *lhakhang* is a Buddhist temple or monastery which houses the relics (*nangtens*) and an edifice of the Buddha or Bodhisattvas for worship;
- chorten are pagodas built as an expression of Tibetan Buddhist beliefs;
- a Bhutanese traditional house is made of earth and stone.

As far back as 747 Guru Rinpoche visited the country and blessed many sites, which are still revered as pilgrim sites in Bhutanese tradition. While most of the monuments date back to the seventeenth and eighteenth centuries, after the period of Zhabdrung Ngawang Namgyal,<sup>1</sup> there are also many monuments which still have associations with famous historical people and events of the seventh and eighth centuries.

With a combined total of thousands of *lhakhangs* and *dzongs* and more than ten thousand *chortens*, Bhutan has a very rich architectural heritage (DCHS, 2008, p. 5). These monuments are veritable treasure houses of cultural, artistic and historic and associated values, and contain innumerable wall paintings, sculptures and other artefacts.

Of even greater significance in the context of conservation is that these cultural properties

still play an intrinsic part in people's everyday lives. For instance, the *dzongs* of Bhutan have played, and still play, an important role in society. They have housed both religious and administrative bodies from the seventeenth century onwards, exemplifying living culture. These heritage buildings in Bhutan are known for being living heritage and they have served as a vehicle and an important link with the age-old culture and traditions that remain integral to Bhutanese national identity.

Until recently, the country's culture and traditions have been sustained in very traditional ways, away from outside influences, and protected by the country's natural geographical boundaries of mountain peaks and dense forests (Junko and Yeshi, 2014, p. 2). Modernisation began in the early 1960s, with the construction of Bhutan's first road, followed by rapid socio-economic transition, posing a threat to the traditional ways and values of life, and which could, eventually, be responsible for the attrition of Bhutan's unique culture and living traditions. Indeed, the country's ageing and degrading heritage assets have not received enough attention or support amidst the nation's rapid socio-economic development. As a result, many Bhutanese historical monuments are now showing signs of wide-scale deterioration and are in need of critical maintenance and restoration work.

Bhutan has also faced natural disasters, which have become more frequent, and have had a severe impact. Many heritage and traditional buildings were damaged by the earthquakes that occurred on 21 September 2009 (in eastern Bhutan; magnitude 6.1) and on 18 September 2011 (near the border between India and Nepal; magnitude 6.9). According to the data provided by the National Recovery and Reconstruction Plan of Bhutan (Department of Disaster Management, 2010), over 800 cultural heritage buildings and 4 950 traditional buildings were damaged as a result of the 2009

<sup>1</sup> Zhabdrung Ngawang Namgyal (1594–1651) was the unifier of Bhutan as a nation-state. He also established the distinctive dual system of governance wherein the spiritual leader (the Jekhenpo) presides over the religious institution and the administrative leader (the Druk Desi) controls secular affairs; a policy that still exists in modified form today.



earthquake, and 6 977 traditional rural houses and 286 heritage sites were damaged as a result of the 2011 earthquake.



Figure 1a  
Punaka Dzong.

Heritage sites and traditional houses are increasingly being demolished and rebuilt, and the historic fabric and distinctive architectural style of heritage sites is thus being replaced.

There has been little focus on the research into the proper use of local and traditional materials and associated Traditional Knowledge Systems. These circumstances have provided an opportunity to look again at Bhutanese Traditional Knowledge Systems, traditional construction techniques and methods, and the numbers of craftsmen and artisans with traditional skills.

The arrival of modernisation and the ready availability of modern materials and techniques is not only causing Bhutanese traditional architecture to be replaced with modern constructions, but is also affecting Bhutan's heritage, as Bhutanese traditional knowledge, techniques and materials are being adulterated. The situation is aggravated because there is minimal understanding of the values and significance of Bhutanese traditional knowledge, techniques and materials, also leading to reduced employment of local traditional craftsmen. In the long-term, knowledge of Bhutanese traditional knowledge and skills might be lost.

The study of the preservation and promotion of indigenous construction practices is therefore crucial for the safeguarding of cultural heritage and indigenous practices. It is also important that it be understood that heritage sites contain a stored record of life and history, providing an irreplaceable source of creativity and inspiration, and a wealth of potential for significant scientific research and education.

## Perception of heritage

Heritage in Bhutan (DCHS, 2011, 2012; Department of Culture, 2016) is associated with historical people and Bhutanese land is considered sacred. Heritage buildings in the Kingdom of Bhutan, such as its huge fortresses (*dzong*), pagoda (*chorten*), temples (*lhakhang*), and monasteries, are dispersed in their thousands all across the country, dotted across the sacred hills, and nestled in between the rocks (Figure 1). The heritage sites and their associated values were identified by visions or prophecies of enlightened people, rendering



Figure 1b  
Ura Lhakhang.



the sites holy. The significance of the association of the heritage sites with enlightened figures continues to

be a focus for the community. Encouragement to work is purely an act of devotion of *khu-sung-dhu* (body, speech and mind) of the people, with the ultimate goal of attaining Buddhahood.

The Bhutanese have never perceived temples and *dzongs* as heritage to be preserved, but rather as sanctuaries to accommodate the values that have emerged over time by the society (Junko and Yeshe, 2014, p. 2). The notion that work needs to be carried out on heritage sites is based purely on spiritual ideology. Moreover, it is believed that conservation is of equal merit to original creation or craftsmanship. It is understood that every living thing will perish and everything will undergo the ageing process. For this very reason, systematic renewal of paintings and other important artefacts is part of the Bhutanese tradition. For example, should a Buddha statue suffer damage to one of its hands or to its face, Buddhists consider it unacceptable for the Buddha to remain an incomplete figure. The statue must therefore



be restored to its earlier form, preferably using traditional techniques and methods. Buddhism requires that the statue be restored so that it can fulfil its primary purpose, without sacrificing its artistic heritage (Figure 2).

This restoration approach contradicts the international conservation standards of restoration as advocated, for example, by the Venice Charter of 1964 (ICOMOS, 1965; Jokilehto, 1999). As Bhutan is the only bastion of Vajrayana Buddhism in the world, incorporation of its heritage management of culture and traditions, into traditional practices, are well-perceived locally. The key to the harmonious interaction of Buddhist culture and the environment exists in the Buddhist belief in the concept of the six realms of existence, where one can make a conscious choice to opt for ethical and harmonious living. A strong belief system allows heritage sites to be kept intact and enables their sanctity to be preserved.

It is believed that every historical site, and all areas that carry significant meaning, such as land, rivers, streams and forests are owned and protected by deities – Nye-Dha-Zhidha (the lords of the soil and the environment) – and that these play

an important role in the protection of the heritage sites. Buddhists consider that these deities must be propitiated to a certain extent. At the beginning and end of all construction, renovation and heritage-site work, a religious ceremony is carried out for harmony and a better way of life. In cases where land is occupied for construction work, Buddhists respect *zakhar* (an auspicious day and time of the day), as per Buddhist cosmology and astrology, to request and receive the land from the deity who owns the land. Following which, a series of rituals, such as *sang* (a purification offering), *sur* (aromatic offering) and *serkem* (a libation offering) are performed to foster mutual understanding and relationships. Through such practices, people are instilled with a sense of responsibility and an understanding of the importance of such responsibility for the peaceful coexistence of all living beings. These cultural attitudes and practices have played a significant role in the protection and conservation of heritage sites, and it is vital that such traditions are maintained.

 **Figure 1c**  
Buli Chorten.



**Figure 2a**  
Buddha and consort  
statue: deteriorated.

Restoration or reconstruction is accepted in the Buddhist context. Reconstruction work to repair an edifice is not incongruent with the Buddhist concept of impermanence and the elimination of desires and attachment. This is clearly demonstrated through the construction of sand mandala, which are painfully constructed, but ultimately destroyed, providing an insight into the teaching of impermanence and attachment (see Figure 3). Indeed, the concept of impermanence is a significant trigger for the renewal of heritage sites. Moreover, in the past few decades, it has been observed that the number of buildings that have been renovated, the frequency of renovation, and the degree of structural alterations have all increased dramatically. Reconstruction is also seen as an opportunity to upgrade a building's

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**Figure 2b**  
The statue under  
conservation.



architectural design to the highest standard possible. In addition, the application of majestic designs and embellishments during renovation works continues to be appreciated throughout the country. This has often given rise to conflict between conservation practitioners and communities.

The middle path of Buddhist philosophy provides a conservation solution in the face of this conflict. It is consistent with the theory of Gross National Happiness (GNH) established by His Majesty the Fourth King of Bhutan in 1972, which also constituted the foundation for the development of Bhutan. GNH is based on the notion that the pursuit of happiness is found in all people and is the strongest of all the desires. Included in GNH is the middle path approach by which a balance is sought between spiritual and material pursuits.

## Traditional Knowledge Systems

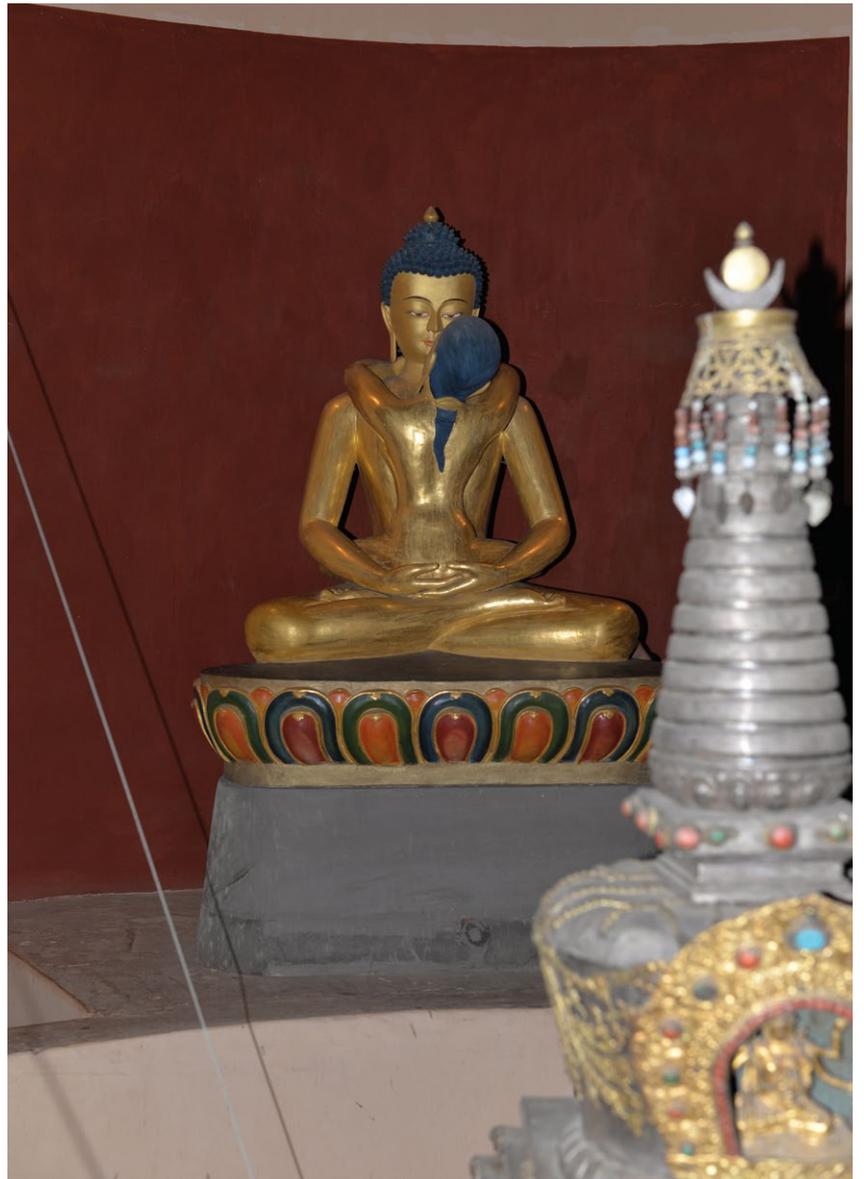
In the following section, I will outline some of the features of one of Bhutan's Traditional Knowledge System that serve the conservation of its cultural heritage. There is little written documentation about the indigenous construction practices of Bhutan. Traditional knowledge has instead been passed down from generation to generation, through oral transmission. Moreover, the cultural heritage of Bhutan represents different stages of evolution, rather than a single design phase; the traditional knowledge that has evolved alongside has survived the test of time. It can be stated that Bhutan's Traditional Knowledge Systems are intact and can be seen in practice in the everyday conservation work carried out on heritage sites,

although it is under threat in the face of modern advancement. We therefore need to look for ways to integrate Traditional Knowledge Systems into the modern management system to meet contemporary needs and also ensure a more sustainable future for Bhutan's heritage and society.

Master craftsmen (*zopoen*) play a vital role in the transmission of Traditional Knowledge Systems. The master-builder's primary role is to merge his in-depth knowledge of Buddhist iconography with the practical and spiritual objectives of his patron. The concept of the master craftsman dates back to the period of the Zhabdrung Ngawang Namgyel and the founding of Punakha Dzong in 1637. There is a revealing story about the status and authority

associated with the cultural role of Trulbi Zow Balingpa (Balip), the Zhabdrung's most senior master-builder (Dujardin, 2000, p. 165). Tibetologist Yoshiro Imaeda in his catalogue on portable shrines (*tashigomang*), discussed the idea of divine aptitude that is traditionally associated with craftsmanship. He writes:

It is believed that the great architect Trulbi-zow Baleb, incarnation of the divine craftsman Vishwakarma, invented the *tashigomang* under the guidance of the Zhabdrung Ngawang Namgyel. The legends tells that once with the benediction of the supernatural power of the Zhabdrung, Trulbi-zow Baleb visited in a dream the heavenly Palace of Guru Rinpoche. The next morning, Zhabdrung inquired of Trulbi-zow about his dream and asked whether he could give form to what he had seen in the dream. Trulbi-zow agreed and made out of a radish the prototype of the *tashigomang*. As Zhabdrung was satisfied with his skill he told him to carve it of wood. (Dujardin, 2000, pp. 165–166)



Recently, His Holiness the Je Khenpo (Bhutan's Chief Abbot) declared the fifteenth day of the third month of Bhutanese calendar as National *Zorig* Day and recognised Pel Dueki Khorlo (in Sanskrit, *Kalachakra*) as the *Zorig* Deity. *Zorig* day is being initiated to raise public awareness and to honour craftsmen and artisans with traditional skills. Its aim is also to promote and establish a culture of dignity and respect for skilled workers and to inspire young people, providing them with the opportunity to showcase their talents through demonstrations and competitions. This signifies the importance of the traditional skilled workers in the modern era of development wherein a new class of skilled workers is emerging. There are different categories of craftsmen, from the *zopoen* (master craftsmen) including four

categories of *zows* (carpenters) and *dozop lopen* (master stone masons), including three categories of *dozeps* (stone masons), and *pazops* (craftsmen for mud constructions), and *lhadrrips* (Bhutanese painters). Such categorisation of workers not only enhances collaboration but improves and contributes to knowledge transfer and the long-term sustainability of skills.

Rapid economic growth and the availability of inexpensive building materials have had a drastic effect on conservation efforts; if left unchecked, they will pose a threat to culture and tradition. Moreover, history has also shown

 **Figure 2c**  
Buddha and  
consort statue  
after completion  
of conservation.



 **Figure 3a**  
The Mandala.

that ancient culture and traditions are disappearing in the face of industrialisation and modernisation. However, Bhutan is still in the phase of conservation, wherein the past and present are linked. Traditional materials and techniques are still valued and respected under the guidance and leadership of the visionary monarchs of Bhutan.

The current perception is that traditional knowledge remains vibrant and continues to be practised in daily lives. However, there are instances where traditional techniques and practices are inadvertently being lost. For example, the materials and the techniques for creating *zhali* (traditional mosaic flooring) are disappearing. Originally, the ground floor of traditional and heritage buildings would have *zhali* flooring, as timber planks were difficult to acquire. The use of *zhali* flooring has advantages in terms of sustainability. However, the availability of timber planks nowadays has reduced the use of mosaic flooring. Although

the Traditional Knowledge System transmission through oral and hands-on practices from *zopoen* (master craftsmen) to apprentices exists, this particular Traditional Knowledge System is disappearing. There are a number of heritage buildings which still have traditional mosaic flooring, but preservation work is needed, and it is difficult to find the skilled craftsmen required, which is a cause for concern.

Bhutan's application of nail-less architecture is considered one of the most ingenious aspects of its traditional building construction work, used in particular, in timber joineries and wooden wedges. The fact that each building component can be disassembled into numbered timber parts, allowing the craftsmen to process, prefabricate and test almost all the components of a building. These processes involves everyone, from skilled to unskilled labourers (including house owners), to transport various components to their final position. The high standard of Bhutan's prefabricated timber architecture plays an important role as an expression

of Bhutanese material culture, national identity and its quest for cultural uniqueness.

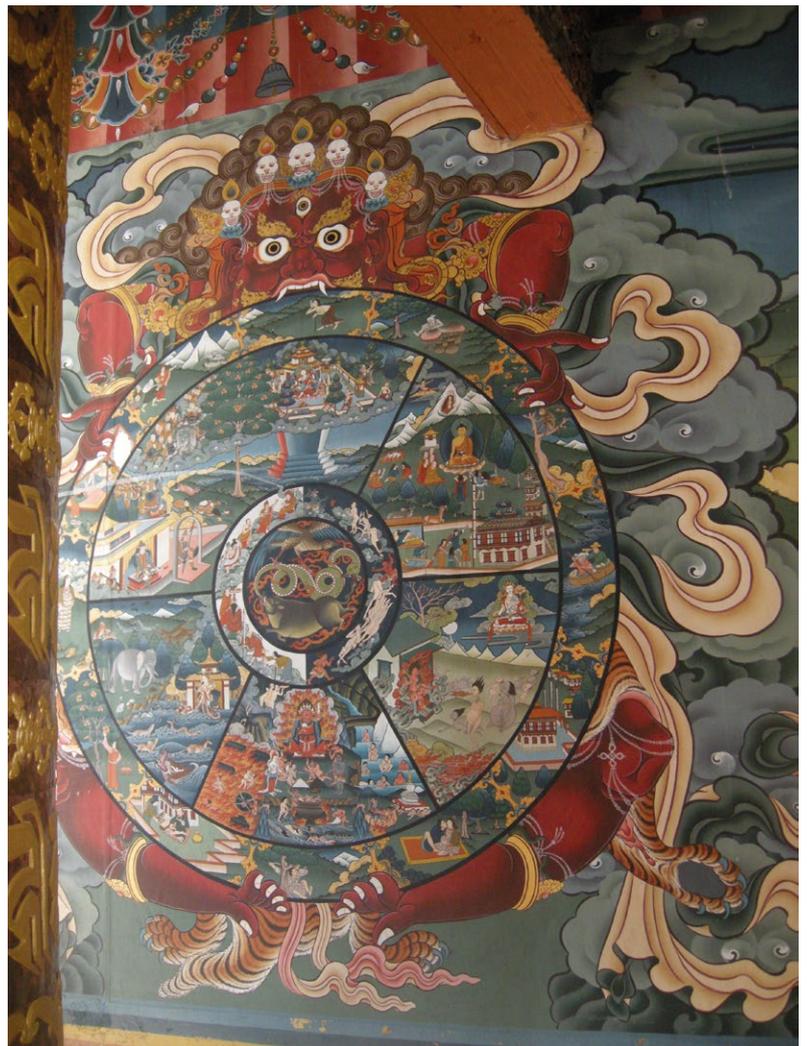
On the other hand, in order to conduct an iconographic programme, master craftsmen should take into account the proportional schemes of anthropometric scale. The use of wooden stencils and human anthropometric scales were considered

effective mechanisms to overcome the problems of language, cultural background and differing levels of craftsmanship. In practice, the *zopoen* (master-builder) provides the artisans working with him with small sticks (bamboo and/or wood), on which elementary units of measurement are marked to achieve standardisation.

### Conclusion: adaptability of Traditional Knowledge Systems to modern conservation systems

Traditional Knowledge Systems and their associated practices in the field of cultural heritage management are highly regarded and valued, but there is concern about the underlying causes of degradation. Age-old traditional practices have been passed down from generation to generation through oral communication. Such practices can still be seen in the construction of traditional buildings, revealing the rich intangible cultural heritage associated with tangible cultural heritage. However, the poor documentation of such practices is a limiting factor. Therefore, every effort is being made to study and document indigenous construction practices. If left unchecked, ignorance of such practices will cause negative

future implications. There is still more to learn from linking traditional practices with modern knowledge systems.



 **Figure 3b**  
The Bhavachakra  
(Sidpai khorlo).



## References

Department of Culture. 2016. Draft Cultural Heritage Bill of Bhutan (unpublished).

Department of Disaster Management. 2010. *National Recovery and Re-construction Plan* [online]. Thimphu. [Cited 7 September 2017]. [www.adrc.asia/documents/dm\\_information/Bhutan\\_National\\_Recovery\\_and\\_Reconstruction\\_Plan.pdf](http://www.adrc.asia/documents/dm_information/Bhutan_National_Recovery_and_Reconstruction_Plan.pdf)

Dujardin, M. 2000. From Living to Propelling Monument: the Monastery-Fortress (dzong) as Vehicle of Cultural Transfer in Contemporary Bhutan. *Journal of Bhutan Studies*, 2(2): 165–166.

DCHS (Division for Conservation of Heritage Sites), Department of Culture. 2008. *Basics guidelines for the Conservation of Heritage sites in Bhutan*, Bhutan, Division for Conservation of Heritage Sites, Department of Culture, Ministry of Home and Cultural Affairs, Royal Government of Bhutan.

DCHS (Division for Conservation of Heritage Sites), Department of Culture. 2011. *Architecture Heritage Journal 2, Bhutan*. Thimphu, Kuensel Corporation Ltd.

DCHS (Division for Conservation of Heritage Sites), Department of Culture. 2012. *Handbook on rammed earth and composite timber construction* (unpublished).

ICOMOS. 1965. International Charter for the Conservation and Restoration of Monuments and Sites (The Venice Charter 1964). [online]. Paris. [Cited 7 September 2017]. [www.icomos.org/charters/venice\\_e.pdf](http://www.icomos.org/charters/venice_e.pdf)

Jokilehto, J. 1999. *A History of Architectural Conservation*. Oxford, Butterworth-Heinemann Ltd.

Junko, M. & Yeshi, S. 2014. Evolving values, heritage practice and authenticity: In case of Buddhist temples and Dzongs of Bhutan. *Meeting on the 20th Anniversary of the Nara Document on Authenticity in Nara, Japan*. Nara, Japan.

◁ CHAPTER 17 ▷

**An insight into the dilemmas and problems facing the implementation of Traditional Knowledge Systems in conservation: the Korean experience**

Sujeong Lee



Art conservation is a pursuit requiring extensive training and special aptitudes. It places in the hands of the conservator cultural holdings which are of great value and historical significance. To be worthy of this special trust requires a high sense of moral responsibility. The conservator has obligations not only to the work of art, but to its owner or custodian, to his colleagues and his profession and to the public as a whole.

(IIC, 1968, preamble)

## Abstract

Traditional Knowledge Systems (TKS) play a key role at every stage of building construction and renewal, the consecration of religious objects, and the preservation of all material remains. Particular religious iconography forms and techniques, and established procedures for the layout of religious spaces and the placement of objects have been passed down. Such TKS provide crucial information for heritage management, both in terms of understanding and conserving heritage. However, in the modern conservation system, the significance of TKS is often ignored or misunderstood. This paper aims to reposition the role and significance of traditional knowledge as a guiding light for conservation practices. It explores the relationship between the implementation of traditional knowledge in the creation and management of Buddhist buildings and artefacts. It further examines, using the Sungnyemun Gate in the Republic of Korea, how traditional knowledge has been applied to conservation through craftsmanship, techniques and ceremonial processes after those objects have been recognised as heritage. It argues that it is essential to understand the TKS that are practised in the process of creating and maintaining Buddhist temples, but also that a selective approach should be taken to the way in which they are applied to preserve temples as heritage.



## Characterising traditional knowledge in heritage

Tangible heritage is the result of a society's intangible character. Cultural, religious, and political activities become imprinted on and are revered as material substance. Objects that have been passed down from one generation to another enrich our lives as essential entities of the present generation. Buddhist temples and objects, for example, are the visible manifestation of religious and philosophical practice. They are material evidence of the harmonious interaction between nature, philosophy, human belief and other intangible elements. Traditional knowledge is just one of many valuable elements that contribute to the understanding of such intangible elements, but it is vital to the conservation of religious heritage.

Many religious objects have been well preserved, while some have been lost or damaged. Some are produced to be burnt during ceremonial practices, and so survive only for a few days. The

values associated with such objects are displayed through ceremonial processes, whereas longer-lasting material objects demonstrate their values in both tangible and intangible ways. Traditional knowledge helps us to understand the religious significance of burnt ceremonial objects and provides technical and material information in relation to the longer-lasting objects, assisting heritage conservators and decision-makers.

Knowledge systems play a key role at every stage of building construction and renewal, the consecration of religious objects, and the preservation of all material remains. Particular religious iconography forms and techniques, and established procedures for the layout of religious spaces and the placement of objects have been passed down from generation to generation. Such TKS provide crucial information for heritage management, both in terms of understanding and conserving heritage.

## Traditional knowledge as part of the process of creation

Traditionally in Korea, master and assistant carpenters were ordained monks. Only monks could participate in the construction and repair of Buddhist temples. Similarly, those painters, sculptors and craftsmen who were responsible for sanctifying temples were also ordained monks, who were specifically trained and who worked together as a group (Kim, 1999, p. 13). Some master carpenters served as abbots in the temples where they worked and held a high social status as a result.

All images and paintings were recognised, not as artworks, but as sacred objects for use during worship. Only an object produced according to codified rules and in a certain form could be placed in a certain space inside a Buddhist temple in order to serve religious purposes. For example, in the Hall of Western Paradise, a painting of Amitabha Buddha depicts his attendants receiving dead beings to guide them to his Western Paradise.

In order for an object to be rendered sacred, strict rules apply to the process of creation.

First, formal ceremonial codes and procedures, as described in written sources, stipulate the processes to be followed. In the case of rituals and ceremonies, every stage, from the beginning to the end, has a particular religious meaning. For example, until the principal Buddha was given his eyes during the Painting Eyeballs Ceremony, which is the final step, the Buddha remains a secular object (Figure 1). Second, only certain forms or colours may be used in the representation of Buddha and only certain depictions of preaching scenes relay religious meanings. For example, whenever Buddha is depicted in art, he has 32 forms and qualities, such as a flat sole, a body of gold, and soft and smooth skin. Buddha's body must shine with golden powder to represent his sacredness. A Bodhisattva, who is destined to become a Buddha and is therefore practising to achieve Buddhahood, wears a sacred crown and a light and a decorated robe. The four guardians who each protect one of the four directions of the



earth hold a certain object so that they can defeat evil: one holds a sword, one holds a stupa, another holds a musical instrument, and the last one holds a dragon.

Monk artists and carpenters believed that their work and service for a temple is a process that accumulates favourable karma. They believed that they will be rewarded with a better life when reincarnated (Jang, 1996, p. 406). They lived together in a temple, where a strict hierarchy is observed by the religious community. Their humble life and devoted labour ascribed further religious meaning to their work.

An auspicious date in the lunar calendar was carefully selected for monk artists to begin a new painting or sculpture. For a certain period of time before the work began, a chief painter and all the assistant painters had to maintain their bodies and minds in a pure and calm state. Alongside the upkeep of their duties, such as daily meditation, celibacy, attending rituals and carrying out assigned works, monk painters had to wash their bodies more often, keep their robes tidy, and maintain silence during the period of preparation. Incense-burning and chanting took place throughout the painting work. In addition, monks chanted and threw flowers while the fabric was being prepared for painting. The temple would also appoint a monk known for his intelligence and experience,

who would study the codes and rules for creating religious objects and for the temple building itself, in order to monitor and check that the rules were followed at every stage, from the preparations to the hanging of the painting.

Storing incense in a small pocket called *hyangnang* and hanging it on the top of the scroll painting is both a traditional and a scientific technique of keeping insects away from the painting. A timber building where a scroll painting was kept had an efficient natural ventilation system, for the better maintenance of the painting. However, not all paintings were placed in an altar. Some paintings for ceremonies that happen annually such as large scroll paintings, were kept in specially manufactured boxes, stored on the floor behind the main altar. These paintings were packed and stored with natural agents that prevent moisture and insect damage. These paintings were only unrolled for a particular annual ceremony, and this moment was their only opportunity in the year to air out under natural sunlight. On ceremonial days, such as Buddha's birthday in May, the huge scroll painting called *Gwebul*, containing a depiction of the Buddha, would leave the building to host a ceremony in a courtyard. The scroll would be returned to its wooden container once the ceremony was complete.

## Misuse of traditional knowledge in heritage conservation and future prospects

The objectives of heritage conservation are different from the aims identified when constructing a building or producing an object. The latter is a process of creating values, while the former is one of preserving and managing values. The traditional knowledge that was applied at the time buildings and objects were created needs to be identified and examined in order to decide what material and techniques should be used in conservation. However, it is necessary for conservators and decision-makers to recognise that the role of

traditional knowledge differs when applied at the process of creation from its application at the conservation process and therefore, the way TKS are applied in conservation requires careful consideration.

In addition, the role and aims of conservators should not be equated to that of craftsmen. Religious objects are heritage to conservators, while they are artefacts or artworks to craftsmen. The approach of a conservator towards heritage differs from the approach of an artist towards artefacts.



Conservators recognise heritage as a culturally-important public asset, which should be handed down to the next generation. Craftsmen and artists understand Buddhist paintings and images as religious objects for expressing religious belief. Religious objects can be renewed, as needed, for religious purposes. The techniques and skills of conservators are therefore not the same as those of craftsmen.

The view that nationally-appointed craftsmen can play a major role in conservation projects as knowledgeable and experienced conservators is an example of how the role of conservators and craftsmen can be combined. Although the participation of craftsmen in conservation, in order to employ their skills and traditional knowledge, would be useful, if craftsmen alone were responsible for conservation projects the process might be managed as a creative, new construction.

The Sungnyemun Gate project (Cultural Heritage Administration of Korea, 2016), on the reconstruction of a burnt National Treasure, displays that such a decision can result in a loss of authenticity in form and design. Instead of employing a conservation architect, the Cultural Heritage Administration of

Korea appointed a master carpenter, who is one of three nationally-designated carpenters given a post in intangible cultural heritage, as a key person responsible for timber work. As the intangible heritage designation system in Korea has played an important role in safeguarding and transmitting traditional crafts skills, the Cultural Heritage Administration has a strong belief that a nationally-designated craftsman, who transmits traditional knowledge and techniques, can restore national pride. However, the intangible cultural heritage safeguarding system allows for a craftsman's creativeness in practising his traditional techniques in their work. The carpenter who was responsible for Sungnyemun Gate project reconstructed the roof section using his preferred style. The newly constructed eaves were more raised than they were originally. The master craftsman's creativeness and preferences in form and design have maintained the artistic and architectural value of the gate after conservation.

Ethical guidelines for conservators (Lee and Lee, 2012, p. 18) clearly state that conservators should

 **Figure 1**  
Ceremony during which the Buddha statue will have the eyes painted.



not disturb or erase traces of traditional materials and techniques. Further, they should understand traditional techniques and the characteristics of materials, while at the same time acknowledging that they are not craftsmen or artists, but professionals with both traditional and scientific knowledge. Their decisions for the preservation of both tangible and intangible elements of material heritage should be made based not only on the traditional knowledge that they have gathered, but also on the best available scientific resources, which would not have been applied in the process of making the heritage object. It is therefore necessary for decision-makers to understand that the role of traditional knowledge in conservation is useful but limited.

The increase in instances where scroll paintings are removed from an original space and placed instead in newly constructed temple museums, or in storage, is an example of the role of traditional knowledge being ignored and the failure to manage

an object as intended. Transferring valued objects into a space which is equipped with security measures sounds like a better choice for the sake of conservation, but many temple museums have a low maintenance budget to keep these objects in a suitable, adapted environment. Many of them were closed not long after construction and then simply neglected. Once a scroll painting is transferred from a Buddha hall to a museum, then the opportunity is lost for it to be exposed to the natural environment for preservation. Additionally, it is not possible for a temple to check the condition of a scroll painting once it is held in storage.

For conservators and decision-makers to apply traditional knowledge as part of a creative process in a rational manner, careful consideration and study are needed. In particular, a clear definition is required for what traditional knowledge is, and how it can be analysed and applied in a way which is useful for conservation.

## References

**Cultural Heritage Administration of Korea. 2016.** *A Report on Reconstruction of Sungnyemun Gate.* Daejeon, Cultural Heritage Administration of Korea.

**International Institute of Conservation for Historic and Artistic Works (IIC) – American Group. 1968.** *The Murray Pease report: Code of ethics for art conservators: Articles of association of IIC: Bylaws of the American Group.* New York, International Institute of Conservation for Historic and Artistic Works (IIC) – American Group.

**Kim, D. 1999.** *The Understanding of Architecture in Joseon Period.* Seoul, Seoul National University Press.

**Jang, S. 1996.** Goryeo Period. In *The Architectural History of Korea*, pp. 341–441. Seoul, The Architectural Institute of Korea.

**Lee S. & Lee S., eds. 2012.** *Ethical Guidelines for Conservators.* Daejeon, National Research Institute of Cultural Heritage.

◁ CHAPTER 18 ▷

**The role of Traditional Knowledge  
Systems in the management  
of Iranian heritage resources:  
past and present**

Saeedeh Hosseini



### Abstract

This paper attempts to examine and review Traditional Management Systems in Iran – those actions, customs and policies that helped Iranian communities conserve their heritage before the birth of the discipline of conservation, which, in Iran, took place in the second half of the twentieth century. The paper embraces both the pre-Islamic and Islamic periods, with a focus on *waqf*, which is a donation and investment system for the management of public buildings and infrastructure, serving religious (mostly Islamic) structures, many of which are now considered built heritage. The adaptability of traditional knowledge to modern conservation methods for built heritage can be demonstrated by taking the lessons drawn from traditional systems and applying them to the conservation of built heritage in Iran. The relationship between modern conservation practitioners, and craftsmen and artisans who still retain traditional knowledge and skills, is key. In the final section, a successful reconstruction project is presented. The project owes its success to the respect and regard it has shown to the community and the community's Traditional Knowledge Systems. This paper will detail the results of the project and could potentially be of help to other conservation professionals working on similar projects.



## Introduction

Looking at different dictionaries for a precise definition of the term “system”, I would choose that of the Business Dictionary: “A set of detailed methods, procedures and routines created to carry out a specific activity, perform a duty, or solve a problem” (Web Finance Incorporate, 2017). This definition describes traditional systems well, as they are sociocultural systems, and their activities are based on, and are for the benefit of society, rather than machines.

ICCROM’s initiative to address the topic of Traditional Knowledge Systems is an important one, since Traditional

Knowledge Systems bring together intangible heritage, built heritage and the environment, and can guarantee sustainability. They also provide an approach to carrying out repairs, maintenance and conservation.

In this paper, I will examine various Iranian Traditional Management Systems, classifying them into different categories and scales, from simple to advanced and complex systems. I will conclude by presenting a successful reconstruction project, which achieved better than expected results through honouring, respecting and promoting traditional systems.

## Traditional Management Systems in Iran

I will first mention the Iranian Traditional Management Systems that still exist, and then consider their adaptability and applicability subject to their dependence on the Modern Management Systems of conservation professionals. Some Traditional Management Systems such as *waqf* still have a strong presence in society, although revisions are needed, while others have gradually been neglected since the emergence of the modernist movements in Iran in the late 1800s. Today, despite economic development, Iran has seen the loss of a significant part of its natural and cultural heritage in less than one century (Abrahamian, 2008).

Two traditional systems directly related to basic human needs – such as food and water – are the pastoral nomadic system and the irrigation system(s) respectively.

### The pastoral nomadic system

Archaeological and anthropological evidence exists documenting that mobile and nomad-like pastoralism has been practised in Iran’s mountain belt since prehistoric times. Analyses of early cultures in the Zagros Mountains (Zagarell, 1975, 1982) indicate that there were forms of migratory human activities, with a mixed economy of agriculture and animal husbandry. The basic principles of economic

strategies and their implementation in Iran’s western mountain regions in the third and second millenniums BCE resemble the semi-nomadic and nomadic forms of contemporary land use in the Zagros Mountains. The pastoral nomadic system is associated with a series of characteristics such as: roaming from place to place, living in tents, moving shelters, finding grass fields to feed domestic animals (which are sources of food as well as the source for materials such as cashmere and wool, used for the production of textiles).

Since the 1960s in particular agricultural workers and city-dwellers have increasingly encroached upon traditional nomad-dominated territories. Nomads have had to struggle, not only against different forms of internal socio-economic changes and adaptations, but also against forms of rural and urban transformation (Ehlers, 2011). Consequently, nomadic territories have become limited and fragmented. This has led to a dramatic change in lifestyle: nowadays, nomads are partly settled in houses, rather than living for the whole year in tents, and they travel by truck, instead of on foot (Ehlers, 2011).

### Irrigation system

Living in a land with limited water, Iranians have invested in irrigation technologies and



systems since their primary settlements. Each hydraulic construction might have its own water management system, and a discussion of these would therefore cover a wide technical domain which falls outside of the scope of this paper. Today, the country is experiencing a severe water crisis and serious environmental issues, both due, in part, to the construction of dams and the resulting disregard of traditional water management systems.

In a vast part of Iran, the traditional irrigation system has been the *kariz* or *qanat*, which is a network of underground canals conducting limited water from underground water tables at mountain foothills, up to tens of kilometres into deserts and plains, to make them liveable, and cultivation possible. Through this technology, many of the settlements that have been shaped and developed over centuries, and the oases that have emerged in the deserts, can be considered cultural landscapes, since without human influence, they would not exist.

It is noteworthy that survival in this cultural landscape (*The Persian Qanat Cultural Landscape* (UNESCO World Heritage Centre, 2016)) goes beyond water management; Iranian scholar Papoli Yazdi defined it as Kariz (Qanat) Civilisation. In the introduction of his book, *Qanat e Qasabe Gonabad, a Masterpiece*, Papoli mentions that in the land of Kariz Civilisation, which lies between Alborz and Zagross in Central Iran, extending from the Persian Gulf to the Hindu Kush Mountains in the east, the potential for raising warriors and commanders has never existed, which is why no conqueror has emerged from this region. From the very beginning of this settlement, inhabitants have had to compensate for the shortage of resources by enhancing their productivity, and they gained special

skills in crafts and trade. Since in times of war trade would fail, they have always been a peaceful people and have learnt to resolve their problems through negotiation and integration (Papoli Yazdi et al. 2000, pp. 9–14). In this case, *qanat* irrigation technology and its specific management system are reflected not only in the users' life style and architecture, but also in a community philosophy: to promote sustainability by avoiding conflict.

Water management systems mostly develop their values through religions, to encourage the community. The Zoroastrian cult is mainly concerned with protecting life-giving elements. Water and fire are the two most vulnerable and venerated elements in Zoroastrianism. Fire and water are distinctive and separate creations, which cannot be mixed. The sacredness of water is a consequence of the protection of the Good Creations (Oestigaard, 2005, p. 35).

In Islam, access to clean water before praying and before attending mosque or a sacred place, is essential (Quran, Toubah, 19). Furthermore, it is a sin to waste water, and excess and wastefulness in using water are prohibited: "Eat and drink but do not be excessive; He loves not the extravagant" (7:31); "Do not squander [your substance] wastefully, for the wasteful are the devil's brothers" (17:26–27). It is also forbidden to monopolise water, because it is a public good which must be shared among men and animals. The absence of water is often more significant than the presence of water, when people incorporate the water needs of daily life into society and religion. A desert environment has a peculiar effect on thought and imagination. The less the water that exists, the greater the dependency on reliable and safe water sources. Thus, the control of water in desert areas has the function of creating structure in all spheres of social and religious life (Oestigaard, 2005, p. 93).

## Origins of the *waqf* Traditional Management System

In water management systems, we discussed the support provided by religion, especially when members of society devote their hard work to God and to individuals who are considered sacred. More advanced types of the traditional system developed

and survived. The best example of this advanced type is *waqf*, which is common in Muslim societies.

In Islamic law, *waqf* is the act of founding a charitable trust, and the trust itself. The essential elements are that a person, with the intention of



committing a pious deed, declares part of his or her property henceforth unalienable, and designates persons or public utilities as beneficiaries of its yields. *Waqf* is not mentioned in the Quran, but there are quotes (*hadith*) from the Prophet, favouring the legitimacy of *waqf*: “The Messenger of God said: ‘When a man dies, only three deeds will survive him: continuing alms, profitable knowledge and a child praying for him’” (Bearman et al., 2002, p. 59). Terminology was probably fluid at first and systematised only later. The first institution is that of *al-habs fi sabil Allah*: the donation of horses, weapons and slaves for the sake of *djihad* (war in the name of God), or houses for sheltering the warriors at the frontier (Bearman et al., 2002, p. 59).

The Islamic doctrine of *waqf* was influenced by Byzantine law. However, the vast diversity of *waqf* makes it different from Byzantine law, which was mainly focused on urban real estate. In Islam, the majority of *waqf* concerns rural property. In early Islam, *waqfs* in favour of relatives and descendants were predominant, rather than those in favour of religious institutions. The immediate spread and popularity of the *waqf* derives from its capacity to serve social and economic needs: it was a means to protect an estate against confiscation by the state, or against disintegration as a result of Sharia succession; it could be used to circumvent the rules of Islamic succession and keep property as much as possible within the agnatic descent group, and, it could provide a regular income for one’s relatives and descendants in order to protect them from want. With regard to mosques and public utilities, there were two types of *waqf*, each serving its own purpose: there were *waqfs* consisting of the mosque or the utility itself (school, bridge or fountain, for example) and there were *waqfs* generating income for the maintenance and operation of these utilities. Finally, *waqfs* provided relief for the poor (Bearman et al., 2002, p. 69).

The act of founding a *waqf* requires a founding declaration. Although not required by law, this declaration would normally be recorded (Bearman et al., 2002, p. 61). Where there is more than one beneficiary, in particular, the founder will usually make arrangements for the appointment of an administrator over the *waqf*, who will set forth the rules for the appointment of his successors.

According to most law schools, the founder is entitled to administer the *waqf* over the course of his lifetime (Bearman et al., 2002, p. 63).

In order to discuss the *waqf* system further, I have chosen the case study of a *waqf* deed from the fourteenth century initiated by Rashid-al-Din Hamadani (Rashiduddin), an Iranian Prime Minister in the Ilkhanid period (1256–1353). Rashid-al-Din was born into a noble Jewish family. He converted to Islam, and was interested in editing books and interpreting the Quran, but is most well-known for his book on Ilkhanid history called *Jami al Tavarikh*. His keen interest in science and education led him to establish a university in Tabriz, where a neighbourhood, called Rab-e-Rashidi, emerged, with all conveniences, for students and teachers to live in (Fazlollah Hamadani, 1977, pp. 33–37).

The *waqf* deed contents provide insight into the *waqf* system and details:

1. Part 1: About the beneficiaries and recipients (*Maqouf Alaibh*)
  - a. Section 1: Recipient holy shrines and public places
  - b. Section 2: Descendants
2. Part 2: Endowments (*Mawqoufat*)
  - a. Section 1: Already donated
  - b. Section 2: To be donated (both movable and immovable)
3. Part 3: Criteria
  - a. Section 1: General
    - i. Positions: Trustee, Supervisor and Inspector
    - ii. Qualifications
    - iii. Positions of responsibility
    - iv. Compensations and proportions to be left to descendants, based on rank
  - b. Section 2: Individual
    - i. Management of two mosques as well as Rashidi prefecture including villages
    - ii. Course syllabi
    - iii. Management of library
    - iv. Management of education centre teachers, students, orphans and their instructors
    - v. About My (i.e. Rashiduddin’s) Mausoleum
    - vi. About *Khmqab* (place for spiritual retreat and character reformation)
    - vii. About the hostel and the kitchen
    - viii. About the shelter
    - ix. About the hospital, pharmacy and wine house

- x. About the private library located in the Trustee's house
- xi. About servants and maids
- xii. About the quality of bread
- xiii. About illumination
- xiv. Eligibility of the poor necessitous
- xv. Budgets for special events, such as: Nowruz, Eid, Ashura, and the Donor's (Rashiduddin's) Remembrance Day, and welfare plans for the poor on these occasions
- xvi. Water management plan for five different springs around the city for consumers, including bath houses (Fazlollah Hamadani, 1977, pp. 37–40).

The remaining part of the *waqf* deed includes all the precise details about the expectations and wishes of the *waqef* (donor). This book provides us with information on a variety of issues, including: types of food (and even recipes); description of buildings, and the urban plans of Tabriz and Yazd (the two cities where most properties were located); details of the book-borrowing system; the names of the noble people and their status; units and scales of water management and land division, and information about the system for the duplication of books, to prepare manuscripts from the donor's editions (Fazlollah Hamadani, 1977, p. 19).

### *Waqf's* role in conservation

*Waqf* has played a special role in establishing the sponsorship and financial patronage of religious and cultural activities. In many cities and villages, special rituals and religious festivals, such as Ashura (Imam Hossein Remembrance Day), have been sponsored by *waqf* funds. This annual festival has been held by Iranians for centuries, holds an important place within society, and has been funded by *waqf* for centuries.

The largest *waqf* foundation in Iran, the Astan-e Qods-e-Razavi Organisation, oversees the *waqf* properties of Imam Reza's shrine. To preserve and extend this complex, this shrine has its own craftsmen and masons; many calligraphers, book-binders and other craftsmen are also sponsored, to preserve the properties and collections belonging to the shrine in Iran and overseas (Mawlawi *et al.* 1987). In recent decades, this administrative body has carried out controversial construction activities inside and around the shrine, demolishing a vast area of the historical city of Mashhad. Since the administration has financial power and influence,

cultural heritage organisations could not undertake any role as advisors in this investment plan.

It has also been very common in Iranian society for movable heritage items, with both practical and financial value, to be entrusted to *waqf* foundations. Items such as books, bath and kitchen items for public uses, carpets for use in sacred or public places, as well as jewellery and other valuables, were donated to remain in a *waqf* foundation as financial insurance. This has led to *waqf* collections, with well-preserved historical objects that can be seen in many museums in Iran.

*Waqf* can potentially play a significant role in the conservation of heritage. *Waqf* buildings have public or religious use, and communities are therefore their most important conservation factor. *Waqf* also have investment plans for the properties that have been entrusted to them, creating a financially self-sufficient system, as well as maintenance and management plans recorded and approved by the donor in the *waqf* deed.



## Traditional Management Systems and conservation in modern times

Modernism became a trend for Iranian rulers in the late 1800s as a consequence of kings' journeys to the West, and students being sent to Western universities to study modern science and technology. The real turning point for the modernisation of Iran was the Constitution Revolution of 1905.

If we consider modern conservation a systematic activity, overseen by an organisation and safeguarded by legislation, there was no modern conservation movement before 1905. Prior to 1905, the conservation and restoration of monuments was practised, for the most part, for religious and public buildings, with the support of *waqf* (Hojat, 2001, pp. 166–212). In a few cases, some monuments outside of this category might have been restored with the agreement and involvement of the king. For example, according to *Etemadosaltane's Journal*, in the nineteenth century, Nasereddin Shah hired a construction team to restore the Sultanieh Monument (Etemadossaltaneh, 1996, p. 635). However, this should not be considered a systematic conservation, since, at the same time, the excavation activities on Iranian archaeological sites such as Susa, were operated by French teams, and the relics that were found were shipped by them to Europe.

The term National Trust appeared for the first time in 1905, written in the Iranian Constitution Law, under the responsibility of the Ministry of Culture. In 1922, the National Properties Society was established by a group of prominent Iranian scholars, and as a result of their activities, The National Property Conservation Act was ratified in 1930. The primary systematic conservation activities were coordinated by the National Properties Society, in collaboration with the University of Tehran and the National Museum of Iran which was under the directorship of André Godard from 1935–1953. He was the director of the first conservation projects in Isfahan and prepared the first National Property List, detailing Iranian monuments and sites.

It is important to note that Western methodology and disciplines have had a significant

impact on Iranian heritage, undermining traditional systems in the eyes of most educated people and decision-makers. Few professionals have sought a moderate way of practising modernity, while maintaining, in parallel, historical skills, values and context (Hojat, 2001, pp. 215–265).

Karim Pirnia, born in Yazd, and influenced by the traditional architecture of his home town, decided to leave the University of Tehran, where he was a student of architecture in the 1940s, when art and architecture programmes at the university were mostly influenced by the French scholars from *l'École des Beaux-Arts*. He never returned to university, instead resuming his apprenticeship with traditional architecture masters, studying what he had already started to practise in his early teenage years in Yazd.

Unlike most of his Iranian fellow architects, Pirnia was critical of the trend of the application of Western ideas to Iranian architecture. He believed that Iranian architectural styles should not be categorised under the names of dynasties, as was common in Western sources about Iranian styles (for example, Achaemenid style, Seljuk Style, Safavid Style, and so forth). He started the categorisation of Iranian styles based on their place of formation and development, and attributed specifications to them. He conceptualised his categorisation using Iranian poems and literature styles already in use in Iran.

His life-long work brought Iranian vernacular architectural technology (*nyareh*) to the fore. These skills had previously been transmitted orally from generation to generation, and from master to pupil. Among his publications is the book *Traditional Iranian Architectural Terminology*. He also delivered lectures and published articles about Peymon, which was a modulation system for architectural design, detailing architectural measurements, under both local and national systems, enabling the architect to work on different sizes and functions, based on the size of the land and the function of the building. It offers major and minor sizes for rooms and service areas, which exist today as building codes in architectural design.



Acknowledging that Pirnia had become a specialist in Iranian architecture, less than two decades after leaving university, he became the deputy of the Department for Conservation of the Iranian Archaeology Organisation in 1955. His appointment provided students and experts with the opportunity to learn from his knowledge and skills.

Fortunately, in the 1960s and 1970s, traditional architectural systems were still practised in small towns and villages by craftsmen and masons. The conservation projects that were led by Pirnia and his apprentices in that period remain some of the best examples of collaboration between craftsmen

and conservation professionals to date (Pirnia, 1998, pp. 6–55). In recent decades, conservation professionals have begun to understand the significance of the role played by communities in heritage management. In the case study below, conservation professionals and communities worked together, and the demonstration of faith by conservation professionals in the traditional systems in particular, led to a successful conservation project outcome.

The text is translated in full from an interview held with Akbar Taghizadeh Asl, conservation project director from 1993–2004.

## Case study: Tabriz Bazaar conservation and reconstruction project

### Presentation

Tabriz Bazaar (Taghizade Asl, 2008, pp. 78–80) is a huge complex of Iranian construction about which there is no exact information, although Marco Polo, Clavijo and Chardin all named it as an important commercial centre for merchants and travellers of the Silk Roads. As with other public buildings and complexes which were part of ancient traditional society, Tabriz Bazaar was once maintained using organic and traditional systems both in terms of its financial operations and the way in which it was run. Yet, after the ratification of the first law of conservation in 1930, and the establishment of a special organisation in charge of restoration and conservation (the National Properties Society), the process of conservation was assumed to be a governmental activity and local people believed that they did not have to become involved in it, while at the same time an outburst of modernity in architecture intensified the ignoring of, or even the damaging of built heritage. More specifically, due to the trend of modern malls and shopping centres, Tabriz Bazaar had gradually been losing its reputation as the commercial heart of the city, and the owners were not interested in maintaining or restoring

their shops, so that the Bazaar was suffering from damaged structure and degradation.

Considering the large amount of built heritage in Iran, Tabriz Bazaar was unlikely to be conserved by the government; hence partnership with users and owners was seen as the only resort. To assist in understanding the work required for the Tabriz Bazaar, a study was undertaken into previous restoration work carried out on a *timche* (a square place, covered by dome and arches in a bazaar, which acts as a crossroad for the passages) in 1994. Ten percent of all of the project's credit and finances had been covered by the shop owners (Taghizade Asl, 2008, pp. 78–80).

This study showed that:

- Property and business owners do not tend to pay for administrative activities, such as the construction permit, and would rather keep track of the financial part of their shared projects.
- Bazaars had their own traditional system for collecting maintenance fees and property management fees (for security, maintenance and construction) which, nowadays, is not discussed. This traditional maintenance system



should be regenerated. In this way, older bazaar owners could act as the best reference point for helping conservation professionals to establish sound partnership guidelines.

As a consequence, two trustworthy persons were selected as representatives of the Bazaar to take part in the meetings held by conservationists.

The negotiations led to the following agreements:

The Cultural Heritage Organisation would be responsible for:

- organising the operational system;
- producing traditional materials, such as brick and mortar;
- negotiating with Tabriz Municipality to ask for authority to be transferred to the Iranian Cultural Heritage, Handicrafts and Tourism Organisation (ICHHTO) for the restoration of the Bazaar shops;
- negotiating with the Provincial Tax Office for exemption of the renovation tax.

The owners' financial partnership percentage rose from 25 percent in 1995 to 100 percent in 2003. Nowadays, ICHHTO merely coordinates the plans, designs and supervision of the restoration process and scaffolding, and produces traditional materials, which are bought by the Bazaar Council for their conservation projects.

Since conservation work interrupted the everyday business of those working near the conservation zones, the people affected needed to be convinced of the benefit of the temporary interruption to their businesses during the conservation and reconstruction work.

In order to pass on this information, some of the shopkeepers were approached by contacts who were related to the conservation staff, and they were also persuaded to attend a meeting in the public centre nearest to their shop (either at the *timche* or mosque) with the other shopkeepers in their neighbourhood. These unofficial meetings were conducted by trustworthy members of the local community and conservation team.

Instead of individually demolishing and reconstructing their shops, the owners were persuaded to think about collaborating in the restoration of the Bazaar as a whole complex and

were educated about its advantages. They were also informed that new construction systems proposed by shop owners, would not be the right way to boost the Bazaar and compete with modern shopping centres; furthermore, they were not compatible with the original construction system of the Bazaar and would ruin its integrity.

After two meetings in two venues, volunteer groups of owners started to restore their clusters (neighbourhoods of shops, with the same or compatible business), with the collaboration of the Iranian Cultural Heritage Organisation.

Consequently:

- the restored clusters received more customers;
- the value of the shops increased;
- the shops which had previously been put to incompatible uses, were converted to compatible activities;
- the number of owners volunteering for restoration of their shops rose.

The reconstruction and maintenance process was thus accomplished successfully, and organic, traditional maintenance and conservation was resumed in Tabriz Bazaar and progressed, so that the conservation management team had more opportunities to pay greater attention to bigger plans and programmes, such as:

- infrastructure planning: sewage, water supply, electric systems, energy supply and firefighting systems;
- central heating;
- strengthening and reinforcing constructions;
- designing gates and entrances at street openings: in the last century, Tabriz Bazaar had been divided by a new street, and, in order to recreate entrances to the Bazaar on both sides of the street, two gates were designed and built;
- restoration of both the active and abandoned mosques of the Bazaar;
- renovation of the banks located in the Bazaar, and remodelling their new and incompatible buildings to forms and shapes compatible with the Bazaar;
- replacing the asphalted floor of passageways with bricks;
- designing, building and installing public toilets.



Now, a master plan is vital, taking into consideration access, warehouses, goods, traffic and parking. Recently, some blocks adjacent to the Bazaar were renovated by the governmental urban management system in spite of the disagreement of ICHHTO; however, finally they were convinced that their needs were taken into consideration in the project.

The rehabilitation of Tabriz Bazaar can be considered a unique experience in the case of joint conservation activities in Iran. It did not have a direct and clear process, but could if collaborators for each type of monument and site conservation could be classified, and if different models could be prepared for different groups of stakeholders.

### Review

The case study of Tabriz Bazaar is proof that respecting traditional systems and working alongside the community can successfully transfer the responsibility of conservation to the community, as it was before modernisation. Where this works successfully, conservation professionals can concentrate instead on consultancy work.

A benefit of the project was that it prepared the field for hiring of traditional craftsmen and masons on the 27-hectare area, which will need ongoing restoration and maintenance. There were jobs as well as opportunities for training the next generation of craftsmen. In order to guarantee that appropriate teams were hired, the ICHHTO local office did not

issue any construction permit in the Bazaar without the approval of the construction team members.

Conservation professionals also decided to reconnect some of the abandoned parts of the Bazaar. Specifically, there were some blocks of the Bazaar located on the other side of the river, unable to attract customers and at risk of losing their businesses, due to their poor connection with the main part of the Bazaar. Tabriz had been the capital of the Aq-Quyionlu Dynasty in the fifteenth century, and its urban development and construction activities extended throughout the city to the other side of the river. Gradually, over a couple of centuries, the Bazaar stretched over to the new part of the city, yet the bridges destroyed after floods and earthquakes were not reconstructed in alignment with the circulation of the Bazaar traffic.

Research, using historical maps, texts and pictures, revealed that the bridges were not only a connection point, but also part of the Bazaar, meaning that the Bazaar did not stop at the river, and people walking inside the Bazaar did not feel that they were walking over a bridge. ICHHTO decided to construct modern bridges using a similar concept to ancient bridges (Bazaar-bridges), to reintegrate all parts of the Tabriz Bazaar, and revive the separated blocks (Tehrani *et al.*, 2008, pp. 101–108).

This is a clear example of a decision leading to the delivery of results which were over and above original expectations.

## Conclusion

The case study of Tabriz Bazaar is proof that believing in and respecting traditional systems, and working with the community can transfer the duty of conservation to the community. Conservationists can find a role on a different level, as consultants. Also, conservation teams need to confer greater importance to system analysts, ethnologists and sociologists, and hire better communicators.

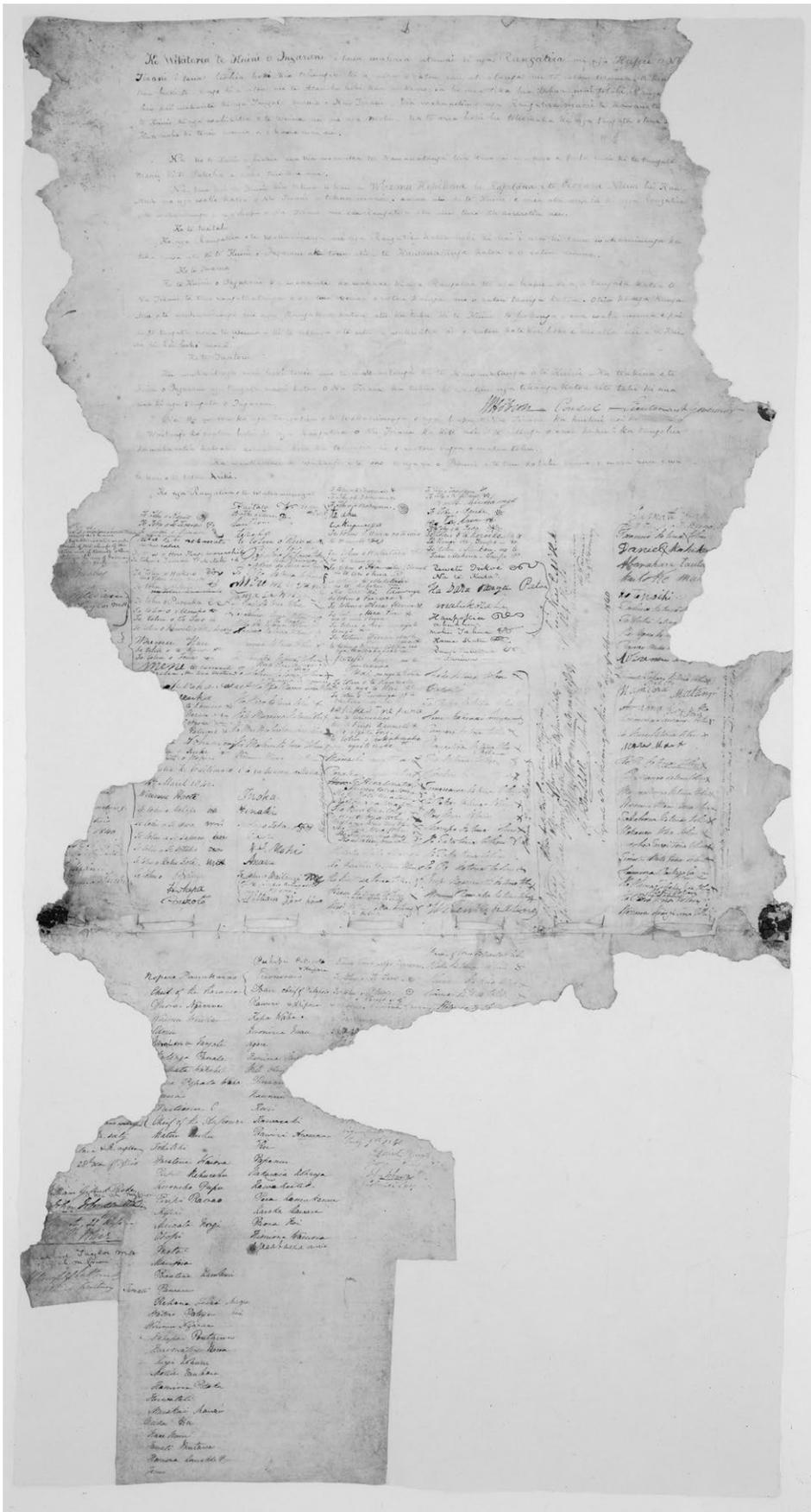
On a final note, I would like to return to the beginning of the paper and to the definition of a traditional system as well as ICCROM's

contribution to this topic. ICCROM's achievements in defining and safeguarding heritage can lead to the development of more sustainable approaches towards conservation by addressing both tangible and intangible heritage. I would compare the role of traditional systems in intangible heritage to that of cultural landscapes and historical cities in tangible heritage, and I believe that updating traditional systems and reinstating them in communities can rehabilitate both cultural and natural heritage and guarantee the sustainability of conservation.



## References

- Abrahamian, E. 2008. *A History of Modern Iran*. Volume I. New York, Cambridge University Press.
- Bearman, P.J., Bianquis, Th., Bosworth, C.E., van Donzel, E., & Heinrichs, W.P. eds. 2002. Volume XI, W-Z [online]. In *The Encyclopaedia of Islam*. [Cited 9 September 2017]. The International Union of Academies, The Netherlands: Koninklijke Brill, Leiden. [Cited 9 September 2017]. [https://library.ut.ac.ir/documents/381543/3581025/Brill\\_-\\_The\\_Encyclopaedia\\_of\\_Islam\\_Vol\\_11\\_W-Z\\_.pdf](https://library.ut.ac.ir/documents/381543/3581025/Brill_-_The_Encyclopaedia_of_Islam_Vol_11_W-Z_.pdf)
- Ehlers, E. 2011. Nomadism. Pastoral Nomadism. Iran. [online]. In *Encyclopaedia Iranica* Foundation. [Cited 9 September 2017]. [www.iranicaonline.org/articles/nomadism](http://www.iranicaonline.org/articles/nomadism)
- Etemadossaltaneh, Mohammad Hassan Khan, ed. 1996. *Etemadossaltaneh Journal*. The Minister of Publishing and Printing in Qajar Period. From the only Manuscript of Astan e Qods Razavi Library. With assistance of Iraj Afshar. Tehran, Amir Kabir.
- Fazlollah Hamadani, Rashiduddin, ed. 1977. *Rab-e-Rashid's Waqf Deed*. Printed from Original Manuscript. Descriptive Criteria of Waqf Affairs and Usage Handwritten by the Donor. With assistance of Minavi, Mojtaba, Afshar, Iraj, Karang, Abdolali. Iranian National Heritage Society (Anjoman-e Athar-e Melli). 1st ed. 1 volume. Tehran, Iranian National Heritage Society.
- Hojat, M. 2001. *Cultural heritage in Iran: Policies for an Islamic Country*. Tehran, Cultural Heritage Press.
- Mawlawi, A.H., Mostafavi, M.T., Sakurzada, E. 1987. Astan e Ghods e Razavi. *Encyclopaedia Iranica Foundation*. New York, USA, updated on 2011.
- Oestigaard, T. 2005. *Water and World Religions: An Introduction*. 1 volume. [online]. Norway, SFU & SMR. Bergen. [Cited 9 September 2017]. [www.researchgate.net/publication/287596060\\_Water\\_and\\_World\\_Religions\\_An\\_Introduction](http://www.researchgate.net/publication/287596060_Water_and_World_Religions_An_Introduction)
- Papoli Yazdi, Mohammad Hossein, Labbaf Khaniki, Rajabali, Labbaf Khaniki, Majid, Jalali, Abbas, & Vothoughi, Fatemeh 2000. *Qanat e Qasabe Gonabad, a Masterpiece*. Mashhad, Ferdowsi University Press.
- Pirnia, M. Karim, ed. 1998. *A research on Iranian Architecture in the Past*. With assistance of Gholamhossein Mamarian. Iranian Science and Technology University. Volume I. Tehran, Iranian Science and Technology University.
- Taghizade Asl, Akbar. 2008. Experience of Community Collaboration in Rehabilitation of Tabriz Bazaar. Interview by Saeedeh Hosseini. *National Heritage Seasonal*, 2, pp. 78–80.
- Tehrani, Farhad, Nawari, Niloofar, Khalilzade, Saina. 2008. Tabriz Bridge-Bazaars. *Soffeh*, 46(17): 101–108.
- UNESCO World Heritage Centre, 2016. *The Persian Qanat* [online]. Paris. [Cited 9 June 2019]. <https://whc.unesco.org/en/list/1506>
- Web Finance Incorporate. 2017. Business Dictionary. System [online]. Fairfax, USA. [Cited 9 September 2017]. [www.businessdictionary.com/definition/system.html](http://www.businessdictionary.com/definition/system.html)
- Zagarell, A. 1975. Nomad and settled in the Bakhtiari Mountains. *Sociologus* 25: 127–38.
- Zagarell, A. 1982. The prehistory of the northeast Bakhtiari Mountains, Iran: the rise of a highland way of life. *Beibefre Zum Tübingen Atlas des Vorderen Orientes* 42. Wiesbaden: Reichert.



The Waitangi Sheet of the Treaty of Waitangi, signed between the British Crown and various Maori chiefs in 1840 (image in public domain).

◊ CHAPTER 19 ◊

**The applicability and adaptability  
of Traditional Knowledge Systems  
in heritage conservation and  
management in New Zealand**

Jade Hadfield



## Abstract

Traditionally, Maori culture and society has geared itself towards the conservation and management of heritage. This was reflected in the transmission of traditional knowledge through ceremonial oratory, and the Maori social and belief systems, intertwined with both the physical and spiritual world. Since the arrival of Europeans, however, considerable Maori traditional knowledge has been lost, or reinterpreted. Despite this, the essence and foundation of Maori traditions – *mauri* (the spirit), *mana* (respect) and *tapu* (the sacred) – have remained and have reinforced Maori cultural practices and their capacity for sustainability. Maori heritage is diverse and includes places and treasures (*taonga*) from the physical and tangible, to the natural environment and the intangible. This paper focuses on the concept of *kaitiakitanga*, or guardianship, which has evolved over time, from a belief incorporating the care of the gods, to the contemporary practice of guardianship over Maori culture and heritage. This paper will discuss how the notion of guardianship has adapted and been applied to modern day policy planning and national legislation to allow Maori to conserve and manage the Maori heritage of New Zealand in a traditional manner. The term *kaitiakitanga*, and the role of *kaitiaki* (guardians) have been embedded into legislation and policy through the principles of The Treaty of Waitangi (1840) (*Tiriti o Waitangi*) which indeed now serves as a platform to assert guardianship, and to manage and safeguard Maori heritage.

## Preface

The detailed study of aspects of Maori culture and history, such as Maori artefacts and treasures (*taonga*); oratory; land, nature and places of significance; and Maori protocol (*tikanga*), are beyond the scope of the present paper. This paper will instead concentrate on the overarching concepts of Maori culture and relevant legislation. For a deeper understanding of the detailed aspects of Maori culture, the reader may look to: Elsdon Best's *The Maori* (1924), Michael King's *Maori* (1984) and Hirini Moko Mead's *Tikanga Maori: living my Maori values* (2003), or general websites, such as

those administered by the *Tē Ara* Encyclopedia of New Zealand (Ministry for Culture & Heritage, 2019a) or the Ministry for Culture and Heritage (Ministry for Culture & Heritage, 2019b). It is also important to note that since each of the Maori tribes of New Zealand holds slightly varied beliefs and opinions, my perspective is that of the *Ngāti Kahungunu* tribe.

The tone of this paper is optimistic. It is not always easy to balance New Zealand's bicultural nature against the Treaty of Waitangi, and the relationship between the two is more complex than is stated here.

## Introduction

Up until recently, the management of cultural and natural heritage in New Zealand has been practised with a Eurocentric focus, as developed under Western European frameworks and in Western European environments. Now a bottom-up approach is more widely accepted, which endeavours to recognise all the different values and knowledge systems that are beneficial to heritage conservation and management. A more social and holistic approach (UNESCO *et al.*, 2013) is now being pursued as a clear objective, embracing natural and cultural heritage, encompassing both the tangible and intangible, and engaging associated communities. Community engagement addresses the connection between heritage and its people, allowing the community, or Indigenous, perspective to be heard.

In New Zealand, current discourse and management practice aims for a holistic approach, addressing the tangible and intangible aspects of heritage conservation and management, inclusive of, or in partnership with, Maori tribes (*iwi*) and sub-tribes (*hapu*). This has been enabled through the commitment of respective government organisations to the principles of The Treaty of Waitangi, and to partnership, participation and protection. Inclusion of Maori has been developed, so that Maori people are now employed

as professionals within the heritage sector, for example, as conservators, site managers, and museum curators. This professional status has helped to ensure that Maori heritage receives the attention and protection that it requires, while strengthening the relationship between the heritage sector and Maori.

Oversight of the different areas of heritage management lies with various government bodies, such as the Department of Conservation (DOC), which is responsible for natural heritage and the environment; Heritage New Zealand, which is charged with protecting historic properties and places; and *Te Papa Tongarewa*, or the Museum of New Zealand, which looks after the physical art and artefacts contained in the national collection.

To understand the conservation of Maori heritage, one must examine the key concepts of *mauri*, *mana* and *tapu*, which lie at the heart of the Maori world. More specifically, this paper will look at the concept of *kaitiakitanga* – the traditional role of guardianship, – and specifically, how it has evolved and adapted to the conservation and management of Maori heritage in New Zealand. We will then discuss The Treaty of Waitangi, an agreement written in Maori and English, and signed in 1840 between the British Crown and 540 Maori chiefs



(Ministry of Culture & Heritage, 2016). The treaty was a significant moment of change for Maori society and the foundation of modern New Zealand. We will focus on how the treaty has provided the

basis for heritage policy and legislation, utilised by the Maori as a platform to assert their rights as the guardians (*kaitiaki*) of Maori heritage and recognising traditional Maori knowledge.

## Traditional Maori values

The Maori are an oral people, they take pride in their oratory skills and have made an art form of it (Figure 1). Genealogy (*whakapapa*) and ceremonial traditions have been passed down from generation to generation through oratory (*whaikorero*). Traditionally, the mechanisms of oral culture and knowledge transmission have been the tools used to preserve the identity and values related to the spiritual world, and in particular, the connection between the realms of the gods (*atua*), people (*tangata*), and the land (*whenua*) (Schuster and Whiting, 2007, p. 72). The basis of Maori culture was, and to an extent, still is, an animistic spirituality, with the belief that there is life and a spirit in everything, and that everything is connected.

The concepts that strike to the heart of the Maori world are *mauri*, *mana*, and *tapu*; they were and still are, heavily engrained within Maori culture and heritage, and are concepts that require knowledge of Maori protocols (*tikanga Maori*) and Maori knowledge (*matauranga Maori*), in order to be able to protect oneself and navigate through traditional values.

### Mauri

*Mauri* is the life force present in everything, and which connects everything. The *mauri* is the essence of life for people, nature and objects; it must be nurtured and protected, because if extinguished, the traditional belief is that life will cease. Prior to European arrival, Maori would often ritually place their *mauri* into an item, such as a necklace made of stone or bone, as this was thought to be an effective way of protecting one's *mauri* (Moko Mead, 2003). *Mauri* is in everything: for example, a carving is not just a carving, it is an embodiment of an ancestor and the *mauri* needs to be kept alive through touch and prayers.

### Mana

*Mana* can be loosely translated as honour, power, prestige, or the essence that is held by the gods, the people and the land. There are varying degrees of *mana*: the higher the status of a person, the more *mana* that person holds. Generally, one is born with one's *mana*; however, it can be earned, or lost, through one's personal qualities, regardless of one's status at birth.

### Tapu

*Tapu* is closely aligned with *mana*. It is complex and goes to the heart of Maori spiritual thought; traditionally, it is intrinsic to Maori values, as it is held to regulate all aspects of life (Best, 1934, p. 83) and to protect the sacredness of everything. Maori life requires balance through *tapu* and *noa* (free from *tapu*); a cautious respect is necessary where a high level of *tapu* is present, as the consequence of breaking *tapu* is ill-fortune or death from divine retribution or revenge (*utu*). Traditionally, *tapu* was a mechanism to maintain social order (Best, 1924; Moko Mead, 2003). As Elsdon Best (1924, p. 357) states, “people did not transgress the laws of *tapu*, simply because they firmly believed that the punishment of the gods would be swift and certain”.

Prior to European contact, Maori had a higher level of and belief in *tapu*. Maori culture is so intrinsically bound with the concept of *tapu* that it has been thought that, once missionaries and the British government broke down the law of *tapu*, “the vitality of the race departed, [...] leaving the people in a defenceless and helpless condition” (Best, 1941, p. 39). The means to protect oneself from the negative effects of *tapu* was through prayers from priestly experts (*tohunga*), who advised on Maori protocol and guided one through the physical and spiritual realms of Maori life until one was safe or free from *tapu* (*noa*). Like *mana*, only



people with a high status were considered to have *tapu*, as they were connected to the gods (Moko Mead 2003), and, also like *mana*, it could be earned. The link between *mana* and *tapu* means that the higher the *mana*, the higher the *tapu*.

Today, *tapu* is still a concept that Maori live by; for example, places of significance are considered *tapu*, such as rivers, forests and mountains. Burial sites, along with any practice concerning death are highly *tapu*. The objects that are considered sacred

are items that were connected to death, or items owned by chiefs.

Many Maori traditions that existed pre-European arrival were lost when Europeans began settling and interacting with the Maori, particularly through missionary engagement and Maori conversion to Christianity (Moko Mead, 2003). Yet, despite this loss, the key values that form the foundations of Maori culture have remained.



**Figure 1**  
Otatara Pa,  
Hawke's Bay.

## Maori heritage and *kaitiakitanga* (guardianship)

Maori heritage is extremely broad; it can be described as *nga taonga tuku iho no nga tupuna* (treasures handed down by our ancestors). It comprises a wide range of places and treasures, from the physical and tangible, to the natural environment and the intangible. It includes art, such as carvings, weavings and adornments as well as weapons, performing arts, and the Maori language. Physical places include: built heritage;

areas with remaining evidence of historical use, such as burial sites; natural areas, like mountains and rivers that imbue the *mauri* or spirit of the people; and areas that no longer exist physically, but retain their spiritual significance (Heritage New Zealand, 2015).

Maori heritage shapes identity and enhances well-being. It carries particular cultural meanings and values for the present and associations with



those who have gone before. For example, a carving contains the essence of life: it is not just a carved piece of wood, it is an ancestor and holds the spirit of one who has passed on. In order to understand the boundaries of the spirit-world and the living, one must work with respect, and adhere to the Maori protocols governing such items.

The concept of *kaitiakitanga*, meaning guardianship imbuing spiritual and environmental ethos, is expressed as the connection between the people of the land (*tangata whenua*) and the spirit world (Te Ahukaramu, 2015). Traditionally, the gods are considered guardians or *kaitiaki* of the land and the people. After contact with missionaries and the influence of Christianity, the role of *kaitiaki* evolved into the form of beings, animals or priestly experts, who would warn of impending danger, or

misfortune, and guide one through the complex network of Maori laws/protocols and maintain relationships between the environment and the people (Roberts *et al.*, 1995). *Kaitiakitanga* has further developed and is now exercised by Maori in relation to the care and protection of people, *mauri*, ancestral lands, waterways, sites, resources and other treasures. In contemporary New Zealand, Maori are the people of the land (*tangata whenua*) and hold *mana* of the land in certain tribal or sub-tribal places, or areas that relate to family, sub-tribes, and tribal groups (Heritage New Zealand, 2015). *Tangata whenua* responsibilities to Maori heritage are embodied in the ethic of *kaitiakitanga*, where Maori act as guardians to their heritage and protect resources using Maori protocols to maintain and revitalise their cultural practices.

## The Treaty of Waitangi and *kaitiakitanga*

The arrival of Europeans was predominantly a detrimental time for Maori. They suffered a loss of traditions, loss of land, and a decrease in population numbers as a result of disease and warfare, all of which challenged and changed their culture (Schuster and Whiting, 2007). However, trade with European settlers was advantageous to some Maori, with some tribes adapting to rely on, and base their activities around, trade. The incorporation of European knowledge into their activities has been described as “selective development of a resilient adaptive culture” (Orange, 2011, p. 17).

At an early point in European settlement and Maori social unrest, The Treaty of Waitangi was written and signed in the Northern Settlement of Waitangi in 1840 by the British Crown and numerous Maori chiefs (Orange, 2011). The treaty is considered the founding document of modern New Zealand, and Maori have used this as a foundation to assert their cultural rights.

The treaty exists in both Maori and in English. Due to the differences between the languages, the English text is not an exact translation of the Maori text, and, as a result, there appears to have been miscommunication from the outset

(Orange, 2011). This has caused extensive debate and much opposition, but it has been determined that both texts represent an agreement in which Maori gave the Crown rights to govern and to develop British settlement, while the Crown guaranteed Maori full protection of their interests and status, and full citizenship rights. Out of the debate, four reconciling Treaty principles have emerged (Department of Conservation, 2017a): (1) the principle of active protection; (2) the tribal right to self-regulation; (3) the right of redress for past breaches; and (4) the duty to consult. Still, today, recognition and adherence to these principles by the New Zealand government ensures the effective protection of the Maori language and Maori culture (Ministry of Justice, 2017). The treaty is now defined by these principles and any cases under dispute are examined, under The Treaty of Waitangi Act 1975, by the Waitangi Tribunal, which has exclusive jurisdiction to determine the meaning and effect of the treaty, as embodied in the two texts, and to decide on any issues raised by the differences between them.

Article 2 of the treaty provides for *kaitiakitanga* (here, translated as customary trusteeship) to be exercised by the people of the land; *kaitiakitanga*



is exercised over Maori treasures, sacred and traditional places, built heritage, traditional practices, and other heritage resources. *Kaitiakitanga* extends beyond current legal ownership, wherever such heritage exists (Kawharu, 2000). In practice, this means that the primary organisations responsible for protecting New Zealand's heritage are run with a bicultural focus, actively engaging with tribes and Maori communities. Maori hold advisory positions within these organisations, providing a voice to represent the interests of tribes and sub-tribes, and playing a significant role in the governance of the organisations. Likewise, Maori advisory boards or groups are also consulted during the decision-making process, which ensures that the appropriate protocols are followed to protect and maintain the *mana* and *mauri* of heritage (Museum of New Zealand *Tē Papa Tongarewa*, 2005).

Policy creation, for example, within the Department of Conservation (DOC), also aims to include Maori. The DOC states that, "Effective partnerships with *tangata whenua* can achieve enhanced conservation of natural resources and historical and cultural heritage" (Department of Conservation, 2017a). The relationship between the DOC and the Ngati Paarau, a sub-tribe from the East Coast of New Zealand who are *kaitiaki* of a historical *pa* site (a traditional Maori village, or defensive settlement) is one such example of an effective partnership. In 1990, the Ngati Paarau formalised their relationship with the DOC, with an agreement that the DOC would manage and protect the *pa* site. As part of this agreement, a conservation corps project was piloted, which resulted in the protection of the *mauri* of the site and the production of carved works (Department of Conservation, 2017b; Walter and Gosling, 2002).

Consideration of *kaitiaki* and *kaitiaki* rights has not been automatic: Maori have continually had to assert, prove and reinforce these rights (Kawharu, 2000, p. 361). This has been achieved through organisations' charters and through legislation, supporting the role of the *kaitiaki* to protect Maori heritage. Pursuant to The Resource Management Act 1991 (Government of New Zealand, 1991, Article 1.2), the modern definition of *kaitiakitanga* is the exercise, by Maori, of guardianship, over natural and physical resources in accordance with the associated protocol. It includes the ethic of stewardship.

The Heritage New Zealand Pouhere Taonga Act 2014 recognises the importance of the Maori relationship with their ancestral lands, water, sites, ancestral places (*wahi tupuna*), burial sites (*wahi tapu*), and other treasures, and how these are intertwined with their culture and traditions. The relationship is further defined and defended under section 6 of The Resource Management Act 1991, affording Maori the right to protect their customary rights and treasures from any inappropriate use.

Further, ICOMOS New Zealand Charter for the Conservation of Places of Cultural Heritage Values (ICOMOS New Zealand, 2007 (2010)), developed in the spirit of the Venice Charter (ICOMOS, 1965), provided protection for intangible beliefs and traditions:

Conservation of a place should be based on an understanding and appreciation of all aspects of its cultural heritage value, both tangible and intangible. [...] [The people of the land have] responsibilities of guardianship and the practical application and passing on of associated knowledge, traditional skills, and practices. [...] Particular *matauranga*, or knowledge of cultural heritage meaning, value, and practice, which is associated with places and *taonga*. *Matauranga* is sustained and transmitted through oral, written, and physical forms determined by *tangata whenua*. The conservation of such places is therefore conditional on decisions made in associated *tangata whenua* communities, and should proceed only in this context. In particular, protocols of access, authority, ritual, and practice are determined at a local level and should be respected. (ICOMOS New Zealand, 2010, Articles 2 and 3)

There has been a history of Maori being actively engaged in *kaitiaki* roles, particularly in the museum sector. Since the 1950s, the engagement of Maori in museums has been officially recognised: it is even thought that Maori consider areas of museums as a *manae* (meeting house, gathering place) (McCarthy, 2016). A seminal moment between Maori and the heritage sector was *Tē Maori*, a major exhibition of Maori art and artefacts that travelled overseas to widespread critical recognition. The exhibition revived Maori pride in their culture and enabled Maori to "take back control over the representation of their culture" (McCarthy, 2016, p. 54). Prior to, and following *Tē Maori*, there was a push towards



the training of Maori to fill professional heritage conservation and management positions. It was found that, although Maori were participating in collections at museums, it was often in a voluntary capacity. Therefore, a number of programmes were established in order to open up paid, professional positions for Maori within museums (McCarthy, 2016). By the 1990s, a number of Maori were employed at the National Museum of New Zealand in ethnology, conservation, photography, display, and education (McCarthy, 2016).

A significant part of the role for Maori heritage professionals is to treat artefacts appropriately and

according to Maori protocols. At times, they are also required to liaise between individual tribes and a museum in relation to particular artefacts, in order to gain access, and manage the relationship between the two. For example, Maori curators and collection managers at the National *Te Papa* museum are known as *kaitiaki*: they are Maori who have entered the heritage sector in professional roles in order to provide expertise in the area of the heritage expressions of which they are the guardians. In addition, they have a responsibility to individual tribes, to involve them in the exhibition and care of their artefacts (Atkinson, 2009).

## Conclusion

The central values of Maori culture are the basis for the conservation of Maori heritage. Maori culture has adapted and modernised its traditions, while maintaining the use of traditional concepts, such as *kaitiakitanga*, to protect the vital intangible aspects of heritage: *mauri*, *mana* and *tapu*.

The introduction of The Treaty of Waitangi was the cause of much grievance, largely as a result of miscommunication, but it has since formed a legal platform to allow Maori to be guardians of their own heritage and use appropriate protocols to protect it. The treaty has served as the basis for a series of national legal documents, such as The

Resource Management Act 1991, The Heritage New Zealand Pouhere Taonga Act 2014, and also for the policies of national heritage organisations, which now all state that Maori are *kaitiaki* and have a responsibility to care for their heritage in a traditional manner. It has allowed for bicultural relationships to be considered integral to heritage management in New Zealand, and has led to the establishment of professional and advisory positions for Maori as *kaitiaki* to their treasures, in order to protect their heritage in an appropriate manner and to care for the tangible and intangible aspects of their heritage.

## References

Atkinson, J. 2009, *Respecting and Preserving Cultural Values: Partnerships in New Zealand Museums*, "Museum Curators and Communities: Embedded Approaches to Participation, Collaboration, Inclusion", conference [online]. Horniman Museum, London, 26th–27th November 2009. [Cited 9 July 2016]. [www.academia.edu/831213/Respecting\\_and\\_Preserving\\_Cultural\\_Values\\_Partnerships\\_in\\_New\\_Zealand\\_Museums](http://www.academia.edu/831213/Respecting_and_Preserving_Cultural_Values_Partnerships_in_New_Zealand_Museums)

Best, E. 1924, *The Maori – Volume I*. Polynesian Society, Wellington.

Best, E. 1934, *The Maori As He Was: A Brief Account of Life as it Was in Pre-European Days*. Dominion Museum, Wellington.

Best, E. 1941, *The Maori – Volume II*. Polynesian Society, Wellington.



- Department of Conservation. 2017a. *Treaty of Waitangi responsibilities* [online]. Wellington. [Cited 16 August 2017]. [www.doc.govt.nz/about-us/our-policies-and-plans/conservation-general-policy/2-treaty-of-waitangi-responsibilities](http://www.doc.govt.nz/about-us/our-policies-and-plans/conservation-general-policy/2-treaty-of-waitangi-responsibilities)
- Department of Conservation. 2017b. *Otatara Pa Historic Reserve*. Napier, Department of Conservation.
- Government of New Zealand. 1991. *The Resource Management Act 1991* [online]. Wellington. [Cited 5 November 2017]. [www.legislation.govt.nz/act/public/1991/0069/latest/DLM230272.html](http://www.legislation.govt.nz/act/public/1991/0069/latest/DLM230272.html)
- Heritage New Zealand. 2015. *Maori Heritage* [online]. Wellington. [Cited 5 November 2017]. [www.heritage.org.nz/protecting-heritage/maori-heritage](http://www.heritage.org.nz/protecting-heritage/maori-heritage)
- ICOMOS. 1965. *International Charter for the Conservation and Restoration of Monuments and Sites* (The Venice Charter 1964) [online]. Paris. [Cited 7 September 2017]. [www.icomos.org/venice\\_charter.html](http://www.icomos.org/venice_charter.html)
- ICOMOS New Zealand. 2007. *Charter for the Conservation of Places of Cultural Heritage Values* (revised 2010) [online]. Wellington. [Cited 5 November 2017]. [http://icomos.org.nz/wp-content/uploads/2016/08/NZ\\_Charter.pdf](http://icomos.org.nz/wp-content/uploads/2016/08/NZ_Charter.pdf)
- Kawharu, M. 2000. Kaitiakitanga: A Maori anthropological perspective of the Maori socio-environmental ethic of resource management, *Journal of the Polynesian Society*, 109(4): 349–370.
- King, M. 1984. *Maori: A Photographic and Social History*. Portsmouth, NH, Heinemann Educational Books.
- McCarthy, C. 2016, *Museums and Maori: Heritage Professionals, Indigenous Collections, Current Practice*. Routledge, New York.
- Ministry for Culture and Heritage. 2016. *The Treaty in brief* [online]. Wellington. [Cited 9 June 2019]. [www.nzhistory.net.nz/politics/treaty/the-treaty-in-brief](http://www.nzhistory.net.nz/politics/treaty/the-treaty-in-brief)
- Ministry for Culture & Heritage. 2019a. *Te Ara – The Encyclopedia of New Zealand* [online]. Wellington. [Cited 9 June 2019]. <https://teara.govt.nz/en>
- Ministry for Culture & Heritage. 2019b. *Ministry of Culture & Heritage* [online]. Wellington. [Cited 9 June 2019]. <https://mch.govt.nz>
- Ministry of Justice. 2017. *The principles of the treaty* [online]. Wellington. [Cited 5 June 2017]. [www.justice.govt.nz/tribunals/waitangi-tribunal/treaty-of-waitangi/the-principles-of-the-treaty](http://www.justice.govt.nz/tribunals/waitangi-tribunal/treaty-of-waitangi/the-principles-of-the-treaty)
- Moko Mead, H. 2003. *Tikanga Maori*. Wellington, Huia.
- Museum of New Zealand *Te Papa Tongarewa*. 2005. *Bicultural Governance*. Wellington, Museum of New Zealand *Te Papa Tongarewa*.
- Orange, C. 2011. *The Treaty of Waitangi*. Wellington, Bridget Williams Books.
- Roberts, M, Norman, W, Minhinnick, N, Wihongi, D, & Kirkwood, C. 1995. Kaitiakitanga: Maori perspectives on conservation, *Pacific Conservation Biology*, 2(1): 7–21.
- Schuster, J. and Whiting, D. 2007. Marae conservation in Aotearoa. In: D. Sully, ed. *Decolonising Conservation: Caring for Maori Meeting Houses outside New Zealand*, pp. 71–88. Walnut Creek, CA: Left Coast Press.
- Te Ahukaramu, CR. 2015. Kaitiakitanga – guardianship and conservation [online]. In *Te Ara – the Encyclopaedia of New Zealand*. Wellington. [Cited 6 November 2017]. <https://teara.govt.nz/en/kaitiakitanga-guardianship-and-conservation>
- UNESCO, ICCROM, ICOMOS & IUCN. 2013. *Managing Cultural World Heritage*. Paris, UNESCO.
- Walter, L. & Gosling, D. 2002. *Otatara Pa Historic Reserve Napier: Conservation Plan*. Gisborne, Department of Conservation.



*Ayutthaya, Thailand by Phaisan (CC0)/Pixabay.*

**Traditional  
Knowledge  
Systems and  
the conservation  
and management  
of Asia's heritage**

◊  
**Conclusions**  
◊



The objective of the Forum was to explore the potential applicability and adaptability of Traditional Knowledge Systems (TKS) in the conservation and management of heritage in Asia through the analysis of examples from across the region.

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## Context

TKS are time-tested and dynamic processes which can contribute greatly to the conservation and management of heritage in Asia and elsewhere. TKS in Asia are the product of diverse contexts and, in many cases – but not all – they were created and are still maintained by communities. The region is particularly rich in written and other documentary sources for TKS. These TKS bring benefits to the communities to which they belong, and to others: they promote social resilience, foster local identity and social cohesion, build intergenerational relationships and encourage conflict resolution. TKS can help conservation professionals to gain a deeper understanding of a given community's connection with heritage and, through this, of heritage itself, and the best means for its safeguarding. TKS can also help conservation professionals to overcome the divide between tangible and intangible heritage, and to connect cultural heritage to the natural environment in which the particular TKS is located.

However, the reality on the ground today is that TKS are all too often threatened by a range of external socio-economic pressures from the modern globalised world (such as development, tourism, changing ways of life, and commodification of heritage), as well as internal changes that occur within the knowledge-holding community. The heritage sector is also under threat from the increasing professionalisation of conservation practices, which all too often fail to recognise the importance of TKS.

The challenge, therefore, lies in reconciling TKS with modern heritage management systems, demonstrating that the two are potentially compatible and could be mutually beneficial, as various examples illustrate. Indeed, there are many TKS in use within a variety of heritage typologies (such as cultural landscapes, urban landscapes, buildings, and protected areas), related to different materials and techniques, that can serve as examples.

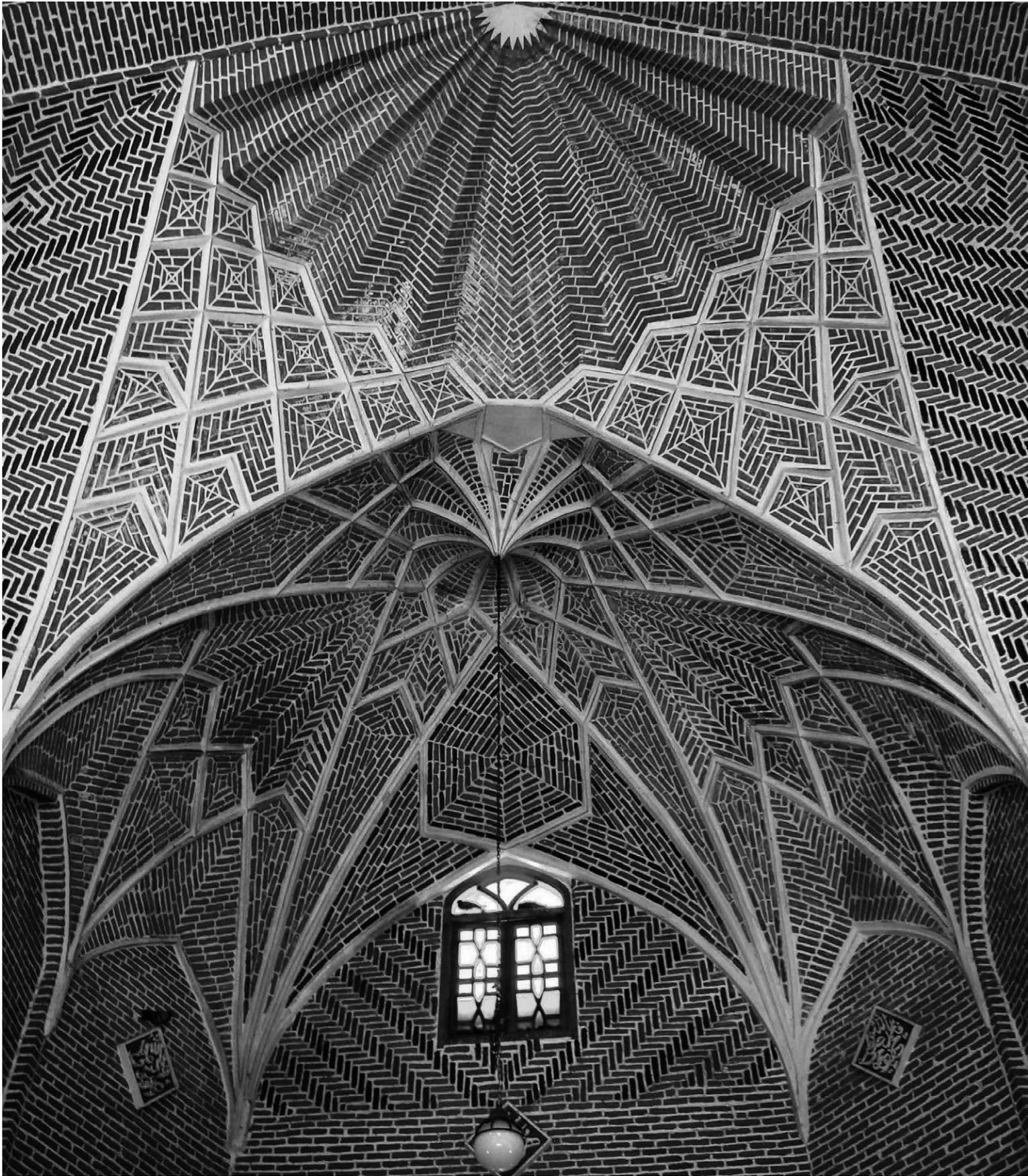


Key issues	Applications/Guidance	Target groups	Links to other Forum themes
Communities can be the source of TKS and community members are knowledge-holders. TKS can contribute to community well-being and empowerment.	<p>Decision-making should include knowledge-holders as well as professionals from the conservation and other relevant sectors throughout conservation processes.</p> <p>Conservation processes should seek to ensure that economic and other benefits are gained by communities, conservation practitioners and the heritage itself.</p>	<p>Institutions</p> <p>Professionals</p> <p>Communities</p>	Policy
TKS are already embedded in various types of management systems, and may offer financial, intellectual and human resources for conservation where the conventional management system is lacking.	<p>Analysis of existing management systems (for example, using the tool developed by ICCROM<sup>1</sup>) can highlight gaps, which TKS may well help to fill.</p> <p>TKS should be taken into consideration in people-centred approaches for the more effective conservation and management of heritage.</p> <p>TKS need to be integrated into capacity building, giving both community members and professionals confidence in TKS as valid approaches to conservation.</p> <p>In some cases it is appropriate to integrate TKS into formal legal frameworks.</p>	<p>Institutions</p> <p>Professionals</p> <p>Communities</p>	<p>Policy</p> <p>Buddhist</p>
TKS continue to evolve over time in response to changing needs, and the survival and adaptation of TKS is a sign of their robustness and relevance today. However, the social, economic, environmental and political context has changed dramatically from that in which the TKS were formulated, and this may have caused their disruption.	<p>In response to changing contexts, solutions might be sought which encourage innovation in TKS to make them more relevant to contemporary situations. At the same time, specific support mechanisms could also be considered to safeguard TKS from powerful external pressures (see above).</p> <p>Knowledge transfer of TKS from one generation to the next needs to be ensured, through the cooperation of young people with those who are more experienced. This knowledge transfer could be supported by the formal education system.</p> <p>Those TKS that have been disrupted should be studied, and an assessment should be made about whether it is possible and appropriate to restore them.</p>	<p>Professionals</p> <p>Communities</p>	<p>Authenticity</p> <p>Buddhist</p>

<sup>1</sup> Wijesuriya, G., Thompson, J. & Young, C. 2013. *Management of Cultural World Heritage*. Paris, UNESCO World Heritage Centre.



Key issues	Applications/Guidance	Target groups	Links to other Forum themes
Sources for understanding TKS include oral, written and audio-visual sources, along with processes and physical evidence. The results from data gathered on TKS can create a rich repository of information.	<p>TKS should be recognised as the intellectual property of the knowledge-holders, and their rights must be respected in the gathering and holding of associated data.</p> <p>Depending on the context and sensitivity of the information, data should be made accessible through sharing platforms; this should be considered a valuable resource for capacity building.</p> <p>There is a need to map and research the evolution of TKS (in terms of continuity and change) over time.</p>	<p>Institutions</p> <p>Professionals</p> <p>Communities</p>	
TKS should be considered a valuable resource for the heritage sector, as it seeks to overcome the divide that has been created between tangible and intangible heritage, and between natural and cultural heritage.	Conservation and management decisions should involve various sectors, including knowledge-holders, to overcome these divides.	<p>Professionals</p> <p>Communities</p>	<p>Policy</p> <p>Authenticity</p> <p>Buddhist</p>
TKS can contribute to building resilience in the face of disasters and to developing effective coping mechanisms for post-disaster response and recovery.	Disaster risk management should involve TKS for disaster mitigation, preparedness, response and recovery.	<p>Institutions</p> <p>Professionals</p> <p>Communities</p>	<p>Policy</p>
TKS are under pressure in the changing context (see above).	The impact on TKS should be given due consideration in decision-making about change, and the potential contribution of TKS should be harnessed for sustainable development.	<p>Institutions</p>	<p>Authenticity</p> <p>Policy</p>
TKS suggest context-specific solutions for conservation that potentially use natural resources in an environmentally-sustainable way, particularly in response to climate change.	The adaptations of TKS need to be understood, and further evolutions encouraged in response to changing conditions.	<p>Institutions</p> <p>Professionals</p> <p>Communities</p>	<p>Policy</p> <p>Buddhist</p>



*Tabriz Bazaar by Architect (CC0)/Pixabay.*



## Author biographies

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Having an interest in studying the material and tangible remains that allow us to understand history, Sathyabhama enrolled herself for a course in archaeology nearly four decades ago. On completing it, Sathyabhama joined the Archaeological Survey of India, of which she is now regional director (south) at Bengaluru. As most of her positions were in south India, she specialised in the field of art and architecture. Eventually, she started mulling over the management of the various temples which dot the region, and this ultimately led to her research in the same area. Sathyabhama was awarded a PhD for her work on Management of Living Heritage Sites with special reference to south India. Today she continues working in the same field.

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An alumna of the School of Planning and Architecture, New Delhi (1999), Sangeeta Bais has over 18 years of conservation experience. Sangeeta has worked with several national and international organisations, such as the National Centre for Safety of Historic Structures (NCSHS), IIT Madras, the Indian National Trust for Art and Cultural Heritage (INTACH), the Archaeological Survey of India (ASI), the Aga Khan Trust for Culture (AKTC), UNESCO and UNDP. In addition, she has been a visiting fellow at the Department of Architectural Conservation, SPA, New Delhi for the past 12 years, and has written manuals, articles and a book on lime. She was also nominated for the US Single Country project on Megacities and Urban Planning. Sangeeta is presently working on the conservation of historic monuments at the Dargah of Sufi Saint Moinuddin Chishti at Ajmer. She is also an expert member of the International Scientific Committee for Stone (ICOMOS).

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Sumedha has also worked on many other World Heritage Sites in Sri Lanka, for example at Sigiriya and Kandy. She is currently working with the UNESCO Sri Lanka Cultural Triangle Project (Central Cultural Fund), identified by UNESCO as a “model campaign” from among UNESCO’s thirty-two ongoing concurrent worldwide projects. She is conservation director, both at the World Heritage City of Anuradhapura and at the North Western Cultural Quadrangle of the Central Cultural Fund, and project manager of the Development Section of the latter’s head office.

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Robert F. McCarthy is a professional archaeologist, heritage manager, and project manager, with a wide range of experience in the archaeology of buildings, finance, accounting, economics, and heritage management in the Middle East, Africa, Europe and Asia, with both



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Her paper "Pull-down test of the rammed earth walls at Paga Lhakhang in the Kingdom of Bhutan", *International Journal of Sustainable Construction* (2014) is the winner of the Best Paper Award of the International Conference on Preservation, Maintenance and Rehabilitation of Historical Buildings and Structures.

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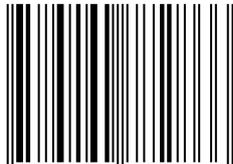
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ICCROM (the International Centre for the Study of the Preservation and Restoration of Cultural Property) is an intergovernmental organization dedicated to the preservation of cultural heritage worldwide. Through training, information, research, cooperation and advocacy programmes, it aims to enhance the field of heritage conservation and restoration, and raise awareness to the importance and fragility of cultural heritage.

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