

**Training Course on Cultural Heritage Protection
in the Asia - Pacific Region 2009**

**Research, Analysis and Preservation of
Archaeological Sites and Remains**

8 September – 8 October, 2009, Nara, Japan



Cultural Heritage Protection Cooperation Office,
Asia-Pacific Cultural Centre for UNESCO (ACCU)

Agency for Cultural Affairs, Japan

National Institutes for Cultural Properties,
National Research Institute for Cultural Properties, Tokyo
Nara National Research Institute for Cultural Properties

International Centre for the Study of the Preservation
and Restoration of Cultural Property (ICCROM)

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Nara Prefectural Government “Horen” Office Ground Floor
757 Horen-cho, Nara 630-8113 Japan
Phone: +81 (0)742-20-5001
F A X: +81 (0)742-20-5701
E-mail: nara@accu.or.jp
U R L: <http://www.nara.accu.or.jp>

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The opening ceremony at Kasugano-so Hotel



Drawing a floor plan and a section of the old farmhouse by measuring



Recording all the information obtained by investigation and observation



The closing ceremony at Kasugano-so Hotel

Contents

Preface

I Introduction

- 1. General Information 3
- 2. Programme Schedule 7

II Proceedings

- 1. Opening Ceremony 11
- 2. Summary of Training Course 13

III Country Reports by Participants 29

IV Final Reports by Participants 295

V Appendix

- A. List of Participants 397
- B. List of Lecturers 402
- C. List of Interpreter and Tutors 405
- D. Staff Members, ACCU Nara 405

Preface

The Cultural Heritage Protection Cooperation Office, Asia-Pacific Cultural Centre for UNESCO (ACCU) was established in August 1999 with the purpose of serving as a domestic centre for promoting cooperation in cultural heritage protection in the Asia-Pacific region. Subsequent to its inception, our office has been implementing a variety of programmes to help promote cultural heritage protection activities, in cooperation with the Agency for Cultural Affairs, Japan (*Bunkacho*); the International Centre for the Study of the Preservation and Restoration of Cultural Property (ICCROM); National Research Institute for Cultural Properties, Tokyo and Nara; the Nara Prefectural Government; the Nara Municipal Government; universities, and museums.

The ACCU Nara's activities include, training programmes for the human resources development, international conferences and symposia, the training of young leaders in cultural heritage protection, updating website for the dissemination of information relating to cultural heritage protection, and the world heritage lectures in high schools. In addition, ACCU Nara has recently begun offering "the Local Training Workshop" which dispatches a group of lecturers from Japan and implements the practical training on cultural heritage protection on sites. We have also set up the system of "International Correspondents" for the purpose of promoting information exchange and networking with the countries in the Asia-Pacific region, and appointed the correspondents from each country, who periodically send latest news on cultural heritage protection in their country.

In particular, the training courses on cultural heritage protection in the Asia-Pacific region have comprised a significant part of our activities for heritage protection, with two themes on alternate year: "Preservation and Restoration of Wooden Structures" and "Research, Analysis, and Preservation of Archaeological Sites and Remains." This was the tenth training course on wooden structures and sixteen participants from across the Asia-Pacific region gathered in Nara to join the course in high spirits.

The areas surrounding Nara are blessed with wealth of wooden structures, some of which have been inscribed on the World Heritage List such as Horyu-ji Temple. These old wooden structures have been preserved, repaired time to time, and handed down to us in a thousand years. Therefore much information about techniques and materials for the sustainable preservation of wooden structures has been passed down and accumulated. In addition, the philosophy or principle of the preservation and restoration was also developed.

Thus in the Nara region, there survives a large number of ancient wooden structures which are unique in the world; there are ample human resources working on a daily basis to carry out conservation; and the philosophy of restoration has been cultivated through year's experience and is widely accepted by the local community. So, ACCU Nara has chosen "Nara" as the training venue because we can take full advantage of its environment.

I believe the participants were able to learn not only the techniques and knowledge relating to conservation and restoration of wooden structures but also the important role of local community by visiting the cultural heritage on-site: the way how local people cared for the cultural heritage; their views and willingness to protect heritage and hand it down to posterity; and their daily society-wide efforts. Cultural heritage cannot be protected solely by the efforts of experts or governments. I am sure the participants understood the need and importance of respecting the views and initiative of the local community as well as joining hands with them in the conservation activities.

Finally, I would like to express my profound appreciation to the distinguished lecturers who offered their expertise in clear terms and to the organisations which provided us with generous support necessary for implementation of the training programmes. I would also like to extend my appreciation to sixteen participants, who actively took part in the programme and helped each other in a friendly atmosphere to acquire latest knowledge and techniques in a far foreign country, Japan. Success of this training depends on their future efforts in the field of heritage protection in each country.

NISHIMURA Yasushi

Director

*The Cultural Heritage Protection Cooperation Office,
Asia-Pacific Cultural Centre for UNESCO (ACCU)*



Introduction

1. General Information
2. Programme Schedule

1. General Information

Training Course on Cultural Heritage Protection in the Asia - Pacific Region 2009 - Preservation and Restoration of Wooden Structures- (8 September – 8 October 2009, Nara, Japan)

1. Organisers

This course is jointly organized by *Bunkacho* (Agency for Cultural Affairs in Japan); the Asia-Pacific Cultural Centre for UNESCO (ACCU); the International Centre for the Study of the Preservation and Restoration of Cultural Property (ICCROM); and Independent Administrative Institution, Nara National Research Institute for Cultural Properties.

In cooperation with Japan Consortium for International Cooperation in Cultural Heritage; the Ministry of Foreign Affairs of Japan; the Japanese National Commission for UNESCO; Nara Prefectural Government; and Nara Municipal Government.

2. Background

In Asia and the Pacific region, there are various forms of cultural heritage which are of great value from a global point of view. Proper investigation, analysis, preservation and development of these sites and remains are required of heritage professionals, in order to ensure that this important cultural heritage is safeguarded for future generations. ACCU Nara in partnership with ICCROM and *Bunkacho* has been organizing training courses since 2000 on this topic with a view to building the capacities of professionals who have been working on cultural heritage protection in the region. This training course aims to provide participants with latest methodology and technology on investigation, conservation and management for utilization of archaeological sites.

3. Dates and Venues

Course dates: From 8 September (Tuesday) to 8 October (Thursday) 2009

Venues: Cultural Heritage Protection Cooperation Office, Asia-Pacific Cultural Centre for UNESCO [Nara Prefectural Government “Horen” Office, 757 Horen-cho, Nara, Japan]

Additional venues: Facilities of cooperating organizations and museums; Sites in Japan such as the World Heritage sites, the historic places and archaeological sites.

4. Objectives of the Training Course

The objectives of the training course are:

- to provide participants with knowledge of recording/documentation and analytical methods for wooden architectures;
- to provide participants with knowledge of principles and methodologies for preservation of wooden structures;
- to provide participants with practical knowledge of technology/techniques and hands-on training for preservation and restoration of wooden structures;

- to provide participants with knowledge of maintenance, utilization, and risk management of historical wooden structures;
- to provide participants with an opportunity to network with colleagues from the region and share experiences.

5. Training Curriculum

● Lectures

- Global Trends in Sites Preservation
- The Japanese System for Protecting Cultural Properties
- Conservation and Utilization of Cultural Heritage Resources in Japan
- Introduction to Archaeological Prospection
- Introduction to Environmental Archaeology
- Introduction to Scientific Dating Methods
- Introduction to Dendrochronology
- Introduction to Conservation Science

● Practical Training and On-site Lectures

- Workshops: Recording of Archaeological Features and Artefacts; Conservation Treatment of Artefacts etc.
- A Study Tour on Preservation, Development and Utilization of Archaeological Sites

● Presentation and Discussion

- Presentation of the Current Status of Each Country on Cultural Heritage Protection and Exchange of Views
- Discussion of Future Issues on the Preservation of Cultural Heritage
- Recapitulation of the Training Sessions

6. Participants in the Training Course

(1) The training course is offered to the following 38 signatory countries listed on the UNESCO World Heritage Convention (see below). For application, UNESCO National Commissions or UNESCO liaison offices need to submit the following documents required for those individuals nominated no later than 20 June 2009: letters of recommendation written by the head of the organization to which a nominee belongs; an application form; a report on his/her major achievements. Provided, however, that Japan Consortium for International Cooperation in Cultural Heritage can also recommend a few applicants who failed to have NATCOM recommendation for some reason, through its members to ACCU Nara. Only in that case, the applicant can substitute NATCOM recommendation with Consortium recommendation.

*A total of 16 people, one from each country in principle, will be selected from the nominees as participants in the training course.

Afghanistan, Australia, Bangladesh, Bhutan, Cambodia, China, Fiji, India, Indonesia, Iran, Kazakhstan, Kiribati, Kyrgyz, Lao P.D.R., Malaysia, Maldives, Marshall Islands, Micronesia, Mongolia, Myanmar, Nepal, New Zealand, Pakistan, Palau, Papua New Guinea, Philippines,

Rep. of Korea, Samoa, Singapore, Solomon Islands, Sri Lanka, Tajikistan, Thailand, Tonga, Turkmenistan, Uzbekistan, Vanuatu, and Vietnam

(2) Qualification Requirements

Applicants should be:

- 1) those who are experts or equivalent and 45 years old or younger, who are engaged in the preservation, restoration or management of archaeological sites and who can make effective use of the results of the training course upon returning to his or her home country;
- 2) those who have a good command of English, the working language for all lectures, so that they can deliver presentations and write reports from the training session (ACCU Nara Office and ICCROM shall be allowed to utilize all contents of presentations and reports, including drawings and photographs, for future publication and cultural heritage protection programmes);
- 3) those who can attend the entire training programme;
- 4) those who submit all of the required documents (listed on item 10. Documents for Application) within the deadlines outlined;
- 5) those who will most likely continue exchanging information and interacting with ACCU after returning to their home countries;
- 6) those who were not previous participants in training courses organized by ACCU Nara Office (however those who have participated in the International Youth Exchange Programs can apply for this programme).

7. Notification of Screening Results

After consideration with other organizers, ACCU Nara will select 16 people (one participant per nation in principle) from among all applicants around the end of July. Each National Commission for UNESCO, Japan Consortium for International Cooperation in Cultural Heritage and successful applicants will be informed of the screening results.

8. Certificate of Completion

Each participant will be awarded a certificate upon completion of the course.

9. Language of the Training Session

English will be the working language throughout the course.

10. Documents for Application

Only complete application with necessary documents will be considered.

(1) Application Form (Form 1)

Please attach a copy of the passport, if an applicant has a valid passport.

(2) Report Relating to Cultural Heritage Preservation.

The achievement report should be written by the applicant and should be a brief summary of

present and previous work related to the theme of the course, cultural heritage protection.
This report will be heavily weighted in selection of the participants.

(3) **Letter of Recommendation by NATCOM (or by Japan Consortium)**

(4) **Letter of Recommendation by the Attending Chief Official** (Annex 1)

(5) Documentation Indicating English Proficiency (if obtained)

11. Expenses

Expenses during the Training Course shall be borne by ACCU Nara, as follows:

(1) Travelling expenses:

Each of the participants (except those from New Zealand) shall be provided with an economy class return air ticket from the nearest international airport from their residence to Kansai International Airport, and transportation fees between Kansai International Airport and Nara.

(2) Living expenses:

Participants shall be provided the basic living expenses incurred during the training course from 8 September (Tuesday) to 8 October (Thursday) 2009. Arrangements for accommodations (a room for single occupancy) will be made by ACCU Nara

12. Secretariat

Cultural Heritage Protection Cooperation Office,
Asia-Pacific Cultural Centre for UNESCO (ACCU Nara)
Nara Prefectural Government "Horen" Office,
757 Horen-cho, Nara 630-8113 JAPAN
Tel: +81-(0)742-20-5001
Fax: +81-(0)742-20-5701
E-mail: nara@accu.or.jp

2. Programme Schedule

Date			Morning (9:30-12:30) (Lecturer / Venue)	Afternoon (13:30-16:30) (Lecturer / Venue)
September	8	Tue.	Opening Ceremony (ACCU Nara)	Orientation Session (ACCU Nara)
	9	Wed.	History of Wooden Architecture in Japan / Cultural Heritage Protection System in Japan (NISHI Kazuhiko / ACCU Nara)	Conventions and Charters pertaining to Cultural Heritage Protection (NISHI Kazuhiko / ACCU Nara)
	10	Thu.	International Cooperation for Cultural Heritage Protection (SHIMIZU Shin-ichi / ACCU Nara)	Restoration of Architectural Heritage in Japan (TANAKA Sadahiko / ACCU Nara)
	11	Fri.	Site Visit: Historic Monuments of Ancient Nara, the World Heritage Site [Joining ASEAN Excursion]	
	12	Sat.		
	13	Sun.		
	14	Mon.	On-site Lecture: Restoration of Architectural Heritage in Practice (Chion-in, Kiyomizu-dera Temple, Kyoto)	
	15	Tue.	Restoration Systems and Project Planning for Wooden Structures (KAMEI Nobuo / ACCU Nara)	Orientation for the Practical Training: Overall Processes of Conservation (HATANO Tsuneo / ACCU Nara)
	16	Wed.	Practical Training: Recording/Documentation of the Old Farmhouse of Tanaka Family (one of municipally-designated tangible cultural properties by Nara City) (HATANO Tsuneo, IMANISHI Yoshio, and YAMAGUCHI Isamu / Nara)	
	17	Thu.		
	18	Fri.		
	19	Sat.		
	20	Sun.		
	21	Mon	Risk Management of Cultural Properties (INABA Nobuko / ACCU Nara)	Introduction to Architectural Heritage in Asia (Gamini Wijesuriya/ ACCU Nara)
	22	Tue.	Presentation and Discussion: Country Reports by Participants I (INABA Nobuko & Gamini WIJESURIYA / ACCU Nara)	
	23	Wed.		
	24	Thu.	On-site Lecture: Survey Methods on Conservation of Vernacular Houses and Townscape (SHIMADA Toshio / Naramachi District)	
	25	Fri.	On-site Lecture: Survey on Painting and Plans for Painting Restoration (KUBODERA Shigeru / Todai-ji Temple)	
	26	Sat.		

October	27	Sun.		
	28	Mon.	Prevention of Insect Damage to Wooden Structures (KOMINE Yukio / ACCU Nara)	On-site Lecture: Reconstruction of Ancient Buildings in the Nara Heijo Palace Site (HAKOZAKI Kazuhisa / NNRICP)
	29	Tue.	Management of Wooden Structures / Safeguarding of Traditional Techniques (NAGAO Mitsuru / ACCU Nara)	Conservation Science for Wooden Materials (KOHDZUMA Yohsei / NNRICP)
	30	Wed.	Study Tour: Preservation of the Citadel - Hikone-jo Castle (Hikone, Shiga Pref.)	
	1	Thu.	Study Tour: Preservation of Vernacular Houses and Townscape I - Shirakawa (Shirakawa, Gifu Pref.)	
	2	Fri.	Study Tour: Preservation of Vernacular Houses and Townscape II - Takayama (Takayama, Gifu Pref.)	
	3	Sat.		
	4	Sun.		
	5	Mon.	Introduction to Dendrochronology: Tree Species and Annual Rings (OKOCHI Takayuki / NNRICP)	Lecture: Future Tasks in the Preservation of Cultural Properties (Theory and Practice) I (Ashley de VOS / ACCU Nara)
	6	Tue.	Discussion: Future Tasks in the Preservation of Cultural Properties (Theory and Practice) II (Ashley de VOS / ACCU Nara)	
	7	Wed.	Writing Final Report (ACCU Nara)	
	8	Thu.	Submission of Final Reports / Summary and Evaluation / Closing Ceremony (ACCU Nara)	

ACCU Nara: Cultural Heritage Protection Cooperation Office, Asia-Pacific Cultural Centre for UNESCO
 NNRICP: Nara National Institute for Cultural Properties



Proceedings

1. Opening Ceremony
2. Summary of Training Course

1. Opening Ceremony

The opening ceremony of the 2009 training course was held on 8 September 2009 at the Kasugano-so reception hall in Nara City, with sixteen course participants and honourable guests from the Agency for Cultural Affairs, Japan (*Bunkacho*), Nara National Research Institute for Cultural Properties (NNRICP), Nara Prefectural Government and Nara Municipal Government.

The opening addresses were given by Mr. SHIMAZU Masakazu, Senior Councilor, Asia-Pacific Cultural Centre for UNESCO (ACCU); Mr. NISHIMURA Yasushi, Director, ACCU Nara Office; Mr. TANAKA Kentaro, Deputy Head, Office for International Cooperation on Cultural Properties, Cultural Properties Department, *Bunkacho*; Mr. KOEZUKA Takayasu, Deputy Director, Nara National Research Institute for Cultural Properties; Mr. ICHIRYU Shigeru, Director, Department of Culture and Tourism, Nara Prefectural Government; and Mr. NISHIOKA Yasuo, Cheif, Cultural Assets Division, Nara Municipal Board of Education. In the above mentioned speeches, organisers and guests extended warm greetings to all participants and stressed the importance of mutual understanding and international network in the field of cultural heritage protection and wished their stay in Nara will be fruitful and enjoyable. Mr NISHIMURA hoped that all participants take this opportunity to exchange information and views on issues of cultural heritage protection as well as to broaden their knowledge of Japan during their stay for one month. At the end of the ceremony, the participants introduced themselves and a group photo was taken with staff and guests.



Mr. Shimazu of ACCU



Mr. Nishimura, Director of ACCU Nara Office



Mr. Tanaka, from *Bunkacho*, Agency for Cultural Affairs, Japan



Mr. Koezuka from NNRICP



Mr. Ichiryu from Nara Prefectural Government



Mr. Nishioka from Nara Municipal Government

After the ceremony, the participants proceeded to the Nara Prefectural Office, where they were welcomed by the Deputy Governor of Nara Prefecture, Mr. KUBOTA Osamu. He greeted them and gave brief overview of Nara Prefecture, and the participants also asked him about the prefecture. Then, they were ushered to the roof floor of the government building, where many historical monuments designated World Heritage can be observed with fine views. In the afternoon, an introduction to the training course was given regarding the course theme, objectives, logistics, and requirements. Following this, presentation about daily life in Japan for visitors was made, followed by an open question period.



Meeting with Deputy Governor of Nara Prefecture, Mr Kubota

2. Summary of Training Course

Various experts delivered a series of lectures during this Training Course. The following is a complete list of the lectures with a brief description of their contents.

■ History of Wooden Architecture in Japan / Cultural Heritage Protection System in Japan / Conventions and Charters pertaining to Cultural Heritage Protection (9 Sept.) NISHI Kazuhiko (Agency for Cultural Affairs, Japan)

- Introduction to various types of Japanese architecture and their respective features
- A lecture on “Law for Protection of Cultural Properties” in Japan: its history and contents
- Mr Nishi also referred to intangible cultural heritage in Japan while showing a video of traditional performing arts, *noh* and *kabuki*.
- Lectures on classification of cultural properties in Japan; how national and regional governments or local communities make their efforts to protect cultural properties.
- Introduction of the World Heritage in Japan, matters concerning to conventions and charters on cultural properties, and related international organisations for conservation of cultural heritage



Lecture by Mr Nishi

■ International Cooperation for Cultural Heritage Protection (10 Sept.) SHIMIZU Sin-ichi (NRICPT)

- Lectures on the significance of international cooperation for cultural heritage protection: introduction of UNESCO international campaigns and international conventions and charters
- Taking up particular cases, Mr Shimizu explained the detailed contents of Japanese international cooperation and supporting organisations.
- At the end, a lecture concluded on issues and future tasks on international cooperation.



Lecture by Mr Shimizu

■ Restoration of Architectural Heritage in Japan (10 Sept.) TANAKA Sadahiko (Agency for Cultural Affairs, Japan)

- Fundamental principles of cultural heritage protection based on the Venice Charter
- Introduction of typical wooden structures in Japan (Horyu-ji Temple, Ise-jingu Shrine and Itsukushima-jinja Shrine) as well as the guidelines underneath for their restoration planning
- Japanese traditional construction techniques applied to wooden structures such as *tsugite* (joinery including spliced and angled joints) and *hagiki* (partial planking);



Lecture by Mr Tanaka

technologies for lacquering and painting on wood

- How to restore architectural heritage while preserving principles of heritage protection
- Viewing DVD on the entire restoration process of Osakihachiman-gu shrine from its dismantlement to reassembly

■ **Site Visit: Historic Monuments of Ancient Nara, the World Heritage Site (11 Sep.)**

MORIKAWA Minoru (NNRICP), YABUNAKA Ioki (Kofuku-ji Temple), SAGAWA Fumon (Todai-ji Temple) and IMAI Yuji / NAKANO Kazumasa (Kasuga-taisha Grand Shrine)



Observing the excavation site of Nandai-mon gate

- At the excavation site of Nandai-mon gate at Kofuku-ji Temple, participants observed the differences in soil colour of strata on a fault plane while being lectured new findings of excavation survey and also newly clarified matters through comparison with unearthed structural remains and ancient drawings of the site.
- At Kofuku-ji Temple, lectures were given on the architectural transition of wooden structures in the precinct and on restoration work of foundation platform of Chukon-do hall, which is currently being restored, including restoration guidelines applied for that.
- Visiting *jikido* (refectory) site preserved under the treasure



Lecture by Mr Morikawa at Nandai-mon gate



Observing the different colours of strata



Lecture by Mr Yabunaka at the Kofukuji Temple



Learning transition of the wooden structures

house as one example of structural remains preservation methods, different from Chukon-do hall site. Participants in the training course joined the group from NEACH (Networking on East Asia Cultural Heritage) to visit Daibutsu-den, Great Buddha hall, of Todai-ji Temple, and Kasuga-taisha Shrine.

- Lectures on Daibutsu-den: the history, current disaster prevention plans and management issues
- Lectures on Shintoism which worships nature spirits and coexists with surrounding nature; on ceremonial reconstruction of the shrine buildings every 20 years while strictly adhering to the original style.

They also visited the virgin forest surrounding Mt. Kasuga and enjoyed watching *bugaku* (traditional dance with musical accomplishment).



Joined the NEACH group at Todai-ji Temple



Lecture by Mr Sagawa at Todai-ji Temple



Observing Daibutsuden of Todai-ji Temple



Observing Kasuga-taisha Shrine



Observing a bugaku performance



Observing Kasuga-taisha Shrine



Observing the Chion-in Temple



Lecture by Mr Takeshita



Observing Kiyomizu-dera Temple



Lecture by Mr Shiraishi



Lecture by Mr Kamei

■ On-site Lecture: Restoration of Architectural Heritage in Practice (14 Sep.) TAKESHITA Hiroshi / SHIRAISHI Etsuji (Kyoto Prefectural Board of Education)

Participants visited the site of preservation repair of Shuedo building in the precinct of Chion-in Temple, and observed the repair work in progress. The building was repaired four times before, and the latest reconstruction was done in 1924. On-site lectures were given on the following topics:

- Management system of cultural properties in Kyoto Pref. and Chion-in Temple
- Two main purposes of the repair work of Shuedo building are to replace the roof and to correct the sagging edges of the eaves.
- Both traditional and latest techniques are used for restoration: for example, new materials in appropriate places are used in roof frames, dampers, bracings and wall panels with mud plaster

At Kiyomizu-dera Temple, they also observed restoration sites at different phases of progress: *umatodome* (where visitors stabled their horses), *kita-so-mon* gate and *koyasu-to* pagoda.

- Detailed features of each structure in the precinct
- Countermeasures against earthquakes
- Problems with growing numbers of visitors

■ Restoration Systems and Project Planning for Wooden Structures (15 Sep.) KAMEI Nobuo (JACAM)

- Japanese legal systems for protection of cultural properties
- Different types of conservation and restoration projects: partial repairs, major repairs and others such as relocation
- System of conservation projects; the owner of the cultural property repairs it under the guidance of national, prefectural and municipal government, and eligible conservation architects supervise whole process of conservation projects.
- A flow of a conservation project was introduced from planning to final report as well as a list of necessary surveys and preparation.
- Presentation of the whole process of restoration work as a case study, the Seki Family Residence, an Important Cultural Property designated by Japanese Government

■ **Orientation for the Practical Training: Overall Processes of Conservation** (15 Sep.) HATANO Tsuneo (JACAM)

- The introduction of practical restoration processes from planning, design to implementation
- Each step in the repair project was explained in detail.
- After checking the workflow of the practical training for the next day, basic precautions were given.



Lecture by Mr Hatano

■ **Workshop: Recording/Documentation of the Old Farmhouse of Tanaka Family** (16 -18 Sep.) HATANO Tsuneo (JACAM), IMANISHI Yoshio (Nara Pref.) and YAMAGUCHI Isamu (Nara City)

- Lectures on an outline of architectural features of Japanese farmhouse and on relocation of Tanaka residence to the present site
- Japanese basic building methods in general; a *tatami* matting has been used as an architectural module in Japan.
- Hands-on training session:
 - Drawing floor plans and cross-sections of the farmhouse on a scale of 1 to 50 by measurements
 - Recoding dimensions and used materials: wood species, quality, preparation process and shape
- Visiting Toshodai-ji Temple with lectures of its history and a distinctive architectural feature while observing how the restoration was done on *kondo* (golden hall), *kodo* (lecture hall), *kyozo* (sutra repository), *hozo* (treasure house) and *raido* (worship hall)
- At the end of three-day practical training, both lecturers and participants commented on their elaborated works.



Lecture by Mr Imanishi



Advice by Mr Yamaguchi

■ **Risk Management of Cultural Properties** (21 Sep.) INABA Nobuko (Tsukuba University)

After the explanation of post-disaster situation of the Great Hanshin-Awaji Earthquake with photographs, participants were asked to consider what they would have done in the face of catastrophe as a conservation architect.

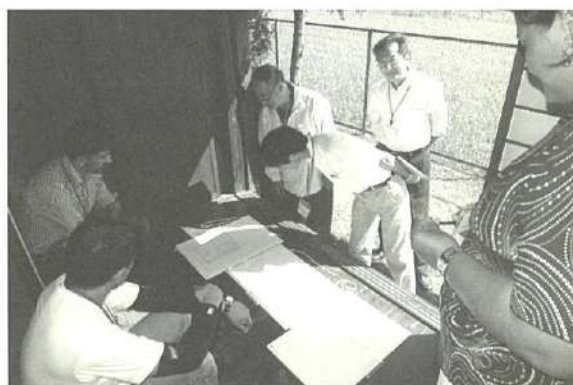
- One of the most important management against natural disasters is the risk preparedness for cultural heritage.
- An introduction of Japanese risk management system for cultural heritage: current status and problems in addition to overseas cases.
- Exchange information and opinions on risk management



Lecture by Ms Inaba



Drawing the floor plan of the house by measuring in a group



Comments by Lecturers



Discussion in the Old Farmhouse



Advice from Mr. Hatano

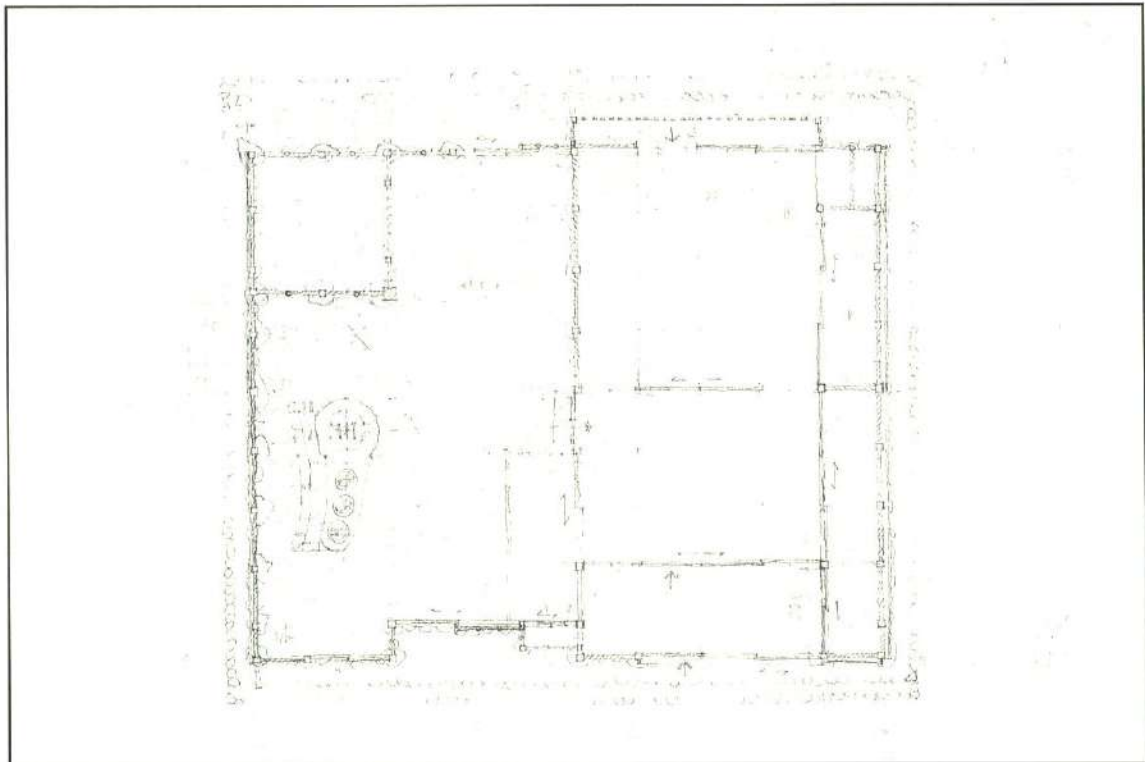


Drawing the section of the house

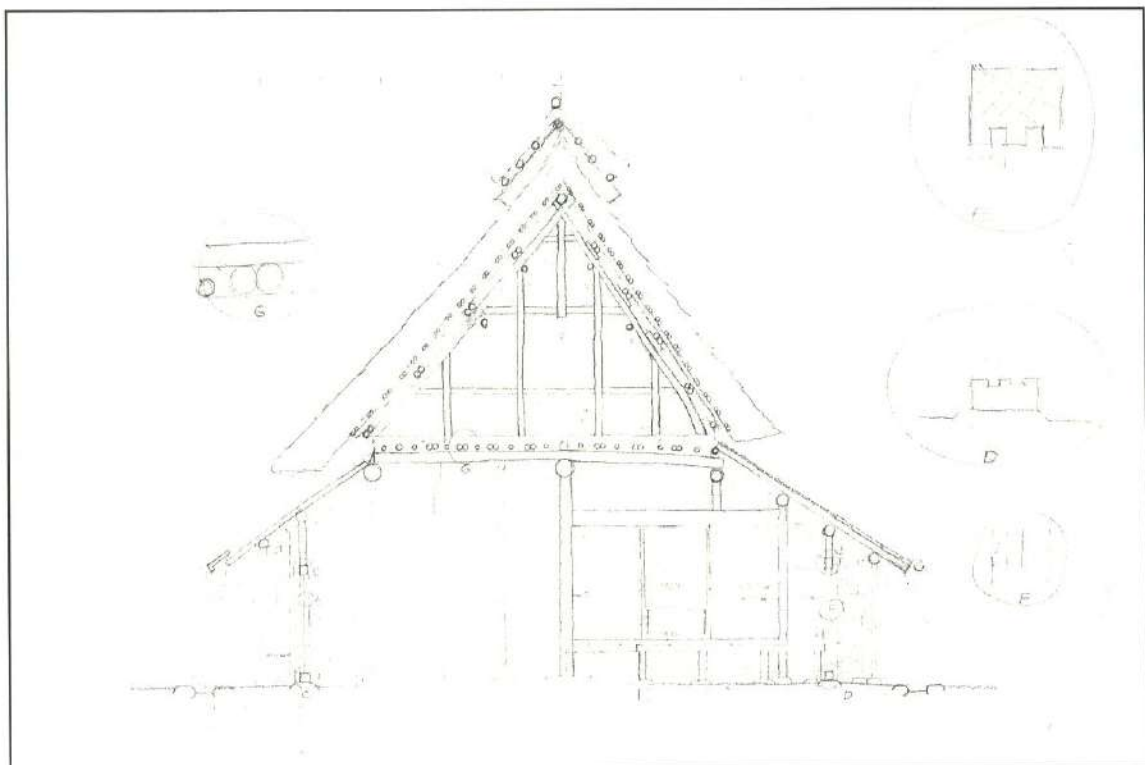


Lecture by Mr Imanishi at Toshodai-ji Temple





Drawing of the old Farmhouse of the Tanaka family floor plan measured by
Ms Arachchige, Mr Hiengkaew, Mr Narmetov and Ms Nguyen



Drawing of the old Farmhouse of the Tanaka family section measured by
Mr Muhammad, Mr Aquino and Ms Viliamu

■ Introduction to Architectural Heritage in Asia (21 Sep.) Gamini WIJESURIYA (ICCROM)

The lecture was delivered from multiple perspectives by incorporating participants' opinions and experiences.

- ICCROM's role and efforts in conservation and restoration of cultural heritage
- Introduction of different types of architecture among Asian countries while showing specific examples
- Global trends in the conservation of wooden structures, based on the Venice Charter and the Nara Document on Authenticity



Lecture by Mr Wijesuriya

■ Presentation and Discussion (22 - 23 Sep.)

INABA Nobuko (Tsukuba University) and Gamini WIJESURIYA (ICCROM)

Each participant made a presentation on the present situation and needs for cultural heritage protection in their respective speciality. Both common and unique challenges in their countries were raised by the presentation, and Ms Inaba introduced the Japanese case and facilitated the discussion in the class. Mutual understanding among participants and lectures seemed to be deepened through question-and-answer sessions.



Mr Wangchuk from Bhutan



Ms Ochirsuren from Mongolia



Participants presented country reports in their respective fields



Ms Viliam from Samoa presented her country report

■ **On-site Lecture: Survey Methods on Conservation of Vernacular Houses and Townscape** (24 Sep.) SHIMADA Toshio (NNRICP)

- The overview of Gango-ji Temple in the Naramachi district: its origin, history, and features of wooden structures in the precinct
- Practical procedures on townscape investigation: the purpose of survey, methods of investigation, comprehensive survey of the present situation and preparation of the report
- The historical landscape of Naramachi; its history, efforts for preservation and transition to the present
- Strolling the Naramachi district with a map to observe old houses/shops and streets under the guidance of Mr Shimada



Lecture by Mr Shimada



Lecture by Rev. Tsujimura at the main hall



At Gokurakubo-zenshitsu of Gango-ji Temple



Observing fire extinguishing systems at Gango-ji



Observing Nara-machi Town

■ **On-site Lecture: Survey on Painting and Plans for Painting Restoration** (25 Sep.)

KUBODERA Shigeru (NNRICP)

- Practical training tasks were to investigate and record the present state of the colouring in the assigned area on Jibutu-do hall, Todai-ji Temple; and to draw a painting restoration plan along with some rationale.

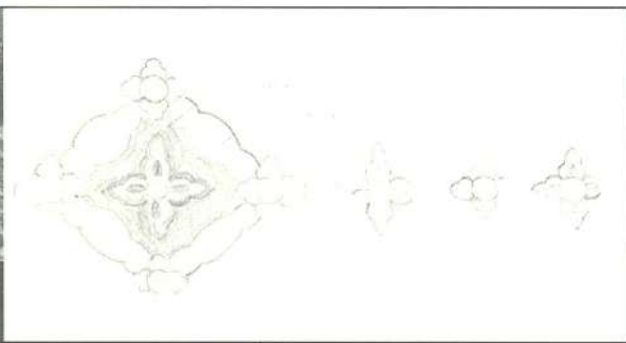


Lecture by Mr Kubodera

- Discussion on how to reconcile conflicting interests and different opinions with owners in each country on colour restoration plans
- Lecture's review and discussion: several principles for restoration of painting in Japan.



Each participant recorded the state of paint in assigned locations at Jibutsu-do Hall of Todai-ji Temple



Drawing made by Mr U Min Min from Myanmar

■ Prevention of Insect Damage to Wooden Structures (28 Sep.)



Lecture by Mr Komine

KOMINE Yukio (Japan Institute of Insect Damage to Cultural Properties)

- Introduction of damaged cultural properties by insects in Japan; various types of harmful insects and their habitat environment; comparison of damage caused by main termites in Japan; and measures to control insect damage
- Discussion on effective countermeasures against insect damage while observing the damaged various woods and paper brought as a sample by Mr Komine

■ On-site Lecture: Reconstruction of Ancient Buildings in Nara Heijo Palace Site (28 Sep.) HAKOZAKI Kazuhisa (NNRICP)

- The outline of Heijo Palace Site was lectured at the Excavation Site Exhibition Hall: its history

from excavation, preservation, and to utilisation.

- Observation of whole Heijo Palace Site from the Second Imperial Audience Hall site and how the site was managed.
- Participants visited *Toin-teien*, the Eastern Palace Garden, reconstructed in 1998 in the southeast corner of the Heijo Palace as an example of reconstruction.
- Lectures on the process of reconstruction: its policy, and how various issues concerning the conservation was solved



At the Exhibition Hall of the Heijo Palace



Lecture by Mr Hakozaki

■ Management of Wooden Structures / Safeguarding of Traditional Techniques

(29 Sep.) NAGAO Mitsuru (Agency for Cultural Affairs, Japan)

- Four important guidelines for drawing a conservation master plan for important cultural property buildings were introduced; those guidelines are mutually related.
 - Preservation and Maintenance
 - Preservation of Integrity of Surroundings
 - Risk Preparedness
 - Utilisation
- The Japanese system to protect traditional conservation techniques for cultural properties
- Specific examples and efforts were presented to inherit traditional techniques: training of conservation architects, training of conservation craftsmen and acquisition of materials for repair
- It was emphasized that conservation techniques should be preserved and passed down the generations.



Lecture by Mr Nagao

■ Conservation Science for Wooden Materials

(29 Sep.) KOHDZUMA Yohsei (NNRICP)

- Characteristics of wood, from the perspective of growth and structure of wood, chemical constituents, physical properties and mechanical properties
- Adhesion of wood: types of natural glues in Japan, the effect of adhesion and adhesion mechanism



Lecture by Mr Kohdzuma

- Traditional adhesive techniques established in each country should be respected.

■ **Study Tour: Preservation of the Citadel, Hikone-jo Castle** (30 Sep.) SHIGAYA Masatsugu / KITAGAWA Kyoko / MITSUO Giro / TANIGUCHI Toru / and HAYASHI Akio (Hikone-shi Board of Education)

- Lectures on Hikone-jo Castle: its history and unique design in comparison with other Japanese castles
- Visiting excavation sites: the long house gate of old Ikeda clan's residence and the Raku-raku-en building in Genkyu-en Garden, which was dismantled for restoration.
- Observation of the stonewalls, turrets, the main keep and the long stable in the castle under the guidance of lecturers

■ **Study Tour: Preservation of Vernacular Houses and Townscape I, Shirakawa** (1 Oct.) KONDO Hisayoshi (Shirakawa-mura Board of Education) and MATSUMOTO Keita (The World Heritage Shirakawa-go *Gassho* Style Preservation Foundation)

- The essential role of local communities toward the preservation of Shirakawa as a historic village
- Regulatory frameworks for landscape conservation
- The needs for protection of the surrounding environment
- Problems and solutions after its designation on the World Heritage List
- Observation of *gassho* style architecture: the structures and features
- Explanations of preservation conditions of each *gassho* style house situated in the World Heritage zone

■ **Study Tour: Preservation of Vernacular Houses and Townscape I, Takayama** (2 Oct.) TANAKA Akira (Takayama Folk Museum) and IWATA Takashi (Takayama Municipal Board of Education)

- Lectures on historical and folkloric materials in the Hida area at *kyodokan*, Takayama Folk Museum; and the historic townscape of Takayama at the City Memorial Hall
- Participants learned the features of old merchant houses along the old streets by strolling in the conservation areas of Important Preservation District for Groups of Historic Buildings.
- They also visited Yoshijima House built in 1907, an Important Cultural Property of Japan



Lecture by Mr Mitsutani

■ **Introduction to Dendrochronology: Tree Species and Annual Rings** (5 Oct.)

MITSUTANI Takumi (NNRICP)

- Introduction of tree species commonly used in Japan
- Introduction of dendrochronology: survey methods and data collection
- The role of dendrochronology and its future potential in the restoration planning



Observing Genkyuen garden



Observing the Rakurakuen site



Observing Hikone castle



Overlooking the whole Shirakawa-mura from the observation platform



Learning conservation efforts in a heritage zone



At Yoshijima house, Important Cultural Property



Observing historic townscape in Takayama city



- Case studies of dendrochronological investigation: Horyu-ji Temple, Shoso-in, and the main hall of Toshodai-ji Temple etc.

■ **Lecture and Discussion: Future Tasks in Preservation of Cultural Properties I and II** (5-6 Oct.) Ashley de VOS

- The community plays an essential part for conservation to protect values; only local community can conserve their own heritage.
- Introduction of important charters, principles and terminology involved in conservation of cultural heritage
- “The Vulnerable Cultural Heritage of South and South-east Asia”, a presentation of typical wooden structures in the region
- Global trends in conservation with reference to the Venice Charter, the Nara Document on Authenticity and the Burra Charter.
- Discussion on several topics such as “understanding”, “Conservation”, “Laws and Charters”; current status in each country; possible future activities necessary for conservation

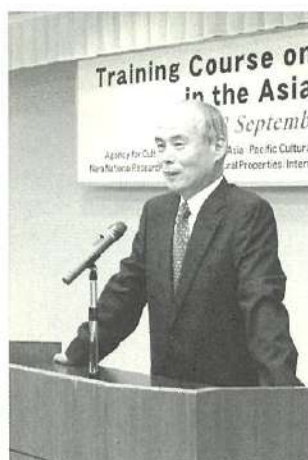


Lecture by Mr de Vos

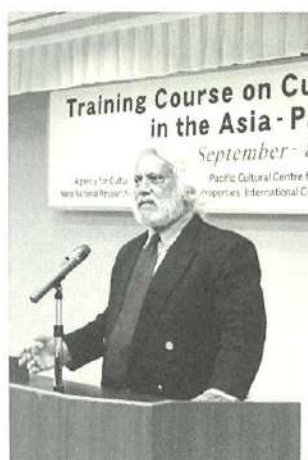
■ **Writing Final Report** (7 Oct.)

■ **Submission of Final Report / Closing Ceremony** (8 Oct.)

The closing ceremony was held at Kasugano-so Hotel in the afternoon. Mr Nishimura, Director of ACCU Nara Office, made the closing address and wished their newly acquired knowledge and techniques from the training programme would bear fruit in the field of cultural heritage protection. Mr Ashley de Vos also made a speech and congratulated the completion of the training programme and wished the best of luck for all the participants in the future back into their own countries. Then, Mr Nishimura awarded a certificate of completion to each participant with words of appreciation of their efforts. Ms Mainifo Viliamu from Samoa and Mr Salman Muhammad from Pakistan made speeches and expressed their acknowledgements and gratitude for the organisers and lectures on behalf of all participants.



Closing address by
Mr Nishimura



Closing address by
Mr de Vos



Awarding a certificate to Mr Hiengkaew



Country Reports by Participants

Bangladesh

Khondker Zahidul KARIM

Archaeological Engineer

Department of Archaeology

Ministry of Cultural Affairs

Problems and Needs for Cultural Heritage Protection and Restoration Activities in Bangladesh

Introduction

Bangladesh, which was established as an independent country in 1971, is bounded on the north, west and east by India, in the extreme southeast by Myanmar, and on the south by the Bay of Bengal. Except for a few low hill ranges on its northeast and eastern fringes, the entire country is almost flat and level, and is essentially deltaic in nature. In fact, it is the largest delta in the world, and truly the gift of three mighty rivers, the Brahmaputra, the Padma (Ganges) and the Meghna. These three rivers, together with their innumerable tributaries, sweep across the vast basin in a bewildering network of channels and streams. These rivers have made and remade the history of the country, and are largely responsible for shaping the destiny of the land and its people.

Historical Background

The early history of Bangladesh is mostly legendary. From the 3rd century BC to the 12th century AD, the northern and western part of the country (then known as Pundrovardhana) was ruled successively by the great Mauryas (3rd century BC), the Guptas (4th - 6th centuries AD), the Palas (8th - 12th centuries) and the Sena rulers (11th - 12th centuries) until the latter's rule was overtaken by the Muslims in 1204 AD. The central part known as Vanga ((Banga, Bangala, or Bangladesh) was ruled by some semi-independent and less well known dynasties. Lastly, from the 7th to the 11th centuries the southern and eastern part of Bangladesh was ruled independently in successive fashion by Buddhist Khadga, Deva and Chandra rulers of the Samatata Kingdom, situated in the trans-Mugha region.

With the conquest of the north and western part of Bengal by Bakhtiar Khilji in 1204 AD, a new era was ushered into the history of Bengal. Over the next two centuries, the whole of old Bengal was gradually brought under Muslim rule. It broke away from Delhi in 1338. For more than two hundred years from 1342, Bengal remained independent until it was subjugated by the Mughals in 1576 AD. Subsequently it remained a rich province of the Mughal empire, until the death of the last great Mughal

emperor Aurangajeb in 1707 AD. In 1757 Bengal was occupied by the British East India Company, and colonial rule continued for nearly two hundred years.

In August 1947, the Indian subcontinent along with east India gained independence from British rule, and the two separate countries of India and Pakistan were formed. At that time Pakistan had two parts: East Pakistan and West Pakistan. The erstwhile East Pakistan emerged as an independent country on March 26, 1971, and was renamed Bangladesh, through a war of liberation. The war ended on December 16, 1971 with the victorious Bangladesh forces accepting the surrender of the occupying army.

Bangladesh is heir to a rich cultural legacy. Over two thousand years of its rich history, many famous dynasties of kings and sultans have ruled and disappeared, leaving marks of their intellect in the shape of splendid cities and monuments, the barren ruins of which are still evident in many places throughout the country.

Landmarks of heritage in Bangladesh range from the 3rd century BC of antiquity to the 19th century AD, before our independence. In the time of East Pakistan, the total inventory of our protected monuments amounted to 152, but now it has increased to 330, including two UNESCO World Heritage sites. These sites include Paharpur (an 8th century Buddhist monument) and a group of monuments at Bagerhat (a 15th century mosque city). We also have innumerable movable antiquities, which are increasing gradually as a result of a growing number of archaeological excavations every year.

During more than two thousand years of its history a large number of prosperous cities, fortified palaces, huge Buddhist monasteries and stupas, magnificent temples, monumental gateways, victory towers, mosques and mausoleums as well as other public buildings were built by various rulers of the country. Most of these noble monuments have perished with the passage of time and at the hands of various destructive forces of nature and man. But those that still survive are not insignificant.

Protection of the Cultural Heritage and My Organization

The Department of Archaeology is my organization. It is a sister organization of the Ministry of Cultural Affairs of the government of Bangladesh. The Department of Archaeology is the only government agency of Bangladesh that bears the main responsibilities for preservation, restoration and excavation of cultural heritage in the country. Taking care of those cultural sites is the prime function of the organization.

There are four sections in the Department of Archaeology. These are as follows.

Conservation Section. This section controls the conservation, restoration and preservation of all monuments under the Department's protection. It also estimates the costs of conservation and conducts documentation of monuments, which are recorded through detailed drawing and design.

Excavation and exploration section. The responsibilities of this branch are to explore and excavate undiscovered monuments.

Chemical section. This section performs chemical treatments for plant and fungus growth on wall surfaces, and for salinity on standing monuments found in excavations.

Publication section. This section publishes books and journals on the basis of information obtained from survey and excavation. It also operates a library to aid research in relevant fields.

Problems of Cultural Heritage Protection

The cultural heritage of Bangladesh is endangered at the moment due to various reasons and problems. This cultural heritage is threatened in Bangladesh as it is throughout the world by numerous factors such as population pressure, irregular planning, haphazard development and expansion, ill-managed tourism, changes in the attitudes, values and lifestyles of local dwellers/owners, functional changes, and many other reasons. The problems encountered by the custodians of cultural property in Bangladesh can be summarized as follows.

Religious influences. Attempts to restore religious sites and monuments has endangered historic aspects of these ruins due to their "sacred" nature, which makes them important to the majority of the public. Most of our monuments are inseparably tied up with the religion of the majority of the citizens and this often makes it difficult to maintain a balance between the conflicting interests of science and religion.

Influence of tropical climatic conditions. The condition of many monuments is alarming due to their age and the tropical climatic conditions. Regular maintenance on a permanent basis is necessary in a tropical climate with a lot of rain.

Problems due to private ownership of monuments. Some of the most important historical monuments are not owned by the government. These still remain in the hands of private individuals who may not extend the appropriate respect that is due to such buildings.

Lack of financial resources. Many cultural heritage properties are threatened with degradation or destruction because of a lack of financial resources for their preservation and restoration.

Lack of finances is one of the major obstacles to upgrading conservation activities. The Department of Archaeology, the main state body responsible for conservation programmes in the country finds it difficult to start more conservation programmes due to the lack of finances. Also there are no suitable funds available to lend to private owners for repairing buildings when necessary.

Lack of required staff. The Department of Archaeology has a very limited staff. This lack of manpower therefore restricts the Department's qualitative and quantitative capabilities. The handling of protection activities for cultural heritage has become very difficult because of the low number of persons on the staff.

Lack of training programmes. The officers and junior staff engaged in protection activities for cultural heritage do not have enough opportunities for training in their work. Therefore their technical and theoretical knowledge is not sufficient. This directly affects the protection of our cultural heritage.

Lack of public awareness. A decrease in respectful attitudes toward public property, the lack of public awareness about cultural properties, and immunities enjoyed by the diplomatic community also seriously affect the protection of cultural properties. Lack of sufficient public awareness programmes in this regard may be the main cause of this situation.

Deforestation. Clearing of forest areas is progressing very rapidly due to rapid population growth, and this destroys ancient sites and monuments.

Agricultural activities. The increasing activities of agricultural cultivation also destroy ancient sites and monuments.

Uncontrolled human and animal intervention.

Spreading of population.

Popularity of archaeological trade. At first, treasure hunters destroyed these places to find valuable things to keep, but today this is happening because of the demand in the local and international markets. Another reason for this is the reduced penalties for looting. Over the past two decades, there has been an alarming increase in organized and conscious theft and vandalism, and in the illicit trade and traffic of cultural property. This has now become a great threat to our precious heritage and demands the immediate attention of all authorities and professionals involved.

Weaknesses in the conservation procedures. Weaknesses in the conservation procedures are also affecting the protection of cultural heritage. Due to the lack of training, funds, skilled personnel, the

appropriate modern techniques and machinery, etc., conservation procedures are weak in many areas. These weaknesses affect the protection of cultural heritage.

Inadequacies of existing legislation. Various kinds of acts have been prepared by the institutes which have the legal power to conduct archaeological work in Bangladesh. But the inadequacy of penalties and some weaknesses in rules and regulations are still creating problems.

Influence of large-scale development processes. As Bangladesh is a developing country, the archaeological landscape we have inherited is critically threatened by various large-scale development projects.

Access and communication problems. Most of the architectural heritage sites in Bangladesh are located in remote and sometimes almost inaccessible places, causing many constraints in regards to their maintenance and restoration.

Lack of proper documentation. Advanced architectural conservation is based on experience in architectural heritage recording and information management. The first conservation levels are associated with knowledge. Knowledge entails documentation as a fundamental aspect of preserving cultural heritage. Architectural records, and information generated from them, play vital roles in the conservation process. In that context, and prior to any conservation measures, architecture must be documented, analyzed and viewed as the result of its evolution and history. The conservation of architectural heritage entails a consideration of the material as well as the immaterial aspects of the heritage. The physical aspects of architectural heritage and its symbolic meanings in historic, cultural and social contexts make up the cultural memory and legacy left to future generations. Such important aspects received little attention in the past. Conservation became even more complicated with the absence of such recording. Thus the development of recording and documentation skills by conservationists is needed at present as it helps them to manage the information scientifically so that these data can be re-accessed and diffused in the future.

Expansion of commercial activities to the heritage zones. The archaeological value of monuments and sites is being threatened by the current expansion of commercial activities, which sometimes destroy valuable ancient monuments.

Private restoration. Some privately owned ancient buildings are being restored and improved by ardent but non-artistic and unscientific people, without informing the relevant authorities and getting their instructions.

Cultural property theft. Theft of cultural property and the difficulty in apprehending and convicting the offenders are major problems.

To a large extent these hurdles noted above, faced during the process of conservation and promotion of architectural heritage in Bangladesh, are mainly due to the fact that the concept of conservation is still very new to the people. This is mainly due to the country's emergence onto the global scene being very recent. Preferences are for modern methods of construction as they are convenient, strong and fulfill current needs. At the same time, traditional methods of organic construction are considered cumbersome. Because of such preferences and values, most fail to see that the unique cultural identity of the country is partly due to the existence of the rich architectural heritage, which to date has a high relevance to every individual in the country.

The archaeological environment is a totally non-renewable resource. A cultural landscape, created by human activity in the past, can never be replicated once modified or destroyed. Once lost, neither archaeological data nor their contextual information can ever be replaced. Some instances of haphazard development are a critical problem in Bangladesh. Modernization and vulgar industrialization and development, urbanization and so forth, have adversely affected the cultural heritage.

Needs

Current needs in our country may be described as follows.

To begin with, greater levels of support and improvements in facilities should be provided in following areas.

- Integrated protection policies
- Legislation and economy
- Survey
- Investigation
- Maintenance and conservation
- Preservation and reconstruction
- Professional qualification and international cooperation

There should also be more programmes to educate the general public and to create an awareness among them about our cultural heritage and the importance of protecting it. In this regard, programmes such as public awareness campaigns can be organized focusing on the value and advantages of cultural heritage protection with examples from other countries. These programmes are particularly essential for living heritage sites to maintain the character of those sites. The participation and commitment of the local population are essential to achieve this. More modern information and communication technologies should be used for these public awareness programmes.

Work on registering cultural heritage properties should be expedited, declaring all ancient monuments and sites of our cultural heritage as archaeological reserves.

Training programmes should be conducted for officers and other staff members involved in conservation work. They should be trained in efficient and systematic local and international strategies and techniques for the conservation, presentation and management of cultural heritage. Developing scientific and technical studies and research will help those specialists to counteract the dangers that threaten the cultural heritage.

More plans need to be made for conserving historic buildings and structures, using them for the present day needs of society such as housing, commercial activities, and even cultural tourism.

Since we have only a small number of experts, we should accept the help of outside experts in identifying the technology that can help prevent the items of heritage from deteriorating further. Encouragement of the exchange of experience and expertise in the field of archaeological heritage management is needed in this task.

Incentives to individual historic building owners should be given for their upkeep.

Facilities should be provided for domestic and foreign tourists, while safeguarding the interests of the residential population and without harming the cultural heritage properties. In this regard, the following needs can be pointed out.

- Friendly welcome and help with any problems or accidents.
- A clean, litter-free and well-maintained site.
- Presentation of the story of the monument/site and its treasures in a way visitors can understand.
- Proper guidance.
- Security and protection for the tourists and their possessions.

More protection from treasure hunters should be given to our cultural heritage properties. Also programmes should be implemented to increase public awareness of the importance of protecting them. For this task appropriate trained staff should be recruited.

With improvements in cultural tourism, a significant proportion of revenue from tourism should be applied to the benefit of cultural heritage protection.

Economic development plans should be improved as far as possible to minimize potential damage, bad visual effects, and pollution that is harmful to cultural heritage properties.

More opportunities must be given to the conservators to find skilled craftsmen, traditional materials, appropriate traditional or modern techniques and tools. In this regard the administrative procedures and regulations must be flexible enough to cater to the needs of protecting cultural heritage.

The legal framework should be enhanced to regulate the respective rights, responsibilities and conflicts between concerned parties who are involved in cultural heritage properties and to protect those properties from treasure hunters.

More funds should be allocated to protect cultural heritage. The governmental allocation is not enough for this. International and local institutions and the general public should be involved in funding for this task.

Architectural Conservation

Architectural conservation within Bangladesh can be divided into two areas.

- Exposure of ancient monuments and sites.
- Conservation of ancient monument and sites

The conservation of ancient monuments can be divided in to several categories, primarily:

- Conservation of stone monuments
- Conservation of brick monuments
- Conservation of timber monuments

This report will discuss only the conservation of timber monuments, because this training course is on the conservation of wooden structures.

Ancient Timber Monuments in Bangladesh

Out of about 400 heritage sites, many palaces, mosques, temples and particularly cities of 18-20th centuries have wooden elements. For instance Panam City contains 50 buildings, and other examples include Tajhat Zamindar Bari, Baliati Palace, Putia Palace, Rani Bhabani Palace, and the Shiva and Dol temples.

These monuments bear various wooden elements such as roofs, doors, windows, floors, hand rests, staircases, railings, decorated shades, cornices, etc. Apart from these, there is a mosque which is exclusively made of wood. Moreover, there are some wooden sculptures of a unique nature. The Department of Archaeology is attempting to conserve these monuments, which are being lost to some extent.

Timber is an important material which is used for building construction. It is one of the oldest building materials. In Bangladesh, recorded timber construction dates back several centuries BC.

The use of wood in Bangladesh structures can be categorized into several types as follows.

Timber used as the base of a building. The base of this type of building is made by placing two logs of timber transversely on four or more stone pillars or rock boulders. The height of these stone pillars varies from building to building. The purpose of lifting the base from the earth is to protect the timber from dampness and termites.

Timber used for the superstructure. This case comprises two or more rows of timber columns that are fixed on a raised platform to hold the roof.

Timber used for the roof where the superstructures can be any material. Most of the roof structures of ancient buildings were made of timber and roofed by using clay tiles.

Others. There are other building elements made of timber which are not included in the previous categories: doors, windows, railings, ceilings, etc. Most of these timber parts are ornamentally carved.

Problems and needs in the conservation of wooden structures

There are a number of problems connected with the preservation of timber buildings.

- Timber is a material which can be subjected to many decaying processes.
- Timber components are often used over large spans, and these are continuously subject to various stresses and strains.
- There may be a scarcity of varieties of timber identical to those used in ancient monuments.
- The special, unusual sizes of timber elements which are needed for conservation are often not currently available on the market, and have to be specially ordered and prepared.
- Current procedures for purchasing the required timber are inefficient.
- Financial problems arise because timber is an expensive building material.
- There is a scarcity of skilled craftsmen for the conservation of ancient timber structures, and a lack of training in the required traditional and modern techniques of conservation of wooden structures.

Common types of damage found in woodwork and their remedies

Damage to old timber, and the appropriate remedies, can be categorized as follows.

- Fungal growth. This is encouraged by the presence of moisture, moderate temperatures, and poor ventilation. This type of decay can be prevented by providing healthy ventilation and a dry atmosphere. To repair fungal damage, an appropriate treatment must be used.
- Insect attack (beetles). Mostly roof timbers are damaged by insets such as beetles that create bore holes in timber.
- Termites. Most ancient timber monuments attract termites, which cause decay. Appropriate types of chemicals can be used to prevent this problem.
- Damage due to burning. Fire sources in the structures should be avoided as a precaution, and burnt parts replaced when conflagration occurs.
- Decay due to water. Appropriate types of chemicals should be applied.

Conclusion

A large number of ancient monuments and sites in Bangladesh which are part of our cultural heritage are endangered at the moment due to different kinds of problems. Insufficient financial resources, lack of qualified staff, lack of awareness of relevant traditional and modern techniques, and so forth, directly affect this situation. At the same time, population growth, haphazard development, poor management, changes of lifestyles, etc., have also influenced this problem.

Archaeology should therefore be oriented towards the protection of threatened cultural heritage, taking appropriate legal, scientific, technical, administrative and financial measures as necessary for solving these problems.

In this regard, it is important to take action to find more local and international financial resources, to train personnel engaged in the protection of cultural heritage, and to arrange programmes to increase the awareness of relevant authorities and the general public about the importance of protecting cultural heritage.

As most ancient wooden structures have faced problems in their protection, it has become a very important task to take immediate action to protect them. Therefore this kind of training programme for professionals engaged in the conservation of wooden structures is greatly appreciated because the knowledge obtained thereby can be used for protecting ancient wooden structures in the participants' home countries.

Bhutan

Karma WANGCHUK

Engineer

Division of Conservation of Heritage Site

Department of Culture

Ministry of Home and Cultural Affairs

Conservation of Architectural Heritage

PREFACE

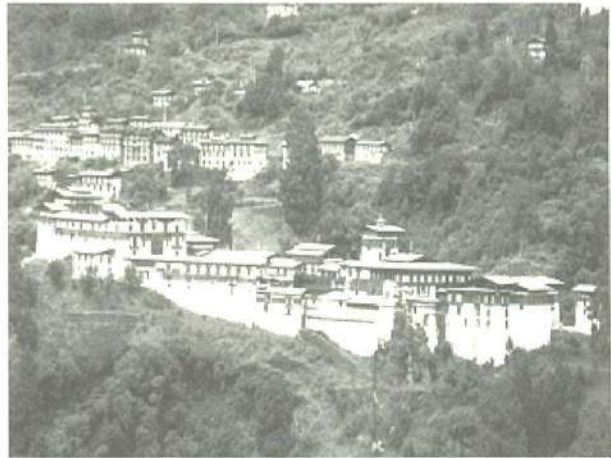
As an introduction to this report on the problems and needs for cultural heritage protection and restoration activities in Bhutan, I would like to share some information on Bhutan and the history of its cultural and historical structures.

Bhutan is a small developing country situated between China and India with its border extending from the southern foothills of India to the greater northern Himalayas. The country is mountainous with an altitude ranging between 200 m above mean sea level to 7000 m from south to north. Altitude is one key factor that contributes to the differences in climate among different regions of the country. Bhutan is also characterized by dense forest growth, with coverage estimated at about 70 percent.

Bhutan has been a country closed to the outside world until the 1950s when it eventually abandoned its policy of isolation and moved towards modernization under the guidance of its third king. However, at the same time, it is not absolutely true to state that Bhutan was completely cut off from rest of the world. This was impossible as Bhutan had to rely on neighboring states or countries to obtain many commodities which people had to cross the border and exchange for with goods of their own. Although very small in scale, such trade and interactions inevitably paved the way for influences from the outside on Bhutan's art, culture and architecture. Nonetheless, the rugged mountains, thick forest and extreme climatic conditions proved huge barriers, restricting such movements and interactions, as the result of which Bhutan developed a cultural heritage that can be called its own.

Bhutan has over two thousand temples and monasteries scattered in every corner of the country. There is not a single village without a temple. The monastery is the focal point of religious and cultural activities in the Bhutanese village where people gather for annual religious festivals and for public meetings. On the average, each district in Bhutan (there are 20 districts) has around a hundred monasteries. Most of the monasteries in the village belong to the local community while the rest normally belong to the government.

The majority of monasteries date back to the 17th and 18th centuries but many have their roots as far back as the 7th and 8th centuries. The Semtokha Dzong is the first *dzong* (monastery-fortress) built in the country, in 1629. As the first dzong built by the Zhabdrung, the Semtokha Dzong was a symbolic establishment of the political and religious authority of the Zhabdrung in Bhutan in the early 17th century. The Semtokha Dzong was visited by two Portuguese Jesuit priests during its construction, the first known European travelers to Bhutan, who were on their way to Tibet in 1629.



Both in form and design, the concept of dzong and monastery architecture is one of the most elegant and harmonious in fortress building in the world. Though massive, Bhutanese dzong and monastery architecture is not heavy, having both form and elegance and a rare blending of harmony and proportion.

In the present day, Bhutan is known to the outside world for its unique and longstanding cultural heritage. The government of Bhutan has in turn given immense importance to the preservation and promotion of this cultural heritage, which now forms one of the central main streams in planning the development of the country.

This report mainly focuses on the conservation of heritage buildings of Bhutan, and their wooden components in particular. Conservation includes survey and documentation, intervention, legal protection and the continuous processes of monitoring and maintenance.

It should be noted however that conservation techniques in Bhutan are still traditional and rudimentary. The idea of modern conservation is in its developing stage and yet to realize fully its benefit. Bhutan is today carrying out renovation works extensively, with statistics showing 70 renovations every year. At this rate there is every danger of losing the authenticity of the architectural heritage of Bhutan.

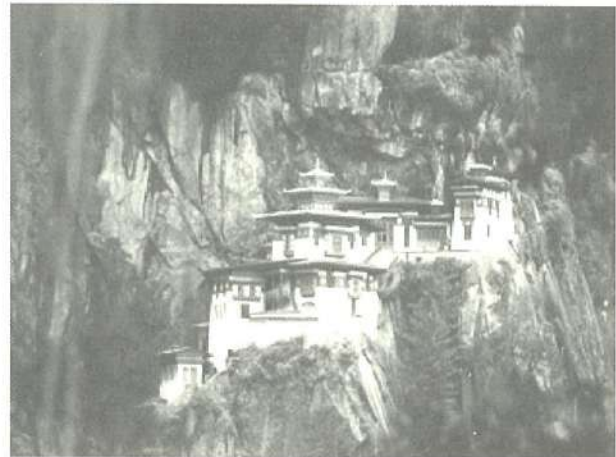
ARCHITECTURAL HERITAGE OF BHUTAN

The architectural heritage of Bhutan ranges from the simple farmhouse, to monasteries, temples, and magnificent palaces and dzongs. Bhutanese architecture also includes examples of the *chorten* (stupa) and bridges. Earlier settlements have mostly been in the inner Himalayan regions rather than the southern foothills where the climate is hot and humid. Thus, thick vegetation, temperature, climate,

geology and even topography, besides religion and the socio-economic conditions of the region, have hugely influenced the development of the Bhutanese architecture. High mountains and dense forests have limited contacts even among people within the country, and thus architecture has developed with typology specific to each region.

Dzongs or fortresses have been built principally for defense and military purposes. These towering structures are built at strategic locations – on hilltops overlooking the valley or surrounded by rivers, providing a vantage point over the advancing army of the enemy. With the transformation of the political situation, these structures later became centers of religion and civil administration.

Temples (*lhakhang*) and monasteries are found scattered all over the country in thousands of numbers. They were built mainly for spiritual reasons but also served political functions. With a theocratic system of government prevailing before the establishment of the monarchy, temples and monasteries served as seats for central control and played crucial roles in the administration of the community or the region. Even today, every village has at least one monastery that facilitates not only religious functions but also communal activities.



Temples and monasteries are built through the collective effort of the community or voluntarily by patrons. Monasteries and temples are built on rocky cliffs where great saints have meditated in caves or hermitages.

Chortens are one of the most symbolic items of Buddhist architecture. These are built to commemorate a great feat or event, usually religious, or in memory of eminent saints or personages. The shape or form of a chorten is usually inspired by a mandala (Buddhist depiction of cosmos). Traditionally, chortens are chiefly built of stones or mud with little or no use of timber.



Traditional Bhutanese bridges can be grouped under two types: chain suspension, and a wooden cantilevered type known as *bazam*. The former is normally adopted for wider rivers and the latter for narrower ones. Traditional bridges not only represent

exquisite pieces of architecture, but are also feats of engineering which have never failed to fascinate foreign visitors. *Bazam* is a wooden cantilevered bridge with or without a roof over it, and usually with bridge houses which are tower-like structures on each end. Typical traditional village houses are two or three storied buildings with walls either of stones or mud. The ground floor normally serves as storage or even for sheltering cattle. The top floor has timber frame walls with window openings.

The unique and most interesting fact about temples, monasteries, chortens or even dzongs is that there has been little digression from the functions for which they were originally intended centuries back, and they still form an integral part of the daily life of Bhutanese people.



TRADITIONAL WOODEN ARCHITECTURE

Timber is one of the oldest and most common building materials, used from centuries past until today in Bhutan. With almost two thirds of country's area covered by forest, timber is intimately associated with traditional Bhutanese culture. Besides the extensive resources, it is out of necessity that timber forms a major part of Bhutanese architecture. It is no exaggeration to say that Bhutanese architecture is largely defined by the wooden components of the structures. Timber has a wide range of uses, from finishing material to the main components of extremely complex structural features. This can be understood from the non-availability of alternative materials, and at the same time the natural abundance of timber.

In traditional Bhutanese architecture, the space, form, texture and identity of buildings are largely governed by the method, design and extent to which timber has been used. Windows of different styles and sizes are constructed corresponding to the type, size and height of the building. Dzongs and temples are usually characterized by a type of multi-tiered bay window called *rabsey*. Aside from the masonry walls, traditional buildings are heavily laden with wooden components.

The way wooden columns are used in traditional buildings is quite interesting to know. Tapering wooden columns with brackets, called *kachen*, decorated to varying degrees depending on the nature of the building, are typical of Bhutanese architecture. These columns are introduced to support the principal beams (*dung*) and joists for achieving a larger space inside. In the first floor and above, these columns are placed on the top of the columns of the floors below in a straight line. All the horizontal members are supported by the columns which are not fixed or restrained against any lateral force, and stand more or less precariously independent. And what is most remarkable about these structures is

that they have withstood numerous earthquakes and other natural calamities over a long period of time. However, there is evidently no record that these have been designed to resist earthquakes.

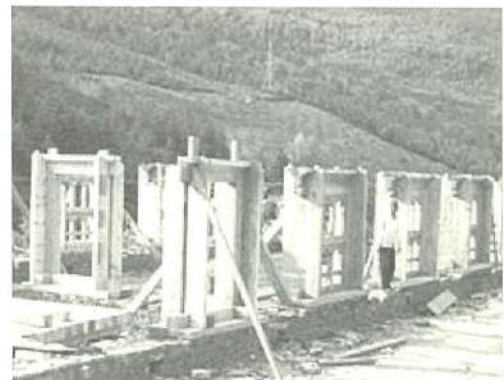
Another striking feature of traditional buildings is the timber pitched roof. The different roof types represent the status in the building hierarchy. Some of the roof types are permissible only for important type of buildings such as temples, monasteries, palaces or government buildings. Traditional roofs make use of extremely heavy timber members. The roof is rarely connected to the building structure, but sits firmly due to its weight. It is a common practice to create a wide attic, and the space is used for drying and storing crops and meat. The attic is open, so as not to counter the wind force but allow it to pass through without causing any damage. It is said that a roof should be perched like an eagle about to take off. Traditional roofs use layers of shingles for roofing, which are held down with large stones.

Traditional architecture incorporates myriad decorative features whose origin can be attributed to inspiration from the world of flora and fauna and religious symbols. It is also seen that some of these developed while solving structural or architectural problems. However, these later became standardized decorative elements and adopted as the norm in the region. All the timbers in a building that are visible are completely adorned with Bhutanese paintings.

WOOD AS BUILDING MATERIAL IN THE BHUTANESE CONTEXT

Wood construction is considered safe, energy efficient, dependable, affordable and environmentally superior. Wood forms one of the most versatile and abundant materials in many parts of the world. It is probably the only renewable building material and can also be recycled. Different wood species bear their own beauty, fragrance, colour and texture. Widely available and easy to work with, wood is used from simple and basic to the most elaborate and intricate architecture. Wood is obviously the most widely used material in Bhutanese traditional architecture, and some wooden structures have survived more than 100 years, proving efficient in resisting earthquakes and other forces of nature. However, being an organic material, wood is easily perishable when exposed to weathering and deteriorating agents, and is highly combustible. The latter is a major challenge, as Bhutanese traditional buildings abound in timber usage but the ideas and techniques of fire safety are little known in the society.

Timber is broadly categorized as hard or soft wood. Some of the hard wood available in Bhutan includes oak, teak, sal, walnut, cypress, willow, mahogany and sandalwood. Soft woods are blue pine, spruce, chir pine, juniper, fir, cedar, poplar and hemlock. Construction with hard wood is sturdy and durable but soft wood is easier to work with.



In heritage buildings, hard wood has evidently survived and fared better than soft wood. Even in olden times, people allotted high quality hard woods to superior buildings and soft ones to ordinary buildings. Affordability and the extent of craftwork required also determined the choice of wood type. Over time, hard wood ready for harvest apparently went in decline, forcing the government to restrict the supply. The practice of growing and harvesting particular species of timber on a lot for a specific construction project developed much later. This was usually carried out by the government for the renovation or construction of dzongs and other buildings of similar sizes and significance. In villages, every farmer owns a forest area which he tends and later harvests for timber for private use. This has encouraged the sustainable use of forest.

DECAY, FAILURE, AND TREATMENT OF TIMBER

The most widespread and severe problem affecting heritage buildings in Bhutan today is the decay of timber. In certain cases, the stability of the whole structure is put at risk due to the decay of key structural members, compounding improper structural designs whose shortfalls reveal themselves over time. For example, there are situations where wooden beams and columns are strained under excessive load, as the result of which beams sag and columns sink, bringing the whole superimposed structures down with them.

The causes of decay are insects, micro-organisms, dampness and weathering agents. Dampness, one of the most common causes of timber decay in Bhutan, is also aggravated or promoted by poor planning and construction faults. However, it is noted that different species have different capacities to fare in a particular situation.



Apart from natural seasoning, there is no other treatment applied to timber. One can easily make out whether timber is well seasoned or not. Timber members not well seasoned are extremely vulnerable to insect attack and decay, and also start to shrink or warp under pressure. Although chemicals and preservatives are not used, the paintings done on wood have contributed a great deal to protecting timber for long periods of time.

CONSERVATION OF HERITAGE BUILDINGS

Under this heading, I intend to discuss as far as possible my views based on experiences that I have gained over time working for the only agency in the country that handles the conservation, restoration, maintenance and rehabilitation of architectural heritage in the country. The agency plans, manages and

executes numerous conservation projects in the country.

The responsibilities of the agency (Division for Conservation of Heritage Sites, Department of Culture) are briefly outlined below to provide a picture of the job activities it carries out.

- Inventorying the architectural heritage of the country
- Preparing project proposals in line with conservation
- Assisting in assessments of proposals and approving projects proposed by the Districts and other organizations in the field of architectural heritage conservation
- Providing technical and administrative help to different agencies with regard to conservation and rehabilitation of historical and cultural sites
- Giving technical assistance to Districts and other organizations for the preparation and implementation of proposals for the construction of new lhakhangs and dzongs
- Undertaking conservation projects in the country



TRADITIONAL CONSERVATION TECHNIQUES FOR TIMBER

Although conservation of timber in heritage buildings is widely carried out in Bhutan, the techniques and materials are largely traditional even today. The conservation activities are explained below in sequence.

Nature of the timber component

It is important to first establish the significance of the timber component. One should ascertain the worth in terms age, use, material and other relative measures. Knowledge of the type of construction and timber species aids in conservation work.

Extent and causes of timber problems

For conservation, the cause and extent of damage should first be determined. These findings also open keys to the right choice of conservation method. Issues to be considered include the following.

- (a) Decay and insect attacks. Timber is usually the most worn out part of historic buildings, as it is affected by termites, rising dampness, fire, and wear and tear. For example, timber floors in historic buildings may be completely deprived of ventilation and caused to decay. The increase in dampness and poor ventilation limits air circulation and creates a favorable environment for

insects and microorganisms that feed on timber.

- (b) Structural issues. Besides causes of damage or decay, understanding the extent of damage and structural implications is essential for determining the course of repair. Timber floor joists and beams on upper floors span the room. Each member is closely studied and only those in critical condition are replaced. These members are often found sagging under the stress of weight. It should be determined whether this is due to inadequate timber size, sinking of the support, or excessive point load.

Repair or conservation work

It is necessary to take great precautions in repairing structural members. At the time of replacing floor joists, beams, lintels or columns, the horizontal members are jacked up. The removal and replacement of each member is done in succession from a suitable point. The outright replacement of joists or other similar members is refrained from unless extremely necessary. It is necessary to study the original timber species and also assess the strength required of the timber.

Total replacement of a unit is carried out mainly for components where structural safety cannot be compromised. However, other non-structural timber elements can be corrected through consolidation, repair or replacement of damaged parts, etc. In conservation, every attempt is made to preserve the original material and existing conditions to retain intrinsic cultural values.



No chemicals or preservatives are used for the conservation of timber in Bhutan. This is firstly because Bhutan was introduced to modern conservation only recently, and these chemicals have become available only a few years back. Secondly, since the chemicals are toxic and not environmentally friendly, the government discourages their use.

Good seasoning and the application after construction of paintings, which were essentially vegetable based, were two major activities that helped protect and preserve the timbers of Bhutanese heritage buildings. The paintings however have weathered over time, and timbers have become exposed to agents of decay.

The concept of conservation in Bhutan is still largely



traditional and very basic. Though it has proved to work relatively well, it is very urgent for Bhutan to become fully aware of modern ideas and techniques for conservation. There is not even legislation in place to protect heritage buildings and sites against various destructive forces that come hand in hand with urbanization. The need for legislation is increasingly more pressing now than ever before to protect, conserve, promote or develop.

The following are some of the traditional methods used in the preservation and conservation of wooden structures.

1. Pounding and storage of logs under water, using ash or without ash. This method prevents the attack of wood by stain and fungal decay. The process gets rid of resins in the wood, and kills termites, wood borers and other parasites (used for carvings, painted boards, ploughs, etc).
2. Lacquering of wood.
3. Boiling in mustard oil to prevent from insect attack and to avoid the splitting and shrinking of wood. Usually used for small sized wooden blocks, used for carving and woodblock printing.
4. Storing above a source of smoke, or smoking the timber structures.

Problems faced in cultural heritage protection and restoration activities

Besides natural problems with preservation of the wooden architectural heritage, we also face problems from the general public and end users, as the conservation of cultural heritage is a relatively new and modern concept to Bhutan. Preservation and continuation of the very art and architecture practiced over the centuries and conservation of the historic monuments that are edifices of our thriving culture present uphill tasks everywhere in the country. As I understand it, the experience for most of the architects, engineers and managers who implement such conservation projects includes having to deal with negative reactions and substantial interference, starting from top decision makers to the general public and end users of the heritage site, and I too have had my own share of this experience. The general public and end users (who are commonly monks in the case of Bhutan) prefer newly built structures to older conserved ones.

Although the policy of the Royal Government of Bhutan emphasizes a balance of economic growth and preservation of the country's rich cultural and spiritual heritage of Bhutan, it has yet to understand fully the values of pure conservation and is far from realizing a middle path between the economy or development and conservation of the culture heritage.



For example, people from a community where a monastery is being restored and the end users, the monks residing in the monastery, always prefer new timber components over the reuse of the old

ones. In such cases they will just say that when funds are available why not replace everything with new items, as they may not have such funds or the opportunity to do it again. These are some of the experiences that one comes across while renovating or trying to preserve old timber components and structures of monuments. Apart from this, Buddhism, which forms a principal vein of Bhutanese culture, has precepts such that come into contradiction with some of the main ethics of modern conservation. The impermanent nature of the world is one example.

Another common challenge that we face in heritage sites or conservation projects in Bhutan is from the fact that all our monuments or heritage sites besides ruins are living monuments. Monks and caretakers, who live in these heritage buildings in the same way as they used to hundreds of years back, undeniably pose a significant threat to these structures. Another factor for wear and tear to these structures is from the increasing population of monks and visitors. Besides, almost all the dzongs, monasteries, temples and other heritage buildings which are made of stone, mud and wood have very poor water supplies and drainage systems. Today, the management of water, sewage, waste and fire is a major issue and a pertinent challenge in all our heritage buildings.

In the course of working in such projects, I have come to an understanding that instead of preaching to people and to end users on the importance of conservation, which is a new concept to them, it would be better as a first step to make them aware of how to take care of such structures, which will eventually help in promoting the life of the structure.

Indonesia

Kosasih Bismantara

Head of Protection Sub-Division

Directorate of Archaeological Heritage

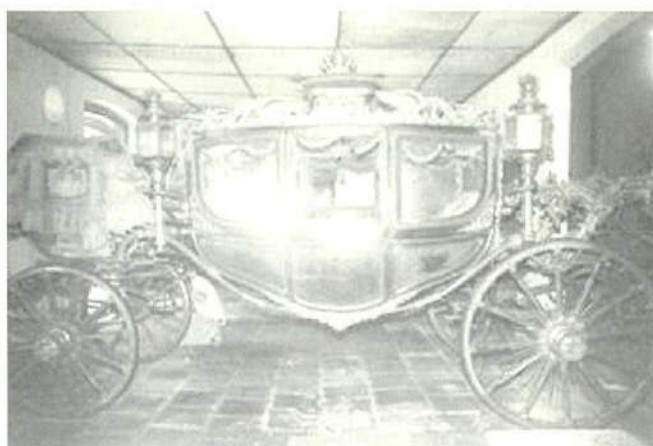
Ministry of Culture and Tourism

Treatment of Wood as a Material of Cultural Properties

BACKGROUND

Indonesia is one of foremost countries in the world especially in the area of culture, as it has various historical materials, some of them of very high value when examined from the perspectives of history, science and culture. For example, much of this cultural property is made from wood, and we know that wood has excellent properties in terms of its physical and mechanical characteristics. It is beautiful, cheap, strong, light, easy to work and serves as a good insulator as well. Accordingly, people have used it from long ago until now to improve their life here on earth.

Wood is one of the organic materials that have been utilized to make various immovable objects like mosques, traditional houses and palaces, and it can also be utilized to make movable goods like statues, relief carvings and engravings, which can be preserved in museums.



Wood thus used in cultural property is certain to be subject to damage and decay. Over time the wood needs to be conserved in order to prevent decay such as mold, so that it will last longer. Like mold, various pests can be agents of decay in wood. These include insects, especially termites and powder beetles, or fungal agents such as mushrooms. Different kinds of agents are

encountered when using wood at sea, as in ships and graving docks, where there are also pests that attack wood, such as ship worms and cockles.

Wood easily becomes moldy if it is always in a wet or damp condition. This is often related to dampness in the soil, as for house and bridge pillars, electrical and telephone poles, fence posts, timber in factories, timber used for flooring, bathroom doors, etc. In addition, wood gets damaged because of termites, including varieties that are ubiquitous in the soil, and those nesting above the soil which we call dry wood termites. And while the powder-post beetle is also everywhere, it does not attack all types of wood. It just attacks woods high in starch like mahogany, munggur, bamboo, cane, and durian wood.

In replacing wood, when the original wood can no longer be used, we must seek the same type and quality of wood. For this purpose we should know about woodworking technology from the stages of the raw material and final processing.



The function of wood preservation is to lengthen the wood's period of use, beyond the span of time it could have lasted without treatment. For that reason, wood preservation needs to be done to increase the quality of wood.

TREATMENT

Pre-execution. Before the execution of treatment, we need conduct technical studies for the purpose of treating the wooden material of any cultural property. This is done in order that the execution will proceed according to proper technical and archaeological principles. The activities of the technical study are as follows.

1. Observations
 - A. Observation of the wood type
 - B. Observation of the damage and decay, noting for example any breaks, cracks, rotting, flaking, fragility, and physical growth
 - C. Observation of the micro and also macro



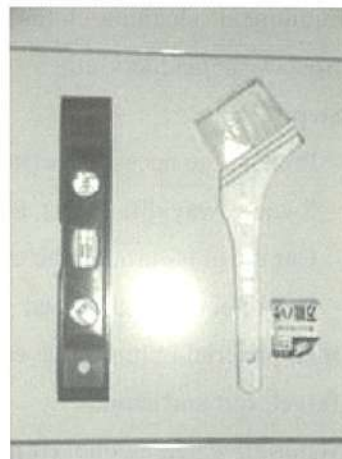
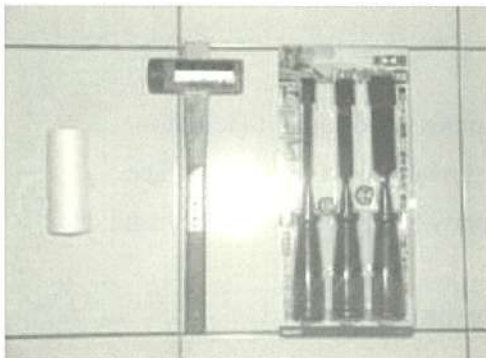
environment (temperature, dampness, rainfall, evaporation)

2. Analysis of the observation results
 - A. Analysis of wood anatomy and morphology
 - B. Chemical and microbiological analysis of damaged or decayed wood material
 - C. Analysis of possible treatments and their impact on the wood
3. Determination of a treatment plan covering the methods and techniques, and the required materials, equipment, effort, and cost

Basic facilities their preparation for treatment. The next phase is the preparation of everything that will be used during the execution of treatment. The activities of this preparation phase and the equipment and facilities involved are as follows.



1. Equipment
 - A. Carpentry tools, for example hammers, chisels, levels
 - B. Materials and equipment for recording data, for example drawing pens, tracing paper, graph paper, cameras, portable lamps, rulers, compasses, film, batteries
 - C. Cleaning and treating equipment such as vacuum cleaners, brushes, sprayers, spatula knives



- D. Treatment materials appropriate to the level of damage and decay. Commonly used materials include the following.
 - (1) Cleansers: Neorever, toluol, and acetone for removal of paint stains

- (2) Agglutinants: epoxy resin (such as Araldite AW106/HV953U, crafting glue (such as Fox Stik)
- (3) Consolidation material: Paraloid B-72 (5%) to strengthen brittle wood
- (4) Preservative: Steadfast (eradicates and prevents termite growth)-

2. Facilities required to support treatment activities for wooden material in cultural properties include the work area for the conservators to perform their duties. Other facilities may be needed on site, for example stepladders, scaffolding, etc.



Treatment. Treatment activities include preventative and curative treatments.

1. Preventive treatment is meant to keep the processes of damage and decay from happening to cultural properties. According to its character, preventive treatment can be divided into two types, being routine treatment and maintenance of the micro and macro environment.

- A. Routine maintenance is treatment done on a periodic basis to prevent damage and decay of wood material.

- (1) Wooden materials in non-movable cultural properties

- Target: stain and organic growth on and near the surface of wood
- Materials: water (for washing or immersion), tobacco, alcohol
- Equipment: cleaning cloths, paintbrushes, brooms, hoes, scythes, palm tree fiber brushes, stepladders, etc.
- Steps
 - Prepare the necessary materials, equipment, and support facilities
 - Sweep away dirt, stains, and organic growth from the wood surface
 - Cut the grass around the cultural property and clean it of rubbish and dirt
 - Repair according to need

- (2) Wooden material in moveable cultural properties

- Target: dirt and stain
- Material: water, alcohol (if required)
- Equipment: dust cloths, brooms, brushes
- Steps
 - Prepare the necessary materials and equipment



- Clean the dirt and stains at the wood surface with suitable equipment

B. Maintenance of climatic condition in the microenvironment, while keeping close watch on the macro environment.

- Target: temperature, illumination, water content of wood
- Materials: water, silica gel, etc.
- Equipment: thermometers, wet ball thermometers, thermohydrographs, moisture meters, hygrometers, lux meters



This activity is meant to control the microclimate (temperature, dampness of air and illumination), and also guard against damage from the macro climate (temperature, dampness, rain bulk evaporation, direction and wind velocity). The ideal air humidity in the museum is 45-60%. For helping to overcome an air dampness problem we can use dehumidifying equipment (air dampness inhalator) or silica gel (air humidity inhalator material). Measuring equipment used in dampness control includes thermohydrographs and hygrometers such as the sling hygrometer. For control of the air temperature, air conditioning (AC) should be used to maintain the ideal air temperature in the museum of 20-24° C. In addition, it is important to know that improper AC installation will produce fluctuations in air temperature that may adversely affect the wood material in the collection.

One thing that has also come to our attention is that items newly added to the collection ought to be restricted at first to a quarantine room for careful inspection. If there are any insects, we must eliminate them totally before putting the item in the collection room. In addition, we have to give a lot of attention to the plan of the trees around the museum. It is suggested that trees or plants are not placed too close the windows, and flowering varieties should be avoided because they may draw insects to the museum.

Good lighting conditions for preservation require low levels of ultraviolet radiation from both natural and artificial light. To monitor light illumination we use a lux meter. Light intensity for organic objects must be controlled between 50 - 150 luxes. Ultraviolet radiation is checked with a UV monitor. Ultraviolet rays are very damaging for organic materials like wood if the wave length is 300-400 nanometers, and ultraviolet rays can also make photochemical reactions in organic materials over the range of 300-500 nanometers.

To weaken ultraviolet radiation we can apply rough (matte) glass or a glass diffuser. This causes the light to be no longer convergent but divergent. We can also put a filter on the windows by using plexiglass plastic of type UF-3, a UV filtering polyester film which can be glued onto the window. Air cleaners are used to remove air pollutants and other elements such as harmful metals. There are many

ways to monitor the macro climate, for example by conducting measurements of the air temperature, dampness, rate of evaporation, and rainfall. Activities related to physical environment maintenance include drainage system repair, and the cultivation of trees in line with standards of esthetics, and the principles of proper treatment of cultural properties.

2. Curative treatment. This refers to activities meant to overcome the problems of both damage and decay of cultural property materials. According to the nature of the materials and techniques used in the treatment, the activities may be divided into two types, traditional and modern treatment.

A. Traditional treatments

(1) Sweeping

- Target: accumulation of dirt, dust, fatty stains
- Materials: water in which tobacco, banana fronds used for packing tobacco, or cloves have been immersed
- Equipment: palm tree brushes, plastic brushes, paintbrushes, dust cloths (cotton material), plastic pails
- Procedure:
 - Soak the ingredient mentioned above in a plastic pail for about 24 hours (if more than that it will be very smelly)
 - Clean the wood which will be conserved in a dry condition, using a paintbrush
 - Dab the extract-bearing water using a paintbrush over the entire surface of wood that is not covered with any protective layers
 - Rub it using the fiber of a palm tree brush carefully until dry, then repeat the process until the entire surface is clean
 - Finally, wipe it thoroughly with a clean cloth

Note: This method is followed for traditional carved wooden houses (*rumah ukir adat kudas*) once a year, and it has been in use over the generations. The result is very gratifying, because it not only removes dust but also helps with preservation by preventing attacks from termites and other insects.

(2) Restoration (repair)

- Target: part of collection item that has broken free, part of building component that has broken away partly or entirely
- Materials: an agglutinant chosen from a variety of possibilities, such as the following
 - Gum arabic (vegetable glue)
 - Anchor (animal glue)
 - Wheat powder with chalk and sirih (betel), easy to find in the market
 - Sawdust water
- Equipment:
 - Fasteners, such as rope
 - Heating stove

- Plastic balance
- Saucer
- Paintbrush
- Heater pan

- Procedure:

- Prepare the wood components which will be joined to one another
- Clean the wood surfaces for joining by using a paintbrush
- Prepare the selected agglutinant
- Dab the agglutinant to both sides of the wood that will be joined, then fasten the wood surfaces, wait until the wood is dry
- Cordage such as raffia, or another fastener, should arrest the two components attached temporary
- If there is a hole in the wood, fill it with an agglutinant that has been mixed with some sawdust
- Camouflage the hole with sawdust as required



(3) Fumigation

- Target: insect pests which attack museum collections
- Materials: a few traditional insecticide materials used include clove, fragrant roots, camphor
- Equipment: trays (for placing or balancing the items), fumigation box
- Procedure:
 - Prepare the materials and equipment required, wearing masks and gloves
 - Put the items for treatment in the prepared tray in the fumigation box
 - Allow the items to contact the fumes for the appropriate amount of time

B. Modern treatments of wood. These activities include various types of surface cleaning, repair and consolidation, and protection through chemical treatment.

(1) Mechanical surface cleaning

- Target: dust and dirt accumulation
- Materials: no special materials
- Equipment: smooth paintbrush, vacuum cleaner
- Procedure:
 - Sweep away dust or dirt using a smooth paintbrush or vacuum cleaner
 - Sweeping must be done carefully and with an awareness of the wood's condition, if it is fragile, to avoid damage to the material

(2) Cleaning the surface with chemical treatments

- Target: fat stains, marks left by the growth of fungi, paint as a result of human acts of

vandalism

- Materials: organic solvents such as alcohol, acetone, toluol, ethyl acetate, or special paint cleansers such as Neorever
- Equipment: smooth nylon brush (such as a toothbrush), paintbrushes, masks, gloves, clean cloth (cotton), spatula (bamboo or wood)
- Procedure:
 - Clean the item while dry using a cloth or toothbrush, to eliminate dust and dirt
 - Prepare a tiny bamboo or wood spatula with the back part wrapped in smooth cloth, then wet it with one of the organic solvents prepared
 - Carefully remove unwanted material from the wood surface
 - In the case of wood covered in multiple layers of paint (wooden polychrome), test the solvent first to check for possible condensation of undesirable paint
 - Use Neorever or other paint cleanser to clean hardened paint crust, or strongly bonded paint which is difficult to clean using organic solvents
 - When applying Neorever, use the cotton-wrapped spatula at the paint stain, allowing it to react for about 3 - 5 minutes
 - Clean it with a smooth brass brush or nylon brush to remove any acid
 - Neutralize the rest of the material remaining on the surface of wood by using alcohol
 - Repeat the cleaning activity until the surface is free from the fat stain, etc.

(3) Repairing holes left by insect attacks

- Target: all damage holes able to be filled
- Materials: items easily found in the market, such as the following
 - Craft glue (Fox), wood glue (Aica Aibon) , or epoxy resin (Araldite Rapid) or similar materials
 - Epoxy resin (Araldite AW106/HV953U)
 - Paraloid B-72
 - Sawdust (*gergajian*, used as a filler for holes)
 - Phenolic microballoons (used with epoxy as a filler)
- Equipment: gloves, plastic balance, spatulas, masks
- Procedure:
 - Prepare the best agglutinant based on test results
 - Add the phenolic microballoon component sufficiently, mix until it becomes homogenous
 - Fill the hole with the material using a spatula
 - During the reactivity period, exercise control to avoid transformation of the material, or adapt its surface to the original style and form
 - Let the material dry approximately 12 hours

(4) Hypodermic injection

- Target: part of macro injection of wood
- Material: thermosetting epoxy resin EP-IS
- Equipment: fasteners, masks, gloves
- Procedure:
 - Wear masks and gloves for safety during the work
 - Prepare the resin and hardener as a homogeneous mixture
 - Apply the material with the hypodermic to the wood
 - Press with the fastener during the drying
 - Remove the fastener after the epoxy resin is dry

Documentation. Data on the cultural property, the damage and decay to the cultural property, environmental data, and type of treatment activity are recorded during conservation, both before, during, and after the execution of treatment. Records include verbal descriptions and pictorial representations such as photographs.

Post execution. Activities to be maintained after the execution of treatment on wood as a material in cultural properties are aimed to ensure preservation through proper storage and monitoring, as outlined below.

1. Storage covers both the wooden items stored in museum collections, and cultural properties on displays that are open to the public. Aspects of storage include the following.
 - A. Minimum standards for storage
 - (1) Wood stored in museum collections
 - Storage racks of the correct dimension for the numbers and sizes of wooden items kept in the collection
 - Room conditions controlled from the perspectives of illumination, temperature, and dampness
 - (2) Wood in displays open to the public
 - Building model must be adapted for the area in question
 - Display facilities of the correct dimensions and conditions for the wooden items they contain
 - B. Equipment for moving to storage: pulleys, carts for conveying, ramps
 - C. Storage procedures
 - (1) Prepare the storage rack or display which has been made according to requirements
 - (2) Receive the shipment of wood which has been treated and shipped in freight containers which have been properly prepared
 - (3) Place the wooden items which have been treated in the proper rack or display, which has been prepared appropriately

2. Monitoring and evaluation, which should be conducted both for the treated wooden items, and the area in which they are stored.
 - A. Condition of the treated wood (check for signs of further damage or deterioration)
 - B. Condition of the storage area
 - (1) Materials: result of recording of the condition of the items maintained, archives of their treatment activity reports, laboratory analysis materials
 - (2) Equipment: measuring instruments for micro and macro climatic conditions
 - (3) Procedures:
 - Observe the conditions maintained for every wood material component of cultural properties, at a minimum of once yearly, either qualitatively or quantitatively, or both
 - Takes samples to be analyzed in the laboratory if required
 - Compare items' condition before and after treatment
 - If any changes are observed, especially degradation of the quality of the treated item, further steps need to be taken

CONCLUSION

Treatment of wood is an action having the technical character of archaeological work, so that the execution must pay attention to the methods and standards that would apply archaeologically. This is done as one part of the agenda for conservation and resistance to decaying processes, so that cultural objects' ages are lengthened and they can be passed on to future generations. For the execution of this agenda, comprehensive knowledge based on experience is required of the character of related problems that may be faced, including possible agents of decay, and the mechanisms of the decay process. Knowledge of these problems is needed for precise diagnostic research as to the proper procedure to be applied.

Iran

Anahita MOSAVI

Head of Workshop / Manager of Architectural Group

Guilan Rural Heritage Museum

Guilan Rural Heritage Museum: Problems and Needs for Wooden Cultural Heritage Protection and Restoration in Iran

Introduction

Iran, with an area of about 1,648,195 square kilometers, is located in the Middle East. This country is bounded on the north by the Caspian Sea and on the south by the Oman Sea and the Persian Gulf as well. The geographical extent and various natural phenomena have given Iran a diverse face from the point of view of nature. The Alborz and Zagros mountains in the north and the west, the arid and semi-arid zones of the center and the east, the coastal regions of the northern and southern edges, and also the forested regions of the north, all have given Iranian nature a novel and diverse image.

Architecture in Iran has a long history. The beginnings of human existence in Iran go back to the Paleolithic. From at least 5,000 B.C., specific samples of architecture had appeared across the breadth of Iran. A common feature of indigenous architecture in all parts of the world is the notable impact of geography and climate on its structure. This impact is found not only in the appearance of the building from the outside but also on the spatial structure within. The mutual impacts of culture and geography on the internal and external aspects, the borders of the buildings and the passages between them are clearly observable. One of the most outstanding impacts is the use of available materials for the construction of the buildings. Irrespective of some exceptions, which are seen in the architecture of palaces or other buildings, all indigenous buildings follow the same trend.

In Iranian architecture as well, materials available in the surrounding environment and nature have mainly been used to construct buildings. This link between the environment (nature) and building is a deep one. The diversity of materials and methods of construction of buildings include buildings made with brick, mud, stone, and sun-dried bricks, as well as wooden units with flat, dome-shaped, or sloping roofs. Generally speaking, as far as climate is concerned, Iran can be classified into four climatic regions:

1. The southern seashores of the Caspian sea
2. The northern seashores of the Persian Gulf and Oman sea
3. The mountainous and high regions of the plateau
4. The plains of the plateau

The buildings in each of these climatic regions have common features from the perspective of the impact of climate. Each of these climates has specific and different conditions. Along the seashores of the Caspian sea, humidity and rain are very intensive, by the seashores of the Persian Gulf and sea of Oman the hot weather and humidity are uncomfortable, in the mountainous regions the cold reaches below zero with long winters, and in the plains of the plateau, the dryness of the air and desert winds are among the important climatic characteristics.



Fig. 1: Iran

Without doubt, traditional builders should use local materials and resources to create comfort for humans inside buildings. The direction of the sun, the favorable and unfavorable winds, the fluctuations of temperature during day and night, and access to suitable water, plants and land have always had a determining role in the form and characteristics of the building.

Despite the superiority of modern buildings, traditional buildings were not in conflict with natural conditions, but by making proper use of those conditions they maintained a balance of coexistence and productivity in the heart of the natural setting.

The Southern Seashore of the Caspian Sea

The southern seashore of the Caspian Sea is the most rainy and green of Iran's climatic regions. The existence of the Alborz Mountains in the south and the Caspian Sea in the north has created a region with specific characteristics. This region in Iran which encompasses Guilan and Mazandaran provinces is covered with vast plantations and abundant forests. Russia, Azerbaijan, Turkmenistan and Kazakhstan are the northern neighbors on the Caspian Sea. Of the climatic features of this region, among others, the following can be mentioned.

- High rainfall in all seasons of the year, particularly in the autumn and the winter
- Relatively high humidity in all seasons
- Low differences in temperature between day and night
- Extensive plant coverage

The high rain, and suitable water and soil conditions have promoted the growth of plants in all parts of the region, which by itself has had a noticeable impact on the type of materials and methods of construction of traditional buildings. Due to the fertile nature of the region and the existence of vast

plantations and abundant forests, the constructional materials are mainly from plants. The use of wood as a dominant material is seen not only in the two provinces at the edge of the Caspian Sea in Iran, but also it is observed in other countries along the Caspian Sea.

In this geographical domain, it is only in Iran that wood has a main role in the structure, decoration and the coverage of the roofs of its indigenous buildings. Of course, it is worth mentioning that in some parts of the western regions of Iran, in the foothills of the Zagros mountains, there are semi-forested areas in which wood sources were used for buildings. The use of wood in other areas has been limited to the production of doors, windows, and sometimes the roof.

Guilan Rural Heritage Museum

Rural museums are a subset of ecomuseums and open air museums which present rural civilization and culture in an open, natural environment. Rural museums take form by transferring monuments and heritage units at real scale, and locating them in settings similar to the initial conditions. These museums are mostly created in areas which have wooden architecture, because it is possible to transfer the wooden parts of the building safely and soundly with minimal damage.

In the age of globalization, with the expansion of urbanism and developments in communications, local-scale cultures as treasures of civilizations are being annihilated. The Guilan Rural Heritage Museum aims to identify, preserve and introduce the forgotten culture of this area by reconstructing its rural cultural/architectural manifestations.

The Guilan Rural Heritage Museum is unique in Iran and the Middle East as the first example of its kind in the world, due to its diverse types of architecture. The plan is to reconstruct the original types of rural heritage units, and display all manifestations of the culture, livelihood, and climate experienced by the Guilan villagers in a real and live way.

As mentioned earlier, Guilan is one of the provinces located on the southern seashore of the Caspian Sea. The cultural diversity and long standing civilization of Guilan have given this province great diversity from the viewpoint of architecture.

The idea of establishing a museum took form after the earthquake which occurred in June 1990 in Guilan, in which the trend for destruction of traditional buildings was intensified. However, the initial studying phase has only started since early 2002.

First, broad studies were made to find a suitable location for the project. After frequent reviews, Saravan Forest Park was selected as the project venue due to the proper topography and similarity with



Fig. 2: Guilan

Guilan, easy access and the existence of appropriate infrastructural installations. At the same time, the necessary staff was trained. The area of the selected site is about 260 hectares, located about 18 km from Rasht on the road to Tehran. According to the studies which were made of the cultural and architectural characteristics of Guilan villages, nine cultural/architectural domains were identified in Guilan. Each of these domains is introduced at the venue of the museum by reconstructing one village.

Upon completion, this museum will be a small sample but a real one, presenting the methods of life and traditional culture of Guilan villages. The architectural part of this museum is a collection in which the age of its buildings on the average is more than 150 years. The aim of Guilan Rural Heritage Museum is not only to transfer the rural buildings, but to keep alive the indigenous culture, techniques of construction, and unwritten knowledge that has survived in Guilan villages.

In this setting, in addition to rural architecture of different regions of the province, other cultural elements related to the instruments of daily life, work, food and clothing will be also displayed. In designing the site, separate places have been planned for the following: restaurants, tea houses, markets and mosques; farms, tea gardens and paddy fields; training workshops for the production of handicrafts such as *gamaj sazi* pottery (used for cooking), *morvar bafi* (pearl-decorated clothes), *Rashti doozi* (clothes specific to Rasht); sites for games and traditional shows such as *gileh mardi* wrestling, *varza jang* (fighting with oxen), and *lafand bazi* (tightrope walking); research centers for agriculture and animal husbandry; a research institute for architecture and anthropology; a children's park; gardens for growing medical botanical drugs and indigenous trees, recreational and architectural camps of the nation's woods; two guest houses inspired by the rural architecture, with a capacity of 150 units each accommodating three to five persons.

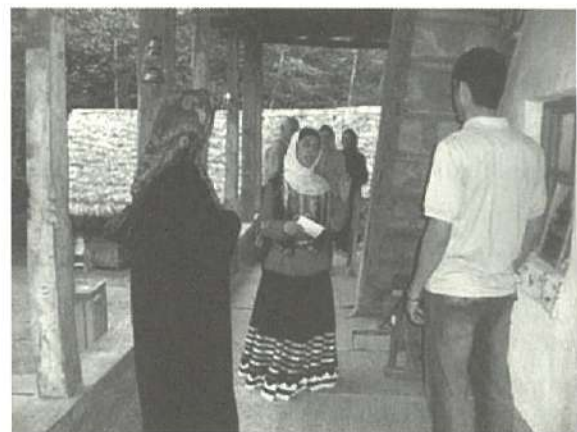
The basic process for transferring the buildings is as follows.

First a group of experts is dispatched to the villages to examine the buildings, so that all architectural types of the designated areas can be reassembled in the museum. Valuable buildings are identified and selected for transfer to the museum. These activities include anthropological and architectural studies. After completing the studies, the building is taken apart and labels attached to the parts to aid reconstruction. After transferring the disassembled materials to the museum, the unit is reassembled at the designated venue and named after the donor or seller of the unit. The area of the museum setting is over 45 hectares, located at the central core of the site.

In May 2005, the first working area of this project (the village of the eastern plain) was launched, and one year later was opened for utilization. In May 2008, the second area (the village of the central plain) was opened. At the same time the third area (the village of the western plain), and in September 2008 the fourth area (the village of the western foothills), were started. In May 2009, these two areas opened, and concurrently the administrative operations of the fifth area (the village of the western mount) were started.



Figs. 3 and 4: The location of Saravan Forestry Park and the Museum site



Photos 1 - 3: Guilan Rural Heritage Museum

Museum Objectives

In Guilan, like most other the cultural domains, due to the spread of local cultures and the absence of a longstanding written record, oral traditions are considered the most important carrier of the cultural and historical heritage. For this very reason, with the death of the elderly, transferred culture is also forgotten. The words, rites, and traditions, the outcome of human efforts, are passing into oblivion with the passage of time, and as a result the younger generations will be the main losers.

The treasure of unwritten knowledge and the method of interaction and coexistence of yesterday's population with the surrounding nature, along with the lack of awareness and ignorance of people today, have gradually led to the destruction of the environment on the scale of a global crises.

The establishment of the Guilan Rural Heritage Museum is one of the rare efforts aimed at registering, recording and reconstructing a part of the cultural and spiritual heritage of the people of this land. This will help the present inhabitants of Guilan find part of their past life in this museum.

The main objective of Guilan Rural Heritage Museum is to register, record, reconstruct and thereby make visible the cultural and spiritual heritage, and the life of the people, of Guilan for the purpose of continuation, sustainability and introduction to future generations. Moreover, maintaining indigenous aspects of identity and introducing them to people (in particular the youth), enriching national culture, strengthening indigenous unity, reinforcing confidence in indigenous culture and taking attitudes free of prejudice towards it, creating motivation among the youth for local work and efforts that rely on existing facilities in the hope of a better life, are among the main objectives of the museum.

To achieve these objectives, the museum constructs traditional buildings in their primary forms and presents the ways of life of the past. In addition, during visiting days, the museum tries to arrange various programs such as exhibitions of handicrafts, photos and paintings, architectural achievements, local clothes, Guilan table clothes, different types of local music, games and traditional shows, etc. Furthermore, performing traditional ceremonies and feasts of Guilan for different occasions such as weddings (directing the bride to the house of bridegroom), seasonal festivals such as Aroos Gooleh, Noroozi Khani, Yalda night of Guilan and so forth, and also celebrating famous Guilan personalities are among other programs being conducted in the museum.

Cultural/Architectural Domains

Despite its limited area, due to its specific geographical position Guilan province exhibits cultural and social diversity, and the ways of life of the people and their architecture form different domains.

According to the studies, nine cultural/architectural domains have been identified in Guilan, and for each of them a specific venue has been selected at the site of the museum. Each domain is introduced through the format of a village. These villages include those of the eastern seashore, the eastern plain,

the eastern foothill, the eastern mount, the western seashore, the western plain, the western foothills, the western mountains, and the central plain.

The common features of the domains under investigation are full coordination between the existing buildings and their harmonious use of indigenous materials and those related to their climate. The architectural/cultural fascination of the nine domains is doubled by comparing them with each other and locating them beside each other. The incomparable diversity of Guilan and the local knowledge of construction of buildings indicate the architectural differences from one region to the other.

The structures transferred to the museum encompass all existing types in the domain under consideration and indicate the different social classes of the village. It is worth mentioning that differences in spatial improvements to these types have roots in the situations of livelihood and economy of the families. Thus, to the extent that the economic situation of the household is better, the number of rooms and dimensions of the building increase. These buildings are reassembled based on anthropological studies and by using traditional instruments, while keeping an eye on their initial position. So far, four villages of the eastern plain, the central plain and the western foothills are under utilization, and those of the western mount and the eastern foothills are under construction.

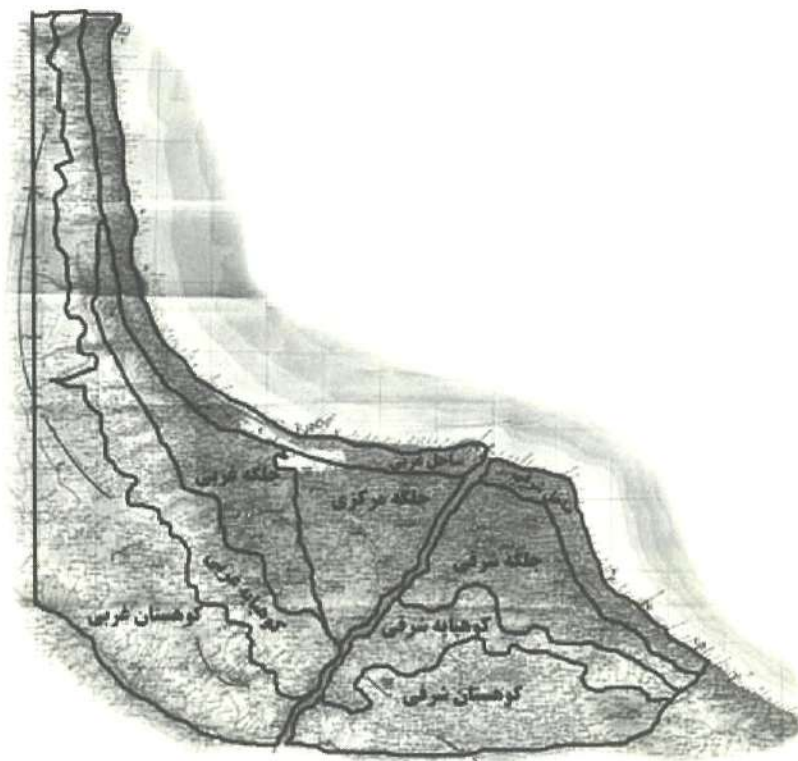
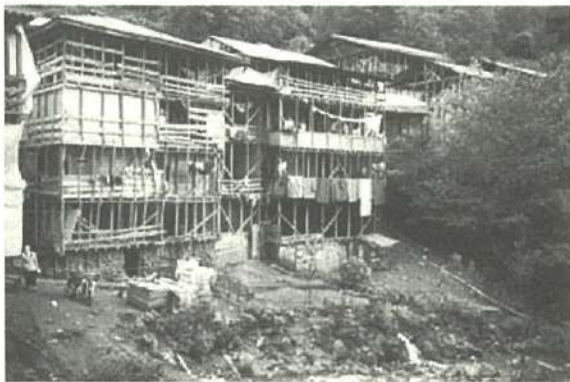


Fig. 5: Cultural/architectural domains of Guilan





Photos 4 - 12: Housing diversity in Guilan

Construction Techniques and Materials

Each of the domains has its own specific type of structure and architecture. The dominant element in the construction of buildings is wood, which in some domains is integrated with mud or stone. In most of the regions of Guilan, the main role in the construction of building either from the viewpoint of structure or aesthetics is undertaken by wood. As mentioned earlier, despite the small area of Guilan, due to natural phenomena (mountains, plain and sea), and the Sefidrood River which is the old traditional border between the western and eastern regions of Guilan, this province is classified into nine domains from the viewpoint of cultural and architectural content. Despite the architectural similarities, these domains have considerable differences from the perspective of the interaction of nature, climate, and the use of wood in construction.



Photo 13: A house in the domain of the eastern plain of Guilan

One example of the rural houses whose geographical area covers a small part of the eastern plain of Guilan is a type locally said to have a good-looking foundation.

The total structural system of the foundation has taken form based on wood. The building is built on the wooden stands (piers), located at the points of load concentration such as the corners of walls. These wooden bases are built from pieces which are assembled in checker-work fashion. No peg or other type of fitting is used to connect these parts with each other. These wooden pieces form the foundation of the building which is placed on a platform made of mud.

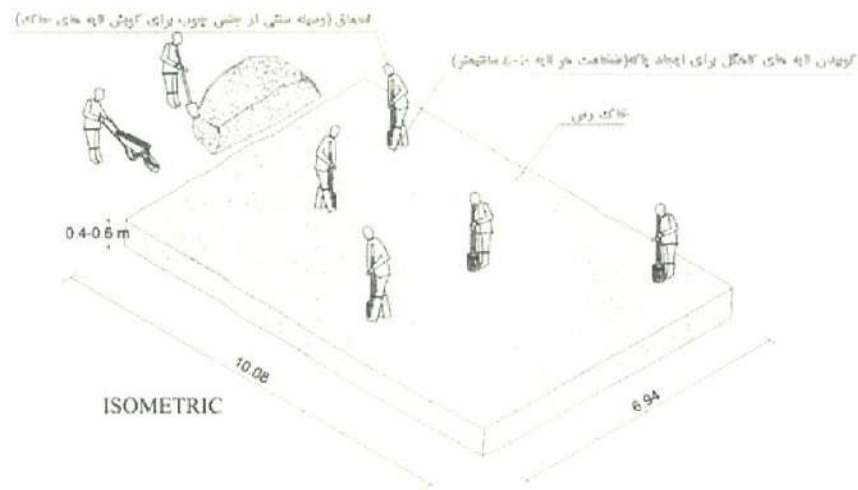


Fig. 6: Construction of a mud-made platform to receive the wooden foundation

For the purpose of further reinforcement, and to prevent the infiltration of humidity into the wooden foundation, a one-meter hole is made at the location of each pier, and lined with tamped layers of coal, mud and ash, as a bed to receive the lowermost wooden pieces.

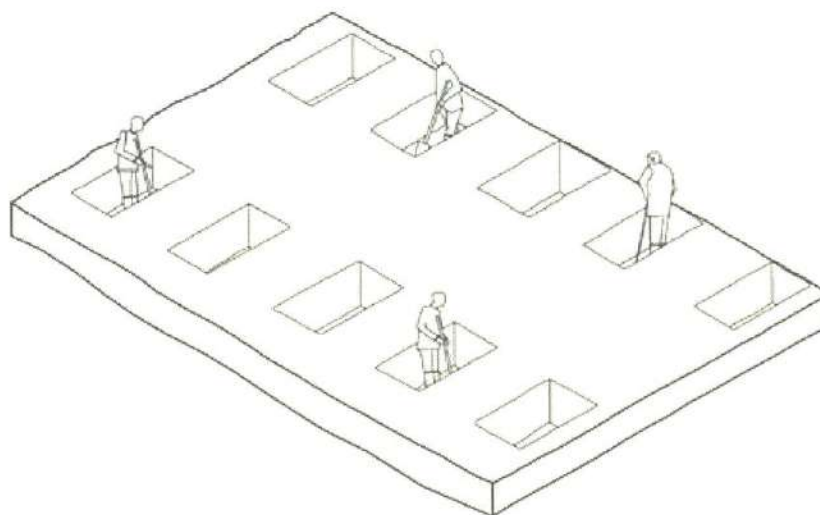


Fig. 7: Digging holes in a platform at the locations of the wooden piers

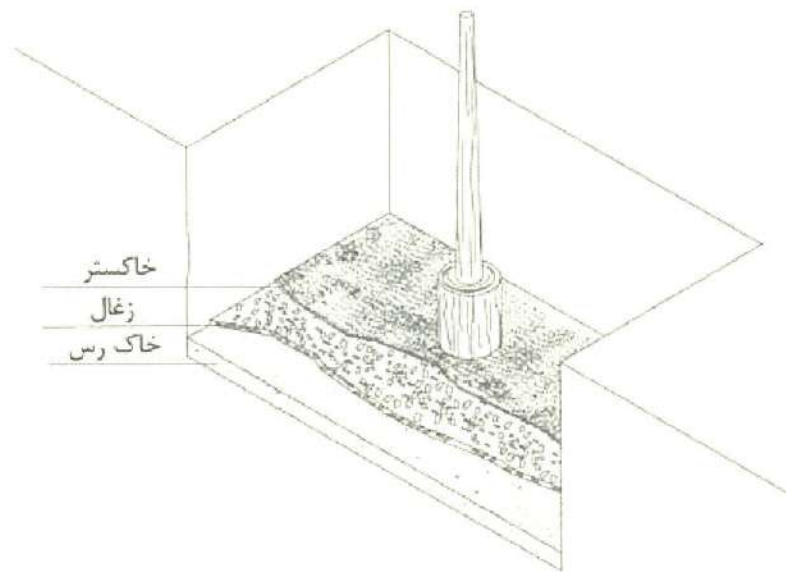


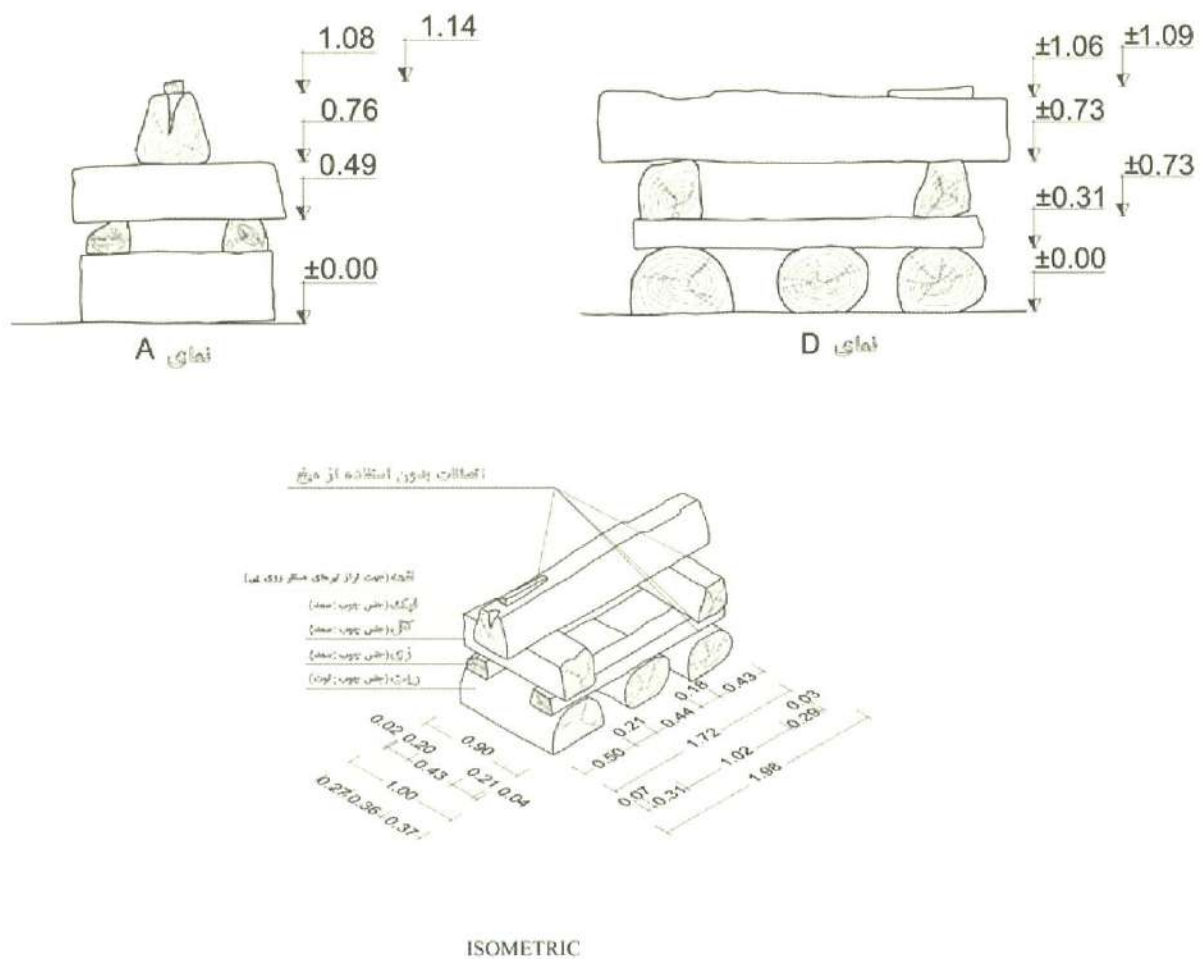
Fig. 8: Layers being tamped to form the base for a wooden pier

After preparing the ground bed, the wooden pieces are assembled over each other. These parts receive the total weight of the building, which is the only force holding them in place. Mounting the building on the wooden base elevates it above the ground surface, allowing air to flow easily beneath the main structure. This keeps the building safe from humidity and possible floods.

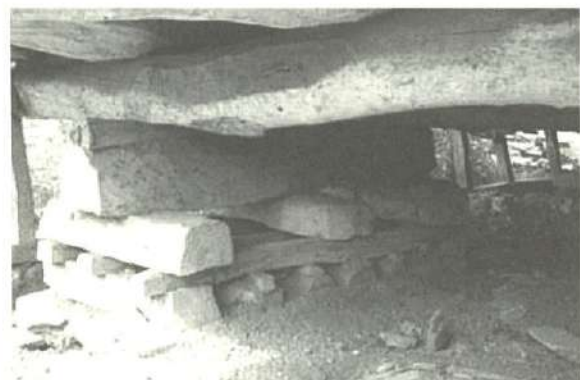
Wood used in the foundation of most of the buildings under investigation are types of hardwoods which are resistant against humidity. In most of the buildings investigated, the lowermost row of wooden parts of the base, located on the ground surface, is mulberry wood.

According to the indigenous people, this wood can serve efficiently despite the humidity for a hundred years. The other wooden pieces of the foundation are mostly of *azad* (margosa) and *oja* woods (called *samad* and *li* in the local dialogues). All these woods are hard and commercially valuable. The age of the houses under investigation in this domain sometimes dates back 200 years. At the stage of disassembly, it is seen that the outer surface of the lowermost row of the foundation (mulberry), being near the mud, shows decay, but the core and other inner portions of the wood are still strong and functional.

According to indigenous builders, the wood was traditionally cut in the autumn, because autumn wood is more solid than spring wood. This increases the wood's resistance. Also, spring wood has a higher proportion of sap which attracts fungi and parasites. In the traditional process, the wood was stored under a cover or in a dry place away from rain and humidity for one year, but even then the wood was not dry. The ideal duration for drying the more fragile softwoods was one to two years, and for hardwoods three to four years. In most cases, however, the wood was used after a shorter period less than the ideal.

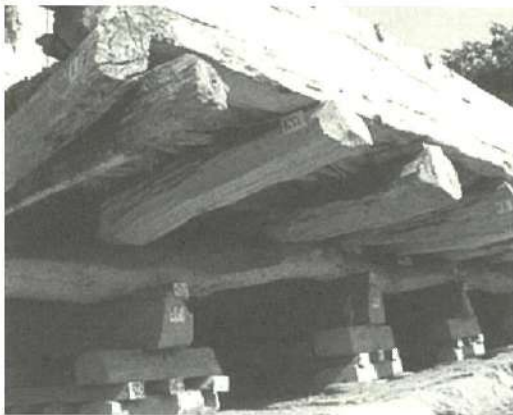
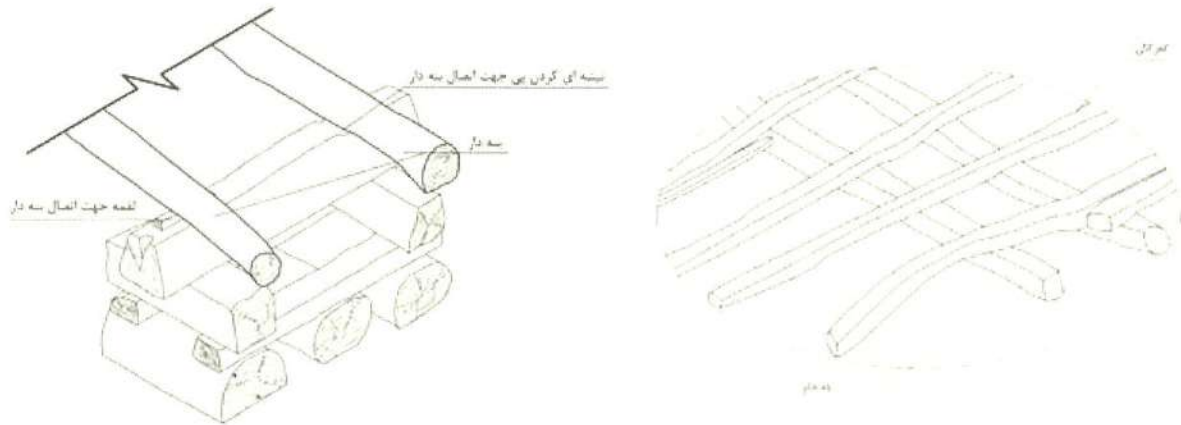


Figs. 9 - 11: Method of placing the pieces of the wooden foundation



Photos 14 - 15: Wooden foundation (base)

After making the foundation, the wooden network which forms the floor of the building (*bone-dar* and *kamarkesh* network), comprised of thick logs having the same shape and natural form, are placed over the wooden base. The wood used for the floor network is of the same type of hardwoods as for the foundation, to withstand the load. This network transfers the load of the superstructure onto the wooden base.



Figs. 12 - 13, Photo 16: Method of locating of the pieces of wooden base

The walls of the rooms are located on this wooden grid so that the locations of the rooms correspond with the locations of piers of the foundation. (B)

In Guilan province, due to the humidity and the necessity of having a good air current, the method of locating the rooms and the relationship between closed spaces and open or semi-open ones (particularly in the plain

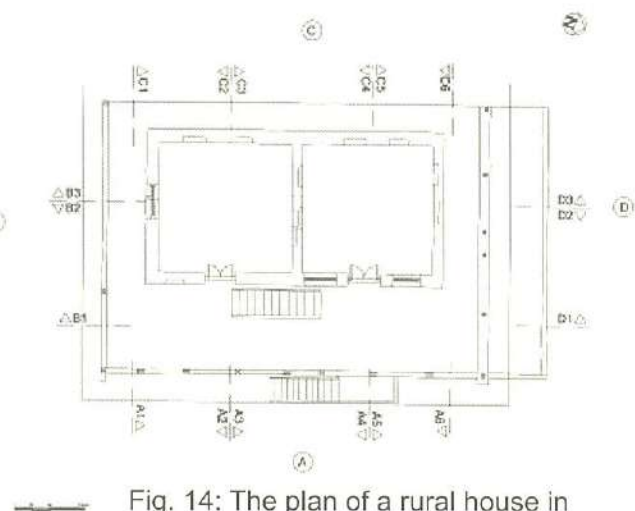


Fig. 14: The plan of a rural house in the eastern plain of Guilan

areas) is noteworthy. Around the core of the house is a semi-open porch (*ivan*), which borders the outside through a row of wooden columns. The central core takes a linear shape and includes the main rooms of the building.

Two main methods of laying wooden walls prevailing in the area of the eastern plain are *zogmei* (*darvarchin*) and *zogali* walls.

A *zogmei* wall is comprised of round timbers which are laid horizontally, with the members of adjoining walls alternating, to form load-bearing walls. No peg or other fitting is used for connecting the members of *zogmei* walls. Only the ends of the timbers are notched slightly with an axe where two walls meet. This in turn helps with the proper location of the round timbers over each other.

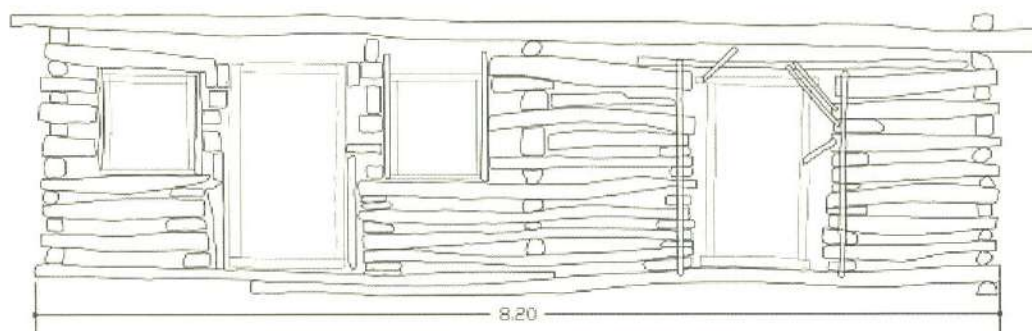
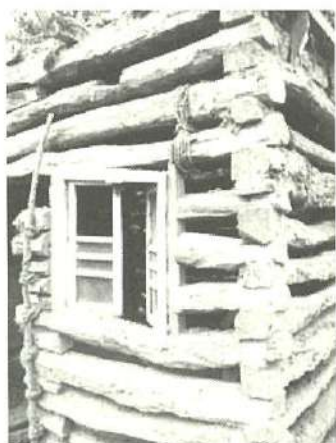


Fig. 15: *Zogmei* walls



Photos 17 -19: Method of laying *zogmei* wall beams over each other

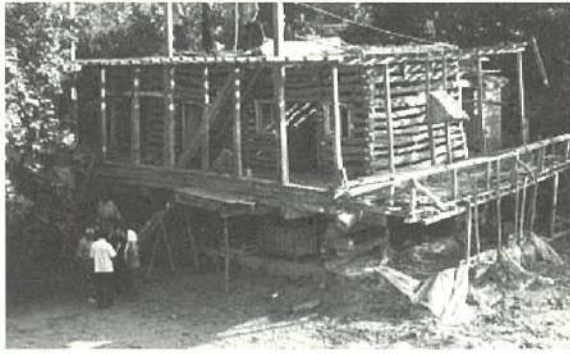


Photo 20: *Zogmei* walls



Photo 21: A model of *zogmei* walls

The types of wood used in *zogmei* walls in most of the buildings examined are from softwood trees such as common alder and Lombardy poplar. The empty spaces between *zogmei* members are filled with a mixture of mud and rice stalks. The members may be connected with each other at points with a *varis* rope (woven from rice stalks). The *zogmei* wall is fully load bearing.

The *zogali* wall is comprised of wooden pillars located at regular distances, over which small tree branches (*zogal*) are placed diagonally or horizontally. The spaces between the *zogal* members are filled with *kaloosh* (rice stalks) and mud. Horizontal beams atop the pillars make a wooden frame. In most of the buildings, the types of these woods are hardwoods such as *azad*.



Photos 22 - 23: *Zogali* walls

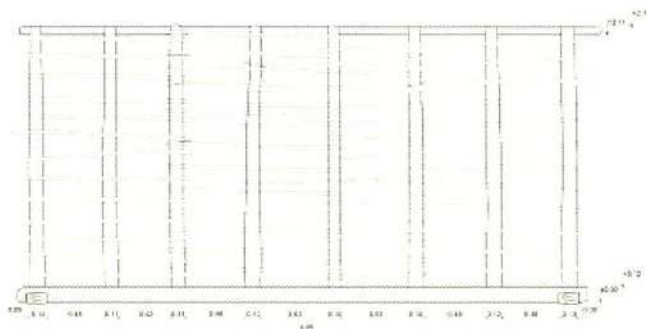


Fig. 16: Diagram of a *zogali* wall

The houses in the eastern plain are built with one or two floors. They include one-, two-, three- and four-room units. The roofs of the houses are sharply sloped, sometimes with a pitch of more than 60 degrees. The roof truss is constructed with poles made from the trunks of long trees. These are selected from trees such as common alder and Lombardy poplar to be straight, smooth and long.

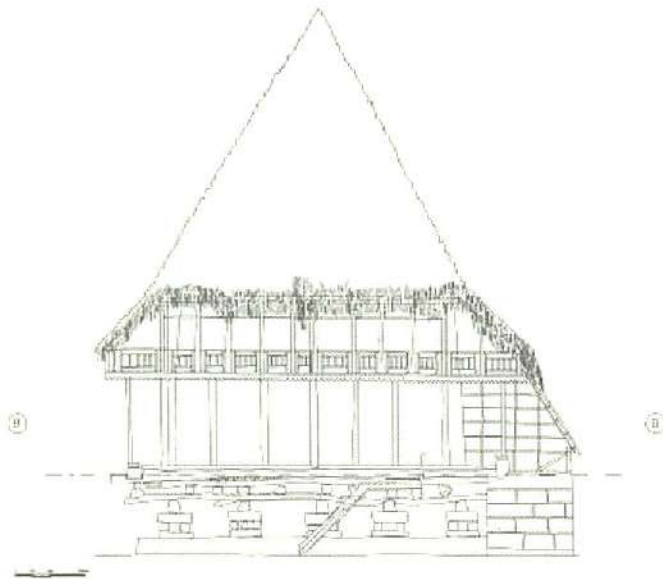


Fig. 17: Ratio of roof height to the building

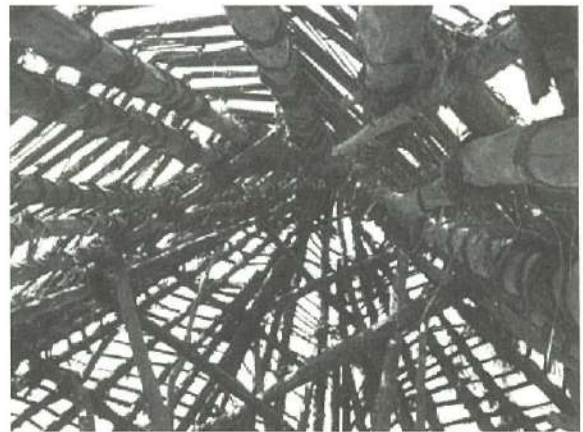


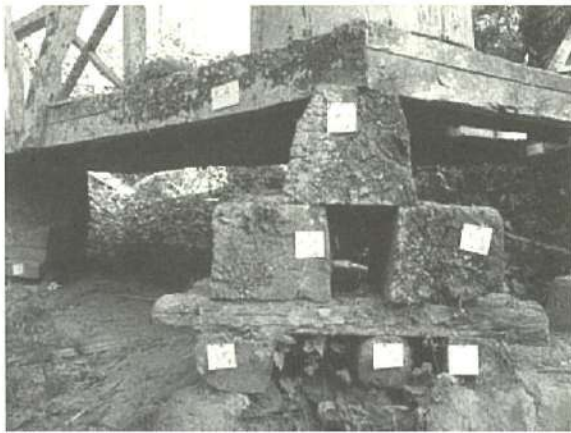
Photo 24: Roof truss

One of the characteristics of the rural houses of Guilan is that each house is associated with a set of buildings. Due to the scattered nature of villages in Guilan, each house forms one such residential collection. In these sets (being in the past mainly free of internal fences and specific borders, but detached from the roadway or neighbor's land by a fence), in addition to the main residential unit, other structures such as the rice storehouse, a place for growing silk worms, a stable and hen houses were constructed according to the method of household's livelihood.

Also, depending on the domain where these sets were located, the subsidiary buildings were different from a structural point of view. In the domain of the eastern plain, the storehouse for rice (known as *kondooj* in the native dialect) is built over a well-shaped base with huge columns. The main reservoir and storeroom are the spaces under the sloped ceiling.



Photo 25: Rice storeroom



Photos 26 - 27: Rice storeroom constructed over a well-shaped base

Another type of wooden base used in different domains of Guilan is a wooden timber pillar known locally as *pakaneh*. This is erected by digging a hole of about 60-80 centimeters and setting a small wooden pillar inside. The placement is stabilized by hammering stone and mud layers around the pillar. This system is mainly used for columns of a porch in the front or around a building.

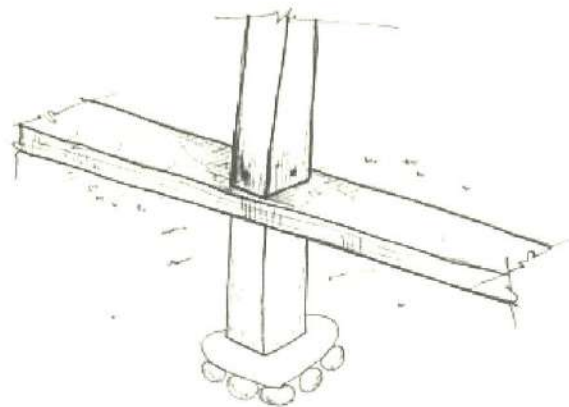


Fig. 18: *Pakaneh*



Photo 28: *Chinei* (mud) wall

Types of walls in Guilan include, in addition to *zogmei* and *zogali*, mud walls called *chinei*, and stone and sun-dried brick walls. Also, there is a type of building in Guilan's countryside known as *poori*, which has a wooden frame covered with a woven fabric of goat wool.

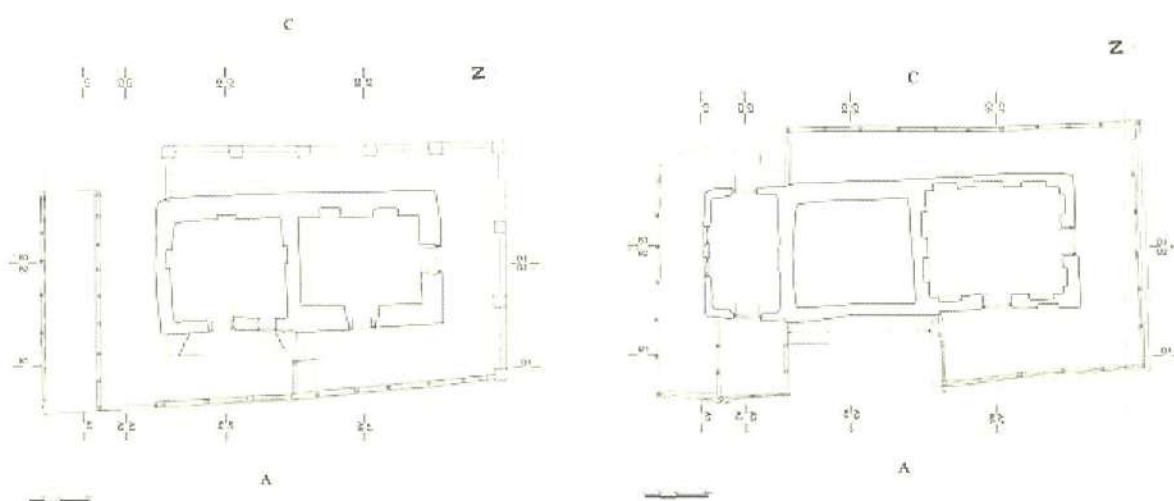
Chinei mud walls are comprised of regular pieces of mud 25 cm square, laid diagonally in rows alternating the direction from left to the right.

Chinei mud walls in some areas (central plain of Gilan) have a wooden frame and the transfer of the building load from the roof to the ground is divided between the wooden columns of the frame and the mud wall. Of course, control of most of the load is made by the frame, comprised of wooden columns linked by horizontal beams. Accordingly, the mud wall plays mostly the role of a filling element.

A noteworthy aspect of the buildings being studied in the region of the central plain of Gilan is the integration of two types of mud walls. In most of the units under consideration and those being disassembled, two types of mud wall and a *zogali* wall were used in one structure concurrently. In these cases, the lower floor had mud-made walls and rooms on the upper floor had *zogali* walls. Due to the existence of abundant reeds in the region, the reeds (bamboos) are used to fill the spaces between the *zogali* wall columns.



Photo 29: Building with mud and *zogali* walls in the central plain (Amini's house)



Figs. 19 - 20: Plan of Amini's house (central plain)

In some parts of the region, the mud wall is a bearing wall and no column or a wooden frame is used inside it. In some of the examples studied, horizontal beams are laid at one-meter vertical intervals. In some stone and sun-dried brick made walls, for example, at every meter of the height, a wooden beam has been inserted to distribute the bearing of the wall. Also the total wall has been divided into sections from the viewpoint of the concentration of the load.

Though in some regions walls are made using stone, mud, or sun-dried bricks, wood still plays the main role in the structure. The load-bearing columns of the external wall of the building, the foundation piles, the covering beams and the truss of the sloping roof are formed of wood. In fact, the internal core of the building, made as explained earlier in a manner combining mud or stone with wooden beams, is built in the intervals between the wooden columns comprising the external structural wall of the building.

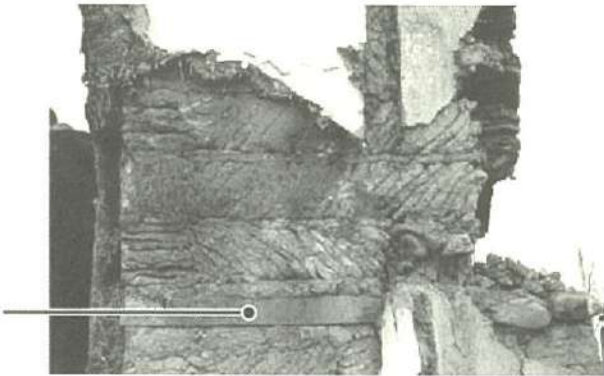


Photo 30: Mud wall with wooden beam

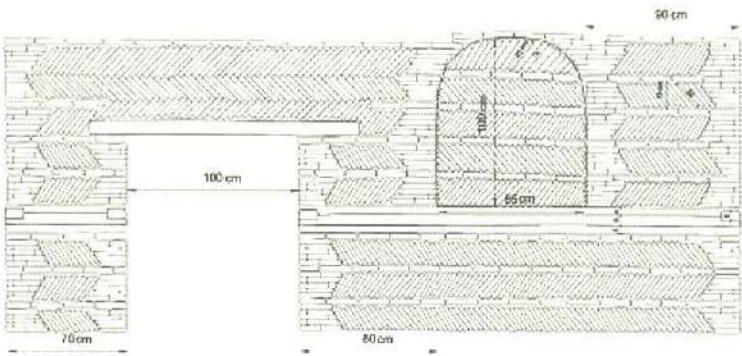


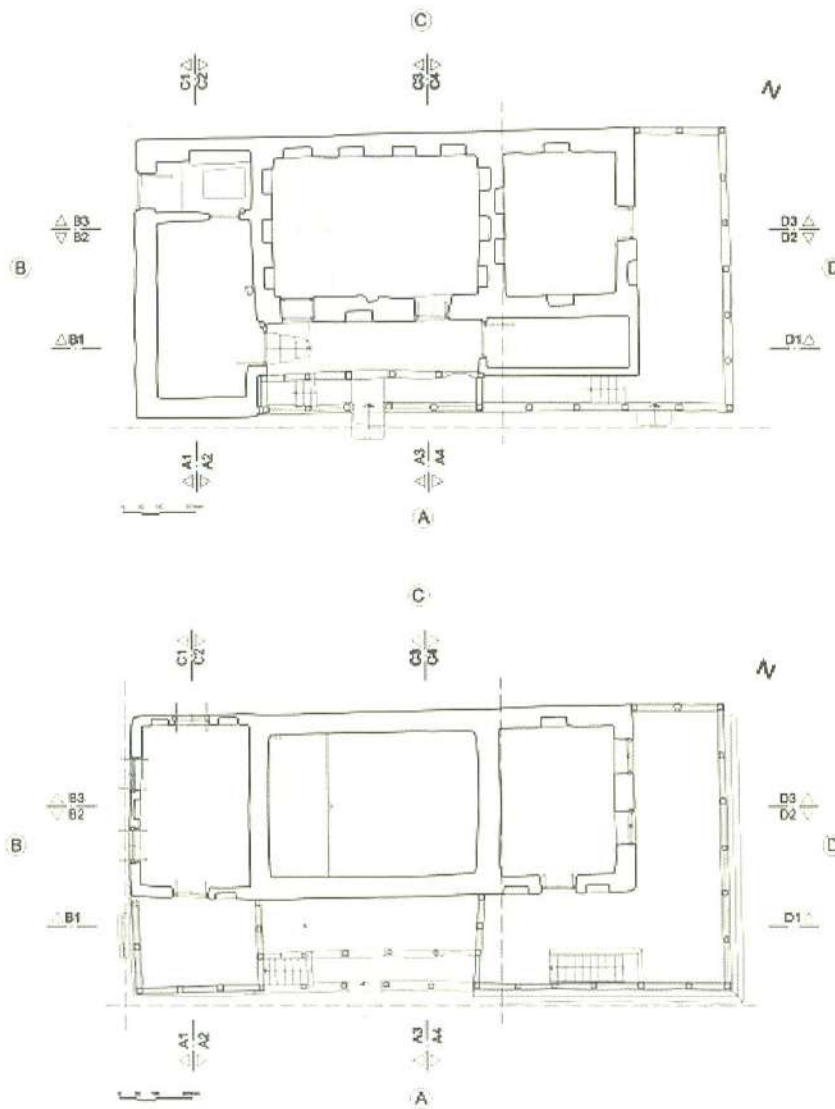
Fig. 21: Plan of a *chinei* mud wall



Photos 31 - 32: Sun-dried brick walls



Photo 33: Building with mud and sun-dried brick walls in the western plain (Moosazadeh's house)



Figs. 22 - 23: Plan of Moosazadeh's house (western plain)

In the areas of mountains and foothills, most of the constructions are built in *zogmei* manner. The construction of *zogmei* walls in these regions is as follows.

First, the dimensions of the rooms are marked off and the areas under the walls are dug in 20-40 centimeters. Stones are then laid there. Over the stones, the first rows of the wooden timbers which form *zogmei* walls are placed. Afterwards, other wooden timbers are placed alternately over each other until reaching the final height of the floor. Using stones prevents the infiltration of humidity into the wood being utilized in the wall.



Photo 34: Construction with *zogmei* walls in the western foothills area (Tarabi's house)



Photo 35: Tarabi's house, displaying the wooden frame

Roofing

Roof covering in Guilan is of various kinds. The materials used include *gali* (a wild plant growing in lagoons), *koloosh* (rice stalks), shingles, and tiles.



Photos 36 - 39: Different types of roof covering

Lat (shingling) is a type of covering for sloped roofs made with wooden timbers. In the wood shingled roof, the shingles are laid from the bottom to the top in a regular order such that the upper row is laid over the lower one. They should cover half of the row below. At the time of laying the shingles, a one-centimeter distance is left between adjacent boards, so that when it rains or the weather is hot and the boards expand, they do not put pressure against each other. The shingle board is made of the red part of the oak tree with the help of hand tools. This part of tree is more resistant against humidity. The dimensions of these boards are not standard, but their approximate thickness is about 1 to 2 centimeters. Also their width and length are about 25 by 40 centimeters.

Decorations

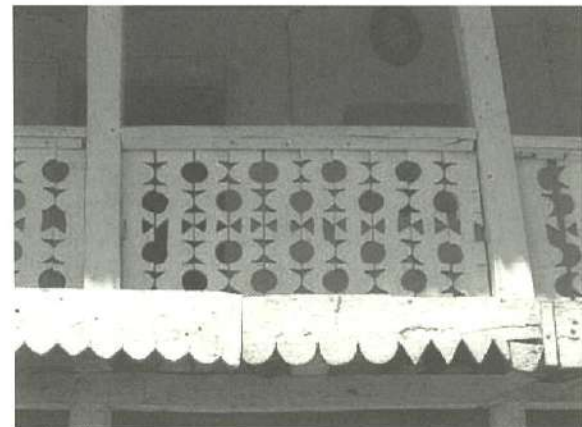
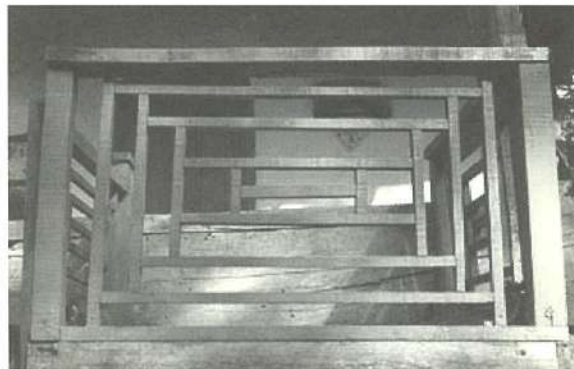
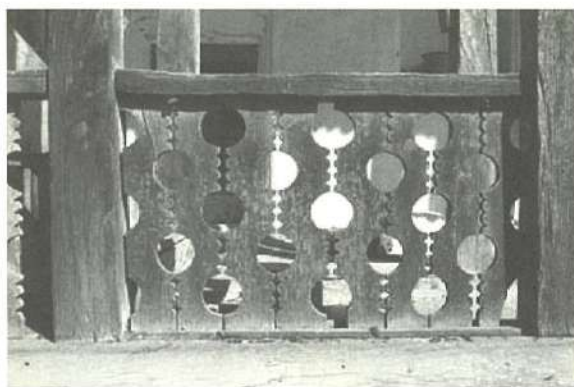
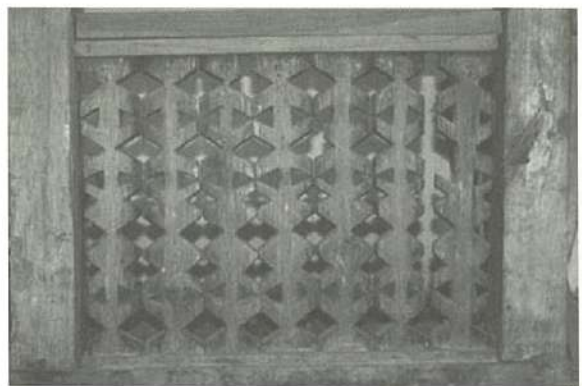
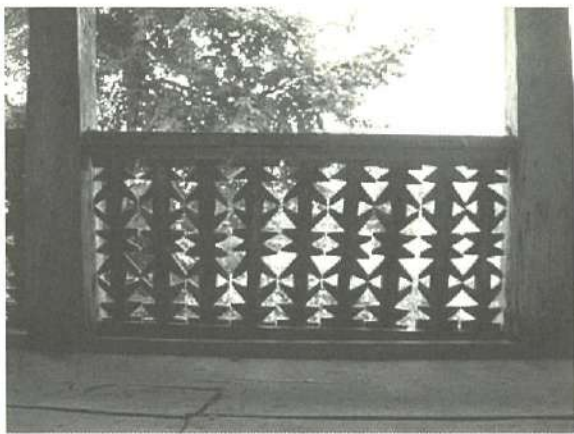
Decorations in rural houses of Guilan have always had colorful and remarkable roles. The decorations being used in the houses of Guilan can be divided into wooden and mud-made types. The wooden decorations include column capitals and rails, and mud decorations are made in form relief works, engravings around the niches and mud walls of rural houses.

The greatest in number and the most elaborate decorations, however, used in rural buildings of Guilan are of the wooden type. They differ from each other depending on the economic condition of the owner of the building. In most of the units, the railing takes inspiration from the shapes of plants observed in nature. The ends of cut and decorated beams, the window and crenellated fascia are among other decorated elements.

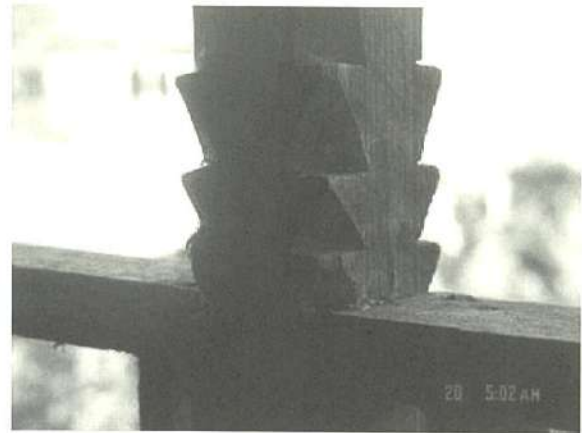
The method of the work of the museum in transferring the decorative wooden elements is to label each component accurately, then the disassembly and classification are performed. Detailed drawings are made of the method of fittings, and photos taken to record the process.



Photos 40 - 44: The column capital and crenellated fascia of the roof



Photos 45 - 50: Decorative railings



Photos 51 - 52: Column decorations

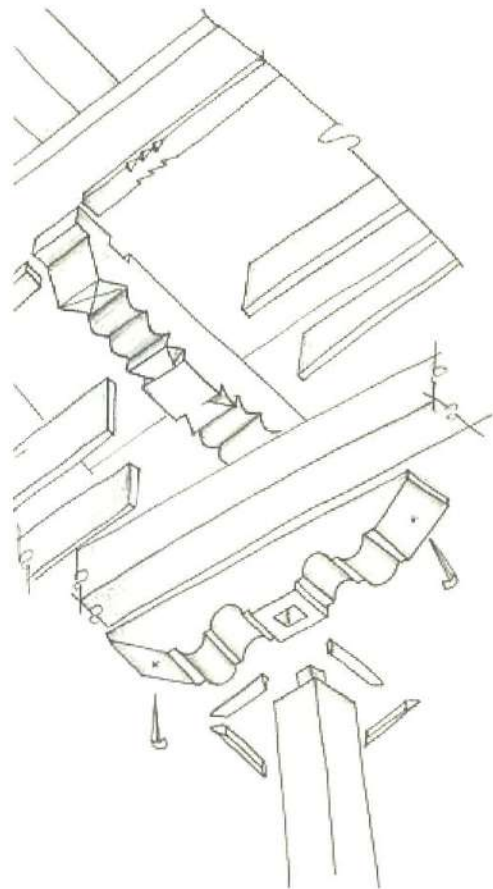
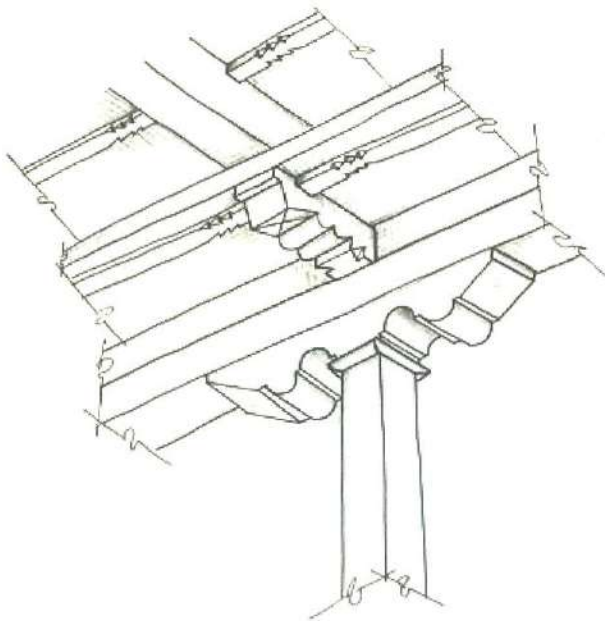


Fig. No. 24: Appearance of the column capital (left), and method of connecting it to the column (right)

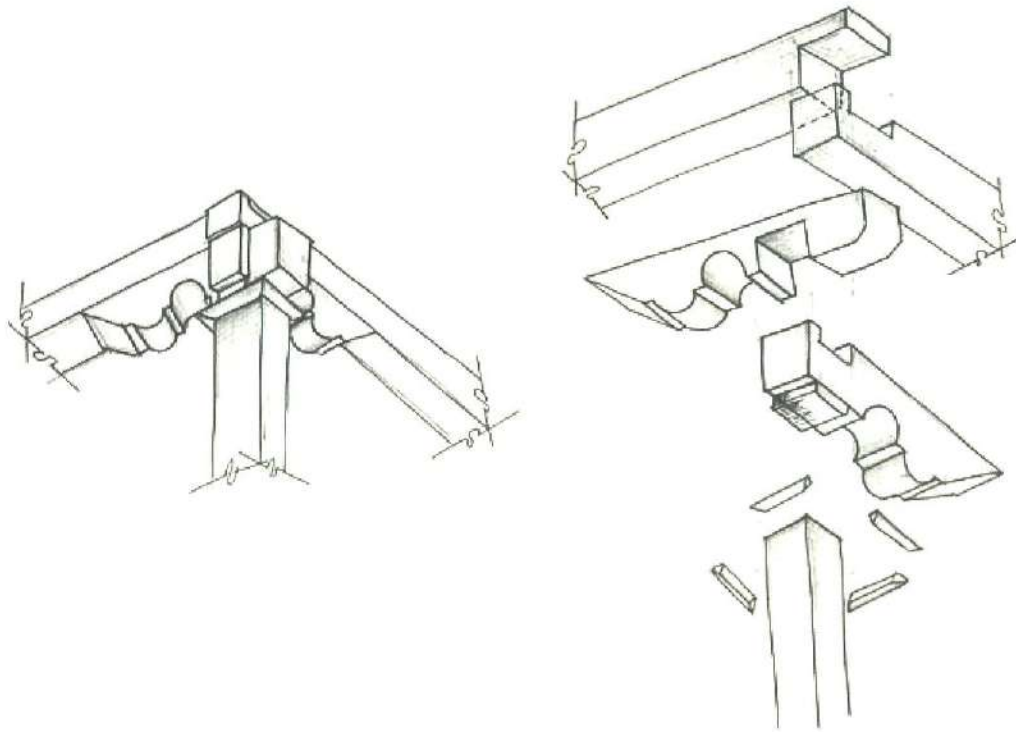


Fig. 25: Appearance (left), and method of connection of a column and crossing beams

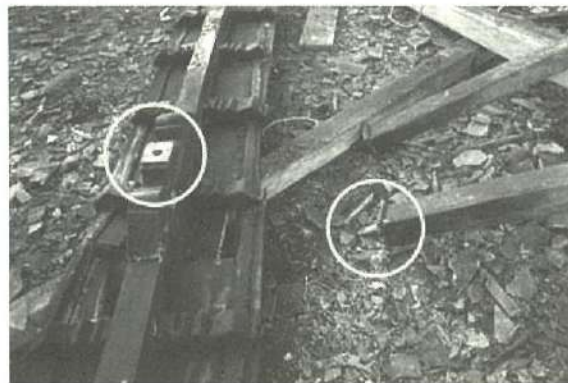
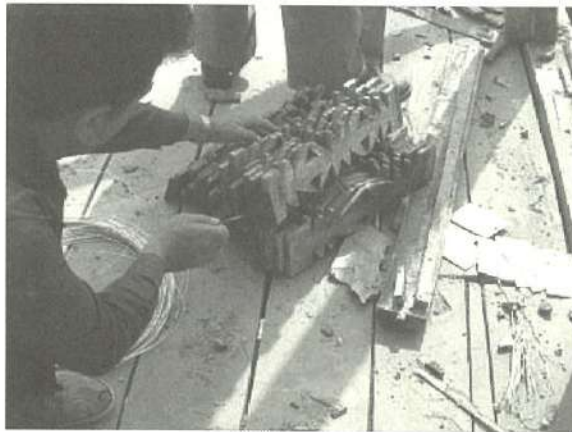
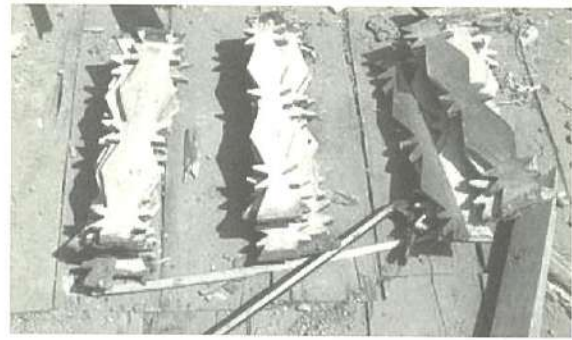


Fig. 53: Checking the fittings

In reassembling buildings with wooden decorations, due attention must be given to the precise details recorded by the drawing of the maps, photography, and the classification of the decorations, so that each piece will once again be reassembled in its proper place.



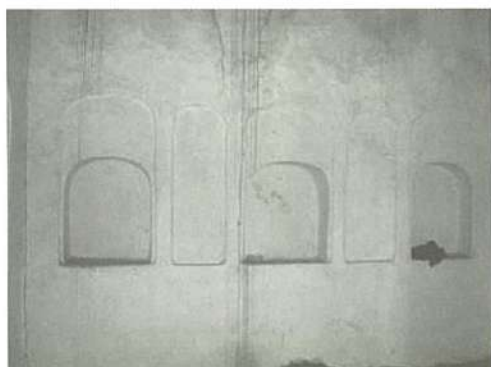
Photos 54 - 56: The stages of disassembly and classification of railing

In addition to the wooden decorations, mud-made decorations are also seen in the rural buildings of Guilan. At the stage of disassembly of these decorations, mapping, modeling and photography are carefully conducted, so that reassembly can be done to match exactly the original situation.

An interesting sample of the mud decorations being seen in the buildings of rural plain of Guilan is the decoration of the “life tree” as a symbol of growth and life in Guilan.



Photo. 57: The mud decorations of the life tree (Mirsayar's house)

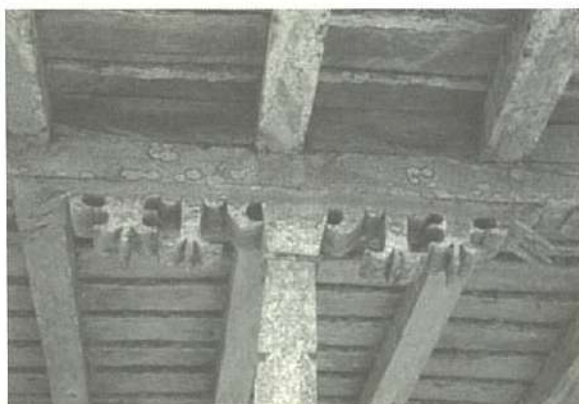


Photos. 58 and 59: Mud decorations of the niche and frame of a window

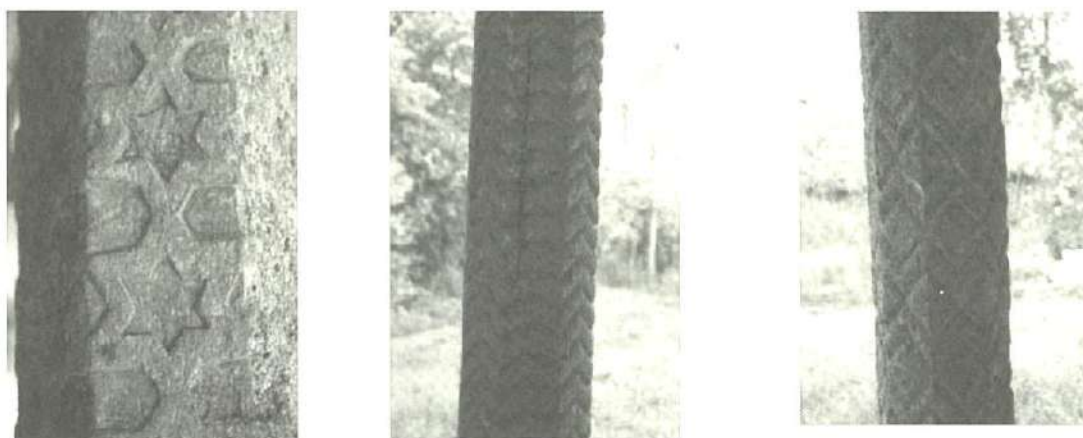
In addition to rural houses, wooden decorations are also observed on other structures in the villages. Examining the shrines that are built in traditional ways in the rural regions of Guilan, many fine and beautiful wooden decorations are observed. The decorations, typically seen on the head (capital) of a column, and as wooden engravings on columns, may be very diverse even in one single building. These decorations are often different for each individual column.



Photos 60 - 61: Two examples of shrines



Photos 62 - 63: Column capitals



Photos 64 - 66: Column engravings



Photos 67 - 68: Decorations

Problems in the Preservation of Wood

As stated earlier, the dominant type of material used in the rural architecture of Guilan is wood. In order to construct buildings, it is mainly the woods of forest trees in the region that are used. For the frame of the building, mostly hardwoods such as *azad*, acacia, *oja*, and oak are used. In making decorations, the wood of *rash*, maple, hornbeam, and common alder are employed. These woods are considered in the softwood category.

The local builders use the wood without further processing to reinforce the buildings. In addition to selecting wood cut in the autumn for the reasons given above, and allowing the wood to dry, they also believe that treating wood with smoke prolongs its life. In most of the houses studied, the wood had

received smoke treatment. The old builders and villagers believe that smoke helps prevent the infiltration of insects, though this idea has not been proved scientifically.

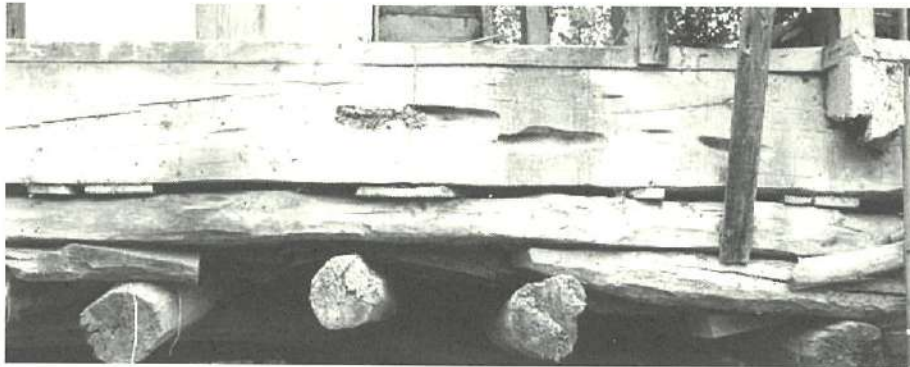
A variety of factors endangering wood, or complicating attempts to study and prevent wood damage in the region, can be summarized as follows.

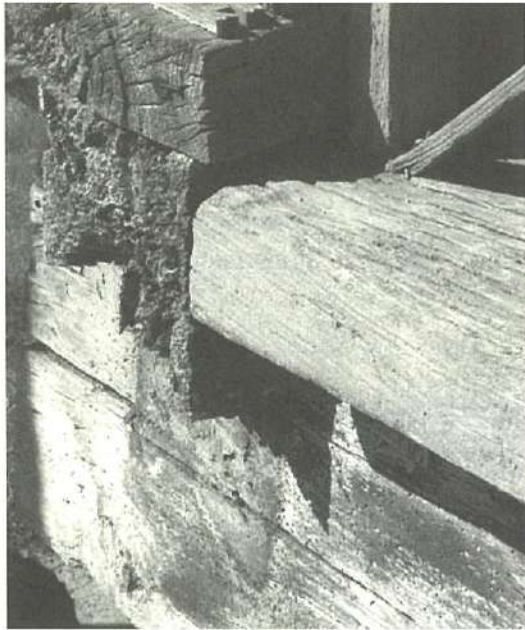
Humidity. One of the challenges in relation with the construction and reconstruction of the wooden buildings which we have faced so far is the destructive impact of humidity on wooden elements. This humidity includes that caused by moisture coming directly from the atmosphere, as well as that produced by fungous disease in wood. The various types of decay observed as a result of humidity include the following.

- In wooden buildings in which wooden columns embedded in the ground are used, it is observed during disassembly that most of the portions of the columns buried in the ground have suffered from decay and have decomposed. However, while this decomposition shortens the portion in the ground, with the exception of a trivial degree of settlement, no other serious issue is seen in the housing unit. Accordingly, even in earthquakes the buildings do not suffer any damage as far as structure is concerned.
- In the buildings standing on wooden piers as described above, the wooden pieces of the lowermost row, which are in direct contact with the soil, are decayed. Due to the fact that these pieces are of mulberry wood, which is hard and resistant to humidity, it is mainly the external shell that is inflicted with decay. In some buildings investigated, due to the decay of these pieces, the building has been lifted with jacks and some stones placed under it.
- In wooden buildings having *zogmei* walls, the first row of the wooden trunk which is laid over stone and mud faces decay. In structures in which hardwoods such as *lilaky* or oak are used, this decay is superficial and affects only the outer surface of the wood. In softwoods, however, the whole wood may be inflicted with decay and the wooden piece no longer usable.
- The two ends of the covering beams of the roof, placed inside the mud are inflicted with decay. In all samples studied, the decay was observed in the two ends of the beams. In some buildings, the decay is deep and in others it is trivial.
- The wooden elements in the western wing of the building, which in Guilan province is exposed to slanting rains in winter and autumn, experience decay. This decay resulting from humidity is seen on the beam ends, the basses of columns, the railings and boarding of the unit floor.

The method used in the museum in the construction of new wooden buildings is to tar the part of the wood which is placed inside the ground or mud. But concerning the prevention of humidity infiltrating from the atmosphere, there is no scientific way to make the wooden pieces waterproof.

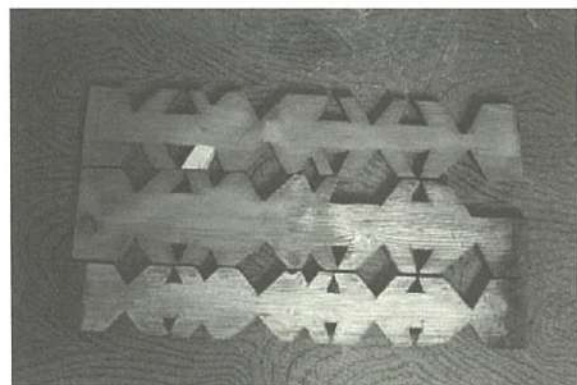
Insect penetration. The penetration of moths and wood-eating beetles is one of the difficulties which we have faced. This beetle, which is black and small, penetrates into the wood and lays eggs in the wood. Some of the woods which are used for the reassembling of the units are suffering from this problem. The traditional method to prevent the penetration of insects is to smoke to the wooden pieces and also to use heating oil. We also use the unproved traditional and old methods, but these methods do not have a great impact over long periods of time.





Photos 69 - 73: Decayed wood and pieces eaten by termites

The renovation procedure adopted at the museum is to conduct constant monitoring of the wooden elements, replacing the decayed wooden pieces with intact ones. Also, in some cases the damaged and decayed pieces are fixed and restored. All structures are examined each week from the viewpoint of possible settlement, structural difficulties and decadence of the members. The restoration of the decayed and damaged pieces are done with the use of woods of the same type as the original wood. In this way, the decayed part is removed and then simulated with new wood.



Photos 74 - 75: Cleaning and renovating the rails

Inadequate scientific data and methods for measuring the life expectancy of wood. Another challenge is posed by the lack of good scientific methods for calculating the life expectancy of the wood for the constructed and reassembled buildings in the museum. The lack of data for specific calculations to

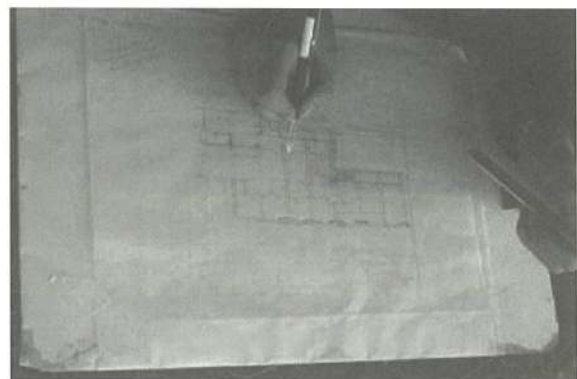
estimate the rate of wear on the wooden pieces, especially beams and columns that bear building loads, the effects of lateral pressures from forces such as wind and earthquakes, the rates of compressing, bending and pulling tensions with regard to the diversity of the types of woods and their specific weights after the final drying process, are causes of some of the dilemmas which the museum is encountering.

The area in section of the wooden pieces used in most of the buildings is similar. In harmony with the increase of the length of the wood, the area of the section also increases, but there is no scientific method to compute the proper ratios of the wooden elements' dimensions. It is worth mentioning that the wooden structures of Guilan are sometimes over 200 years old. They have experienced two major earthquakes and heavy snowfalls.

Fire. Wooden buildings cannot resist fire, especially buildings for which all the structure is made of wooden materials.

Disassembly and Reassembly

The basic function of the museum is the disassembly and reassembly of rural buildings. Efforts have been made to identify every type of architectural form related to different social classes of the villages for each cultural/architectural domain, and transfer examples to the museum. After identifying and documenting the selected type (documentation includes preparing the layout, drawing the details, taking photos of the unit), all observable wooden pieces of the building are labeled. It is worth mentioning that the pieces hidden in the ground mud are labeled at the stage of disassembly.



Photos 76 - 77: The documentation process

All labels are posted on the pieces based on a pre-determined system. Labels made from aluminum sheeting are prepared. Numbers are then written on them with oil-based colors, and are attached with two nails to the concerned element. Later on, all numbers are copied down on pre-prepared maps.

Labels are attached to vertical pieces at the lower part on an internal surface, and to horizontal pieces at the right side corner. For each building floor area, a specific color is selected in the following manner: green for the ceiling (level 2), red for the first floor (level 1), blue for ground floor (level 0). Also, naming is done based on the first letter of the native term for the members. For example, columns are named with S and reeds with N. The operation of labeling begins from the highest surface, i.e. from the ceiling.



Photo 78: Labeling the truss of a sloping roof



Photo 79: Labeling the beams of the first floor

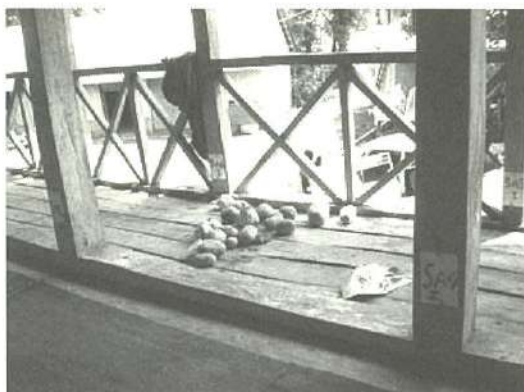


Photo 80: Labeling the columns of the first floor



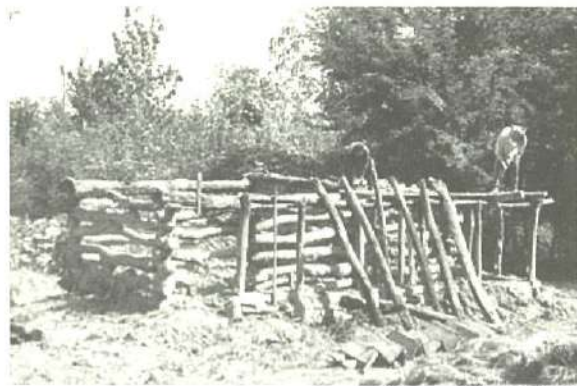
Photo 81: Labeling the door of the first floor



Photo 82: Labeling the flush beams

After the completion of labeling, the building is disassembled. From the highest surface of the structure, i.e. the roof, the components of the building are detached. In this process, efforts are made to disassemble all components precisely and cautiously. All stages of the process are photographed and recorded, with necessary plans and details of the components being drawn. In order to understand the method of construction of the building, observations are made of the walls and the base of the building. After the end of disassembly process, the materials are transferred to the museum and reassembled.





Photos 83 - 92: Different stages of building disassembly

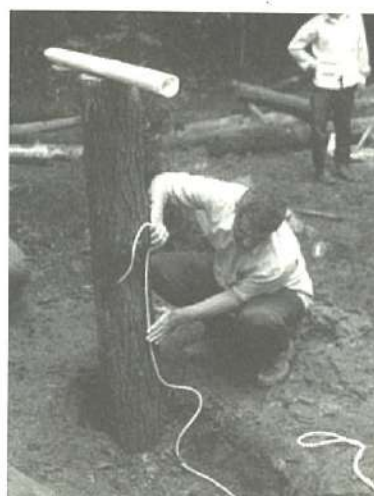
The process of reassembling the building is the most complex aspect of its transfer to the museum site. The reason is that should be reassembled at the museum with regard to the spirit prevailing over it, which is influenced by the location, way of life and dominant culture of its village.

Reassembly is not the transfer of volume but the transfer of a building, a residential unit in which in all its layers, life was flowing.

Each rural house is defined with its yard. Though the yard is the border between the outside and inside, it does not create any spatial detachment between nature and the architectural space. The border of the yard and the outside is a transparent layer which gives meaning to the interaction between the architecture and the environment.

A house draws its identity from the place where it is built, and changes from being simply volume into a living space. In reassembling the building, the aim is to relocate the building at the museum in a manner that will not destroy the relationship between the building and its venue. Reassembly is in fact the point of connection of past and present, and it gives a new identity to the building in a new place. This new identity does not reduce the meaning of the building as a place for living, but adds something to that. Furthermore, it removes the color of oldness from it and gives renewed dynamism and life to a forgotten unit.

The nine architectural/cultural domains of Guilan province have been provided with locations in the museum site, with due attention to their position and their dominant geography and consideration for access routes, connections with other domains, and the appropriateness of the topography. The act of reassembling the building is performed with regard to the documentation and labels on the wooden members, in full loyalty to the principles of traditional construction of the building.



Photos 93 - 99: Different stages of reassembly



Photo 100: Building before disassembly



Photo 101: Building after reassembly

The reassembled villages in the museum

The village of the eastern plain. The cultural/architectural domain of the eastern plain of Guilan encompasses the plain regions east of the Sepidrood River. The inaugural ceremony for work on this village was held in May 2005, and it was opened to the public in May 2006. This is the first reassembled village in the museum.

When arriving at the village, you will visit six residential sets. Each includes the house, *kondooj* (rice storeroom), stable, hen house, *talambar* (place for growing silk worms), well, garden and toilet. In addition, the village has a mosque, traditional tea house, furnace for extracting coal in the traditional way, place for games and traditional shows, markets for handicrafts, stands to bake bread and other facilities. The village of the eastern plain is comprised of thirty-six structures.

The interesting point in the construction of the foundations of these buildings is the lack of use of pegs or other wooden fittings. The stability of the base elements is through the force of weight. One of the characteristics of the architecture of this area is the fully wooden frame of the building, well-shaped bases, and pyramidal roof (*yelm*). The sharply sloped roof of the structure sometimes reaches a height of 10 meters. The steep pitch prevents the penetration of rain into the inner body of the building. The two shells (envelopes) of the building create wind current and add to its beauty as well.

Among the livelihoods of the people of this region, agriculture can be mentioned with rice as the main product. Growing silk worms is another activity of the villages, but it has lost its flourishing position.



Photo 102: The residential complex of Mirsayar



Photo 103: The residential complex of Pormehr



Photo 104: The residential complex of Montazeri



Photo 105: The residential complex of Rafiea



Photo 106: The tea house



Photo 107: The mosque

Village of the central plain. This domain entails the plain regions of the center of Guilan, the western edge of the Sepidrood River, the city of Rasht and part of the city of Shaft. This is the second reassembled village of the museum. Its administrative operation was started in May 2007 and it was opened to the public in May 2008.

Five residential complexes (compounds), Biyalva, Danesh, Amini, Moradi, and Sadeghi squatter units,

have been reassembled in this village. Each collection includes residential units, *kondooj* (rice storeroom), stable, hen house, *talambar* (place for growing silk worms), well, garden and public toilet. Inside the village, a traditional tea house, blacksmith shop, and paddy fields have been established as well. The village of the central plain consists of sixteen structural units in all.

The wooden frame of the buildings, with their mixture of *zogali* and mud walls, and the sloped roof called *kaloosh sar* are among the architectural features of the central plain of Guilan. The transparent bodies of the building not only create wind current and comfort in the building, but also add to the visual aspect of it. Houses in this region are mainly built over a platform of tamped soil with the coating of *kaloosh* (rice stalks) and mud, which reaches 60 to 100 centimeters from the ground surface, to prevent from the infiltration of rain into floor of the building.

Among the livelihood activities of the people of this region is working in paddy fields. In the past, the people used to grow silk worms and manage orchards of prune trees as well, but these activities are not thriving now.



Photo 108: The residential complex of Biyalva squatter



Photo 109: Residential complex of Moradi



Photo 110: Residential complex of Amini



Photo 111: The tea house



Photo 112: Rice field

Village of the western plain. This domain includes the plain areas of the west of Guilan from the cities of Shaft to Astara. Its administrative operation started in May 2008, and it went into utilization in May 2009.

Seven architectural types have been identified in this domain, and their study and disassembly stages have been performed at the venue of the museum site. Among them, three residential complexes, those of Mohtashamtalab, Mousavi and Mousazadeh, are already in use. Other disassembled units will be reassembled to complete the village. Each residential set includes residential houses, *kooti* (rice storeroom), stable, hen house, well, garden and toilet. Inside the village, a traditional tea house has also been constructed. At present, this village is comprised of eight structures.

The mixture in the wooden structures of the transparent layers and mud frames of the mud walls, and the sloping *kaloosh sar* roof are architectural characteristics of the western plain of Guilan. The building typically has two shells, the external transparent shell and an internal shell, which not only solves climatic issues and creates wind current, but also it gives diversity and beauty to the building. In most of the units, erection of the building over a platform made of tamped soil, covered with a plaster of *kaloosh* (rice stalks) and mud, prevents the infiltration of humidity into the floors of the rooms.

The main livelihood of the people of the western plain region is through the cultivation of rice and tea, animal husbandry, and in a limited fashion from growing silk worms.



Photo 113: The residential complex of Mousavi



Photo 114: The residential complex of Mohtashamtalab



Photo 115: The tea house

Village of the western foothills (mountainside). This domain encompasses the mountain foothills of the west of Guilan. The administrative operation of this domain began in May 2008, and it went into utilization in May 2009. Seven examples of architecture have been selected in this domain. Among them, the reassembling operation of the residential compound of Tarabi and Lotfi has been finished and other buildings which have been studied will be transferred to the museum to complete the village. Each residential set includes houses, *koroj* (rice storeroom), hen house, stable, well, garden and toilet. The fully wooden skeleton of the building, using stone in the foundation, and the steep *kaloosh sar* or *lateh sar* roof, are among the architectural features of the mountainside areas of the west of Guilan.

The formation of this style of building in the foothills of the mountains has given a very different visual image from that of the plain regions. Despite having two shells, due to different climatic conditions, it is denser as compared with the plain areas. Animal husbandry, working rice paddy and hunting wild animals are among the important economic activities of the people in the mountain foothills of the west of Guilan. Also, on a limited scale, people used to engage in growing silk worms.



Photo 116: The residential unit of Tarabi

Village of the western mountains. This domain entails the mountainous regions and countryside areas of the west of Guilan. The executive operation of this domain was started in May 2009 and it went in use in September 2009. So far, seven architectural examples have been selected in this domain. Among them, the reassembly operation of the residential units of Hajatpour has been completed and other buildings under consideration will be transferred to the museum to complete the village. The fully wooden skeleton of this building, using stone in the foundation, and the steep *lateh sar* roof, are

among the architectural characteristics of this region.

The formation of this style of building in the mountains has also given a distinct visual image as compared with other plain regions. Due to the climate of the mountains, it consists mainly of a core and the transparent layers are covered by boards. Animal husbandry, and the cultivation of tobacco, wheat and barley are among the important economic activities of the people in the villages of the western mountain.



Photo 117: The residential unit of Hajatpour

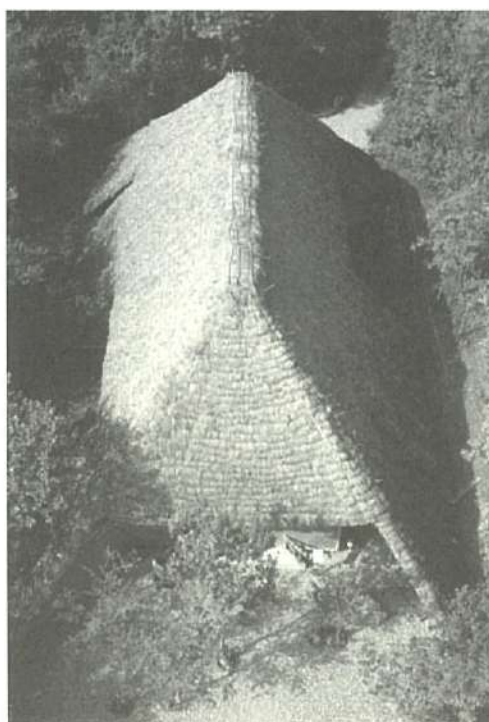
Entrance Building of the Museum

One of the objectives of the museum is to revive the architecture of wood and the native knowledge which is particularly manifested in the relationship between climate and architecture. In line with this, in addition to the reassembling the rural units taking inspiration from this architecture, and with regard to the needs of museum, certain structures have been constructed for museum use at the site, including the entrance building of the museum

This building is constructed by taking inspiration from the rural architecture of Guilan, and using the local materials such as wood, mud and *kaloosh*. The entrance building of the museum can be used as a conference hall for holding ceremonies and events. The achievements of the museum are on display, to familiarize the visitors upon their arrival with the museum's purpose and activities. The plan of the building is a rectangular form, 7 by 20 meters, with projections extending from the four corners, and the middle of the length of the unit being covered with a *fakoun*, a sloped ceiling which extends close to the ground. In rural buildings, this is built to prevent the entrance of rain in the wings facing the winter winds. The projection areas are used for exhibits. The design of full, empty, open and semi-open spaces in the building has given it a transparent image. The entrance floor area is 218 square meters.

The design is such that the interior of the building is formed with a three-meter central corridor, separated by rows of detached columns from the two side spaces, which are exhibition spaces. This gives the visitor the possibility of passing through, and at the same time observing the exhibits inside the entrance building. The horizontal windows and the sloped ceiling of the unit have given it a bright and cheerful atmosphere. Using the traditional elements of Guilan in the decorations inside the hall, such as niche and jut, etc., enhances the visitor's visual communication with the museum. The building stands on a platform in 60 centimeters height which is boarded. The system of the

construction of the building uses a wooden skeleton, with its base formed with four-length rows of wooden columns of the acacia tree. The building has two entrance and exit doors. This unit went into use after 45 days of construction, with the three functions of entrance, exhibition and convention hall.



Photos 118 - 121: Museum entrance



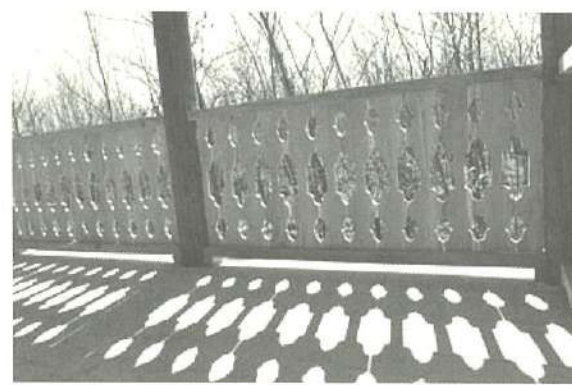
Guesthouse of the Managing Body

This building takes inspiration from the rural architecture of Guilan, using native materials for a modern building. The building faces towards the southeast, and it was constructed by the technical office. The structure of the unit is wooden, consisting of wooden beams and columns. A total of 66 columns help it stand firmly in place. The plan of the building is rectangular in shape, 13.6 by 17.2 meters, with a floor 60 centimeters above the ground surface. This building has two floors, with the area of each floor being 224 square meters. The ground floor and the first floor have semi-open

porches (*ivan*) on all sides. Access to the ground floor *ivan* from the outside is through three steps on the front side of the building. This floor includes one room and one private restroom, dining hall, living hall, kitchen, public toilet and staircase giving access to the upper floor. The upper floor includes four rooms with private toilets. Access to the upper floor porch is through the central passage, on which the rooms are located to each side.

In constructing walls, thick panels (for audio and thermal insulation) have been used and are boarded over to make the walls. The floor of the ground floor *ivan* of is covered with brick, and the remaining floors with parquet made of *rash*, hornbeam and oak. The roof is covered with *andoila*, a combination of tar and natural fibers used for large roofs and factory sheds, and having only green materials that are naturally recyclable.

This building went into utilization in less than eight months. The beautiful space and specific form of its internal architecture has converted it into one of the most beautiful structures of the museum. Therefore the building is not considered to be an unnecessary element in the environment, but a unit having arisen from the environment itself.



Photos 122 - 125: Guesthouse of the managing body

Lao P.D.R.

Amphol SENGPHACHANH

Chief of Division / Chief Architect

Management Office of Vat Phou World Heritage Site

Ministry of Information and Culture

Cultural Heritage Protection and Restoration Activities in Lao P.D.R. (Wooden Structures)

Introduction

Lao P.D.R. has a long, rich and splendid cultural heritage, which reflects its civilization and its national history, inherited over the millennia. This cultural heritage is not only seen in the lifestyle, and in the traditional customs and diverse activities of the Lao people, but also in innumerable historical and archaeological sites such as buildings, vernacular houses, historic cities, city walls and streets, and other architectural features.

Champasak, one of the few historic cities which continue to survive in Lao P.D.R., is a small town located along the Western side of Mekong River, 500 km southeast of Vientiane and 40 km southwest of Pakse. It is a major feature of the Protection Zone for “Vat Phou and Associated Ancient Settlements within the Champasak Cultural Landscape,” inscribed on the list of World Heritage in 2001. It is a city with a totally linear form, aligned on a north-south axis and approximately 5 km long by 200 m wide, situated on the riverbank. It faces the Mekong river to the east and the Phou Kao mountain range to the west, providing extremely unique views to the city. Based on an inscription made by a king named Devanika, found in the modern village of Vat Louang Kao, it was the capital city of the earlier Khmer empire (Chenla period), and appears to have been founded around the middle of the 5th century AD.



Aerial view of Champasak

Two inscriptions, discovered recently in the same area, inform us that as early as the end of the 6th century this was the capital city of King Mahendravarman, who later became ruler of the Sambor Prei Kuk area (240 km to the southwest, in Cambodia); later on, this city (often identified as Shrestapura) lost its political role as capital when the founding dynasty extended its rule over the whole of Khmer territory. *(Based on the Champasak Management Plan, Lao-UNESCO)*

Bassac, which at the time of the visit by Van Wusthoff in 1641 was a small border post, became the capital of a small principality in 1712. *(Travels in Cambodia and Part of Laos, Francis Garnier, P. 80)*

In the 14th century this city was occupied by the Lan Xang kingdom, which lasted until the end of the 17th century. After that it became the capital of the Champasak kingdom, founded by King Soy Sisamouth Bhuddhangkune, which continued from 1712 until 1892, at the beginning of French colonial period. During this period the city centre moved from place to place, initially being located in the area where Champasak is today, but in 1791 the city centre moved to Mueang Kaokeung some 40 km to the north and on the opposite side of the river from Pakse town today. Then in 1837 it moved to the south some 35 km and was located at a Vaxay village named Mueang Kaohinlod, and finally in 1864 the capital moved back to where it had been in the beginning. *(From a history of the Champasak kingdom)*

Since 2001 this city has attracted numerous people, with business moving more quickly than before, the price of land starting to increase and foreigners turning to investment here, so that local people are motivated to sell their land, and tear down old houses to build new modern ones. Accordingly the risk to heritage is high, and there is need to find better solutions for the protection and preservation of the remaining traditional architecture.

I. The role of wood in general construction

As the former centre of civilization in earlier periods, Champasak has a long, rich and splendid cultural heritage. Today, various architectural remains from those periods are visible throughout this territory, in the form of ancient monuments, urban features, vernacular houses, historic buildings, and religious buildings which are spread out over the area.

Since the ancient period, wood has been used for various activities of construction because of its characteristic solidity and strength, making it suitable for the main structure of different types of building, and its fine texture and ease of use in the construction processes; in general all of the men in our region have long experience working with wooden structures. Moreover, our region is covered with huge forests which include a high variety of quality wood, and the local people are able to obtain it easily and prepare it for different activities as they want.



In the past, most buildings such as village houses, religious buildings, as well as royal palaces were built as wooden structures, except for some buildings of outstanding importance such as the main sanctuaries of Buddhist temples, which were built with stone blocks or walls of brick and lime mortar, but the roof structures and suspended floors were still made of wood. For this reason we can say that all the architecture of our region utilizes wood, and can be called wooden architecture.

II. Problems of wooden structures

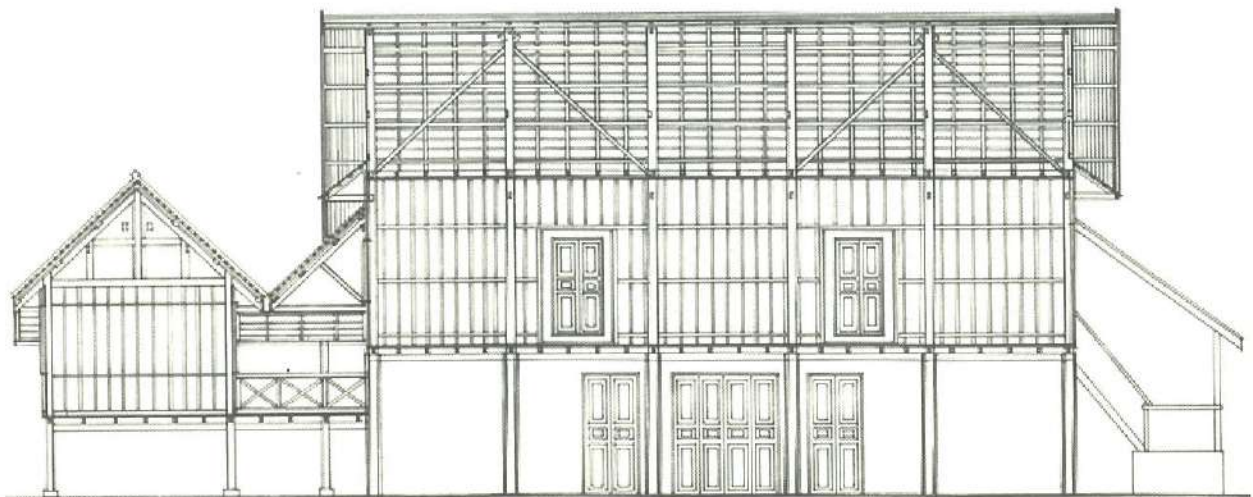
Even though wood is suitable for the main structures of buildings, it is still weak in comparison with other materials such as reinforced concrete or steel. The local climate is tropical and characterized by

monsoons, and divides into a dry season and a rainy season, with rainy, warm, and cloudy southwest monsoons from mid-May to September, and dry, cool northeast monsoons from November to mid-March. It is always hot and humid, with an average rainfall of more than 2000 mm per year.



The natural impact of this climate causes serious deterioration to wooden materials, compounded by damage from termites and other flying insects.

Accidental fire is one of the most severe disasters for wooden structures in our country. In the ancient period, the burning of towns by conquerors after defeating their enemies happened often during warfare between states, and much of the valuable architecture that had been built over a century would be destroyed in a day.



Drawing of a vernacular house in Champasak

Other dangers to wooden structures come from the lack of experience in preservation and restoration of the cultural heritage, threatening the total and permanent destruction of these buildings.

III. Maintenance and restoration activities

Currently in our country, the idea of preservation and restoration of cultural properties has basically begun only fifty years ago. All too obviously, this idea is limited in practice to technical experts who work in this field, and is still not appreciated enough by the general populace or the politicians whose role is to rule the country, this being a major problem to resolve in future. The maintenance of wooden properties, until this basic solution, will suffer from the lack of experience, proper policy, scientific knowledge, and modern equipment needed to carry out this kind of work.

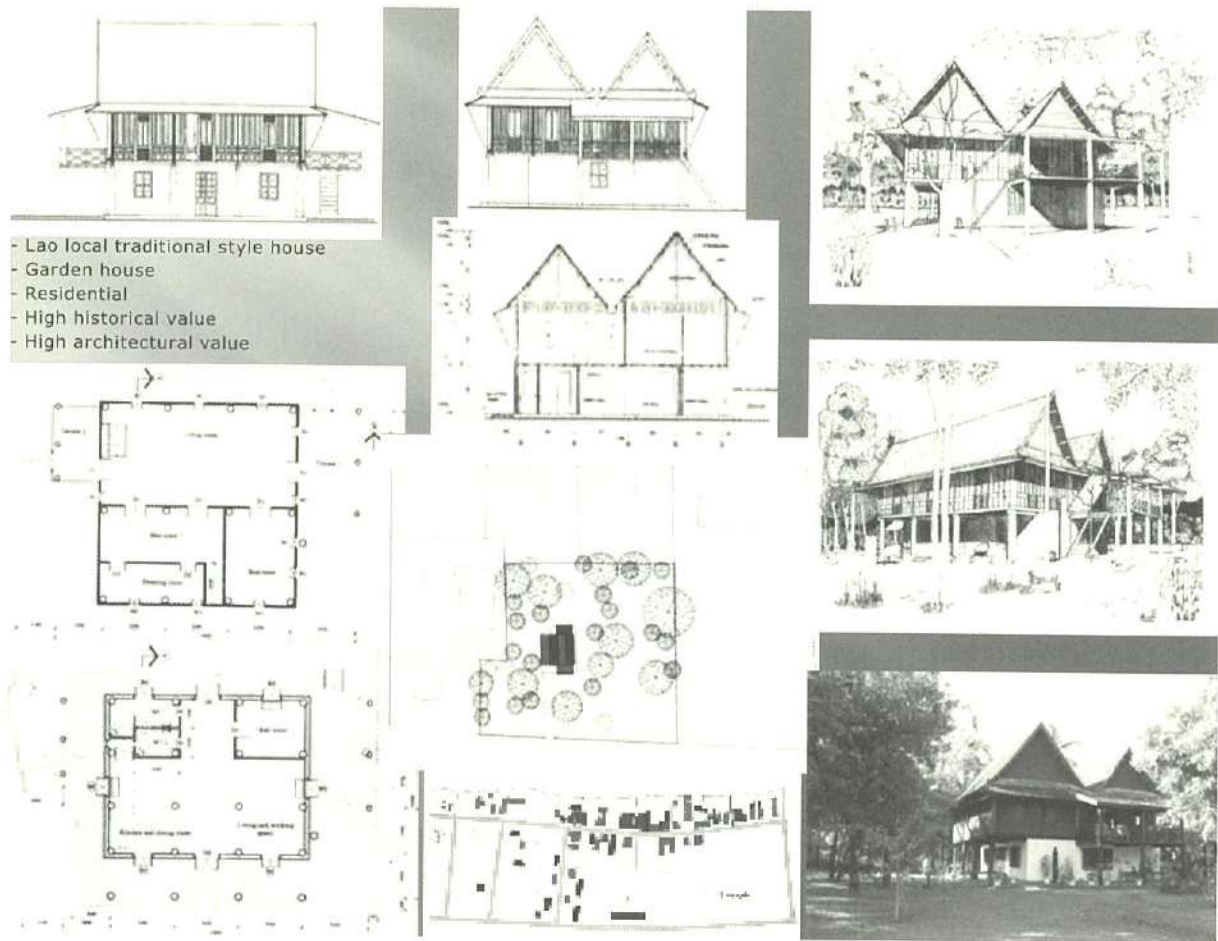
Some preservation and restoration activities on cultural heritage protection are successfully carried out in areas where the idea is well established, for instance the historic Town of Luang Prabang, the capital Vientiane, and Vat Phou and Associated Ancient Settlements within the Champasak Cultural Landscape, where all historic buildings are classified and listed for protection and maintenance under national and international rules of protection.

Since 1999, as the chief architect in charge of historic buildings and ancient monuments, I have carried out some restoration of historic monuments and buildings under my responsibility, as follows.

Restoration of a vernacular house (Lao local traditional style house) This style of house is very well known among Laotians as the type of home especially for high ranking people during the Kingdom period.

This particular house was built by Prince Thongpoun around 1865, when the Champasak kingdom moved its capital back to this city. Previously it was a totally wooden structure, built on stilts with a terracotta tile roof made in the traditional fashion (fixed without nails). The lime concrete ground floor and brick wall were added in 1960 when it was restored, and some of the wooden roof structure replaced. The last recent restoration was carried out in 2000, when I was the architect for project, which mainly focused on the entire wooden upper floor, wooden roof structure, and replacing the wooden staircase of the entrance and the lime concrete ground floor.

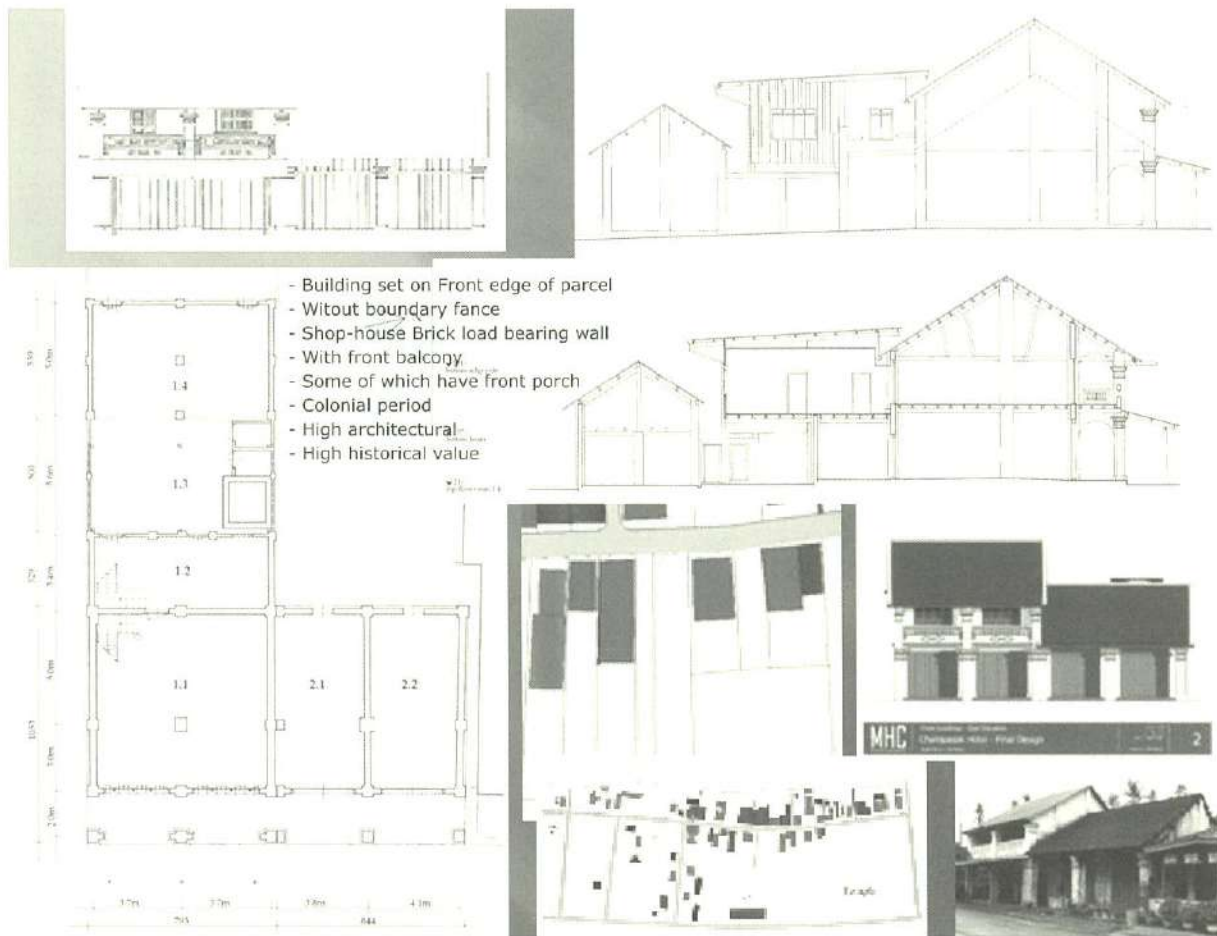
Current examples of this type of building are very few in this area, and it seems to be forgotten by the local people, but has nonetheless attracted the interest of conservators and foreigners.



Restoration of a shophouse This style of house appeared in Champasak between 1890-1954 during the French colonial period, at which time it was widespread over the main street of the town. In the present day, local people have changed their minds, and this style of house, not as popular as before, is being replaced by the new modern style of house.

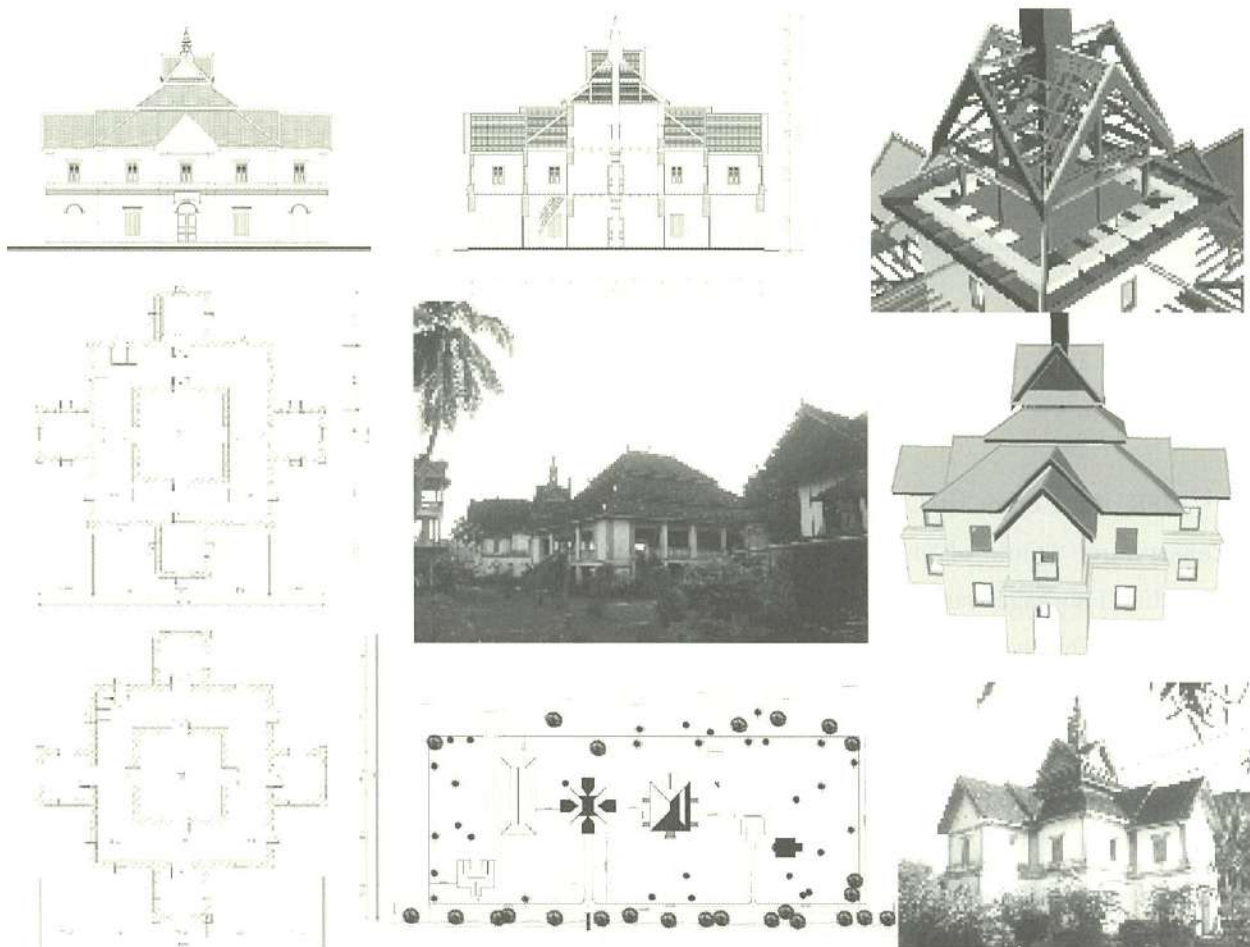
This house was restored and has preserved its function, as now it is open to the public again as a famous restaurant in the town.

The restorations were applied to some parts of the house such as the lime concrete ground floor, the wooden upper floor, the stucco walls, and the mainly wooden roof structure.

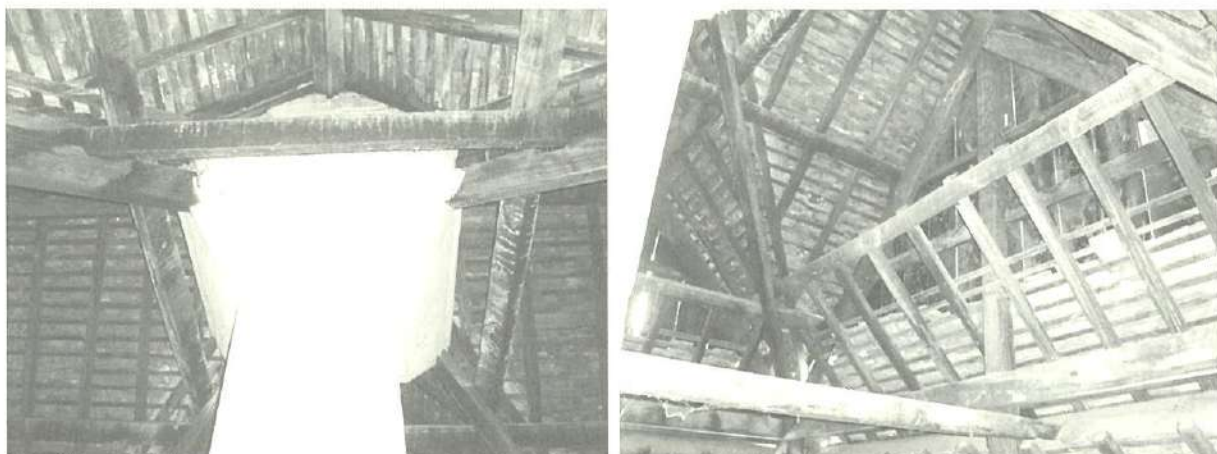


Restoration of a Buddhist library The Buddhist library of Meuangkang temple was built in 1900, as a two-story building with brick load-bearing walls, lime stucco, and a terracotta tile roof. Wooden architecture could be found on the upper floor, ceiling, staircase, and the main part of the roof structure. The style of this building is a mixture of local Lao and Chinese architecture; it is of high architectural value and the biggest Buddhist library in all of the country. Since it was built, no restoration work has been applied to any part of the structure.

At present, some parts of the wooden floor and roof structure are in bad condition, and need to be restored or replaced with new pieces of wood urgently, and proper maintenance work must be provided for all of the wooden structure.



We have submitted a restoration project proposal to the local government for budgetary support, and still waiting for the result.



Wooden roof structure of the library

Mongolia

OCHIRSUREN Oyunchimeg

Conservator of Wooden Structure

Center of Cultural Heritage

Ministry of Education, Culture and Science

Historical Wooden Architecture of Mongolia

In 1988, the Center of Cultural Heritage was established under the name of Restoration and Conservation Studio of Museum Objects, and in 1996 digital documentation and registration work for cultural heritage was added to our activities and the name changed to Center of Cultural Heritage. Since that time we have been working on the conservation and documentation of intangible and tangible cultural heritage.

The Center of Cultural Heritage is a state organization in Mongolia, specializing in digital documenting, conserving and restoring the historical and cultural heritage. We also provide guidance to museums in methods for registering and digitally documenting museum objects, immovable monuments, and intangible heritage.

Our center has three main divisions.

- Division for the Protection of Tangible Cultural Heritage
- Division for the Protection of Intangible Cultural Heritage
- Restoration and Conservation Division for Historical and Cultural Heritage

The Restoration and Conservation division has three main laboratories.

- Restoration laboratory for museum objects and archeological artifacts
- Restoration laboratory for immovable monuments
- Restoration laboratory for the decorations of architectural and temple structures

At present we are not working on wooden architecture, but only on wooden decorations of architectural and temple structures, because we lack the modern techniques and technology, and skilled professional conservators.

We have cooperated, however, with the wooden architecture conservation company Suld Uul, which has a specific license from the Ministry of Education, Culture and Science, for conserving and restoring historical wooden architecture. We have conserved and restored many kinds of monastery and temple structures working with the Suld Uul company.



Before conservation



After conservation

We started the conservation work pictured here in 2006, based on research conducted at the site. First we cleaned away dust and grime, and then conducted digital documenting of the conditions before conservation work.



Before conservation



After conservation

Wood is a very important material particularly for Mongolian architecture. Mongolian wooden structures and architecture developed with the nomadic living style. Accordingly Mongolian wooden structures and architecture developed in different fashion from other countries, having their own design, decorations, colors, and methods. Mongolian craftsman use the hides and organs of livestock and hunting animals to make adhesives like glue, etc. This differentiates their work from that of wooden structures and architectural methods in sedentary countries. Mongolian craftsman use many kinds of woods for their wooden structures and architecture, and in addition to birch and wood from shrubbery, ebony is usually used in columns and joists, oak is usually used in roofs and floors, cedar is usually used in decorated wooden structures, and sandalwood is usually used in Buddhist items and in furniture for the king and nobles.

Mongolian craftsmen prepare some woods by soaking in water for 2 or 3 years, for columns and joists.

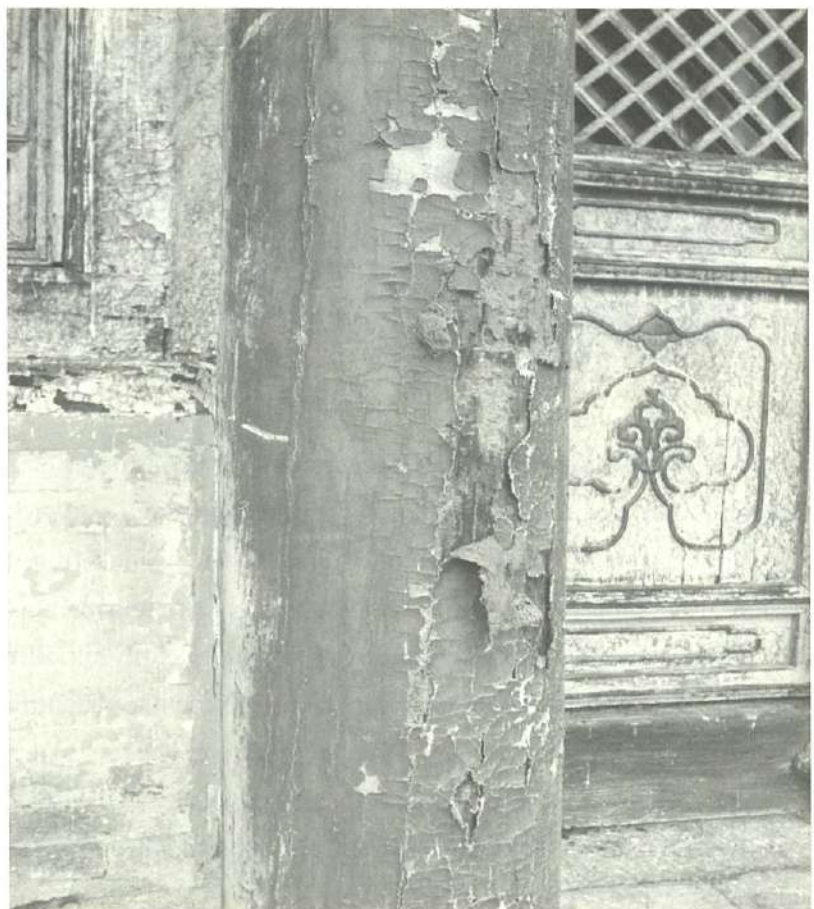
Damage to wooden architecture: The Amarbaysgalant monastery

Weather and time damage historical wooden architecture and wooden objects. Many kinds of damage, such as discoloration, deformation, deterioration, cracking, decomposition, etc., are seen in Mongolian wooden architecture, as in the example of the Amarbaysgalant monastery shown here.



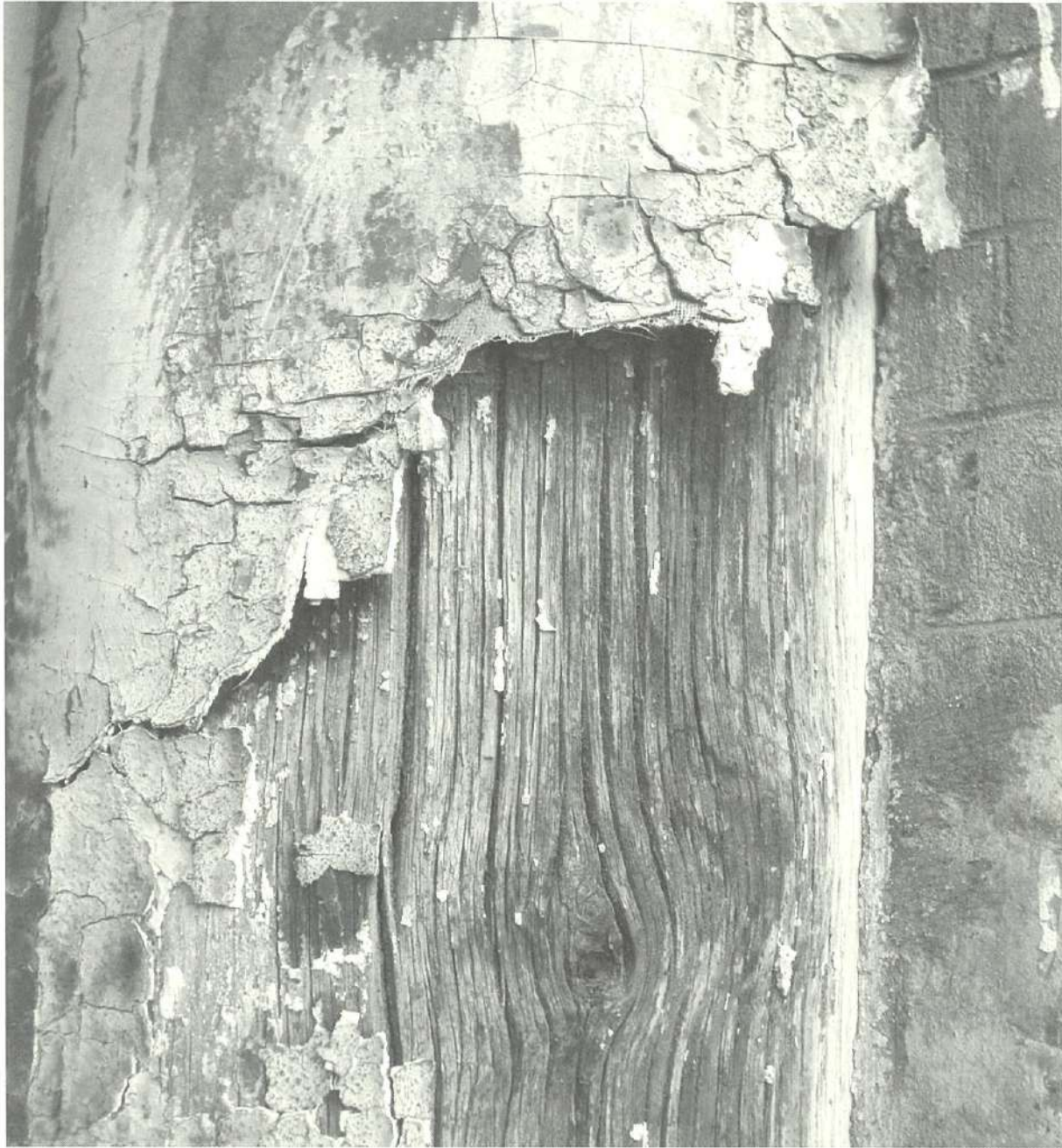
Deterioration of a doorstep

Column of the Amarbaysgalant monastery. The coating of paint was peeling away, and some parts of it were missing.





Column of the Amarbaysgalant monastery. The coating of paint was peeling away, and some parts of it were missing.



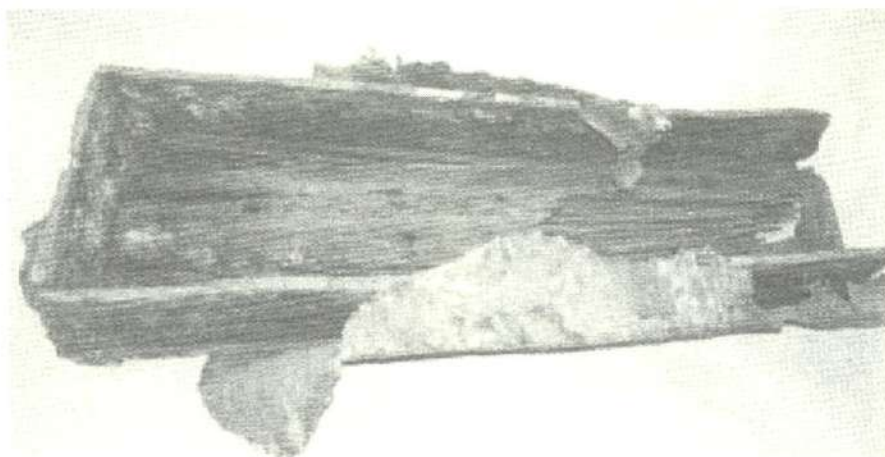
Column of the Amarbaysgalant monastery. The coating of paint was peeling away, and some parts of it were missing or decomposed.

Conservation of archeological wooden artifacts

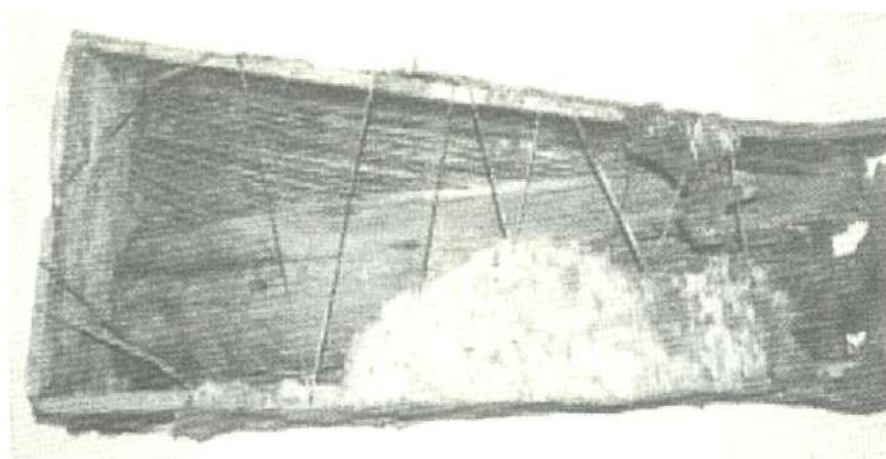
As prevention against damage such as that just illustrated, we have been engaged in the conservation and preservation of wooden architecture and objects. Many wooden objects show damage such as discoloration, cracking, decomposition, loss of some of their parts, etc. When conserving and restoring such damaged objects, we use the same kinds of wood and pigments as in the originals.

Nowadays, before conservation work on wooden objects, we first determine the extent, in terms of percent, and the nature of the damage, as regards to physical damage, chemical damage, biological damage, etc., and carefully observe the object's characteristics, including smell as well as form. We then research similar wooden objects for comparative purposes. We then clean, conserve and preserve the objects, as seen in the examples depicted below.

Wooden coffin recovered from Mavan tolgoi, Ongon soum, Sukhbaatar province



Before cleaning and conservation



After cleaning and conservation

Wooden ladle



After conservation

Shaman's tambourine



Before conservation

Carving of a Mongolian ger (nomadic house)



Before conservation

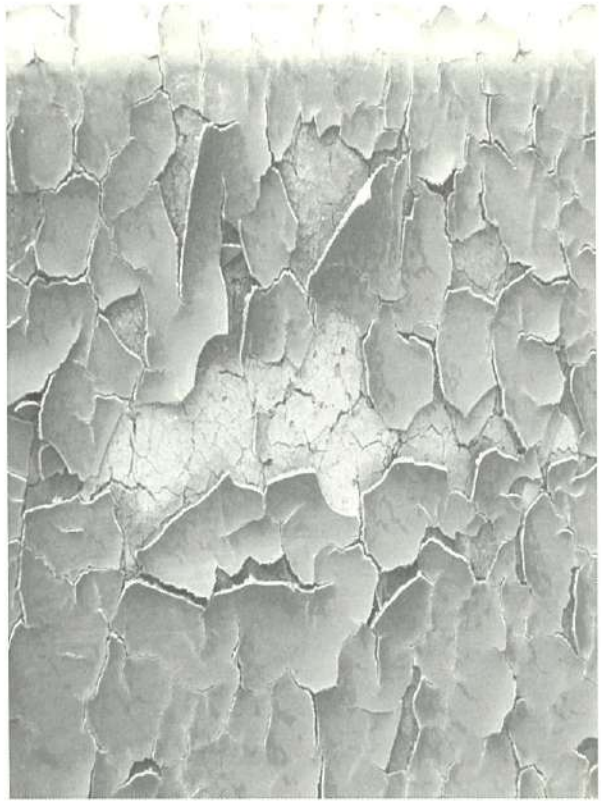


After conservation

The Bogd Khaan Winter Palace museum

From May 2006 to October 2007, the Bogd Khaan Winter Palace museum's center gate and entrance compound were conserved with the aid of a cultural grant from the Chinese government, with Chinese conservators performing the work on the compound and gate. But now that same gate has been seriously damaged and the coating of paint is peeling away due to weather conditions, and perhaps other reasons. In my opinion, when Chinese conservators worked on the gate, they did not conduct sufficient research concerning the gate, with regards to its coating of paint, the composition of the materials, etc.

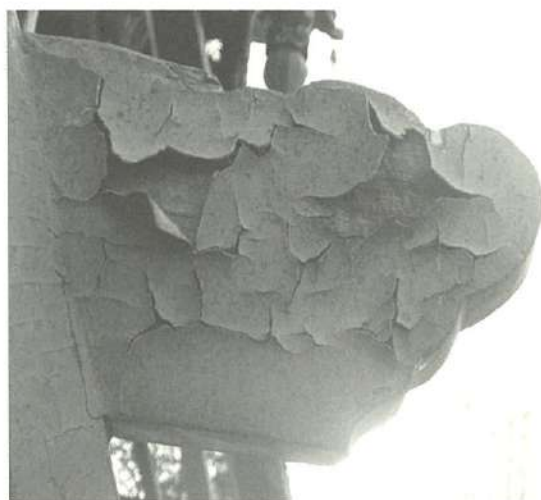




When conserving and preserving historical wooden architecture, we prefer to keep the original form as much as possible.



Bogd Khaan Winter Palace museum, center gate



Damaged column

Myanmar

U Min Min

Conservator

Department of Archaeology

National Museum and Library (Northern), Mandalay

Ministry of Culture

Problems and Needs for Cultural Heritage Protection and Restoration Activities in Myanmar

I. Introduction

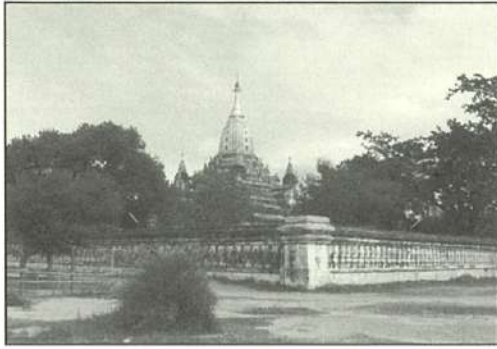
It is a great honour and a delight that one of the public service personnel of the Department of Archaeology, National Museum and Library from the Ministry of Culture of the Union of Myanmar has been selected by the ACCU Nara office, in cooperation with ICCROM and UNESCO, to attend the 2009 training course on the conservation of wooden structures in Nara, Japan.

II. Historical Background

Myanmar is a Theravada Buddhist country in Southeast Asia. The historical period in Myanmar began with the Pyu period (from before the 1st century A.D. to the 10th century A.D.). The Pyu period was followed by the Bagan period from 11th to the 13th centuries. After the Bagan period, the Pinya-Innwa period began, lasting from the 14th to the 17th centuries, followed by the Taung-Ngu (Nyaung-gyan) period (from the 16th to the 18th centuries) and the Konbaung period (from the 18th to the 19th centuries).

Myanmar is famous for its rich cultural heritage and ancient architecture from the Pyu period on. The development of architectural technology can be followed in buildings and monuments over the history of Myanmar. A large number of religious monuments such as pagodas, temples, stupas, monasteries, *tazaungs*, *pyatthats*, *zayats*, palaces and dwelling houses have been built throughout the country since the Pyu period. Myanmar has kept abreast with other countries in terms of building with brick, stone and wood, in accordance with changes in architectural technology.

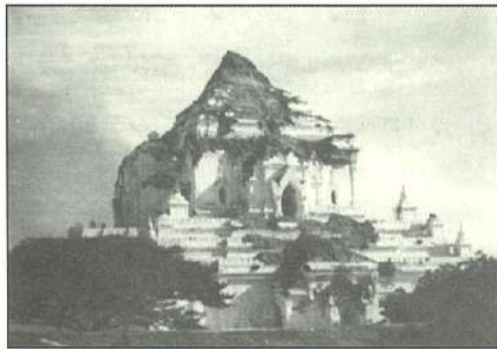
Monuments of the Pyu period such as the city walls of Sarikhtayar, Mine-maw, and Han-lin, and religious monuments such as the pagodas Phaya-mar, Bawbaw-Gyi and Phaya-Gyi in Pyay, are evidence of this technological development. The Bagan period can be called the florescence of Theravada Buddhism. Exceedingly famous religious monuments and pagodas, such as Ananda, Thatbyinnyu, Dhammayan-Gyi and Kantaw-Palin show the status of architecture of the Bagan period.



Ananda temple in Bagan



Thatbyinnyu temple in Bagan



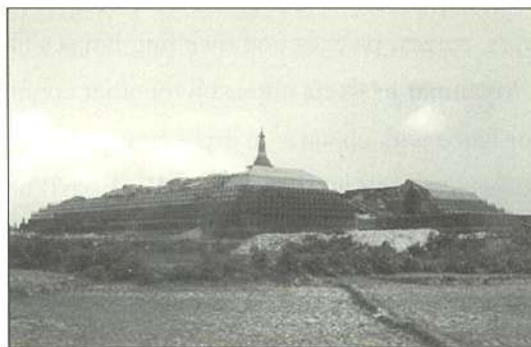
Kantaw-Palin temple in Bagan



Dhammayan-Gyi temple in Bagan

Evidence of the architecture of Pinya period, such as the Myin-sai city wall, Nan-Oo Zedi (pagoda), Pin-ya Aung-Segon Zedi (pagoda), and the Pinya city wall, can still be seen in the present day.

Koethaung temple in Rakhine state, made of sandstone, was built in 1553 by King Min-Takkhar during the Pinya period.



Koethaung temple in Rakhine

Although the cultural heritage of monuments and buildings made of brick and stone can still be seen now, buildings made of wood can no longer be seen because of the effects of weather and natural disasters. Pictures of such buildings from the Bagan to Konbaung periods can be seen in mural paintings.

III. Myanmar Geography

Myanmar lies roughly between 92 and 101 degrees east longitude and between 9 and 29 degrees north latitude. Almost all of the country falls within the tropical zone. The total area of Myanmar is about 678 million square kilometers. It is roughly comparable in size to Thailand or France, and is 1.8 times larger than Japan. Myanmar has five neighboring countries: Thailand to the southeast, Laos to the east, the People's Republic of China to the north, India to the northwest and Bangladesh to the west. Nearly 60 percent of the territory of Myanmar is covered with forests.

IV. Major Laws Concerning the Preservation of Cultural Heritage

In Myanmar, the cultural heritage of ancient monuments and antiquities has been protected since the passage of the Burma Antiquities Act on 1 April 1957. The Government of the Union of Burma subsequently amended this Act in 1962. A new law entitled the "Protection and Preservation of Cultural Region Law" was promulgated in September 1998. It consists of nine chapters, namely: (1) Title and Definition, (2) Objective, (3) Determining Culture Heritage Regions, (4) Function and Duties of the Ministry of Culture, (5) Protecting and Preserving the Culture Heritage Region, (6) Applying for Prior Permission, Scrutinizing and Issuing, (7) Prohibition, (8) Offence and Penalties, and (9) Miscellaneous.

V. Organization Responsible for Preservation

In Myanmar, the government organization responsible for the preservation, restoration and reconstruction of culture heritage monuments is the Department of Archaeology, National Museum and Library. There are nine local branches, as follows.

1. Mandalay Archaeology, National Museum and Library Divisional Office
2. Yangon Archaeology, National Museum and Library Divisional Office
3. Bagan Archaeology, National Museum and Library Branch Office
4. Innwa Archaeology, National Museum and Library Branch Office
5. Taguang Archaeology, National Museum and Library Branch Office
6. Shwe-Bo Archaeology, National Museum and Library Branch Office
7. Pyaay Archaeology, National Museum and Library Branch Office
8. Bago Archaeology, National Museum and Library Branch Office
9. Myauk-U Archaeology, National Museum and Library Branch Office

VI. The Primary Buildings of Myanmar Architecture

Undecorated wooden buildings have not changed significantly from the early Bagan period (11th century) to the 19th century. The architecture of wooden buildings and the art of wood carving developed to their highest levels in the mid-19th century, when the capital was located at Amarapura.

(a) *Khaung Yoe Hsaung*

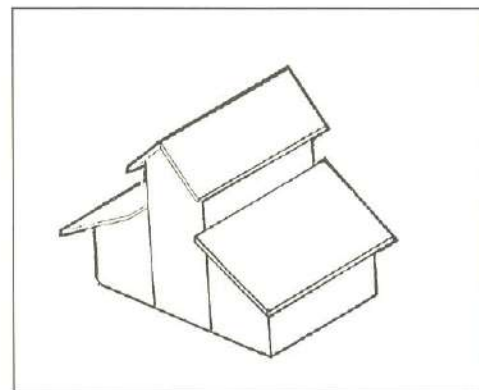
The name refers to a type of ridge pole. It is the simplest dwelling house. Generally, the walls are made of bamboo mats or thin teak boards, but protect effectively from the wind and rain.

The photo at right is of a village house in Innwa. It stands on wooden pillars, and has walls made of bamboo.



(b) *Yoon Hsaung*

This type of was mostly used by the Yoon ethnic group in northeast of Thailand. It has pent roofed extensions on both sides of the main building or core, and was the style used for the main gates of the Mandalay city wall.

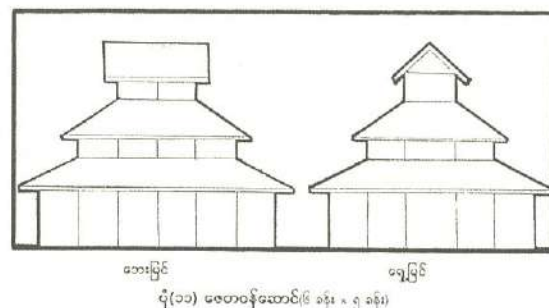


(c) *Laipaw Hsaung*

Laipaw hsaung is a multi-story building on rectangular plan, with each story smaller in area than the one below giving a terraced appearance, and with the uppermost story having a gabled roof. A one-step terrace is called *dawi hsaung* and two-step terrace structure is called *zaytawun hsaung*.

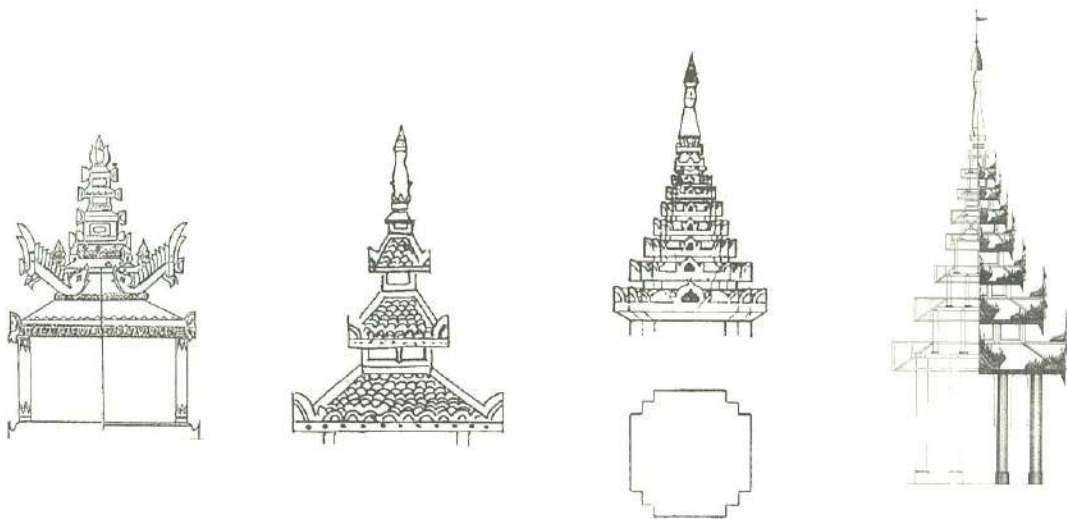


Zaytawun hsaung in the Mandalay palace



(d) *Pyatthat Hsaung*

A type of structure with a tiered roof, very conspicuous in Myanmar culture, is the *pyatthat*. Four kinds of *pyatthat* were built from the early Bagan to the Konbaung periods. These are the Bagan period *pyatthat*, 1st Innwa period *pyatthat*, 2nd Innwa period *pyatthat*, and the Konbaung period *pyatthat*. *Pyatthat* are also referred to by the building materials used. Wood, steel and brick are generally used.



Pyatthats: Bagan period

1st Innwa period

2nd Innwa period

Konbaung period

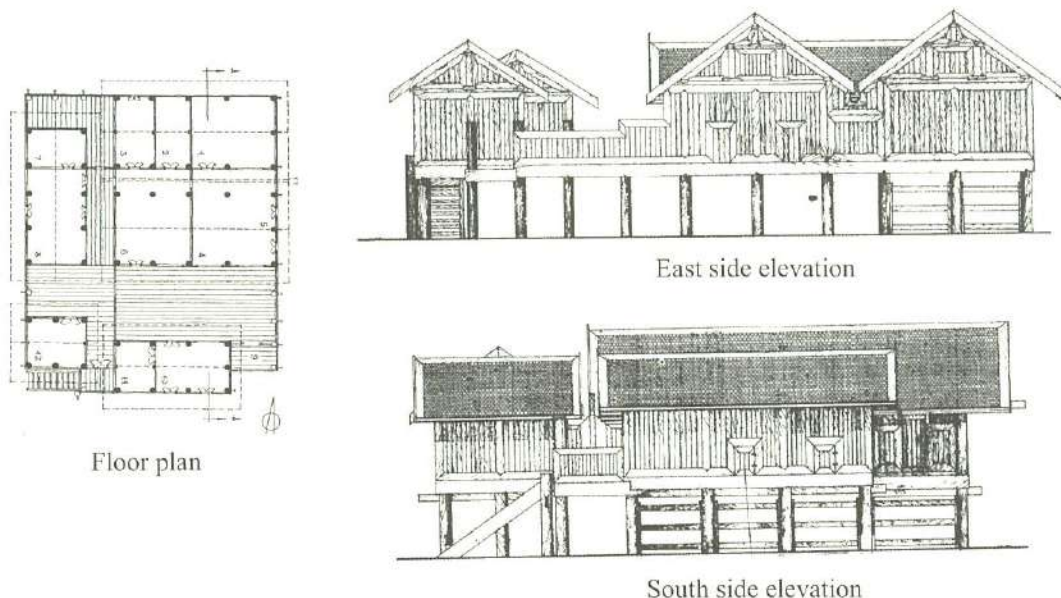
VII. Structural Systems in Traditional Wooden Buildings

Traditional building materials are suitable for local climatic conditions. Walls made of bamboo mats or thin teak boards protect from wind but do not hinder natural ventilation of the room. Walls and roofing protect effectively from rain, whilst their good heat-insulating properties also protect from the burning rays of the tropical sun. Also important is the ability of bamboo, palm leaves and teak to evaporate surface moisture easily while absorbing very little of it. Wooden constructions are usually covered with crude or mineral oils for protection against moisture and insects. While seeming to be flimsy and short lasting, the simplest dwelling houses can be very durable.

While the teak frame in a simple house can last decade or more, it is not difficult to change the walls and roofing every 8-10 years, should they crumble with age. The real menace to Myanmar wooden dwellings is fire, which sometimes destroys whole villages and urban districts. It is possible that this constant danger of fire was an important factor in the adoption of cheap and easily restored types of dwelling. The roofs are most vulnerable. In the hot windy weather one spark is enough to set fire to the dry thatch. That is why every house has a long hooked bamboo pole (*micheit*) for pulling off the roof as soon as a fire breaks out. Usually there is a type of broad paddle (*mikat*) in addition to the *micheit*, for beating out the flame. In the dry season, pots full of water are often placed on the tops of houses.

The principles of a Myanmar wooden architecture typology were suggested in 1964. Different types of buildings are closely connected structurally and iconographically, the unity of materials and building methods being the basic reason for these connections. It is important to note that the majority of wooden structures also function as dwellings. A monastery (*pongvi kyaung*) is inhabited by monks, a palace (*nandaw*) by a supreme feudal lord, and a temple (*ohnmin*) by a deity. That is why traditions of folk dwellings are reflected directly or indirectly in the other types of wooden buildings. An ordinary house was allowed to have a simple gable roof. Houses of privileged people could have two-tiered roofs. Three-tiered roofs could be used by members of the royal family only. These houses were called accordingly houses with two roofs (*hna hsaung pyaing ein*) and houses with three roofs (*thon hsaung pyaing ein*).

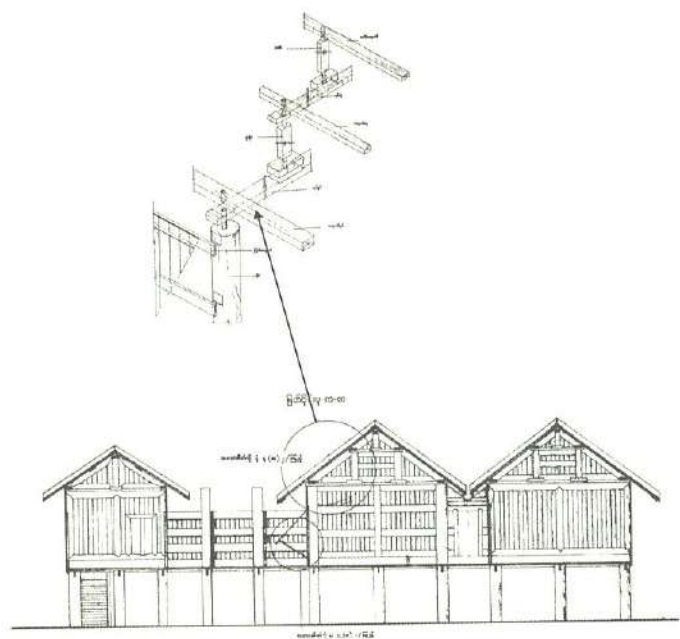
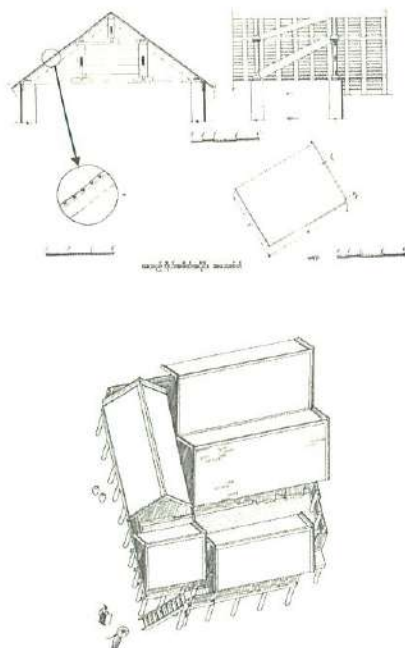
The basic component of each Myanmar wooden building is a frame composed of posts (*tain*) and beams. Wall partitions are attached to the frame. The floor is elevated above the ground level at least 0.5-1 m, but usually for 1.5-2 m, to protect the house against moisture, floods and snakes. In villages people keep cattle under their houses; in towns this space is used for workshops and different domestic purposes. The plan of an ordinary folk dwelling is very simple. One or two rooms and a terrace are covered with a simple gable roof. In town houses open ground floor space often replaces the terrace. All kinds of daily life takes place in this open roofed space. It serves as a shop, and as a living and dining area. The rooms are used for rest, for receiving guests, and as shelter in stormy weather. Traditional houses have no furniture. Wicker mats and light blankets serve for everyday needs. The traditions of Myanmar Buddhism and royal state regulations mandated simplicity in everyday life, and forbade sleeping and sitting on raised structures. Only the king could sit on a throne and sleep on a bed.



All sections of Myanmar society during the periods of the Myanmar kingdoms traditionally built relatively small and simple houses. One surviving solid wooden house was built in the 19th

century in Monywa. This traditional wooden house owned by prominent author U Chin Au was completed in 1838. The size of this house was close to an ordinary one, but U Chin Au had more room in his residence. Rooms in commoner houses were as a rule multifunctional, used for different needs. In the richer house of U Chin Au, each room had its own designation. Between the two bedrooms of the master and of his wife was a bedroom for small children. A special block contained guests' rooms. There were also big living rooms for male and female family members, and a storeroom and kitchen in a small separate block.

The house had five blocks, each under its own gable roof. All blocks were on an extensive open platform which united the house physically and functionally. Large living rooms had walls that lifted from the platform side. The main elevation was the southern one. Its central part was occupied by a guests' room with two big windows. This room projects slightly outside the platform and served also as a "box" for spectators, to observe performances of itinerant actors and jugglers. This room had a staircase on one side, and also a so-called "elephant platform," a small landing for unloading heavy items from carts and from an elephant's back. Under the house was a stable.



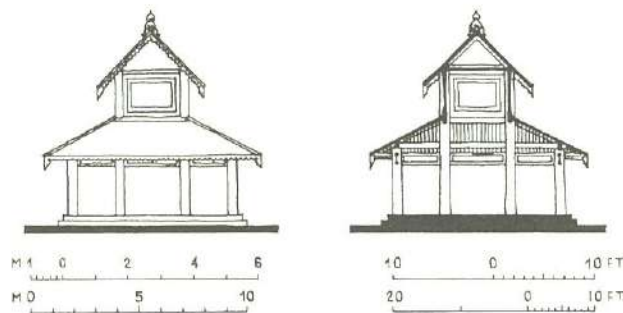
VIII. Wooden Structures Built for Special Purposes

The period of the Konbaung dynasty (1752-1885 AD) left examples of different traditional wooden buildings. *Zayats*, *tazaungs*, *pyatthats*, royal palaces (*nandaw*), monasteries (*pongy-kyaung*) – all of these building are represented in various examples, differing from each other both in volumetric composition and in type of decoration.

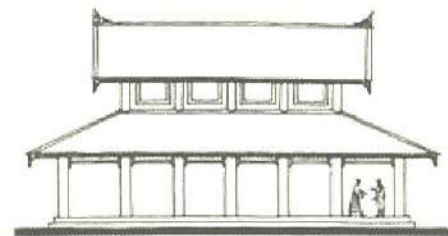
(a) *Zayat*

Generally the *zayat* is a very simple structure, looking like a roof on the posts. It is the most common building in Myanmar after the ordinary dwelling. *Zayats* are well known under different names in many oriental tropical and sub-tropical countries. Each of them developed its own type using different materials, with different proportions and decorations. Myanmar *zayats* are nearly always built of wood. The roof is supported with log posts, with the wooden floor slightly above the ground. The main purpose of the *zayat* is to serve as a place for resting and lodging. In the most worshipped sacred places, *zayats* are usually the predominant structures, being rest houses for pilgrims. They are also used in some religious ceremonies, for preaching or simply as a meeting place in villages.

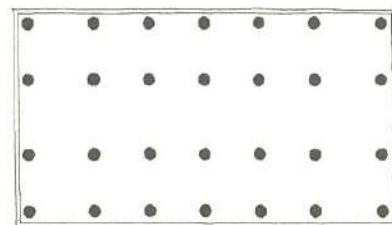
Zayats built especially for the Buddhist examination are called *Tudhamma zayats*. They have two-staged roofs and wall panels richly decorated with wood carvings. Rows of these buildings form a thoroughfare leading to the foot of the Mandalay Hill.



Side elevation and section



Front elevation



Plan of Tudhamma *zayats*



Rows of Tudhamma *zayats*
at the foot of Mandalay hill

(b) *Tazaung*

Tazaung is another type of wooden structure widespread in Myanmar. In the broad sense *tazaung* is a temple. Placed at the foot of a pagoda they shelter under their roofs statues of the lord Buddha, in front of which people pray and meditate.



Tazaung, the eastern side of the Shwezigon pagoda in Bagan, 18th century

(C) *Pyatthat*

Pyatthat means venerable and lovely. It is a kind of royal building built with multi-tiered roofs centered on a single axis. It may be a building for hosting a sacred umbrella, or a royal building for gems of the King and Queen. It cannot be used by ordinary subjects. The skeletal structure of the wooden building has not changed distinctly from the early Bagan period (11th AD) to the Yadanarbon period (19th AD). The steepness of the roof's slope and height of the wall can differ slightly.

The roof of the *pyatthat* (pavilion) is the style most widely used for roofing royal and religious buildings in Myanmar. It is a very specific Myanmar architectural form with an original pyramidal shape. *Pyatthat* consists of an odd number of square roofs, decreasing in size upwards. Roofs with small decorative gables in the centre of each tier are most common. Nearly always these roofs are richly decorated, usually with carvings and a layer of gilt.

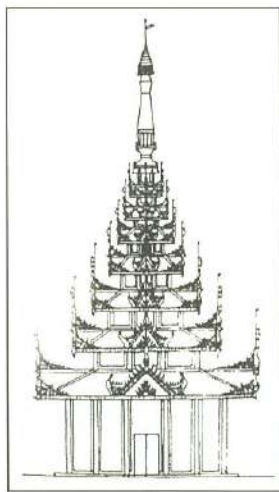
The Myanmar *pyatthat* has a simple and logical structure. A wooden skeleton is formed by a number of stacked three-dimensional frames, each narrower than the one below. Over the bottom frame lie two strong beams, crossing in the centre of the *pyatthat*. They support a pillar which can be considered the spire of the *pyatthat's* skeleton. The pillar ends with *hti* (umbrella) and other crowning elements.

The number of tiers in a *pyatthat* roof were not allowed to exceed nine – usually there were three, five, or seven roofs. The number of roofs depends on the significance of the building. In Myanmar the *pyatthat* is the most universal tower-like tiered structure. It crowns the most important rooms of monasteries, throne halls in Royal Palaces, turrets over the city gates and towers. It is found over functionally significant premises as the most distinguishing feature.

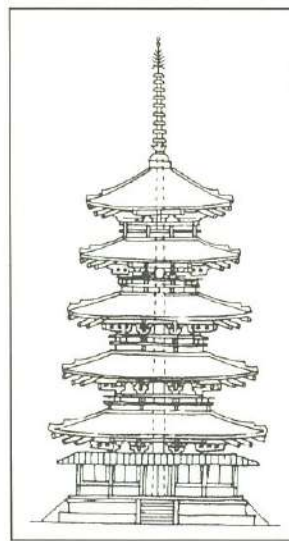
The *pyatthat* has been known for many centuries. Bas-reliefs from the famous 11th century Ananda temple in Bagan show several images of wooden structures including five, seven and nine-tiered *pyatthats*. *Pyatthat* images are depicted also in the wall paintings of many Bagan temples.

All the images show quite developed compositions of different *pyatthat*. Unfortunately no earlier *pyatthat* images are known, so it is not possible to trace their origin and follow the development of this extremely interesting architectural form. Superficially, *pyatthat* resemble Chinese and Japanese pagodas because of the many-tiered structure. However, many-tiered compositions with pyramidal shapes are common for Buddhist religious buildings in many countries.

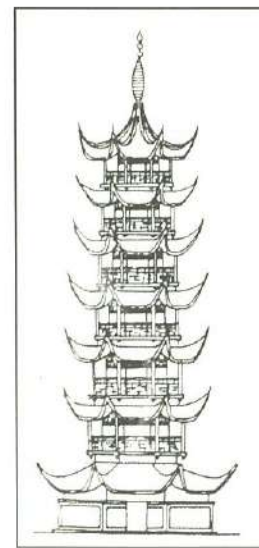
Tiered wooden structures in Myanmar, China, Japan and other Buddhist countries differ by their function, structure, decoration systems and colors. It would be very interesting to compare these different structures. In Myanmar the *pyatthat* is probably the most universal tower-like tiered structure. It crowns the most important room of monasteries, throne hall in royal palaces, turrets over the city gates and towers and, of course, and the countless *tazaungs*.



Pyatthat in Myanmar



Japanese pagoda,
Hōryūji, Nara



Chinese Pagoda,
Lung Hua, Shanghai

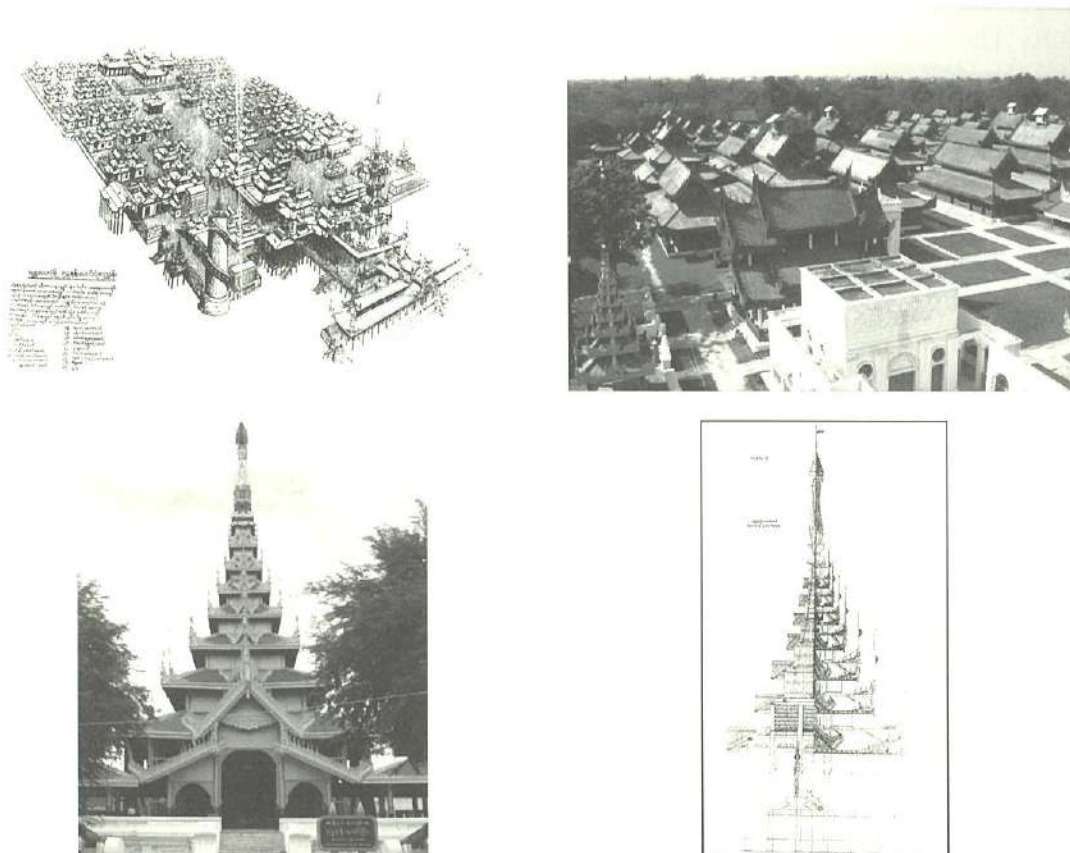
The Myanmar *pyatthat* stands over an open room; in the centre of the Japanese pagoda is a huge pillar which goes through the building from bottom to top. Burmese esthetical concepts are different from the Far Eastern traditions of building decoration. The Myanmar *pyatthat* is a simple and logical structural system. The frame of a *pyatthat* is never decorated. Elements of architectural decoration hang on this plain frame. On the contrary, in China in Japan each of the carrying members of the frame can be richly decorated. Complicated and elaborate adornment of beams and brackets is peculiar to the traditional Far Eastern buildings. They also have typical roofs whose corners curved upward. These are never used in Myanmar. The colors of Myanmar wooden buildings moreover differ greatly from Chinese ones. Chinese traditional buildings are painted profusely with bright colors. In contrast, red, green, yellow blue paints are completely alien to Myanmar. Instead, in Myanmar the deep dark colors of teak predominate. This wood is treated with insect-repelling oils, the building

interiors and facades are layered with gilt, with the cinnabar and gold leaf finish on the lively carvings providing balance.

(d) Royal Palace (*nandaw*)

In Myanmar, palaces were built throughout the historical periods. Information concerning early origins of Myanmar royal palaces and their development is very scarce. Ruins of palace foundations are still partially visible in the ancient Pyu cities of Beikthano, Sriksetra and Hanlin. Wooden *pyatthats* are imaged in the 11th and 12th century Bagan bas-reliefs and wall paintings. One of the hand-drawn 19th century *parabaiks* shows a sketch plan of a palace of King Manuha of Thaton. It was a suite of halls terminating with a *pyatthat* and two reception halls. Unfortunately, all this information cannot give even a rough idea of the appearance of ancient palaces.

The Mandalay palace followed palace compositions of Innwa and Amarapura, whose drawings can be seen in *parabaiks* of royal palaces. Archaeological excavation has revealed the location and the remaining brick platforms of the palace. All of the palace superstructures were totally damaged due to fire, weather, and other agents, and have been under reconstruction since 1989 by the government.



Mya Nan San Kyaw palace in Mandalay

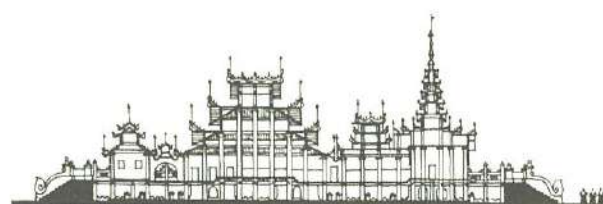
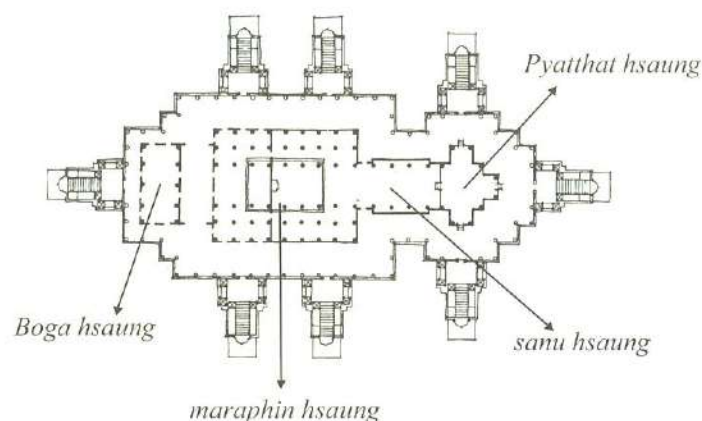
(a) Monasteries

Monasteries are the richest and most conspicuous carved wooden structures among Myanmar traditional wooden buildings. They are called *kyaung* or *pongyi kyaung*, which also means school, with

pongyi being a monk. At the easternmost end of the axial plan is the *hpaya hsaung* (*pyatthat hsaung*), which houses the principal image of the Buddha. As it was crowned by a multi-tiered *pyatthat*, it is called *pyatthat hsaung*. This chamber is often connected to the main prayer room, the *hsaung ma gyi*. However, some early Mandalay monasteries such as Thin-Gaza lack this connecting passage, or *sanu hsaung*. The connecting chamber has also been called the *zing gyan* but this is more correctly the open verandah surrounding the main rooms.

The *sanu hsaung* was connected architecturally, but it was also a reception room, once described as “an enclosed verandah used as a reception chamber, and here offerings are received and intercourse carried on between the priest and his supporter.” Likewise, the *hsaung ma gyi* – the large part of the monastery – has also been described in different terms. For instance, the two-part living quarters and devotional area of the central hall is often called the *maraphin*.

The *sanu hsaung* leads into the *maraphin hsaung*, a large hall-like room divided with a partition into western and eastern parts. The name of the hall originates from this partition because *maraphin* in Myanmar means “partition, dividing a hall into two parts.” It is always the largest room in a *kyaung*, covered by a separate three-tiered roof, clearly distinct in the composition of the building. In the eastern section of the *maraphin*, near the centre of the partition, stands a throne with an image of Buddha. The floor in the middle of the *maraphin* is always elevated two to three steps, with a low fence usually surrounding this elevated area. This is the scene for various activities. A monk sitting on the elevated floor delivers sermons, teaches novices and monastery school pupils, who take their place on the lower level. At the western part of the *maraphin* is a private room, closed with walls from the rest of the *maraphin*. The *boga hsaung* (western room), on the main monastery axis separate from the *maraphin*, houses novices and pupils or may be used as a store-room.



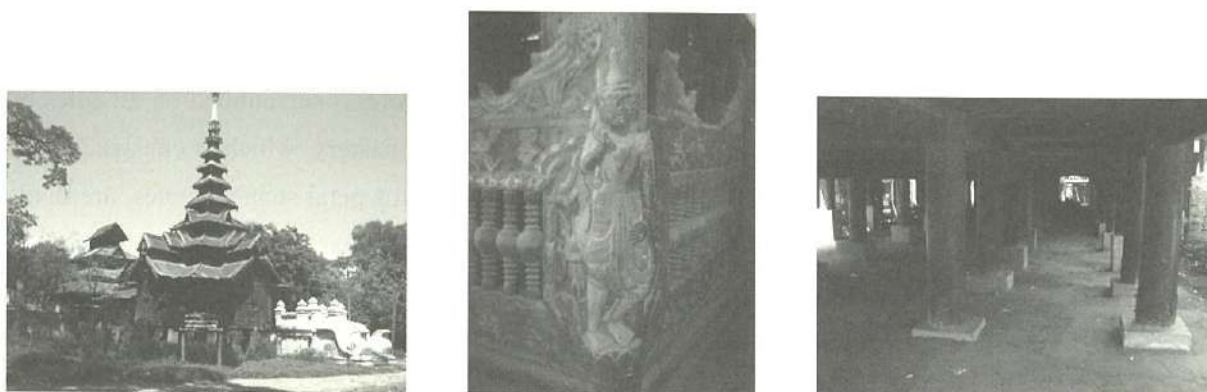
Side elevation of a wooden monastery

IX. Preserved Monasteries in Upper Myanmar

Upper Myanmar has over 50 ancient wooden monasteries and many *pyatthat* on the Mandalay city wall. Among them a number have been preserved by the Myanmar Department of Archaeology, National Museum and Library, in line with budgetary considerations. The following are some of the preserved monasteries and *pyatthats*, described in this and the next section: Thin-Gaza, Shwe-In-Bin and Shwe-Nan-Daw wooden monasteries in Mandalay, and Lei-Zin wooden monastery in Salin.

(a) Thin-Gaza Wooden Monastery (*Kyaung*), Mandalay

Thin-Gaza was built during King Min Don's reign, by the minister of forests. This monastery is supported on a platform approximately 2 m high and 40 m long. The shrine room (*pyatthat hsaung*), intermediate area (*sanu hsaung*), main hall (*maraphin hsaung*), and storeroom (*baw ga hsaung*) are surrounded by a corridor, following the typical Konbaung axial layout from east to west. The main hall has been partitioned into a reception room and sleeping quarters. Extra apartments to the left and right have been added to the wings on the north and south sides. Access is by way of a pair of "mango bud" masonry staircases. The Department of Archaeology, National Museum and Library undertook the preservation of this monastery in 2000.



Thin-gaza wooden monastery, Mandalay

(b) Shwe-In-Bin Wooden Monastery (*Kyaung*), Mandalay

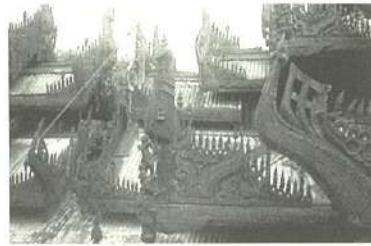
This monastery, which was patterned on a royal monastery, was built after the British annexation of upper Myanmar in 1895, by a Chinese merchant married to a Myanmar woman of royal blood.

This monastery is built on a platform nearly 2 m high and supported by a total of 167 sturdy teak pillars. It is dominated on its eastern end by a seven-tiered, 9 by 9 m cruciform-shaped image room (*pyatthat hsaung*) with gables projecting in three directions. Light enters this room through small porthole windows which are also the focus of the diagonally arranged planking comprising the walls of the *pyatthat* spire. The largest apartment, the reception hall (*hsaung ma gyi*), is over 32 m long and marked externally by a series of three classic (*zaytawun*) roofs, and is divided into two parts by a partition wall. The western section of the reception hall, which serves as a dormitory for monks, is connected to the storeroom (*baw ga hsaung*) by an interesting architectural feature in the form of a covered arched hallway or *gon hsaung*, surrounded by a small tiered roof. The 11 by 5 m storeroom

is marked externally by three triple *zaytawun* roofs which are lower than those of the *sanu hsaung* to the east, but higher than those of the covered *gon hsaung* hallway to the west. It has eight masonry staircases.



Eastern Door at the image room



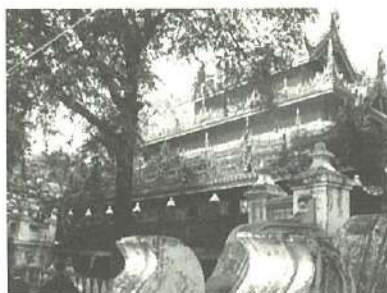
Wood carvings at roof corners



(c) Shwe-Nan-Daw Wooden Monastery (*Kyaung*), Mandalay

During his reign King Thibaw donated this monastery, to serve as a side monastery to the centrally-placed Atumishi, within the outer enclosure wall of the compound. It had originally been part of the palace at Amarapura, and was shifted to Mandalay to become the royal apartment of King Mindon. After the death of King Mindon on 1 October 1878, it was moved to its present site on 18 November 1883.

The monastery consists of a 35 by 21 m main hall (*hsaung ma gyi*) surrounded on all sides by a 2.5 m wide veranda. A total of 150 teak pillars supported the monastery, which is constructed on a platform built nearly 2 m above the ground. The pillars, set on lotus petal-shaped stones, are made of marble (*sagyin*). Outward-facing effigies of rearing dragons, that appear in triplicate at the corner, guard the foundation pillars around the perimeter. Curtains of batwing (*lin no daung*) ornaments in subdued relief span the interior spaces between the pillars below the veranda, and serve as a foil to the writhing vertically-oriented reptilian forms.



Shwe-Nan-Daw *kyaung*



Wood carving of handrail,
Shwe-Nan-Daw *kyaung*

X. Conservation Measures: Lei-Zin Wooden Monastery, Salin

As an architectural engineer as well as conservator in the Department of Archaeology, National Museum and Library (North Branch), Mandalay, Upper Myanmar, I have responsibility for the

conservation of the ancient monuments in upper Myanmar. I would now like to give a brief account of the conservation measures that I recently carried out at Lei-Zin wooden monastery in Salin in 2004.

(a) Background History

Lei-Zin, situated in Salin, is a wooden monastery approximately 30 m long and 15 m wide, resting on a 3 m high platform support by 245 posts. It was ordered donated in 1889 by Daw Mya Bu, whose family had built other monasteries within the compound. The building, surrounded on all sides by a veranda, is of classic proportions, consisting of a seven-tiered cruciform shrine room (*pyatthat hsaung*), a narrow intermediate apartment (*sanu hsaung*), and a main room (*marphin hsaung*) subdivided into two apartments. There is no storeroom (*baw ga hsaung*). Access is by way of six brick and stucco staircases on the north and south sides. An earthquake in 1975 damaged the structure. Because of crumbling masonry and encroaching vegetation, only two staircases are currently usable. The special charm of this monastery lies in its fine proportions and its well-appointed under-roof ventilation, in the form of boldly carved screens of open-work, under the eaves. The paneling on the exterior of the shrine room is also worthy of note, as are fragments of crisply carved floral balustrades which, unfortunately, are in the process of being devoured by invasive creepers. There are still a few examples of competently carved smaller dragons in relief, tenoned to the top of the some of the outer foundation posts, below the floor of the building.

(b) Condition of the Monastery Before Conservation

I will now discuss the Lei-Zin monastery before it was preserved in 2003. We would lose this precious culture heritage building if we did not have a chance to preserve it. According to our traditional building methods, all of the monasteries were built by digging holes for wooden pillars. Thus, the parts of the wooden pillars in the ground become ruined after a number of years. Following this, the upper part of the monastery leans in different directions and eventually collapses into a heap of wood.



The condition of Lei-Zin monastery before conservation

In this case, I had the chance to preserve the image room (*pyatthat hsaung*), the room for the chief monks (*sanu hsaung*) and reception hall (*hsaung ma gyi*). After thoroughly examining the cause of deterioration, the following damage was noted.

1. Rainwater leaked up from the drains, the ground level of the monastery being lower than the surrounding area; some parts of the windows and roofs were badly deteriorated.
2. During the rainy season there is water accumulation around the monastery, and in the other seasons moisture deteriorates the pillar bases, therefore some supporting pillars under the monastery had sunk or were fragile.
3. Due to water accumulation and moisture, another problem was that the whole building leaned approximately 18 degrees towards northeast, and the most badly leaning part of the monastery was the *pyatthat hsaung*, so it was dangerous for the monks who lived there.
4. The worst circumstance was the earthquake of 1975, which affected the whole monastery. The sculptures and carvings of the *pyatthat hsaung* broke off or were damaged badly, and the core of the *pyatthat hsaung* leaned more.

(c) Process of the Conservation Work

Before starting the conservation work, photographic records and drawings were made from each and every corner. The conservation work was carried out in the following steps.

1. Space under the monastery and surrounding and the ruins was cleared systematically.
2. Pieces of the building in danger of falling off were systematically marked and recorded, then removed and stored in a secure place.
3. To prevent further leaning, the building was supported by wooden posts.
4. The ground around the pillars was dug until the pillar base could be seen.
5. The detached parts were separated for temporary keeping.





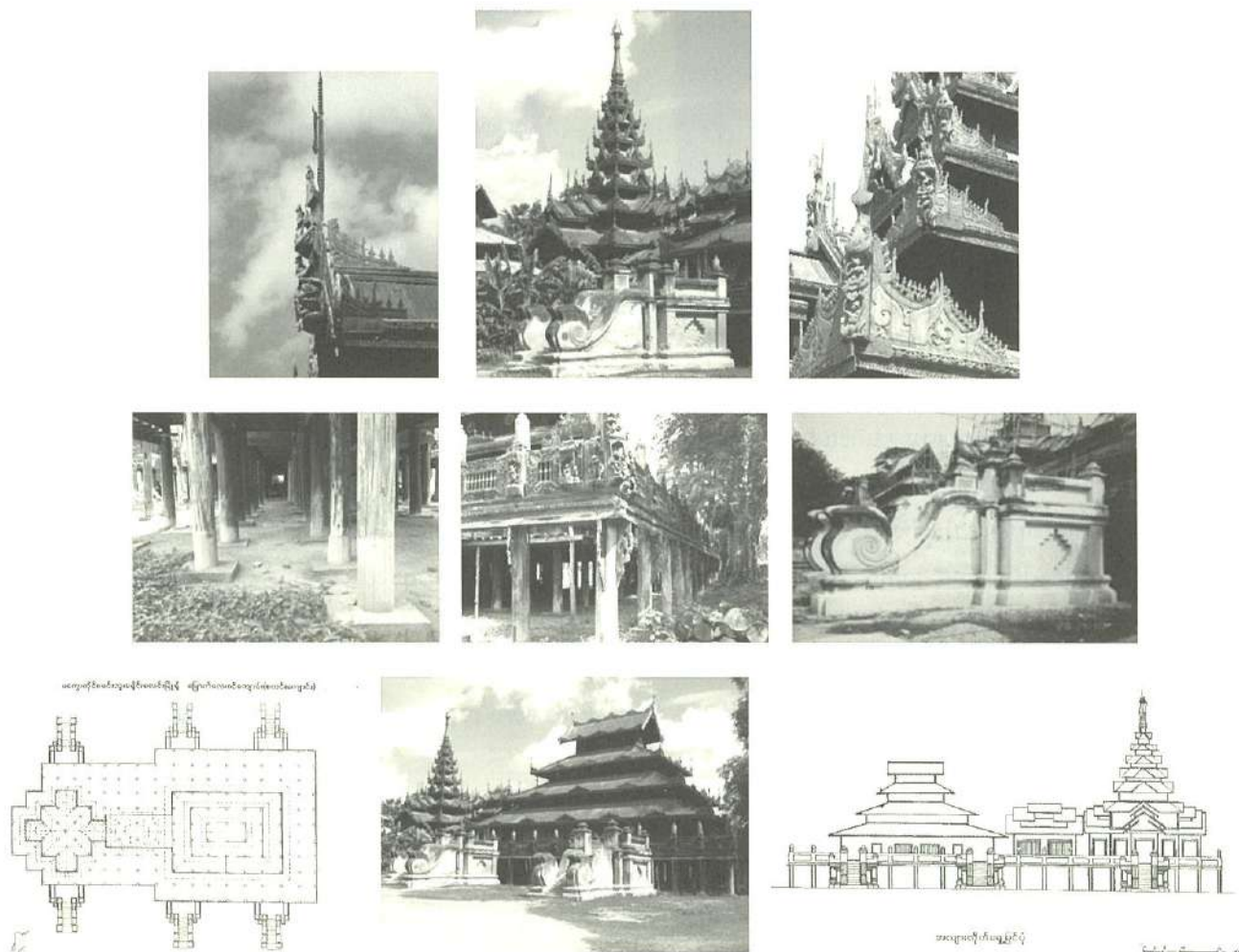
During conservation of Lei-Zin monastery

6. The structure was pulled back upright, and the main pillars supported with wooden posts.
7. Submerged pillars were raised to the adjusted level.
8. Bad parts of the bases of pillars were cut, and concrete footing was providing.
9. Ruined beams, joints, zinc sheets, wooden flooring and wooded carvings were removed and replaced with new ones.
10. Portions temporarily dismantled were replaced systematically.
11. All the missing portions of the brick staircase were repaired to get the original shape and design.
12. All the pillars and exposed parts of the building were applied with thick crude oil in order to protect them from the effects of weather.
13. All the zinc sheets were applied with red oxide external paint in order to protect them from rainwater.

(d) Problems Faced During the Preservation Work

The problems facing during the preservation work are as follows.

1. Due to a lack of sufficient funds, the work was not completed in the expected time.
2. Up-to-date facilities, such as construction equipment like cranes, derricks, etc., were not available, so that more money was spent unnecessarily for labor charges during the operation.
3. Skilled workers were moreover not in sufficient supply and more are required.
4. As teak wood is very expensive nowadays and not easily available, other kinds of wood had to be used as replacement, which will not be as durable in the long run.
5. Although the conservation work of the monastery was completed, an annual maintenance fund is still required.
6. For further conservation work, advanced methods of conservation are required. There are a few well-trained technical assistants in my department and it is difficult to cope with a large quantity of ancient monuments.



The condition of Lei-Zin monastery after conservation

XI. Benefits from the Training Course

After attending the 2009 ACCU training course, I believe that I will be able to undertake further preservation and restoration work for historic wooden buildings in my country. I will apply the useful modern techniques and methods of preservation of wooden monuments that I study in Japan to my restoration and presentation work in Myanmar. I will also share my experiences with other conservators so we can preserve our ancient monuments and make them long-lasting for many years.

Nepal

Suresh Suras SHRESTHA

Archaeological Officer

Department of Archaeology

Ministry of Culture & State Restructuring

Wooden Architecture and Conservation: A Case Study of Swayambhu Stupa Conservation

Part 1: Overview of Wooden Architecture and Conservation in Kathmandu Valley

1.1 Background

Kathmandu Valley is the seat of the capital of Nepal. The cultural heritage of Nepal is significantly represented in Kathmandu Valley, in the cities of Kathmandu, Patan, and Bhaktapur, presenting an epitome of harmony in urban design and architecture, and refined culture. The Kathmandu Valley was inscribed on the World Heritage List in 1979, and contains the royal palaces of the three cities, Swoyambhunath, Baudhanath, Changu Narayan, and Pashupati. All of the sites of Kathmandu Valley World Heritage Site (KVVHS) are declared as Protected Monument Zones (PMZ) by the government of Nepal. The history of the valley begins with accounts preserved in a number of chronicles, which mention the Gopals and the Mahishapalas who ruled the valley as far back as the 7th century BC. The Lichhavi period is considered to as the “Classical Era” and a “Golden Age” in the history of Nepal. The highly developed Gupta culture in India influenced the Lichhavi era.

The Mallas were great contributors to Nepalese architectural and cultural heritage. Jayasthiti Malla founded the Malla dynasty in 1350 AD. After 1428 the valley was divided into the three separate Malla kingdoms of Kathmandu, Lalitpur (Patan) and Bhaktapur. The late Malla period is known as the “Golden Age” for Nepalese architecture and workmanship of bronze, wood, brick and stone in the valley. The Mallas developed skilled craftsmanship in working with bricks and wood to such a perfection that their buildings, whether temples, palaces, or private or public houses, have aesthetic value. After conquering the valley, the Shah rulers adopted the Malla tradition and started to flourish. There was also some Mugal influence in this period. The style of white stucco palaces, copying the prevalent European neo-classical style that is specially known as the Rana style, was imported and adopted. After 1951 Nepal opened its borders to the world. Its various monuments of architectural importance are mostly centered in and around the Kathmandu Valley, consisting of numerous palaces, monasteries, temples, dwelling houses, public houses, water systems etc. Intricately carved wooden architectural members, such as pillars, windows, doors, roofing, stairs/ladders, brackets, tympanums, and struts over and around a core structure of bricks, are the characteristic features of traditional Nepalese architecture.

1.2 Wooden Architectural Structures in the History of Nepal

Human beings have been using wood from time immemorial. We humans have always felt the magic of trees and wood. It is believed that early men were inspired by trees to make shelter for their protection. As timber is a perishable material, no trace of such evidence is found. In the context of Nepal, an archaeological excavation conducted in Tilaurakot of the western Terai region revealed some evidence of timber used to build a house which was dated to the 6th century BC. Nepal is rich in excellent wood art. The carved doors and windows of monasteries, temples, palaces and private residences are their most decorated elements, and the most elaborate examples of wood carvings to be found anywhere in the valley. "The decoration on the wooden constructions is so lavish that virtually no part of the wood is left blank" (S. B. Deo, *Glimpses of Nepal Woodwork*, 1965). We cannot find any traces of woodwork from the Lichhavi period. We can only rely on inscriptions and Chinese travelers' accounts. Some Lichhavi inscriptions focus on different temples, palaces and monasteries, such as: Changu Narayan, Vishnu Vikranta, and Pashupati temples; Managriha Kailashakuta Bhavan and Bhadradhivas Bhavana palaces; Guvihara, Manvihara, Raj Vihara and Kharjurika Vihar monasteries, etc. The Chinese travelers also mentioned these palaces in Tang annals in 647-48 and 657 AD. The Medieval period is well known for the developed art and architecture of Kathmandu valley. It is very famous especially for wood and bronze art along with its architecture. The Kasthamandapa is known as the oldest wooden architectural structure in the valley. Besides this, the oldest wooden workmanship includes the struts of Rudravarna Mahavihara (Buddhist monastery) of Patan, Itumbahal of Kathmandu, and Indreshwor temple of Panauti. We accordingly can say that the art of woodcarving is indeed the pride of Nepal. Wood is not only used in architecture, but also in iconographic representations of aesthetic value.

1.2.1 Existing Traditional Architecture in the Kathmandu Valley

Kathmandu, the modern name of the main city of Kathmandu Valley, "is said to be derived from an ancient building, which stands in the heart of the city near the *durbar*, and which was originally and is still known among the Newars as Kathmandu, from *kath* "wood" (of which material it is chiefly composed), and *mandi*, or *mandau*, "an edifice, house or temple." Hence Kathmandu means "city of wood," as it probably was originally, before the destruction of many of the wooden buildings. The architecture of the valley typically consists of a combination of a structural wooden frame and masonry or brick walls. Kasthamandapa, meaning "wooden house or temple," is an example of a temple built using this system, originally built during the Licchavi period (3rd–7th c AD), and considered to be the oldest wooden building still standing in its original structural shape in Kathmandu. An old legend recounted about Kasthamandapa says it was built using a single *sal* (one of the famous types of *Shorea*) tree.

The existing traditional wooden structures can be classified in five different categories, each with its distinct features, which can be differentiated by their characteristics and utility. The types are:

- 1) Temples
- 2) Royal palaces
- 3) Monasteries
- 4) Dwelling houses
- 5) Public houses (*pati/pauwas*)

The wooden structural system is not always apparent, as the wooden components are highly decorative and do not look structural. There is intricate carving work of symbolic, often colored figures on the pillars, brackets, struts, and window and door frames. The overall impression is as though sculptural works have been inserted into the wall rather than forming an integral and critical part of the structural support. The combination of wood and brickwork for structural purposes is also found in multi-storied temples, in the frame system of the peristyle and the walls of the central cell. The central cell is square in plan and made with thick walls that rise upwards, giving the building structure its rigidity. The same combination of two structural materials is also found in Newar houses. This construction system, which gets its aesthetic and structural values from the association of wooden elements and brick walls, is commonly used in the Kathmandu valley and is an original expression of Newar civilization. The wooden Nepali roofs have a very different structural concept when compared with buildings found in other countries with similar cultures.

Temples. Kathmandu valley is known as the city of Temples, and Nepal is famous for its unique multi-roofed temples. The oldest temples are Changu Narayan (325 AD) and Pashupatih (6th c), while Kumbheshwor (14th c), Chandeshwori in Banepa (14th c), Indreshwar Mahadev in Panauti, Nyatapola in Bhaktapur (16th/17th c), and Taleju at Hanumandhoka are the best examples of temples with fine developed architecture of medieval Nepal, along with the Shikhara style temples of Krishna Mandir (16th c) and Mahaboudha, both in Patan. Most of the temples are built in square, rectangular, circular or octagonal plans. The structures are built of brick over a wooden framework. Decorated wooden windows, doorjambs, and other wooden structures pierce the walls of bricks. The stories are supported on wooden brackets. There are certain rules in designing temples. Definite standards are recognizable in the choice of plan, the structure as a whole and its orientation, while the number of roofs, the types of building materials and their quality, the carvings and sculptures are also made according to strictly defined canons.

Royal palaces. *Durbar* is the Nepali term for palace, and *layaku* is the old Newari term for the same, which refers to a palace or royal palace. Large squares and groups of temples surrounding the palaces are named after the various *toles* (i.e. neighborhoods), the places where they are situated. All the palace complexes of the three cities in the valley (Kathmandu, Patan and Bhaktapur) differ in appearance, according to their positions in the city and the groupings and styles of the buildings, but they are very similar in many characteristics and they are still retain their basic plans, including groups of various courtyards.

The earliest Malla royal palace of Bhaktapur has lost part of its original features due to an earthquake in 1934. It was said that the Bhaktapur palace complex consisted of 99 courtyards surrounded by buildings, but only nine or ten are left in present. The existing building and courtyard still have the essence of the past, showing its grandeur of art and architecture. Its original construction dates back to 1427, in the reign of Yaksha Malla. Most of the kings who followed him added wing after wing to the complex. The 55 Windows palace has undergone a major *in situ* conservation project. The most remarkable palace in Kathmandu is the Hanumandhoka Durbar. King Ratna Malla laid the foundation in 1484. Restoration of the old buildings and some construction is credited to King Pratap Malla in the 17th century. There are five main courtyards, which still exist in the palace complex. The Mul Chowk or main Chowk (built by King Mahendra Malla in 1565) is the most important, where all the religious celebrations and coronations of Malla kings used to take place. Sundari Chowk and Mohan Chowk were built by Pratap Malla (1641-1674) for the residence of the king and royal family. The Nashal Chowk, built by Pratap Malla, was the venue for the coronation of Shah Kings. Prithvi Narayan Shah and his successor Pratap Singh Shah built Lohan Chowk. At present one part of the palace is converted into a museum displaying the Shah ruler's biography.

Another most impressive palace is Patan Durbar. The palace buildings materials are bricks and timber, and are distinct in feature. It is the best-preserved palace and retains most of its original form. This palace square comprises the palace with its temple, courtyards and the group of temples built in front of the palace complex. The palace buildings seem to have been built in 17th century and later. The present form took shape during the reign of Siddhinarasinha Malla (1620-1660) and Srinivasa Malla (1660-1684). Sundari Chowk, the most beautiful part, was completed in 1627, and was the residence of Siddhinarasinha Malla and his family. The temple inside the palace complex either stands on a raised platform or emerges on the palace structure itself. A series of super-structures of brick over a plinth of stone or brick is lavishly decorated with wooden carvings.

Monasteries. Buddhist monasteries are another type of building, known as Vihara and usually consisting of a two-storied court style building. The concept of Vihara as a dwelling place was developed during the lifetime of Lord Buddha. When Buddhism was becoming popular, many Sangha (monastic orders) were formed by followers of the Buddha. In Buddhism, the Tri Ratna (Buddha, Dharma, and Sangha) were considered most important for sustaining Buddhism. Sangha played the key role of spreading the teachings of Buddha. When the Sangha became larger, devout followers of the Buddha started to donate land and build permanent dwelling places for monks and followers. They built Viharas in a specific architectural form along certain basic principles.

There are more than 300 Buddhist monasteries in Kathmandu Valley sharing a common basic plan. Architecturally, the Vihara, set on a raised platform, is a two-storied structure surrounding an enclosed square courtyard. Except for the main entrance, which consists of a small centrally placed doorway

flanked by two blind windows in the main elevation, the ground floor is totally sealed off from the outside. Arcaded porches on all four elevations overlook the inner courtyard. Directly opposite of the main entrance is the room for the main shrine, which is a simple rectangular room. In all four corners, a staircase leads to the upper floor. The upper floor is used as living quarters, for prayer or as an open hall for monastic ceremonies. Intricately carved wooden windows, doors, struts, etc. decorate the monastery and most are decorated with metalwork.

Dwelling houses. A typical traditional domestic house is made of brick and a large number of timbers. The houses are arranged in groups with common walls between houses adjoining one another in a series, or they may stand in complete isolation as the availability of land permits. Generally private houses among the poorer inhabitants occur on the fringes of towns. The houses in the center of the town are of four stories. Every house or group of houses having open spaces serves as a playground for children, a warming area, and provides a sitting area. The common life style within each habitation, together with similar building methods, has led to uniformity in architectural style, with little variation.

Generally each house has at least three floors. The ground floor is used for storing wood, farm implements, tools, and livestock. The street side serves as a shop which has an arrangement of wooden doors. The pillars and posts are carved with various designs. The first floor is divided into a number of small rooms (*mata*) serving as bedrooms. The second floor, with lavishly decorated bay windows or simple windows, serves as sitting room. The top floor serves as kitchen and shrine room. We can find masterpieces of different types of windows in houses. Because of the unique character of the traditional buildings, there are building by-laws to protect and to preserve the traditional look, which are implemented within the protected monument zones (PMZ) of Kathmandu Valley.

Public houses. Public rest houses known as *pati*, *powha*, *sattal*, *mandapa* or *dharmashala* etc. are traditional rest houses mainly made for travelers, pedestrians, and for community or social activities. They are mainly located near temples, palaces, wells, and public sources of water along a trade route, in public courtyards along the road. Royal families or religious groups build them. The oldest rest house in the valley is the Kasthamandapa, also known as Maru Sattal, built in 11th-12th centuries.

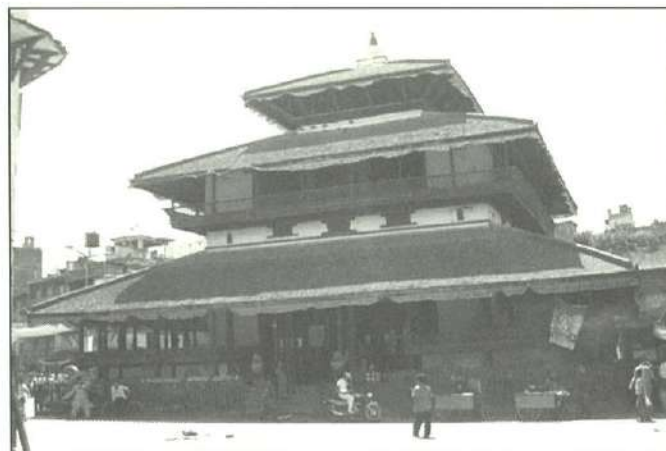
The more specific term *pati* refers to the smallest and most widely distributed of the rest houses, which despite its limited size, has similar functions to the other types. As well as being a short night stay shelter for travelers, it serves the closely interwoven Newari society living in its neighborhood as a meeting place for games, or for social and religious gatherings.

The layout of each *pati* is identical and consists of a rectangular brick platform. *Sattal* is another type of rest house, which is generally two-storied, or a *mandapa* type, or a house type. These three differ

in plan, firstly, at the ground floor which is either square or rectangular, secondly, having a layout with open halls or room divisions, and thirdly, in the height or number of stories. These rest houses contain a large number of wooden members with carvings such as pillars, lintels, and windows representing traditional workmanship.

1.2.2 Existing Wooden Monuments in Kathmandu Valley

Kathmandu valley is known for the remarkable wooden components used in traditional style temples, palaces, monasteries, etc. Wooden works of architectural design have spread throughout Nepal from their origin in Kathmandu. There are numerous wooden monuments in the valley from throughout the ages. There are many difficulties in studying them properly at present. Most of the architectural structures have undergone repair and alteration several times, causing confusion when trying to confirm their dates and record them. The application of preservative coats of black enamel by the locals also makes it difficult to know the details about them.



Kashthamandapa of Basantapur

Rudravarṇa Mahavihara, Patan (13th c), Chhusyabahal and Musyabahal in Kathmandu, and Indreshvara temple in Panauti (14th c), Chandeshwari temple in Banepa and Bhuvaneshvara temple near Pashupathi, Devapatan (15th c), Nyatapola temple of Bhaktapur, Kashthamandap of Basantapur and Hanumandhoka palace of Kathmandu (17th-18th c), still exist in their original forms and structures (S. B. Deo [1985] has calculated the date of the construction of these wooden temples and viharas on the basis of epigraphic records).

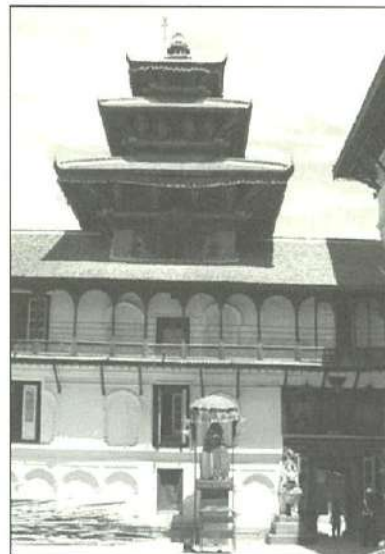


55 Windows palace of Bhaktapur after renovation

As far as extant architectural monuments are concerned, no monuments built earlier than the fifteenth century have survived the frequent earthquakes that occur in the valley.



Chandeshwori temple of Banepa



Hanumandhoka Durbar

Several inscriptions indicate the large scale of earthquake damage and destruction of monuments and public houses. Other causes of damage are due to the perishable nature of wood, as it is quickly affected by rainfall, high and low humidity, vegetation and wooden insects.



Indreshwor Mahadev temple of Panauti

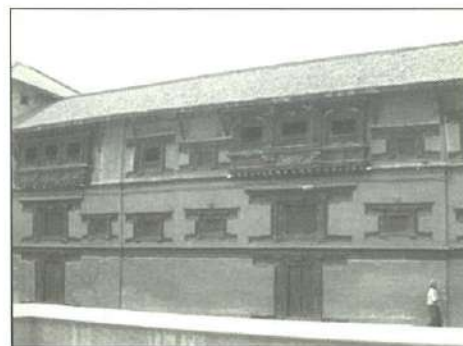
1.2.3 Elements of Traditional Wooden Architecture of the Kathmandu Valley

The architectural styles of Kathmandu Valley can be divided into the traditional/original Nepalese architectural style, and the imported architectural style. The traditional architectural style comprises mainly private houses, palaces, temples, monasteries, stupas, *patis* (wayside resting places), *pauwas* (community dormitories), *dhungedharas* (public taps for drinking water and open air bathing), etc., and the imported architectural style comprises various methods of construction which do not have Nepalese origin, i.e. European neo-classical style in the Rana style palaces, temples, houses etc. In traditional architecture, the framework is of wood in the form of pillars, doors, windows, beams, rafters, brackets, struts, tympanums, etc. All the exposed surfaces of the wood are exquisitely carved to make the façade more elegant. They show a very high quality of wooden workmanship. Woodworking is still a living art in Kathmandu valley. One of the most interesting features of this wood construction technique is the assembly of different components using special joints for each element, nearly always avoiding the use of fixing devices made from materials other than wood. This means that subsequent repair is relatively easy, as only the deteriorated components need to be replaced. Elements of wooden art found in Kathmandu valley are discussed in the following sections.

Roofing. Wood technology is particularly evident in the roofing system and gives the architecture its distinct Newar style of a steeply pitched roof and large overhanging eaves. The Nepali roof has the essential role of protecting the building from the severe monsoon rains and from frequent extreme exposure to the sun, which is particularly strong at high altitudes.



Inner side of the roof



Outer side of the roof

Temple roofs have symmetrical pitches springing from the central point of the cell. The number of tiers varies from a minimum of two to a maximum of five. The pitches are made up of small rafters that spring from the corners in a radical arrangement. At the different levels they are supported on the walls. On the outer side there is a large overhang supported by an eaves beam, which in turn is supported by carved wooden struts. On the inner side the rafters are anchored to a tie beam fixed to the walls. All elements are joined using wooden wedges. Domestic roofs generally have two steep

itches of about 40-50 degrees in order to make full use of the available space. A ridge beam rests on a central pillar and on the lateral gable walls to form the structure. Two principal rafters are tied up to the central pillar, leaning against the lateral walls on a wooden wall plate, which transfers the thrust to the walls. The wooden elements are held together with wooden wedges.

Doors, doorjambs, lintels. The main types of door are rectangular, triple cupped or trefoil, foliated and arched. Rectangular doorframes are generally found at the main entrance of palaces and monasteries. The doors, their leaves, and doorjambs are excessively decorated.



Artistic wooden doors, windows, cornice, struts, lintels and tympanums

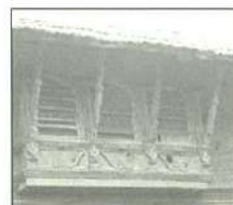
Windows. Windows play a vital role in medieval wooden architecture. Windows are the most elegant and varied feature. The most remarkable windows are those of the 55 Window Palace of Bhaktapur, the peacock window of Pujari Math Bhaktapur, those of Kumari temple and Sweta Bhairav temple in Kathmandu. *Desemadu jhya* (not found anywhere else in the country), placed in a private house, is also an unique and well known window in the valley.



Carved traditional window and cornice



Carved pillars, windows



Artistic *biman jhya* (window)



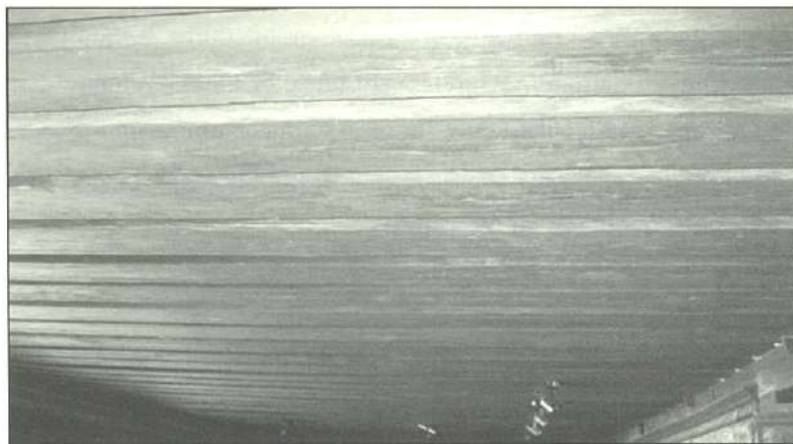
Ku jhya(CornerWindow)

Stairs. Stairs are always made of wood and their design is very similar in all the different building types, from traditional houses to royal palaces. Their main characteristic is that they are very steep, narrow and in one continuous flight due to the limited height between stories.



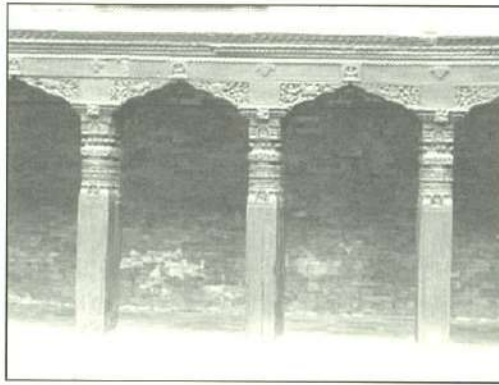
Stairs of Patan Durbar after renovation

Floors/ceilings. Floors or ceilings (floors of the upstairs story are ceilings for the one downstairs) are built with simple battens, rectangular in section, upon which planks are laid. These in turn support the final floor finish. Newar carpenters have developed their own construction techniques accordingly to provide additional bracing by linking the vertical and horizontal structural components, as Nepal is located in an earthquake zone.

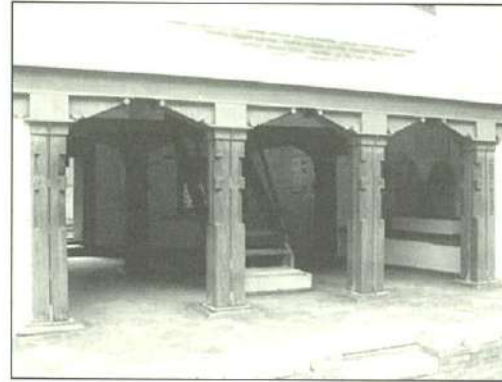


Ceiling of a traditional house (horizontal wooden beams)

Pillars. The wooden pillars belonging to royal palaces, monasteries or temples, are heavily decorated with motifs and molding. Such pillars can be categorized into four types as square, cylindrical, cypress and composite.

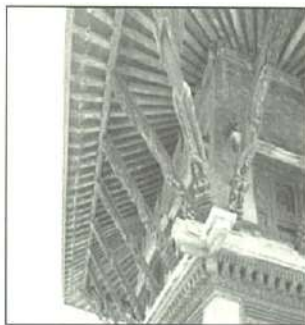


Wooden pillars in Keshav Narayan Chowk

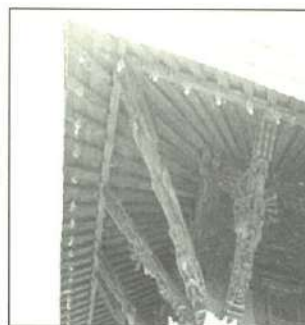


Wooden pillars after conservation (iron plates)

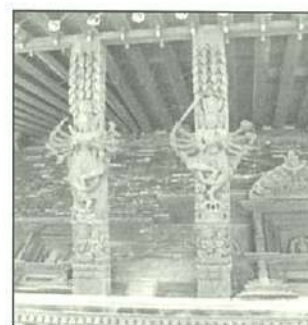
Struts (tundal)/bracket. *Tundal* or *tunala* are placed to support the projecting eaves of the roofs. This can be seen particularly in multi-storied forms of temples, palaces, monasteries and in the houses, and this is Nepal's own original contribution. The carved struts are a dominant feature of traditional architecture.



Carved Struts



Kushala – corner struts



Carved struts

Tympanum (torana). This is a most fascinating feature of Nepalese temple architecture. *Torana*, the local term, is actually a Sanskrit word and generally means a gateway. *Torana* is basically semicircular in form and placed above temple doorways, windows, and between pillars.



Different artistic wooden tympanums from doors of temples

1.3 Problems and Needs for Preservation and Conservation

Insects like termites and beetles deteriorate wood objects. The effects of such bio-deterioration mainly depends upon the quality of the wood and its surrounding environmental conditions. Apart from these, other causes of destruction are the factor of age, natural factors (earthquakes, floods, wind, rain, fire, dust, ground water, lighting and the germination of trees over the structures), and negligence in maintenance or shortages of money and human resources. Further damage may be done to a structure by paint, neglect, alterations, vibration, pollution, theft, tourism, calamities, wars and animals. Insects affect soft woods quickly but not as easily for hard wood. After the earthquake of 1934, the majority of wood in Kathmandu Valley's architecture was replaced with soft wood. Accordingly the rate of bio-degradation increased for those items. In soft woods, insect food materials such as carbohydrates, starch, and plant cells edible for some insects are present.

There are hundreds of monuments scattered all around the Kathmandu Valley. They possess beautiful wood carving along with medieval Nepalese woodwork. Every structure is fitted with wooden items such as doors, windows, struts, entablature, eave boards and tympanums etc. These parts are integral to Nepalese architecture. These monuments, including the wooden parts, have been conserved by the people with their traditional knowledge from time immemorial. After the establishment of the Department of Archaeology, the Ancient Monuments Preservation Act was promulgated and executed for the conservation and preservation of monuments. It is very hard to conserve all of the monuments with the very limited budget provided by the government, as we have thousands of monuments around in Kathmandu Valley alone. Government agencies other than the Department of Archaeology use modern technology for the conservation of these monuments, while people prefer to use traditional methods. The major problems currently seen for the conservation of the monuments (including wooden parts) thus includes deficiencies in budget, experts, modern techniques, proper management, coordination between government agencies, manpower, coordination of traditional and modern technology, documentation and public awareness. Accordingly these are also the major problem affecting wood conservation. The Department of Archaeology, the municipalities and other agencies related to heritage conservation are working together for the conservation of the monuments of the valley.

1.4 Conservation Practice and Status of Wooden Structures in Kathmandu Valley

The pillar inscription of Nighliha clearly mentions that King Ashoka of India during his visit to the area had reconstructed the wrecked stupa of Kanak Muni Buddha. It shows that conservation and preservation of important monuments were initiated from the 3rd century BC in Nepal. Among more than 200 Lichhavi inscriptions, some note the preservation and conservation of historical monuments and waterspouts, etc. The inscription at Sundhara (Patan) by Ansuvarma of 608 AD clearly states the temple of Matin Gram had been damaged by mice, mangos, birds, and human carelessness, and the Royal Patronage renovated it later. In the same way, the Sikubahi (Patan) inscription dated 573 AD

clearly mentions the erection of terracotta replicas, instead of wood, of icons of female goddesses during the conservation work. Similarly, inscriptions also shed light on the Trust for the well being of the monuments like the Gosthi or Guthi. This consisted of donated property, with the income raised from the land used to maintain different kinds of monuments. At the same time, old and damaged icons or building materials were replaced, maintaining the authenticity. The same tradition was followed during the Malla period as well. The extant architecture was made of materials such as brick, wood, and stone etc., that can be reused. So at that time people were aware about retaining the originality of the monument. The tradition is still in practice in Kathmandu valley.

Apart from these, vegetable oil was used as paint for the wooden surfaces to protect them from insects and climatic effects. There is a custom of cleaning wells and public water spout drains, and clearing and polishing wooden structures or members before the start of the monsoon or rainy season even today in the traditional ethnic culture of Kathmandu valley. This is a continuation of practices from time unmemorable.

Although there are many problems, the Department of Archaeology (DoA) is always doing its best regarding the conservation of these wooden structures with very limited budget using traditional knowledge (and modern technologies in some cases), in close collaboration with the local people and in coordination with Kathmandu Metropolitan City in Kathmandu, Bhaktapur Municipality in Bhaktapur, Lalitpur Sub-Metropolitan City in Patan and Kathmandu Valley Preservation Trust (KVPT) and other many NGOs/CBOs in Kathmandu Valley, over the past two to three decades. Some examples of the conservation works done by the DoA in coordination with these institutions are described in the following sections.

Swayambhu stupa. This is an ongoing project from last year. Although the objective of the project is to apply gilt to the copper sheets of each and every part of the stupa, which was already gilded but is worn out and has dents, the project also have to conserve everything else in the stupa, including rebuilding missing parts and repairing dents, and another major aspect is the upper wooden structure, which is going to be done very soon. This ongoing project will be completed in the next year.

Fifty-Five Windows palace. The 55 Windows palace, constructed by Bhupatindra Malla and famous for its 55 bayed windows and mural paintings, is located in Bhaktapur. It is unique an innovative masterpiece which presents a summary of Malla period palace construction, not only artistically and in terms of architectural design, but also in its structural approach. The conservation of the palace was completed this year, preserving its very important mural paintings and the authenticity of the palace.

Chyasindeval (Octagonal temple) of Hanumandhoka. Conservation work has just been completed this year by the DoA at this temple, under my supervision as a project chief, to strengthen the wooden

components and re-roof the structure.

Chandeswori temple. Chandeswori temple is located in Banepa, the small northeast city of Kathmandu. Renovation work has been going on for the past six years, dismantling the entire temple and rebuilding it again reusing some of the existing materials, including some of the wooden parts that had undergone chemical treatment. After completing the renovation of temple, the application of gilt to the copper sheets of its roof is still underway, which will be finished within the year.

Pujari Math. This is located in Bhaktapur city and is famous for its intricate woodcarving. The very popular beautiful Mayur Jhya (Peacock Window) is also part of this monument. Wooden doors, windows, pillars, tympanums, eave boards and entablatures are some of the special woodcarvings of this monument. The consulting firm John Sanday & Associates, with the support of the German government, restored part of the building which collapsed a few years back. Chemical treatment was also conducted for the conservation of wooden members.

Part 2: Case Study of Swayambhu Stupa Conservation

2.1. History of Swayambhu Stupa

Swayambhu is one of the holiest pilgrimage centers in Kathmandu valley, equally venerable to Buddhists as well as Hindus. It is a great center of reverence not only to the people of Nepal, but also to all peace-loving people of the world. The Swayambhu is situated in the west of Kathmandu city. The hill is called as “Padmagiri” and “Vajrakuta” in ancient epigraphic sources. It is also called “Gopucchha” and “Gosringa” hill because it looks like a tail or horn of a cow when one observes it from Chobhar hill.

The story of Swayambhu is closely associated with the origin of Kathmandu valley. According to the Swayambhupurana, the valley in the beginning was a big and beautiful lake known as “Kalidaha.” The legend further explains that the Vipaswi Buddha came here and sowed a lotus seed in this beautiful lake which grew up and bloomed with a thousand petals. On that very flower a dark-blue flame emanated, and it is known as Swayambhujoti, a self-originated flame. Having heard about this auspicious flame, Mahamanjushree from Mahachina came with his two spouses, Varada and Mokshyada. After paying homage to the Swayambhujoti, he drained the water of the lake by cutting out the narrow slit in the hill at Chobhar with the help of his spouses Varada and Mokshyada, and the dried out lake was gradually changed into a valley suitable for human settlement. A stupa was erected in the place where the Swayambhujoti had emerged, which has been known as the Swayambhu Mahachaitya.

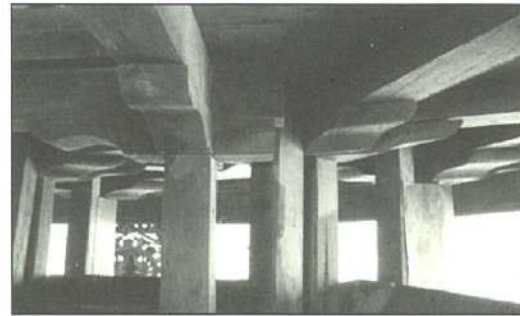
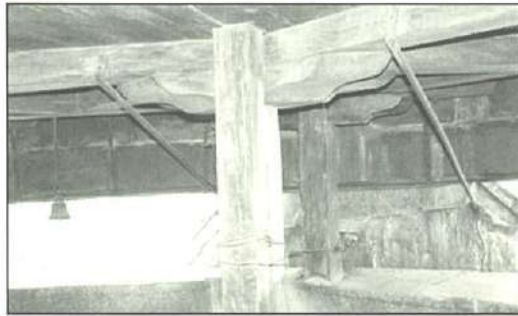
It is difficult to determine when exactly the lake dried up and human settlement in the valley began. On the base of various evidence most scholars of Nepalese history believe that the earliest phase of construction of Swayambhu stupa occurred around the beginning of the 5th century, and credit for this noble work goes to the Licchavi king Vrisadeva. The Swayambhu Mahachaitya, as believed by scholars, was a simple mud mound until its repair and enlargement in the Licchavi period.

It is difficult to say exactly who founded this stupa and when, but certain repairs and perhaps enlargements of this Swayambhu stupa must have been carried out in the Licchavi period. The first authentic historical evidence of such restoration dates from 1129 and is recorded in an inscription adjacent to the stupa. This stupa has suffered with many natural calamities and human vandalism in course of its long history. One of the severe acts of vandalism was in the Muslim invasion in the valley in 1349, during which the army of Sultan Sams-ud-din looted, destroyed and burned innumerable monuments of Kathmandu valley, including this Swayambhu Mahachaitya. Twenty-three years after this incident a nobleman, Rajharsh Bhallok of Kathmandu city, renovated this stupa in 1372. During the time of King Jyaysthiti Malla and his son Jotir Malla, the stupa was renovated again. The most frequent repairs to this stupa are either the replacement of the central wooden shaft called the “Yashthi” or the repair of the finial. During the time of King Laxminarasimha Malla the central wooden shaft was replaced by Shyamarpa Lama of Tibet. In 1751 another notable renovation was carried out on this stupa. King Prithvi Narayan Shah of Gorkha had also made a donation, which is mentioned in an inscription found in this area.

There is no mention of the damage to this stupa caused by the earthquake of 1934. In 1961, several renovation works were carried out in the area. In 1977, a severe landslide on its eastern side occurred on a hill which now has been stabilized. Thus, the age-old cultural traditions and monumental remains of Swayambhunath hill are not the achievement of any individual or group of people of any particular time, but a collection of contributions made by many scholars, kings, devotees and donors in different times over more than two thousand years.

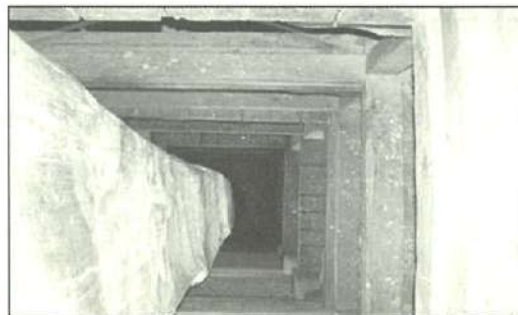
2.2 Present Status of Swayambhu Stupa

The Swayambhu Stupa Conservation Project is underway and it has completed the conservation of the Vajra with Mandala icon and the nine niches serving as shrines of Panchadhyani Buddhas with their female counterparts, which are around the dome of the stupa. All of the niches are made of stone and covered with gilt copper sheets. Due to many reasons, the copper sheets have become dented and the gilt is so worn out that it was deteriorating gradually. So the conservation of stupa is being done by the Tibetan Ningma Meditation Center, California, USA (an international donor agency) in cooperation with the Department of Archaeology, Government of Nepal, and the Federation of Swayambhu Management and Conservation (a community based organization).



Wooden structure inside the Trayodasha Bhuvana

Although the stupa is made up of stone and lime *surkhi* on the outside, there is a huge and major wooden part of the structure as well. This major wooden part of the stupa, “Yashthi,” is not seen from the outside, but is like the spinal cord or the back bone of the human body. The whole structure above the dome is based on it.



The central backbone “Yashthi” of the stupa

In the same way, the Goldhoj above the Hermika is also a major wooden structure, as well as the thirteen tiers of circles above the Hermika, known as Trayodasha Bhuvana. Trayodasha Bhuvana is a major wooden structure of the stupa and is also covered with gilt copper sheets, making the wooden structure invisible. Actually, this part is of great importance and a big challenge for the conservation of the wooden structure. The rest of the parts, which are made up of stone and covered with gilt copper sheets, do not pose problems for conservation, because they are easily conserved by mending or repairing the dents and reapplying gilt. But the wooden structure is more difficult as it is of heavy wood, and some members are in poor condition from rainwater leaking through the damaged copper sheets. Removing the copper sheets from wooden structure is a challenge on the one hand, and repairing the damaged wooden structure presents another challenge in keeping the authenticity of the design, workmanship and value.

2.3 Causes of Decay of Swayambhu Stupa

Although the outside of the stupa is made up of lime *surkhi*, and the niches and some other parts are of stone and of less concern for conservation, because they are still in good condition, the parts that are

covered with gilt copper sheets are of great concern for conservation work. The major causes of decay for the stupa are as given in the following sections.

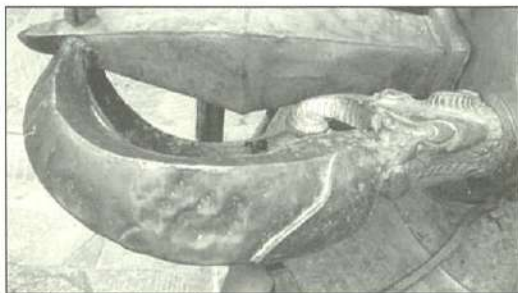
Natural atmospheric effects. The gilt copper sheets have been in place for the last hundred years. During this period the gold has worn out due to heat from the sunlight, or due to cold and rainwater, all of which cause the material to decay.



Damaged wooden structure of the Trayodasha Bhuvana

Due to different activities, the copper sheets are torn and damaged, and from these places rainwater enters the wooden structure and causes decay or damage.

Activities of monkeys. The Swayambhu is a Buddhist holy place in the middle of a hilltop covered with jungle, where many monkeys live. They come to the stupa area and do as they like, which is a major cause for damage to the copper sheets and other structures.



A dented portion of Vajra and Kalasha due to monkey and human activities

Human vandalism and theft. Human vandalism is another agent of decay and loss of the structures. One of the statues from the niches was nearly stolen a decade ago, but fortunately could not be removed and was saved.



The lost tongue from Makara



The lost icons from a tympanum

The structures are also damaged by various activities of human beings such as offering different things to the gods, putting lighting in front of the niches and stupa, etc.

Bird droppings. This is another major cause for decay of the wooden structure. The Trayodasha Bhuvana is the main place for nesting for pigeons, and their droppings fall and are very difficult to clean up. This causes damage to the wooden structure.



Wooden structure damaged by bird droppings (now cleaned)

2.4 Conservation of Swayambhu Stupa

The physical condition of the stupa was studied as it was conserved 100 years ago. Prior examination had concluded that the stupa must be conserved due to its poor physical condition. The gilt copper sheets were broken, some objects from the niches and other parts of the stupa were missing, and almost all of the gold was worn out on the copper sheets. So permission for conservation of the stupa was given to the Federation of Swayambhu Management and Conservation, with direct supervision of the Department of Archaeology. The funding agency is the Tibetan Mingma Meditation Center California, USA.

The conservation work is being conducted in three different phases, as discussed in the following sections: documentation; conservation of the parts around the dome (nine shrine niches), including Vajra and Mandala; conservation of upper parts of the dome of the stupa.

2.4.1 Documentation

The Department of Archaeology (DoA) put a provision in the Memorandum of Understanding (MoU), signed with the Federation of Swayambhu Management of Conservation (FSMC), that all activities regarding this conservation work must be documented according to conservation norms. The Tibetan Mingma Meditation Center (TMMC) has established a Documentation Center for the conservation of Swayambhu Stupa in accordance with the MoU between FSMC and TMMC. I am also involved and guiding the team. In this way monitoring and giving guidelines to the project for conservation work are done from the side of the DoA as well. The Documentation Center prepares a full documentation of the parts to be conserved before doing the work, during the work and after the conservation work. It recommends conservation work to be done in accordance with the physical conditions as they appear at the site, and prepare documentation of ongoing conservation work, as well as the documentation after conservation work. In this way, the Documentation Center has finished the documentation of three different stages of conservation work of the Vajra and Manadala icon, and nine shrines around the dome of stupa. Now it is preparing for the documentation of the Hermika and other parts of the upper structure.

2.4.2 Conservation of the parts around the dome (nine shrine niches), including Vajra and Mandala

According to the MoU agreed to between DoA and FSMC, and between FSMC and TMMC, the gilding project is not only responsible for gilding the rusted worn out copper sheets, but also responsible for the conservation of parts of the entire stupa. For that reason, the donor agency TMMC started with the documentation of the whole stupa, under the guidelines of the DoA regarding documentation for conservation and the conservation work itself.

The conservation work was divided into two parts: that of the lower part, which consists of the components around the dome of the stupa, being the Vajra and Mandala icon, and the nine shrine niches; that of the upper part, consisting of components above the dome, being the Hermika, Trayodasha Bhuvana, Chhatravali, etc. The conservation of the lower part is explained here, and that of the upper part in the next section (2.4.3).

Vajra and Mandala. Kathmandu valley has a unique tradition of Vajrayana Buddhism. Buddhist tantric priests use vajra in all forms of worship. Mandalas occupy an important place in Vajrayana. The teaching of Vajrayana is replete with mandalas. A mandala is worshipped in esoteric ceremonies. The Kathmandu valley itself is also regarded as a mandala, for that reason is called Nepal Mandala. Thus the vajra and mandala have been playing vital role in the Buddhism of Kathmandu valley. The Vajra and Mandala in front of Mahachaitya comprise a remarkable icon representing the essence of Buddhism of the valley. But it had been damaged due to lack of care and vandalism.



Vajara and Mandala, before conservation



Vajara and Mandala, after conservation

There were three major parts to the Vajra - left, middle and right. All of these were removed and several dents repaired, and many smaller and larger holes were also mended and repaired. All of the parts were reassembled and the surface gilded again. The Mandala was in worse condition, and it was also gilded where the gold had been lost. In the end, the Vajra and Mandala were reinstalled in their original places.

Nine shrine niches around the dome: Shrine of Ratnasambhava. The Ratnasambhava Buddha is displayed inside a small three-storied shrine, which is covered with gilt copper sheets. Three Kalasa-shaped pinnacles are displayed on the top of shrine and an image of Ratnasambhava Buddha is seen on the Toran in a gesture of offering with his right hand. The copper sheets were fixed with screws and nails. Different tools were used for taking out the nails and screws, i.e. grinder, hammer, and others. It was done in the presence of distinguished guests from various government offices – the Department of Archaeology, District Administrative Office, District Police, Kathmandu and other institutions as well (Metropolitan City, TMMC, FSMC, Swayambhu Youth Club, etc.). After removing all of the parts from shrine, members of the technical group, which consists of representatives from the above-mentioned organizations, signed out as witnesses to the process.

After removal, all the parts of the shrine were cleaned so that the broken and dented portions could be seen easily. Then broken and dented parts were repaired. The gold, originally purchased in bars, goes through several processes before it is finally gilded on copper sheets. Basically, it needs to be made thinner and cut into small pieces, before being ground with mercury and broken glass. This was done at a ratio of 1:3 (1 part gold to 3 parts mercury). The copper sheets were cleaned, using a heating process and then washed with acid in preparation for receiving the ground gold, which is applied with a brush. Next, this was heated with fire, during which time the mercury burns off and the gold sticks to the copper sheets. The parts are then soaked in warm water and polished with agate brushes, giving a shiny golden touch before reinstallation. This required 2 *tolas* (approximately 23.33 g) of gold on each square foot of copper sheet on the average. There were big and several extensive dents on the pinnacle. Almost all gold was worn out on the Pravas and pinnacles, which were repaired and

re-gilded as well. On the Chatra of the pinnacles, there might have been hanging leaves, which were missing. Furthermore, leaves on the prava were also missing, which were reconstructed on the basis of comparative evidence.

Before gilding, almost all gold was worn out on both sides of the three-storied roofs due to the environment, monkeys, lack of maintenance, etc. There were broken joints and damaged gilt copper sheets. Now all are re-gilded and dents are repaired. The left and right elevations were carved as bricks because it is a wall section. Almost all of the area of these elevations was covered with whitewash. Therefore, gilt sections were not visible before the conservation work. Nails were missing in the joining. The left and right elevations were cleaned and dented sections repaired as well being re-gilded. On the right elevation, below the first roof, there was a row of animals' heads. Altogether 62 heads were there, and among them 2 were missing. An entire part of the row was covered with whitewash, and when this was removed it revealed 25 items. All of the heads were cleaned and gilded, and missing heads remade.

Almost all of the gold was worn out on the Toran, which is made of joining various parts such as Nagkanya, Makaras, Ratnasambhava Buddha and Chepu. The upper part of the Chatra of the Toran and tongues of Makaras were missing. There is an image of Ratnasambhava Buddha in the middle of the Torana. The parts of the basement are Kwapau and Nagwa. These parts were completely worn out. The corners of Kwopau and Nagwa had turned brown and many small dents were visible. The corner point of Kwapau was also broken. This happened due to butter oil lamps, the constant touch of humans and a lack of maintenance. During the restoration, all those damaged parts were repaired and re-gilded. The process of reinstallation of the gilt copper sheets on Ratnasambhava Shrine was then started. According to the removal plan, the upper part of the shrine was removed first but in the installation process the work began with the lower part. The copper plates have been perfectly fixed using screws and nails. The entire installation process took eight days to complete.

Due to several factors, such as weather conditions, constant touch by people, monkeys and pollution, the shrine presented many parts that were seriously damaged or missing. Through research work, old pictures and archives as well as comparisons of the shrines among themselves, the project team was able to identify the missing parts and fix the broken items keeping the original presentation of the shrine. Altogether sixteen missing parts such as pinnacle, leaf, tongues of Makaras and hanging leaves were replaced, and two major parts, the face of Maudagallyayan and the trunk of Makara, were repaired. In addition 108.95 *tolas* of gold were used for the gilding work of Ratnasambhava Buddha Shrine.

In the same way, all nine shrine niches underwent conservation one after another, and every copper sheet from the each and every shrine was re-gilded, missing objects were replaced, and dented or

damaged sheets were repaired as well. Where the replacing of objects was concerned, the project team, especially from the Department of Archaeology, was very sensitive that every object to be replaced be given a special mark, through which one can easily differentiate it from the others. Conservation of the shrines of Pandara Tara, Amitabha, Arya Tara, Amoghasiddhi, Akshobhya, Locana and Vairocana were done in similar fashion, within about ten months.



Nine shrine niches after conservation (re-gilding)

2.4.3 Conservation of the Upper Parts of the Dome of the Stupa

While the work of conservation of shrines around the dome was going on, the team was doing research on the Hermika and all of the upper part of stupa, as well as the study of technical methods. After completion of the conservation of the shrines, the project team has taken on this very big job. Currently, the copper sheets are being removed from the Hermika for repair and re-gilding. Simultaneously, the team invited wood and stupa architecture experts of worldwide renown, who had already constructed a replica of the Swayambhu stupa in Germany and are in the process of making another replica in China. They joined the team very happily.

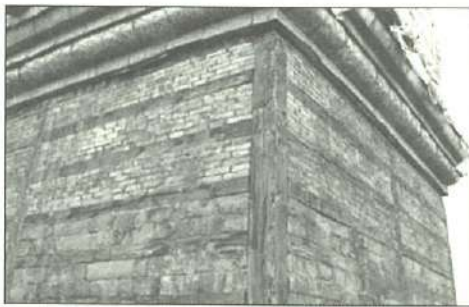


Removing copper sheets from the Hermika

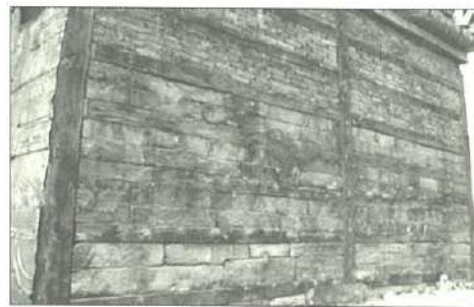


Deteriorated wooden members in the Hermika

We are jointly doing our best for the conservation of Swayambhu stupa, for the wooden structures above the Hermika as well as re-gilding the copper sheets wrapped on it. It is an ongoing project and we expect it will be completed successfully.



Eastern and southern side after removing copper sheets



Wooden structures used with stone and brick works

The Hermika is built up of stones, bricks, and wood as well. The lower portion of the wall is of stones and the upper is of bricks, and vertical as well as horizontal wooden beams are used as tie beams between the layers of walls. Some beams have been damaged by rainwater entering from the damaged copper sheets of the upper side.

Part 3: Conclusion and Bibliography

3.1 Conclusion

In Nepal, especially in the Kathmandu valley, the traditional basis for intervention was demolition and reconstruction of the building in question, rather than restoration. These works were never preceded by rigorous graphic documentation in line with western methods. Each rehabilitation or reconstruction project was carried out by “memory” and would vary depending on the particular craftsman who was carrying out the work, and their individual skills. Although the social structures and ways of living

have changed in Nepal over the past century, research shows that craftsmen's activities still remain relatively unchanged. They still have many important skills in woodwork and others that are relevant to the present day. Woodcarvers still use traditional tools and technologies without the help of metal joints. They play an important role in the preservation and conservation of traditional technologies and skills, and by default in the historical patrimony of Nepal. This specialized knowledge, which in other countries has often almost disappeared, helps to create a continuity with the past, thus ensuring that past experiences are never lost.

There are thousands of monuments and other wooden structures in the Kathmandu valley, which are the precious heritage left for us by our ancestors with their advanced traditional technologies. We must preserve and conserve it with traditional knowledge. Conservation of Swayambhu stupa is also one of the most important examples of the conservation with the active participation of local people, as they came to know that the heritage belongs to them. Three tiers of committees were formed for the execution of the project. There is the Technical Committee, which consists of representatives from government agencies: DoA, District Administrative Office, Security from Nepal Police (district level as well as Metro Police), representatives from semi-governmental offices (Guthi Sansthan, Kathmandu Metro Politan City and the NGOs/CBOs), the Federation of Swayambhu Management and Conservation (FSMC), as well as other local clubs. Another two more committees are the Technical Sub-Committee and the Monitoring Committee, which consist of the representatives from the local clubs, residents, priests of Swayambhu, wooden structure experts, gilding experts and other related stakeholders as well.

The Department of Archaeology has given permission (authority) for execution of the project to FSMC, and the sponsor, the Tibetan Mingma Meditation Center (TMMC), as well. Although it is being run with funds from TMMC in coordination with DoA and FSMC, in reality it is impossible without great contributions from the local people. Accordingly, there is need to initiate a solid strategy for motivating people as well as making them aware that it is impossible to preserve the heritage without their involvement. If people become aware of their heritage and get support from the relevant authorities or agencies, we can bring our traditional art and architecture back into their lives. The traditional patterns of living style may not be appropriate today, but their essence still has an important role in our behavioral life. It is the sprit and essence that we have to put into this heritage, by revitalizing and reusing the potential according to current requirements. Conservation needs to be treated as an issue of culture.

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New Zealand

Atareiria Rowena Akuhata HEIHEI

Pouarahi, Maori Heritage Advisor

New Zealand Historic Places Trust

Problems and Needs for Cultural Heritage Protection and Restoration Activities in Maori Built Heritage in Aotearoa/New Zealand

Introduction

Ko Huruiki toku maunga

Ko Mokau toku awa

Ko Mokau toku marae

Ko Ngatiwai toku iwi

Ko Atareiria HeiHei ahau

Huruiki is my mouna

Mokau is my river

Mokau is my marae

Ngatiwai is my tribe

I am Atareiria HeiHei

As the opening of this report suggests, the importance of identity as a people and as a culture, where and how they fit in the world, is the key to understanding the value Maori place on their traditions and culture. It is also mindful in terms of the conservation of Maori built heritage to understand the deep connectivity, strength, and pride which exists with Maoridom of their heritage, *taonga tuku iho* (treasures handed down from their ancestors)

This report considers the problems and needs for cultural heritage protection and restoration activities in New Zealand. It discusses various aspects of Maori built heritage in general, and also those aspects associated with my role as Maori Heritage Advisor with the New Zealand Historic Places Trust. It will look at the conservation needs of Maori built heritage in New Zealand.

It will also provide the setting in which Maori built heritage existed in the past and unto the present day, and the factors that have impacted and continue to influence Maori built heritage decision making today.

The main area in the conservation of Maori built heritage in New Zealand are Maori meeting houses and those structures that are part of *marae* (communal cultural sites). Maori history is carried in physical material culture, but also in spiritual and cultural mediums. These are linked in a metaphysical way to each other and play an important role in sustaining the Maori as a people. There

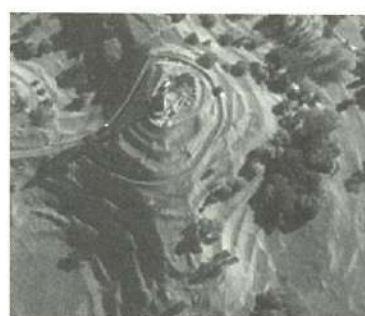
are few physical remnants of the early Maori built heritage that have survived through time, but there is evidence in the archaeology of the landscape that acknowledges its existence.

The New Zealand Historic Places Trust/*Pouhere Taonga* has continued to be involved with, and develop approaches to, the conservation of the built history of the Maori since the 1970s, when it introduced conservation programmes to assist Maori with the restoration of their *marae*. The establishment of the “*Tira*” Maori Heritage team as a distinct group within the NZ Historic Places Trust, to provide, advise and support Maori groups at the level of *iwi* (tribe), *hapu* (subtribe) and *whanau* (family) in the restoration and repair of their *marae* buildings, shows a continuing commitment to Maori built heritage protection.

As long as the Maori are involved in the development, decision making, and implementation of conservation processes and are supported and resourced by professionals or experts and sponsors, then Maori built heritage will survive without difficulty.



The Settlement of New Zealand



Many Maori oral traditions assert that the Polynesian explorer Kupe was the first to visit New Zealand from Tahiti in approximately 925 AD, and was followed by another explorer, Toi, in 1150 (Taonui

2006). A migration known as the “Great Fleet” of seven canoes is said to have arrived around 1350, bringing the ancestors of Maori to New Zealand. Radiocarbon dating in the 1960s-70s found that New Zealand was settled sometime around 1200, probably by people from East Polynesia, who set off in different canoes at different times. Canoe traditions and genealogical affiliations to migratory canoes are important to Maori identity.

Although there is a strong connection between the Maori of New Zealand and their counterparts in eastern Polynesia, the landscape of New Zealand in which the early Maori settled was vastly different from anything seen in the rest of Polynesia in terms of geography and climatic conditions. The land is vast with many hills and valleys, and climate differences which change markedly as you travel from the far north of the North Island to the deep south of the South Island of the country. The climate ranges from sub-tropical in the Far North to subantarctic cold in the deep south. There would have been elements of familiarity in the presence of the volcanic landscape, much like the volcanic islands and atolls of wider Polynesia. New Zealand was much colder than their former Polynesian homes, and of necessity their material arts changed and developed. Warm clothing and houses were needed, and new techniques evolved for weaving, and the different flora and fauna that abounded in this “new home” meant that the Maori learned to utilize new resources, such as flax fibres for making garments, and the different timbers available for erecting large plank-built houses. The survival rate of the early built structures is virtually nil due to the highly perishable nature of the materials used, combined with the climatic conditions. The only proof that these existed at all is via the archaeological evidence in the landscape and some of the early descriptions of the Maori by explorers who encountered them.

Maori Society

Maori society is tribal, and generally consists of different tribal groups called *iwi* who have *manawhenua* or authority over tribal lands called *rohe*. These *rohe* would contain natural resources including the sea, forest, rivers, lakes, plus cultivated areas and also *marae* and *kainga* their home settlements. Each *iwi* (tribe) is made up of several inter-related *hapu* (subtribe), and in turn each *hapu* is made up of several *whanau* (family) groups.

Maori society is governed by a structure or *tikanga* and *kawa* (customs and protocols). *Tikanga* and *kawa* are extremely important as they dictate the general behaviour, logic and common sense guidelines for daily life and interaction. *Tikanga* has commonly been based on experience and learning that has been handed down through the generations relative to the Maori world view. *Whakapapa* (genealogy) too plays an important role within Maori society. It can divulge a person's identity, his relationship to others and even how he may respond in certain situations.

The shared *whakapapa* that exist within this tribal society could determine the social bonds that lend assistance to the various needs that may arise in times of need. This could be defence against

attack during times of war or help with planting and harvesting of food in times of peace. Inevitably the relationships are maintained and strengthened through marriage and alliance and dutifully remembered and acknowledged in the recitation of one's *whakapapa* during *whaikorero* (speeches) when welcomed on a *marae*. In the past the very survival of a person may depend on his knowledge of *whakapapa*.

Background to Maori *Marae* and Meeting Houses



The *marae* complex is an ancient institution with roots deep in Polynesia. With the discovery of New Zealand by early Polynesian explorers around 1000 years ago, *marae* became the central hub for tribal activities in New Zealand. The *marae atea*, central space within the *marae* complex, was used for discussion and debate, and was where unification was forged. It is essentially a defined piece of

ground designated for the purposes of the tribe. It also represented on certain occasions the realm of the gods, *atua*, and a place where customs and rituals were carried out for funerals, and for welcoming guests.



The *marae* remains a vital part of everyday life in most Maori communities, in perhaps a different way in the larger cities where pan-tribal groups are usually responsible for the building and maintenance of such *marae*. But the *marae* is still recognized as the central nucleus of Maori tribal groupings.

With time came the development of the physical entity of the *whare tupuna*, or meeting house, that supported the functions of the *marae atea* but also asserted the identity of the tribe with its carved, painted, and woven artwork. The structure also interacted with the Maori spiritual realm. Meeting houses are considered the medium where Ranginui (Sky Father) and Papatuanuku (Earth Mother) touch one another. This is the creation story, which describes the world existing within the embrace of the parental gods. Far back in time this embrace was so close that the children found it difficult to live in the darkness. One child, Tane, the god of forests, decided to separate his parents by forcing them

The *tahuhu* (ridge beam) running the full length of the *whare* represents the backbone of the ancestor and is the most sacred part of the *whare nui*. This contains the *mauri*, or the life spirit, of the people that ties the building together. This structure is a powerful genealogical map that ties the descendant people together as tribal, subtribal or family groups.

The positioning of each is also important, as the *poupou* opposite each other are connected through the *heke*, and the *tukutuku* on each side of a *poupou* are also related. Learning to read a *whare* will open up an extraordinary history book. So the next time you enter a fully carved *whare*, stop, pause and be aware, that you are entering into a living history book.

171

in nearly all cases as previously mentioned it is not only named after an ancestor but it is structured to represent symbolically the ancestor.

Thus, on entering the house it can be seen as entering into the bosom of the ancestor. It follows also the interaction between people on *Te Maraenui Atea-o-Tumatauenga* can be and should be significantly different from the type of interaction which is normally encouraged inside the house.

It is believed that inside the house the Guardian of Peace (Rongomatane) reigns, and it is in this atmosphere and under this belief that people are required to interact with one another.

The meeting house traditionally faces east, to see the first rays of the sun as each day dawns. Likewise, in our *tangihanga* (funerals) the body lies in state, within the bosom of the ancestor, or under the protection of the ancestor to witness the fullness of its last days on earth.

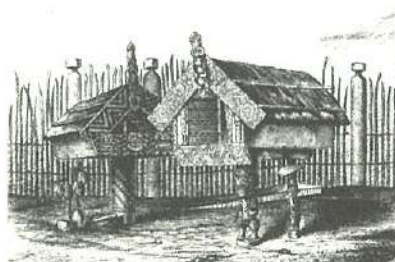
The *Whare Kai*



As the name implies, this is the eating house, the place where the “inner being” is satisfied. The *whare kai* is a separate building, not necessarily as a physical reality but in some cases as a concept or belief. It is here that the *manuhiri* (visitors) are fed when staying at or visiting the *marae*.

The concept of *tapu* prescribes where food is eaten, where it cannot be eaten, and also where drinks can and cannot be drunk. To the Maori, food is a common element (*noa*) and the opposite of *tapu*. Whereas the *whare tupuna* (meeting house) is *tapu* (sacrosanct) and food cannot therefore be eaten there, the *whare kai* is free from *tapu* – the two are at opposite ends of a continuum.

Other Buildings and Structures

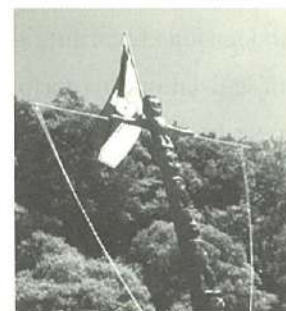
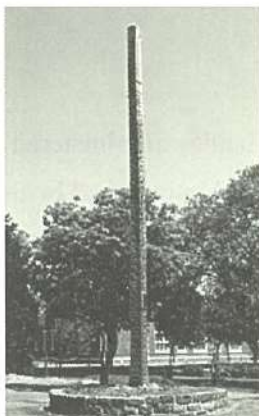




Other structures on the *marae* provide a more supportive role. *Pataka* (food store) is a rarer structure that may still be found on a *marae*, traditionally used to hold important resources of the *marae*.

In times past, but not evident in modern times, a *whare mate* (funerary house) was used in funeral ceremonies to separate the sacred rituals associated with death. These collections of structures form the *marae* complex that supports and provides for the tribe's needs.

Many *marae* have an *urupa* (graveside) nearby, acknowledging the ancestors as a living dimension of life. An ancestor is commemorated within a building – respects are paid to those who have passed on to the *hono-i-wairua* (gathering place of spirits) within a *whaikorero* (formal speech making), reflecting the belief in the merging of life and death that is significant and meaningful for the Maori. *Whare karakia* (church) are buildings sometimes featured with a *marae* complex



On some *marae* memorials to a significant ancestor or people who died in the Second World War are found to the side of the *marae* or *whare nui*, and in some cases a *pouhaki* (flag pole) stands majestically at the side of the meeting house.

In more recent times buildings for administration, a health clinic and *whare taonga* (museum), housing for *kaumatua* (elders) and *kohanga reo* (early childhood language facility) are added to the complex.

Last, but not least, the ablution block and toilets are placed significantly to the rear of the *whare nui* and the *whare kai*.

Te Tiriti o Waitangi Marae is perhaps the best known Maori *whare nui* in the country, mainly because every February 6 images of it are beamed into our living rooms as Maori leaders, crown ministers, rank and file politicians and others congregate at Waitangi to commemorate a pivotal event in New Zealand's history – the signing of the Treaty of Waitangi.



The *marae* remains a vital part of everyday life in most Maori communities, in perhaps a different way in the larger cities where pan-tribal groups are usually responsible for the building and maintenance of such *marae*. But the *marae* is still recognized as the central nucleus of Maori tribal groupings.

Risks for Maori Built Heritage: Site Protection for Marae Complexes

New Zealand has over 1000 *marae* in active use, most of which include meeting houses and associated support buildings. More than half of the *marae* were built in the period from 1880 to the 1950s. *Marae* are still being built today or redeveloped to support the needs of the many individual subtribes or *hapu*. Generally each *marae* represents a subtribe unit of 100 – 2,000 people. There are larger *marae*, which service the requirements of the whole tribe or *iwi*, and are often much larger buildings within a central location. The land on which *marae* stand is usually common land designated as Maori Reservations and set aside by the tribe for the purposes of a *marae*.

All legal decisions regarding the actual governing, use or division of the land is administered through a piece of legislation in a formal court process. The Te Ture Whenua Act is administered by the Maori Land Court (a division of the Justice Department), which presides over the appointment of trustees and setting up the governance structure. The reservation status of *marae* land ensures that the *marae* itself is fairly well protected. *Iwi/hapu* management plans are planning documents produced by Maori that can inform councils of things such as the recognition of the relationship that Maori have to *marae*, their lands, and associated sites of significance.

New Pressures on Heritage Structures and Marae Redevelopment

While the land status has protected *marae* from outside interests, *marae* are living cultural institutions in a state of constant change and development. Maori have adapted and changed over time especially in the years since the arrival of Pakeha. So too have *marae* evolved, and the uses of the *marae* have become many and varied. Some *marae* have become learning schools which run University outpost courses, and others provide health services for the tribe, while social services, early childhood education programmes and even businesses are being run out of *marae*. With this growing variety of new uses and activities some of the older structures of *marae* come under increasing pressure to be redeveloped to support a new activity or service.

Generally *marae* buildings enlarge as the population they service grows. The meeting house becomes integrated with other buildings, i.e. dining rooms and ablution blocks added to the meeting house, and the total complex then becomes modernised. While this is inevitable with a living complex such as a *marae*, there are many unnecessary compromises being carried out.



Te Hapa O Niu Tireni
- an integral part of its
landscape. Photo: Dean
Whiting, NZHPT

With the introduction of new materials and construction techniques, the conservation of an existing structure is often not seen as important when considering priorities, compared with expansion and modernising

Marae are vibrant and living communities, places where *whanau*, *hapu*, *iwi* and other Maori groups gather. The endurance of tradition, customs and ways of expression provides a culturally rich marker of identity and a yardstick for the maintenance of this identity in the face of change. One of the ways *hapu* and *iwi* nurture and sustain their identity is through these buildings.

Sometimes the limited financial resources of communities can influence the choices made in the redevelopment of *marae*. This can result in the loss of built heritage fabric on *marae*, which is often replaced by inferior or incompatible materials, using unsympathetic techniques and designs for the new buildings. Some work has been successfully undertaken in such a way as to enhance the heritage values of older structures on *marae*, by employing conservation architects to produce sympathetic new structures, and upgrading old structures while still conserving the values of the building. However, overall redevelopment would be one of the greater risks to the heritage values of older *marae* buildings.

Government Regulatory Influences

Government regulation over the last 150 years has influenced and shaped the construction style and use of *marae* buildings. The regulatory environment of today is also much more complex and demanding, making it more difficult for traditional techniques and materials to be used. Building, health and fire regulations have had the most impact in generally improving living environments, but sometimes after compromising heritage and cultural values associated with the building fabric.

Traditionally meeting houses were lined with *raupo* reeds, a swamp reed, on the walls to provide cover and insulation. Ceilings and walls were often lined with stems of *toitoi*, a native grass. Materials such as these are seen as being extremely flammable. Fire regulations have been persuasive in the reduction of utilising these materials in favour of timber facsimiles of the material as a substitute to help reduce fire risk. This type of replacement usually occurs during the upgrade of older structures. The fire

regulations have also required that two doors be provided for the exit of people in the event of fire. In many instances a door has been cut into the back wall across carved sections of the building.

Traditionally meeting houses are constructed with only one door on the porch of the building. It is an important cultural element of the structure, and a second door compromises the significance and use of the main entrance. Cutting through walls also compromises the way in which the meeting house is used for certain functions. A *hui*, or meeting, is often organised within the *whare nui* where people sleep and discuss issues. The life force of the gathering follows the speakers as with the seating arrangement (facing each other around the walls), and the speaking rights are passed from one person to the next through the building structure. If a new door or entrance is cut through the structure, the spirit of the speaking is said to be broken. This conflict of cultural function of the building and the issues of having to comply with building regulations can compromise the cultural and historical values of some *marae* structures. It is important that the building regulations not only give consideration to the historical and cultural values of these types of buildings but are flexible enough to accommodate alternative solutions, for example fire retardants used on traditional fibre materials, alternate exits through windows, and fire sprinkler protection.

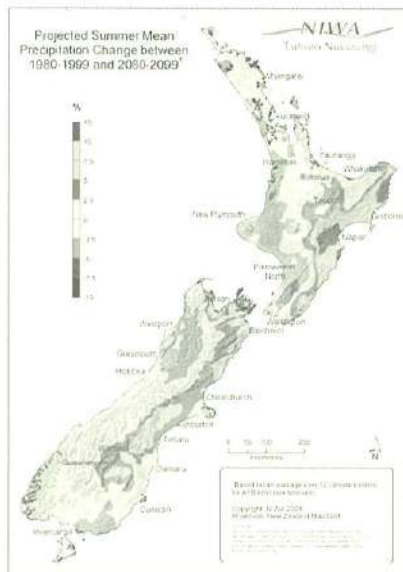
Loss of Natural Resources

An important factor that impacts the retention of traditional materials within *marae* structures is the loss of natural resources for construction and repair work. Large areas of New Zealand have been converted to farming land (including the draining of wetlands) or exotic forestry production (*Pinus radiata*). An increase in population and the development of areas previously rich in natural resources for housing, transport and business add to the problem. As a result there is less area available for sustainable harvesting of indigenous timbers and natural fibre materials. Most of the large native land tracks have been designated as conservation reserves and national parks. This reduction in availability of materials has also forced compromises to be made in the construction methods used on *marae*, where not only has the resource diminished but often the local knowledge of its collection and preparation. As a result there are more substitute materials and construction methods employed. It is an important link to be maintained: the link between buildings, their people and the environment.

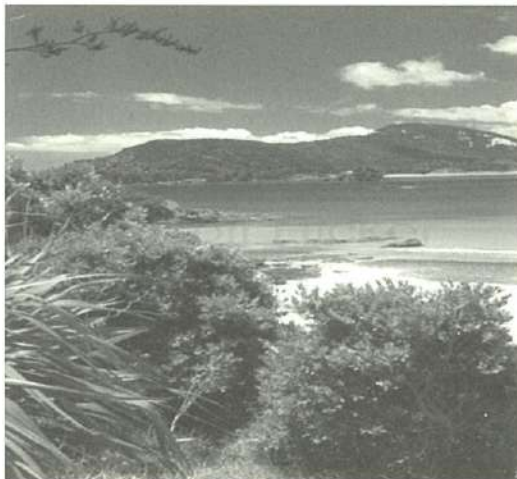


Meeting houses become an important tangible connection to these areas. More effort is needed for cultural planting of traditional materials, access to National Parks for cultural resources, and the retention and sharing of traditional knowledge for the harvest and preparation of these materials.

Fire, Climate and Natural Deterioration



New Zealand's climate and geomorphology have negative impacts on the integrity and longevity of its wooden structures. New Zealand is an island nation on the Pacific "rim of fire" which has a wet temperate environment with some of the highest UV levels in the world because of its close proximity to the large ozone hole over Antarctica. As a result, wooden structures have to withstand constant effects of dampness, decay, biological attack, and UV degradation. Its position over the Pacific Plate means New Zealand is also subject to earthquakes and volcanic activity.



As a result, *marae* structures require constant maintenance for their survival during, and protection against, natural disasters. Many buildings have been lost after relatively short periods of disuse as the direct result of the effects of weather and decay. Many associated *marae* structures, including food storage buildings, have essentially disappeared from the landscape due to rapid decay of timber structures. Although meeting houses are a type of structure that has existed for many centuries, the earliest complete examples remaining are those found in museums dating

from the 1830s. Existing structures outside of institutions that remain on *marae* date from the 1850s at the earliest. There are meeting houses in existence that have retained parts of earlier buildings within them, but more often the structures date from early last century. Many meeting house structures from the land wars period of the 1860s have been destroyed or abandoned. The subsequent land confiscations, and those occurring after this time, resulted in the alienation of Maori from traditional *marae* and lands.



One of the immediate and relatively common forces of destruction is fire. In the last 10 years more than three significant buildings have been lost to fire. Most *marae* structures do not have (and in most cases cannot afford) fire protection systems, and in remote rural locations (where many smaller *marae* are found), access to water is a major issue.

Other Risk Factors

Since the arrival of Pakeha in New Zealand, Maori have always been eager to learn and trade, readily (in most cases) accepting change and the adaptation of aspects of Pakeha culture within their own cultural practises, customs or traditions. Some things have remained constant, such as the importance of the *marae* and the *tikanga* of the *marae*.



The adaptation of new materials and new ideas for the uses of *marae* comes from the younger generation, living away from the *marae* (in the cities) and holding expectations for more modern, conference-like facilities.

Another potential problem for *marae* can stem from the “volunteer” basis on which *marae* are run day to day. These are volunteers belonging to the *whanau* (family), *hapu* (subtribe), and *iwi* (tribe), and although passionate and dedicated to their *marae*, they may not have the skills needed or the time to oversee the projects effectively in addition to their work and family commitments. This in effect would require a project manager (possibly outside of the *whanau*, *hapu*, *iwi*) who has the necessary resources and skill set to complete such projects

Conservation Approaches



Traditional Methods of Preservation

Traditionally, Maori conserved material culture in a number of ways. The passing of traditional skills and techniques from master to student, such as with master carvers or great weavers, has ensured that these precious skills are not lost. In many cases this is passed down through the generations within a family. There are still well known “families” of weavers, carvers and artists, such as the Te Kanawa and Schuster families. Some skills are taught through carving schools, and in more recent times both carving and weaving are offered through polytechnic (tertiary) schools or even adult or night classes. The formal carving schools have retained the traditions and knowledge of a particular tribe and their carving style and expression. This is particularly notable in the eastern North Island where the culture of carving schools remains intact through to the present day. This process is a form of conserving the cultural values of a tribe by passing knowledge and skill to express the history and identity that they represent.

The retention of the physical heritage that a tribe possessed, including the artefacts kept in its meeting houses and other items such as canoes, is now being identified as a special need for housing such as a designated *whare taonga* (museum) that is situated within the *marae* complex. Traditionally carved items from meeting houses were often hidden in caves or buried in swamps to protect and preserve them during times of war. Often carvings were left for months to years. These early methods for the protection and retention of cultural material are important as they demonstrate a practice of preservation that was traditionally carried out. Old carvings are still sometimes placed in swamps today. Some traditions also went in a different direction by allowing buildings to deteriorate naturally and return to mother earth. This practise is still used today especially where the sacredness of a building renders it “untouchable”.

Conservation Workshops and Methods



The establishment of the NZ Historic Places *Marae* Conservation Programme through the successful training workshop project at Rongopai Marae, near the city of Gisborne (on the lower eastern coast of the North Island), during the 1970s, not only helped to provide local people the necessary skills for conservation work, it also highlighted some fundamental differences

between the approach of museum trained conservators and the expectations of local Maori. Not only were there major differences stemming from the remote location of the site and the scale of the structures, but also from the very different cultural viewpoints of each party. In the ensuing debate about the relevance to Maori of the application of conservation, although not a new concept in the general sense of restoration and preservation of Maori cultural material as with the resurgence of *marae* building during the 1930s, it was the approach from a scientific basis that differed. This was more widely accepted once Maori themselves were trained in conservation.

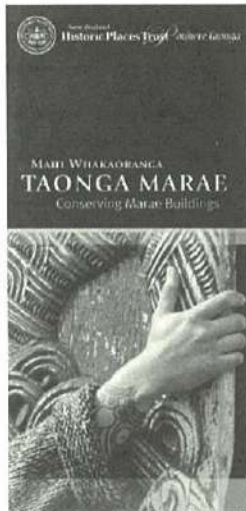
The relationships Maori have with their *marae*, arts and land is important. Conservation practice emphasised the retention of information held within the structure from its original construction. As a living entity to Maori, *marae* have a spiritual element which allows the spiritual world to move unhindered through the structure of the building. The restorative and reconstructive works were undertaken by the conservators to enable the life force to flow and reinstate the pathways, as damaged areas were perceived to hinder the movement.

Conservators were faced with new challenges including finding new treatments and methods when working with both new work and old. Some *marae* were deliberately left incomplete, to allow future generations the opportunity to add their part to the building later on. Spaces are often left on meeting



houses for the purpose of allowing the buildings to be current, reflective and relevant to the present generation. This was sometimes reflected where some *marae* were deliberately left incomplete to allow future generations the opportunity to add their part the building later on. This accommodation of new work and allowing original surfaces to be repainted did not always sit well with mainstream conservation practice.

What became increasingly important was the development of Maori conservation practice in its own right, and more importantly, under the leadership of the Maori themselves. In the mid- to late 1980s the NZ government put together a package to train Maori in conservation through the Canberra University Conservation Course in Australia. From this programme four Maori conservators were trained, two of whom received post internship training and eventual employment with the NZ Historic Places Trust. Out of this period of time the NZ ICOMOS Charter was developed, which also reflected and accommodated the different value system of the Maori, and changes were made to the code of ethics for the NZ Professional Conservators Group.



The NZ Historic Places Trust currently provides assistance directly to *marae* as part of its Maori Built Heritage programme. Within the past year a concerted push by government and funding agencies to provide information to *marae* trustees regarding *marae* planning and funding has been initiated via seminars held at various locations around the country.

The result is the ongoing interaction and involvement by Maori to conserve their buildings, and this is achieved through programmes run by NZ Historic Places Trust that focus on providing technical advice and support, as well as training in specific conservation treatments needed, along with maintenance advice for these buildings.

Technical and Advisory Services



A range of technical services should be available for tribal groups to access. It is important to provide technical services for problematic conservation tasks and urgent architectural and engineering advice for built heritage that is at risk. Some services are available through the NZ Historic Places Trust, and there is also local advice from some museums and local councils.

However in New Zealand these specialist conservation services are mostly available through conservators in private practice, representing a cost for which *marae* must find funding.

Maintenance Plan Advice

An important area that requires further work is the development of better maintenance of *marae* buildings. Some *marae* have regular work done to ensure buildings are checked and repaired as required. For most this involves annual checks by a local builder or services trades person. However, decorative work such as exterior woodcarvings and painted artwork require more specialized knowledge on maintenance. Further work is needed to promote the development and implementation of maintenance plans on *marae* to ensure the long-term preservation of these structures. A maintenance plan is a very useful tool to guide the *marae* administration to programme regular checks, identify specialists if required, and also develop their own skills to keep up the buildings. A maintenance checklist is currently under development by the Maori built heritage team of the NZ Historic Places Trust.

Conservation Training



At present the NZ Historic Places Trust (NZHPT) runs conservation workshops to provide skills to tribal groups when working on specific projects, usually as part of restoration of a heritage structure which has reached a crisis point. It is very much a reactive process rather than a proactive one. This delivery mode by the NZHPT is effective for training groups who are working specifically on projects, but less effective in providing coherent and long-term skills for any particular region.

One suggestion would be to identify groups or individuals with skills and encourage further training to build up the numbers of Maori conservators and practitioners.

There is a lack of professional and practitioner resources needed to carry out remedial and maintenance conservation programmes. In 1990 the Department of Internal Affairs (NZ government), through the Cultural Conservation Advisory Council, provided grants for study at Canberra University

and post internship programmes at the NZ Historic Places Trust and the then National Museum. This training and development is no longer available and has meant that there are only a few conservators working on *marae* projects, and they are unable to keep up with the demand for their specialist skills.

There are currently no Maori architects practicing in the field of building conservation. While there are a handful of conservation architects providing advice on *marae* there is little collective development of conservation knowledge and no formal training available in NZ. More work is needed in promoting conservation practice to existing architects, and a programme of postgraduate training for those who wish to take up the work. More funding is needed to develop this further.

There is a definite gap in the heritage sector which requires a better understanding of what the training needs are. There is a need to develop internships and training scholarships that allow students to be suitably qualified. The options for training have become more difficult with the closure of the Canberra University Conservation Course. The closure will force the cost of training up and also reduce the opportunity for conservators to develop their conservation skills

Conservation Research

Research into Maori built heritage is needed to enable better conservation, protection and maintenance methods that have been developed specifically for Maori built heritage. Most conservation methods have been “borrowed” from techniques employed in other parts of the world, developed for other cultures.

As fire has been identified as a very real risk to *marae* structures, some important research has been undertaken to look at the behaviour of fire in *marae*. This research has involved full-scale fire tests, analysis of fire in traditional meeting house construction, and background research on past cases of fire in *marae* buildings and computer modelling of fire behaviour. One of the important outcomes of the work is a search for new methods and practices of fire protection in meeting houses. The difficulty with many *marae* is their location in remote locations poor access to water. Installation of sprinklers is often not viable because it is prohibitively expensive. Alternative solutions and practices are needed for these situations. Part of this is also looking to develop fire regulations that work on a more performance based approach rather than applying building code compliance regimens that cut across cultural values of a building. As was mentioned earlier about the cutting of doors in meeting houses to allow for a second exit, alternatives can be found in window exits and better protection with sprinklers.

Research has looked at the cellulose deterioration of the NZ flax leaf, *phormium tenax*, through the dying process, and the possible treatments to stop deterioration. The flax fibre is used throughout Maori textiles, including woven panels in meeting houses called *tukutuku* panels.

Other research has looked at the traditional resource *kokowai*, or red ochre, a red clay used as a dye and often seen as the red pigment on *whakairo* (carvings) on the front of *marae* buildings

All of these areas of research will have a direct impact on the preservation of *marae* structures. A more planned approach is needed for future research to ensure that this body of information develops in a logical sequence and is tied to real needs of *marae* building conservation. More understanding is also needed on building construction techniques, materials, and science alongside historical and cultural and traditional research.

Advocacy



It is important to raise the awareness and profile of Maori built heritage through advocacy. Mainstream New Zealand has begun to appreciate Maori heritage as unique to this country and a distinctly New Zealand identity. The need to cling to the heritage of the early settlers has been replaced with an interest in the heritage of New Zealand. Maori audiences too should embrace their own heritage as distinctly “Maori” and something that has involved and developed into what is acknowledged as Maori, and different from other native traditions within Polynesia.

Conclusion

Marae conservation illustrates the importance of all aspects of the conservation concept, including the ability to accommodate the cultural, spiritual and traditional values that are displayed between Maori and their *marae*. The cultural and historic fabric of a *marae* structure includes a dynamic relationship of history, people, and the structure itself.

The success will depend on a more collaborative approach made by heritage agencies and more partnership programmes developed with Maori Tribal Groups. But most of all the success of conserving Maori cultural material will continue as long as Maori have a role in the development, decision making, and implementation of conservation efforts.



The relationship Maori have with their *marae*, and therefore their link to the *tupuna*, is important and significant. An analogy of this would be as follows: Maori and their culture are seen as a fire burning strong and fierce, but over time the fire dies to nothing but ashes (through assimilation/colonisation came a loss of language, loss of land and culture), though within the ashes is one small ember (the part of Maori life on the *marae*, with its *tikanga* and *kawa* that has never died), and with care and attention that ember can once more burn as a strong and

fierce fire, *taonga tukuiho* (pride in the heritage, the link to their *tupuna* and culture).

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Pakistan

Salman MUHAMMAD

Conservation Architect

Aga Khan Cultural Service Pakistan

Problems and Needs for Wooden Architectural Heritage Protection and Restoration Activities in Pakistan

1- INTRODUCTION

Before identifying the problems and needs for the protection and restoration of wooden architectural heritage in Pakistan, it is important to classify and explain first the architectural, and secondly the wooden architectural, heritage in Pakistan. At the same time, it is important to know the role of state authorities responsible for the protection of architectural heritage. Due to its geopolitical location, Pakistan has nurtured many old civilizations and cultures which significantly paved the foundations for many world class monuments and sites. The Indus Valley and Ghandhra civilizations are prime examples in this regard. Pakistan has six sites on UNESCO's World Heritage List.

In Pakistan, at the government level, there are two departments which are responsible for the protection and restoration of architectural heritage and archaeological sites. The protection and maintenance of secular historical monuments and sites is the responsibility of the archaeology department, while the maintenance of Mosques, shrines and other Muslim religious places is the responsibility of the provincial Auqaf department. Similarly these two departments are responsible for keeping records and inventories, and for information management of sites at the national level. The Punjab Auqaf Department, for example, was responsible for the work on the tomb of Shah Rukn-I-Alam, which won an Aga Khan Award for Architecture for its restoration work in 1983. The uncontrolled development in urban areas increases the pressure on these departments even more. At the same time these departments are very much vulnerable to legislative changes due to the political situation in the country. As a result, incompetencies develop due to short term policies which ultimately deteriorate the state of conservation of monuments. The lack of financial resources and technical expertise makes the situation more difficult to handle at the level of international standards.

In addition, there are a limited number of non-governmental organisations working in the conservation of architectural heritage in Pakistan. International organisations like UNESCO and Aga Khan Trust for Culture (AKTC) are prime examples in this regard. In some cases, institutions like UNESCO work in close collaboration with the departments at government and non-government levels.

Generally speaking, in developing countries like Pakistan the institutions responsible for conservation do not have adequate capacity to undertake the most important prerequisites for the protection and restoration of heritage. This system barely follows the guidelines based on international charters and conventions, which are rather stagnant due to lesser use. On the other hand the coordination and information sharing between the working organisations is also missing, which is crucial in this regard.

If we compare this situation with the Western world where the movement for preservation monuments and sites is fairly well established, one notices a huge difference. For example the Athens Charter of 1931 and then Charter of Venice in 1964 contributed towards the development of an extensive international movement which has assumed concrete form in national documents. Charters and legislation pertaining to architectural preservation provide definitions and objectives for the purpose of preservation. Legislation empowers the state to realize the objective. In developing countries, the preservation movement has a more recent origin. A few countries have prepared charters and passed legislation for the protection and preservation of the built heritage, which is a first step towards the protection and conservation of architectural heritage. In Pakistan, the educational institutes do not offer proper training or an exposure to graduate level studies in conservation and restoration. Therefore it is hard for any student, during their studies, to get hands-on experience in heritage conservation.

2- THE SITUATION IN PAKISTAN: AN OVERVIEW

After the independence of Pakistan in 1947, the Government amended the first Ancient Monuments Preservation Act of India previously passed in 1904 in order to correspond to the new constitutional requirements. Therefore, in 1962 the Ancient Monuments Preservation Amendments Ordinance was presented. New acts were similarly presented in 1968 and 1975. A list of protected monuments was maintained by each Archaeological Superintendent responsible for their maintenance and yearly reports on their condition. Monuments had to be inspected at least yearly. Priority in using government funds was given to the preservation of as many monuments as possible; any repairs should be carried out only if really necessary and if special funds were available for this purpose. However, annual maintenance was to be carried out so as to avoid major interventions (Reza H. Ali, 1990).

The Islamic Republic of Pakistan ratified the 1972 UNESCO Convention in July 1976. Since then, the country has maintained an ongoing relationship with UNESCO, having been elected several times as a member of WHC. As of December 2000, Pakistan has six UNESCO listed sites: (1) Moenjodaro ruins, listed in 1980; (2) Taxila ruins, also listed in 1980; (3) Takht-I-Bahi Buddhist ruins and Sahr-I-Bahlol and surrounding ruins, also 1980; (4) Thatta historic monuments, listed in 1981; (5) the Fort of Lahore and the Shalimar Gardens, also listed in 1981; (6) the Rohtas Fort, listed in 1997 (<http://whc.unesco.org/>). Based on information available on UNESCO's database, no new sites have been included since 1997. Out of these six, three are archaeological and the rest are architectural sites.

According to a 1994 study sponsored by the International Conservation Union (IUCN), although by 1994 Pakistan had identified 243 monuments and 112 sites, “effective protection only covered a total of 83 monuments and sites together in all Pakistan; the Auquaf receiving the greater allocation of funds” (Qureshi, 1994:3, 8). The Antiquities Act of 1975 (the Act) is the applicable legislation. The IUCN study referred to above calls for new comprehensive legislation, covering all built heritage, especially historic settlements. Additionally, this IUCN study also recommends the strengthening of regulatory entities, together with further training for their personnel.

Thus, cultural heritage protection (CHP) in Pakistan seems to have been given limited priority. “The whole concept of CHP has been viewed not only with an anti-development bias, but also as resource intensive and unaffordable” (Qureshi, 1994:2). Notwithstanding, until 1997, Pakistan had been a beneficiary of international financing for: (1) preparatory assistance, including the nomination the Karakorums in 1994, (2) training assistance, (3) technical cooperation and, (4) emergency assistance, specifically for the Shalimar Fort and Gardens (www.unesco.org/whc/sp/pak.htm).

3- CONSERVATION IN NORTHERN PAKISTAN

The basic aim of explaining the situation of Northern Pakistan is to highlight the integrated efforts of Aga Khan Cultural Service (AKCSP), which is the Pakistani arm of Geneva-based Aga Khan Trust for Culture (AKTC) and its Historic Cities Support Program, which sets the highest international standards in conservation of historic monuments and sites. With my own participation during work with AKCSP it is rather easy to present this case. In its short operational period since 1992, AKCSP has won eight prestigious UNESCO awards for the Asia/Pacific region for its complete restoration and reuse projects.

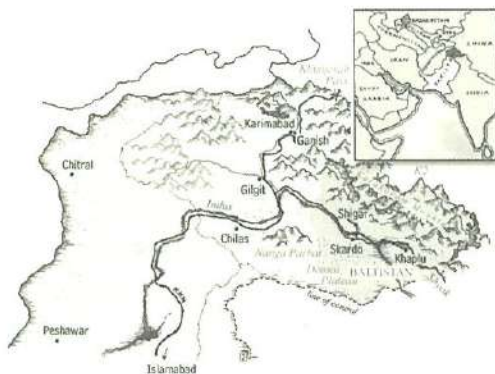


Fig. 1 Map of the Northern Areas



Fig.2 Altit fort and Altit settlement is the ancient capital of Hunza

The state of conservation and heritage management in the Northern Areas has been neglected despite the presence of centuries-old cultural assets of high value. The Northern Areas is one of the few regions in the world where early human settlements (Fig. 2) still exist with its simple construction technologies catering to various societal needs. Over the centuries human interaction with the

immediate environment has resulted in a unique architecture that blends with the ecology. However, the inroads of modern technology, since the construction of Karakorum Highway (Fig.1), have put the fragile ecology, comprising the world's three highest mountain ranges and glaciers, under threat. During the last three decades a large number of historic monuments have already disappeared, including archaeological sites as well as mud-walled fortifications and traditional arts and crafts. One of the significant impacts of the recent development is a fast-changing built environment, with a concomitant rise in environmental pollution of various kinds. In the Northern Areas of Pakistan, which is now called the Gilgit-Baltistan region, the situation of CHP regulation is different. Although the Act's Article 1 establishes its application throughout Pakistan, other provisions therein seem to exclude its application to this region. There seems to be an apparent contradiction, which could be related to the ambiguous constitutional status of the Northern Areas of Pakistan.



Fig. 3 Astana of Mir Yaheya in Shigar is a significant example of community participation in restoration. This project later won a UNESCO award for its restoration.



Fig. 4 Wooden column and capital of audience hall in Shigar Fort

In this situation, since 1992 the Aga Khan Cultural Service Pakistan (AKCSP) has been involved with the inventory, restoration and rehabilitation of cultural heritage in Northern Pakistan. The Historic Cities Support Programme (HCSP) promotes the conservation and re-use of buildings and public spaces in historic cities in the Muslim World. HCSP undertakes the restoration and rehabilitation of historic structures and public spaces in ways that can spur social, economic and cultural development. Individual project briefs go beyond mere technical restoration to address questions of the social and environmental context, adaptive reuse, institutional sustainability and training. In several countries, local Aga Khan Cultural Service Companies have been formed to implement projects under the supervision of the HCSP headquarters in Geneva.

AKCSP has successfully restored major landmark monuments in Northern Pakistan, including the

historic Baltit Fort (850 years old), Shigar Fort (400 years old), Amburiq Mosque (750 years old), and has upgraded a number of traditional human settlements in Hunza and Baltistan, as well as promoting traditional crafts and construction techniques. Preserving local identity and at the same time introducing contemporary living standards (including sanitation) is key to the ongoing cultural development process, which is undertaken with the active involvement of the local population. Environmental planning strategies to preserve specific assets are now being implemented through new local institutions such as Town Management Societies and Cultural Heritage Trusts. These completed conservation projects go beyond mere technical restoration. Free training to young people and the generation of new income opportunities for residents of surrounding areas have made these projects sustainable and successful. One of the significant examples in this regard is the restoration of the centuries-old tomb (Astana) of Mir Yaheya in Shigar. Skilled people trained during the conservation of Shigar Fort actively participated in the restoration of this tomb (Fig. 3). Technical assistance was provided by the AKCSP and all the materials and labour were provided free of cost by the community. This project later won an UNESCO award for its restoration. In recognition to these efforts, AKCSP won a number of international awards such as the UNESCO Asia/Pacific Award for conservation, British Airways and PATA awards for prompting tourism, and recently the Responsible Tourism Award. The major aim of AKCSP's projects is to restore the glory of the built heritage and use cultural heritage as a tool for sustainable development in remote regions.

4- WOODEN ARCHITECTURAL HERITAGE IN NORTHERN PAKISTAN

The majority of monuments in the Northern Areas of Pakistan are constructed with wood as a major structural and architectural material.



Fig. 5 Kharmang palace

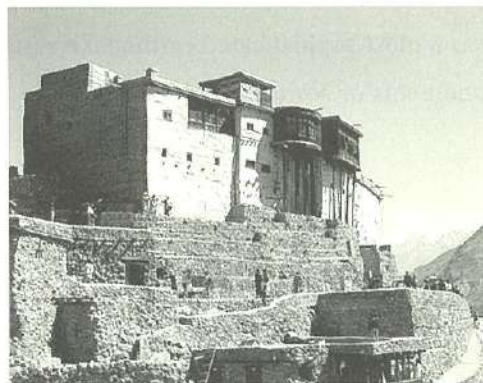


Fig. 6 A view after restoration of the over 700-year-old Baltit fort in Hunza

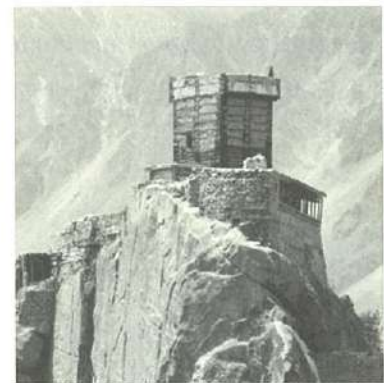


Fig. 7 A view before restoration of the over 900-year-old Altit fort in Hunza

4.1 ARCHITECTURE AND CONSTRUCTION

Generally the monuments of Gilgit-Baltistan are heavily influenced by neighbouring regions. Monuments such as Baltit and Altit forts in Hunza share the same construction and decorative features

as Baltistan. Wood is used as for the main structural and decorative elements.

4.1.1 Architectural decorations

Baltistan appears heavily dependent on influences mainly from Kashmir, its great and dominant neighbour. Some additional influences have probably come from Ladakh, culturally a part of western Tibet, with which it shares its Tibetan language. There were also important influences from Iran with respect to certain crafts. Moreover, the southern Tarim basin, that is, Khotan and Yarkand, may well have contributed to the rich vocabulary of carved wooden motifs.



Fig.8 A carved wooden door in Khaplu palace shows influence of Mughal architecture



Fig.9 A carved wooden false ceiling in Khaplu palace displays the wood carving tradition of the region



Fig. 10 One of the projecting wooden balconies at Khaplu palace

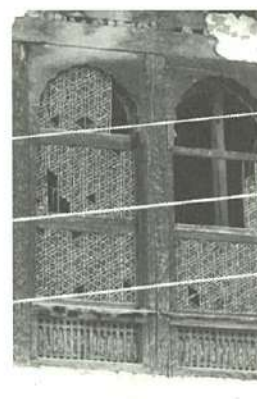


Fig. 11 Wooden lattice work in the window of the Queen's quarters in Khaplu palace

4.1.2 Cator and cribbage construction

Most of the historic forts, palaces, *khanaqahs*,¹ mosques, and shrines were constructed with the timber cage technique, also called *cator* and cribbage construction technique. "Timber lacing" or the combination of *cator* and cribbage is a most sophisticated earthquake-resistant construction technique, finely demonstrated in the great monuments of Northern Pakistan.

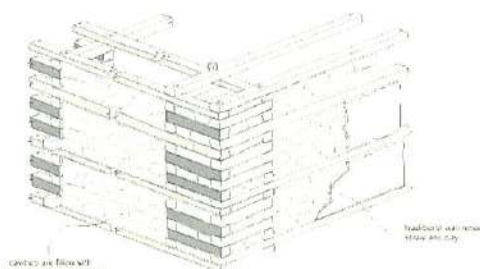
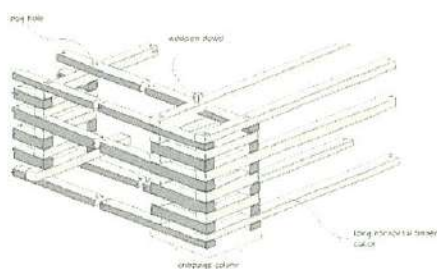


Fig 12 & 13. Schematic drawing of *cator* and cribbage construction technique. This technique is most common in the monuments of the Northern Areas, and it is earthquake resistant.



Fig 14. Detail of *cator* and cribbage in the entrance loggia of Khaplu palace

¹ *Khanaqah* is a religious building combining a Mosque and Sufi retreat center in Baltistan region of Northern Pakistan.

5- CASE STUDIES

The two case studies presented here are major projects on which I have personally worked. For the last nine years, I have been working in various positions in heritage conservation with Aga Khan Cultural Service Pakistan (AKCSP). Before taking my masters degree in Belgium, I worked on several restoration and adaptive reuse projects in Northern Pakistan. The most prominent project was the restoration of the 400-year-old Shigar fort in Baltistan, which was restored and adapted for exclusive use as a heritage museum and guest house. This project introduced cultural tourism as a totally new development sector in Pakistan. Issues like conservation and heritage management, adaptation of a vernacular monument for a new function, and its linkage with the development and mindset of the people were addressed during the time of this project. These issues and challenges have been continuously examined in assessing the merits of subsequent projects. I realized that the experience I got from this project would easily be replicated on others, but more critically I thought this experience should be further consolidated because a project like this demands an up-to-date and multi-disciplinary knowledge base. New exposure during my masters program in Belgium gave me an opportunity to improve my understanding of issues in the conservation of architectural heritage. Theoretically, this involved many issues related to the history, conventions, charters and management of cultural heritage, but at the same it also addressed many practical issues such as recording techniques, mapping of conditions and assessment of the built heritage before conservation. I focused my energies on improvement in all of these areas, which are basic prerequisites for any conservation project of built heritage, in order to enhance my competence and performance.

5.1 SHIGAR FORT CONSERVATION PROJECT

At a height of 2,250 meters, Shigar fort is located 30 kilometres from Skardu town, where it stands on the bank of Shigar stream built upon a massive rock. Once the seat of the ruling Amacha dynasty of Shigar, the fort, which has now been converted into a small residence with guest rooms, presents a new model for the restoration of endangered cultural monuments in Northern Pakistan. It is a three-story structure, constructed on a plinth of a massive stone base, using a timber *cator* and cribbage technique. Although the fort appears to be one structure, in reality, it is a collection of three separate structures built adjacent to each other at different times. Each of these structures reflects different engineering and traditional skills. The fort has more than 40 small and large rooms; these include the audience hall, living rooms, cooking areas, servants' quarters and a family mosque. There is a Mughal style garden immediately to the east, which has a water pavilion in the centre of a pond called *baradari*, which was a typical feature of Mughal gardens. The timber elements are richly embellished with animal figures, floral and geometric designs, and the style of the carvings have Kashmiri and Tibetan features.



Fig. 15. View after restoration of 400-year-old Shigar Fort in Baltistan



Fig. 16. View of the restored audience hall, now a museum of local wooden artifacts at Shigar Fort

The restoration of the Shigar fort/palace, and its conversion into the "Shigar Fort Residence" by the Aga Khan Trust for Culture, builds on a process that began with the restoration of Baltit fort (inaugurated in 1996) and the historic village of Karimabad, both in the Hunza valley. While it builds on these earlier efforts, it also represents a pioneering approach that stresses adaptive reuse. In addition to restoration efforts, the Trust has also focused on reviving traditional skills, generating new employment opportunities and providing training in the jobs needed for a changing economy.²

Featuring guest rooms that highlight the heritage of the region, the project is meant to bring cultural and economic objectives together in a way that sustains the operations and maintenance of the fort while providing a catalyst for economic improvement in the area. The project is also part of the infrastructure for a new form of cultural tourism that combines accommodation at an international standard with intimate, first-hand experience of the unique natural and cultural heritage of the area.

As far as the technical impacts are concerned, one could notice a significant change in the restoration campaign. The project contributed a lot in terms of enhancing and reviving local technical knowledge and practice. A number of local architects, engineers, craftsmen, carpenters and masons were trained in reviving and practicing the traditional knowledge of materials and construction techniques, which were almost lost before the restoration work. Another significant impact was the demand for skilled people for the construction of new structures using traditional materials and techniques.

The project is one of a series of social, cultural and economic development initiatives carried out by the Aga Khan Development Network in the Northern Areas of Pakistan since the early 1980s.

² <http://www.akdn.org/news>



Fig. 17. One of the views before restoration of Shigar Fort, showing the deteriorated condition



Fig. 18. View of the restored 400-year-old Shigar Fort

5.2 KHAPLU PALACE CONSERVATION PROJECT

The case study of the conservation of 200-year-old Khaplu palace will present my experience of some of the major outcomes in recording and restoring an outstanding example of a vernacular monument in the mountainous area of Pakistan. Conservation of this palace complex started in 2006 with the aim to reuse this entire complex as an exclusive guest-house and heritage museum displaying the local and regional heritage. The conservation and reuse activities on the palace complex are now in their fourth year. These conservation activities have been following international charters and conventions. Revival of traditional building crafts is another set of objectives for the project. As for the previously successful Shigar fort project, AKCSP hired local young men for training in traditional building crafts of wood carving, lattice making, and construction techniques.

5.2.1 The survey and project

Located in the rugged Karakoram mountain range at a height of 2,500 meters, the 200-year-old Khaplu palace is the finest surviving royal residential edifice in Baltistan, Northern Areas. Its significance lies in its cultural importance as a former seat of royal government in the area, and in its quality as a building, both aesthetically and as an exemplar of traditional building typology with a lot of influence from neighbouring regions (Kashmir, Ladakh, China, and central Asia). As part of a wider cultural

heritage support programme in Baltistan, long-term sustainability is one of the prime objectives set by AKTC-AKCSP for this project. Working closely with the local community, the project is contributing to the revival of traditional wooden and building crafts, income generating activities, and the building capacity of locals.



Fig. 19. A panoramic view of Khaplu valley, with Khaplu palace in the middle



Fig. 20. Panoramic view of Khaplu palace, showing the main palace building at right, and the 100-year-old Darbar house in the middle

The form of Khaplu palace is rectangular (22 m x 17 m) and four stories high (Fig. 21-22), a large three-storied timber portico as an entrance loggia locally known as *jarookh* is at the front. In contrast to other timber porticos in the region, here the existing form of the timber portico is half octagonal, which significantly adds to the aesthetic value of Khaplu palace. This entrance loggia is accessed by means of stone staircases on both sides of loggia. The loggia features cusped wooden arcades and cusped arched windows also integrated with wooden lattices and carvings. These features distinguish the building as a “palatial” structure. The palace is flat roofed as are other secular buildings in the region. This entrance loggia is in the linear axis of the main door of the complex.

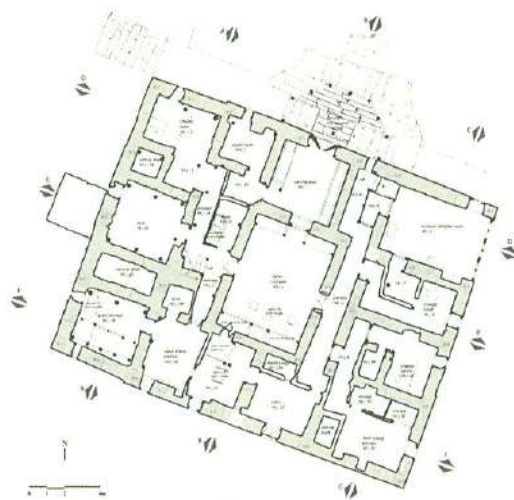


Fig. 21. Floor plans of the Khaplu palace at level 1

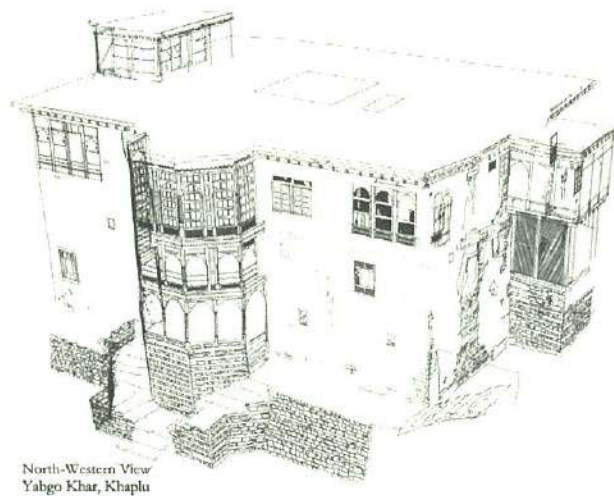


Fig. 22. A complete 3D wire-frame model of Khaplu palace. Northwestern view of the palace shows the severe damage on western façade.



Fig. 23. Northern façade of Khaplu palace



Fig. 24. Eastern façade of Khaplu palace

Site surveys and documentation prior to any conservation and restoration works are now defined as a basic prerequisite for understanding a historic building or site. This has been widely expressed in many national and international charters and conventions – from the Athens Charter of 1933, to the Venice Charter of 1964, to the Burra Charter. This discipline needs proper training, human resources and equipment. In the absence of any previous documentation efforts, the current documentation programme with EDM equipment was experimental in nature. Its main objectives were as follows.

- Disseminate and build capacity in recording techniques with REDM (reflectorless electronic distance measurement).
- Gather detailed information on a vernacular monument and site in the form of base drawings.
- Make detailed recordings of the monument as found, which ultimately allows us to propose conservation and reuse plans.
- Set an example of architectural survey which would be available for researchers and experts for future studies.

- After conservation, this documentation will provide us the basis for management, monitoring and maintenance of the site and monument.

In a remote situation where documentation of heritage faces huge challenges, such as deficiencies in expertise, means of communication, dissemination and standard guidelines, the basic aim of this documentation campaign was to address the cited challenges. Documentation is a process which continues during the conservation of any monument and this is the only accurate tool to record the information for understanding the structure which ultimately leads to the management of a conservation plan.

The field survey, as a training process, was initiated in October 2005 primarily to cover the topographical features of this historic vernacular site. Initially the field data were gathered with one total station (Leica TCR 405), and were downloaded on a computer and then converted to vector form with the help of LisCAD and AutoCAD. The second and comprehensive stage of documentation of historic buildings was initiated in March 2006 with the aim to document the monuments for practical conservation work. The parallel running conservation activities made this documentation campaign more challenging, as we needed to record the monument and site in their state as found. Therefore, the more practical solutions were worked out to meet the time and conservation activities. The inevitable combination of EDM survey and rectified photography was followed. A combination of a field laptop, TheoLT and AutoCAD software for real time survey and Trectify for image rectification purposes was utilized.

5.2.2 Documentation practices

In this project, the EDM survey provided us an opportunity to interpret the obtained data in a variety of ways. Most of the team members knew the architectural documentation with conventional manual measurement and drawing methods. The new EDM survey technique was never easy to understand, therefore, initially it was very important for me to provide them common and easy examples. For this we initiated introductory lessons with the instruments and future interpretations of the data in the form of drawings. In a remote environment this was not an easy job to do, therefore it was important for us to overcome the limitations of our survey with new technology. Soon the team realised that this technique reduced a substantial amount of time and labour in comparison to manual methods, and above all it is very precise and accurate.

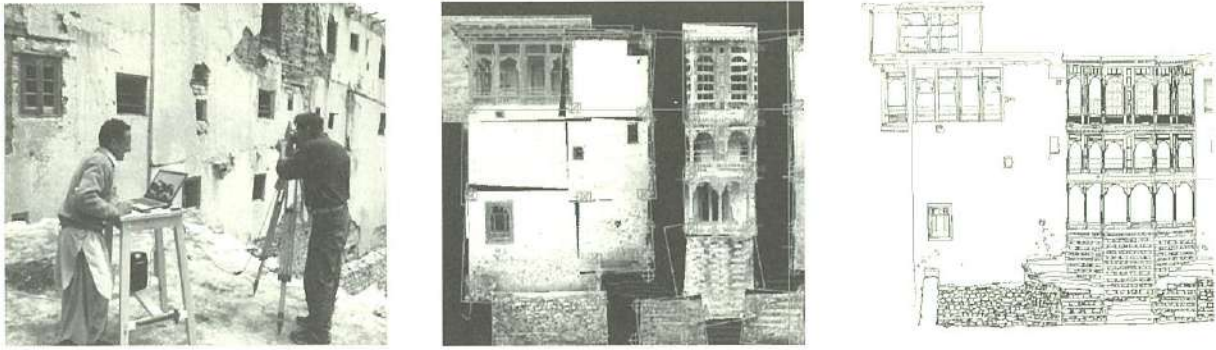


Fig. 25-27. Documentation of Khaplu palace in progress with a total station

The team also knew the problems with manual documentation methods. The inaccuracies in the manual documentation process, due to the manual sketches, manual measurements, and the conversion of manually drawn scaled drawings into vector drawing through a laborious scanning process, were easily mitigated with this combination of EDM and rectified photography surveys.

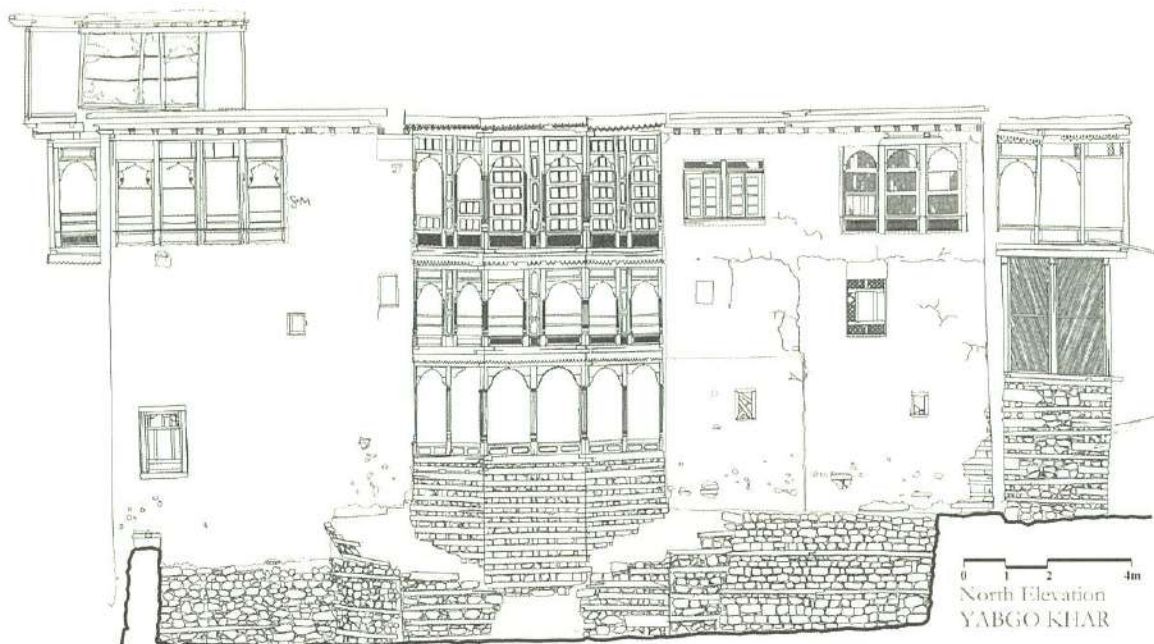


Fig. 28. North façade of Khaplu palace. The wooden entrance loggia at the centre was the subject of major conservation activity in 2008. This restoration was very closely monitored with a total station.

Since 2006 most of the architectural documentation has been completed in the form of floor plans, reflected ceiling plans, structural plans, detail elevations of each room, cross sectional drawings, building elevations and a complete 3D wire frame model. Most of the major elevations and elevation features in the cross sectional drawings were completed with the help of image rectification software combined with EDM survey. Rectified photography has been used to map the condition of external and internal elevations of the monument, which was later converted into vector form.

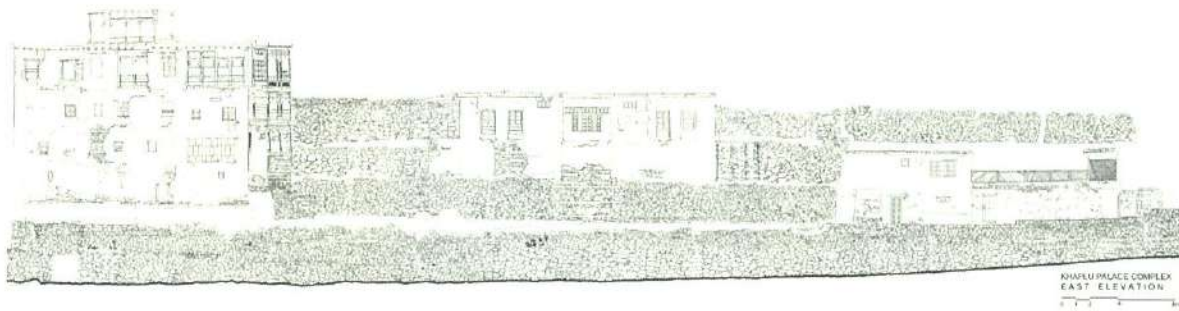


Fig. 29. Completed east elevation of Khaplu palace site. Hundred-year-old historic agricultural walls and buildings are documented using EDM (total station) survey and rectified photography. This drawing is an AutoCAD product developed from 3D wire-frame.



Fig. 30. Rectified photography of western elevation of the 100-year-old Darbar Khang

5.2.3 Conservation practices

The following example of investigations and conservation of the wooden entrance loggia at Khaplu palace will present the approach of AKCSP towards the protection of wooden structures in Pakistan. First, data in the form of CAD drawings produced with the help of the EDM survey have been used to study the monument and its adaptation for reuse. Secondly, the data were key to identifying and studying the dilapidated parts of the monument. A total station has been extensively used during the investigations of the structure of the main entrance (the loggia) of the palace. The abnormal tilt and the subsidence revealed by the EDM survey of the loggia at the floor level of level 1 showed that this part was not structurally connected with the main building of the palace. The investigations showed the tilt of 14 cm and subsidence of 8 cm in the structure. Based on such structural examinations of the palace, the intervention proposal was implemented. A new connection and additional wooden beams were proposed. The base wooden *cators* in the foundations were completely rotten due to ingress of rain and channel water. Damaged *cators* were replaced with new wood and were also provided a new foundation of dry stone masonry in order to stop the capillary action of water. In order to remove the tilt and subsidence in the structure, hydraulic jacks and turning buckles were used. The process of lifting and pulling back the structure to a satisfactory position was closely monitored with the help of the total station and allied software.

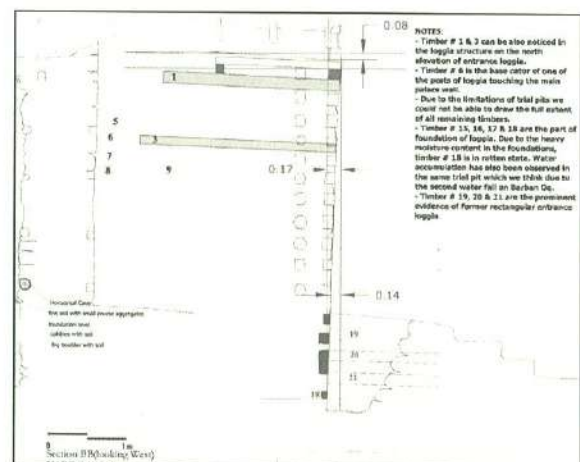
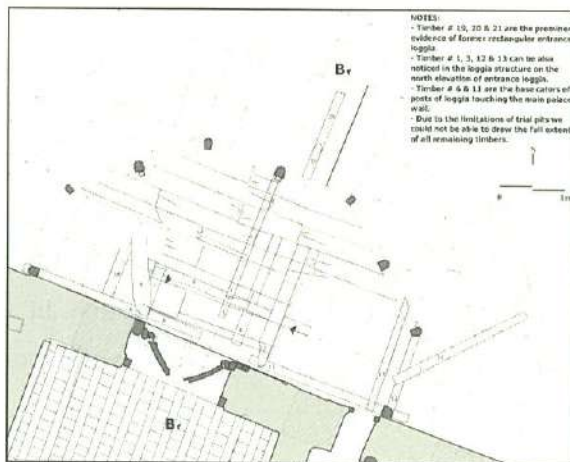


Fig. 31-32. Set of drawings produced for the restoration of a wooden entrance loggia about 10 meters high. This set of drawings shows the structure and location of timber elements in the plan and section. Additionally, the sectional drawing shows the subsidence and bulge in the structure

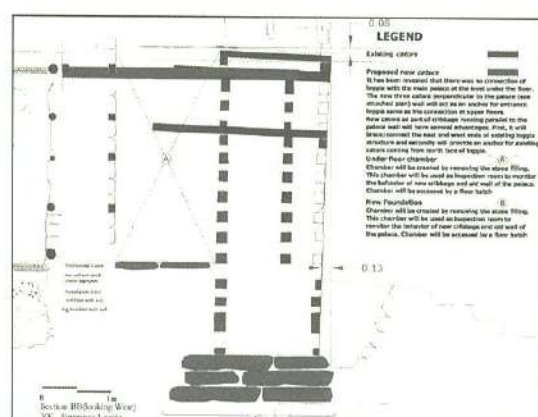
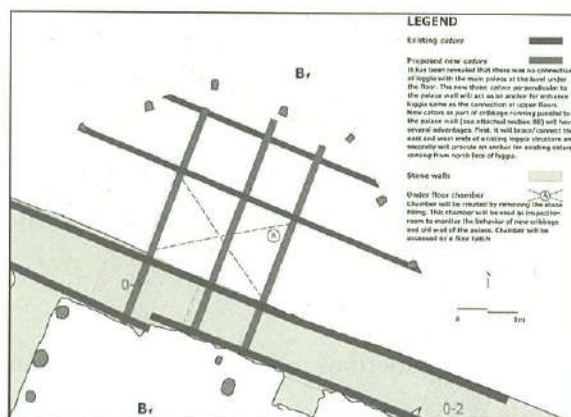


Fig. 33-34. This set of drawings shows the proposed interventions to restore the loggia structure



Fig. 35. Traditional construction techniques being implemented during restoration of the loggia



Fig. 36. Closely monitoring the lifting and pulling back of the loggia to a stable state, with total station



Fig. 37. Lifting the loggia to a stable state with the help of hydraulic jacks



Fig. 38. Turning buckles being used to pull back the tilted loggia

6- CONCLUSION

Conservation, restoration and management of cultural heritage have so far received little attention within the main discourse of development in a society where many of the traditional social conventions, which used to hold the community together, have become fragile over the last few decades due to the current rapid change and high pace of development. Modern tools of development and governance are not fully internalized by such societies, making them more vulnerable to unplanned development. Thus efforts such as those of AKCSP have to be made in an ambiguous situation. In a situation like this there is serious demand for promoting the conservation of cultural heritage as a tool for local development, through practical projects as demonstrations.

Before implementing any conservation policy it is important to have a pool of experts and a proper inventory of the cultural heritage of a region. Unfortunately, due to the political status of the Northern Areas of Pakistan, these prerequisites are missing at the national level. Since 1992 the efforts of AKTC, with the help of its operating arm AKCSP, have been quite substantial in the conservation of heritage in Northern Areas. The bench mark set by AKCSP with the sustainable restoration projects of over 800-year-old Baltit fort in 1996 (UNESCO Award of Excellence, 2004), and Shigar fort/palace in 2005, has earned national appreciation as well as international recognition. Subsequently, the initiation of the Lahore walled city project by AKCSP in 2007, at the request of the Punjab government and World Bank, is the continuation of recognizing the efforts of AKCSP at the political level, which will ultimately change the stagnant and impractical conservation policies at the national level.

The process of standard conservation based on international guidelines, which was initiated on vernacular monuments in Northern Pakistan, has now been actively practiced in the walled city of Lahore by documenting and conserving the thick urban fabric and historical monuments of great importance. It has been encouraging to see all this progress, but there is still a long way to go in spreading and sharing this knowledge with other actors in the field.

In the context of Pakistan, the rate of uncontrolled development and the lack of updated technologies and expertise are the main causes of heritage loss and the main hindrance to the documentation and conservation of architectural heritage. In this situation the authorities concerned for cultural heritage should at least start upgrading the documentation process of deteriorated monuments, in a more accurate and up-to-date manner by utilising the best practices.

It is important for AKCSP to share and disseminate the work on different aspects of conservation with government departments and other non-government organisations. All the inventory work should be used as an important tool for regional planning and future land use planning. All the stakeholders in this sector need to know the importance of conservation, and most importantly all this should be part of the curriculum of various educational institutes. It is important to learn from our own experience in

this respect, and from the efforts and experiences of each other. We must, therefore, create our own pools of knowledge and our own information exchange mechanisms.

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Philippines

Nelson Laxamana AQUINO



Project Supervisor / Historical Site Development Officer II
Cultural Properties Conservation Division
Department of Tourism - Intramuros Administration

Problems and Needs for Cultural Heritage Protection and Restoration Activities

I. ARCHITECTURAL ORIGIN

History

The first inhabitants of the Philippines arrived between 300 and 200 B.C. Of Malay-Polynesian descent, the people lived in groups of 30-100 families in a unit of society called *barangay*. Some lived through agriculture and fishing, while others were nomadic. They traded with mainland Asia, especially China. Islam was introduced in the 14th century.

In 1521, Magellan stumbled upon the islands in his attempt to circumnavigate the world. The Philippines was thus introduced to the western world. The Spaniards ruled for over 300 years and brought Christianity, which led to the building of many great Baroque churches. In 1898, the Americans replaced the Spaniards as the Philippines' colonial masters. The Americans left the Philippines in 1946, leaving the Filipinos to run their own government.

Climate

The climate in the Philippines is a tropical monsoon climate, marked by wet and dry seasons. The dry season lasts from March to June and the wet season lasts from July and October, with the remainder of the months a mixture of both. The annual lowland temperature is 80 degrees F (27 degrees C).

Community

Ancient Filipinos lived in big settlements along the bays, coastal areas, and mouths of rivers. Interior settlements were established at the headwaters and banks of rivers and their tributaries. The houses were usually built side by side along the river banks or seashores. Other types of settlements included

clustered communities and scattered communities on the inland hills and plains.

These ties to the water made it the most practical location for a community. The water was a major source of food like fish, shrimp, and shellfish, which were easily harvested. Transportation on and along the rivers and streams was also practical. Also, the alternative, the primary forests, were not strategically attractive environments.

These early settlements were also mobile and temporary. The slash-and-burn agriculture practiced by the Filipinos caused them to search for new land, because once the land is cultivated and harvested, secondary growths and tough grasses made it difficult to recultivate.

Elements

In response to the climate, the roof of the first Philippine houses, nipa huts or *bahay-kubo*, was high pitched and usually open gabled for ventilation. The steeply sloping pitch also protected from the wind and rain. The roof also provided wide overhanging eaves, to give shade from the hot sun.

These houses were elevated three to four meters from the ground, supported by wood or bamboo. There were usually four or more of these support posts. This helps air to circulate beneath the house. This space underneath the house, called the *silong*, can also serve as a workspace, a storage space, a granary, or a pen for livestock. In addition, the raised structure sits well above ground that may flood if located next to coastal or riverside areas, and also keeps small rodents and other creatures from entering the main structure. A ladder, *hagdan*, is used to enter the main structure. It could be drawn up at night or when the owners went out.

The structure was usually four-walled with *tukod* windows. These windows had swinging shades, which could be propped open during the day. There was usually one simple multi-use space in the interior. This open interior not only provided ventilation, but also gave a spacious feel. This space could be used for cooking, eating, and sleeping. Sometimes the cooking was done over an open fire built on a heap of earth in one corner, or partitioned off in a space in front of the ladder. Sometimes, there was an open front porch, *pantaw* or *batalan*, with jars of water for washing dishes. This gallery also served as an anteroom or lounging area. The structure could easily be added to, should the need arise.

Materials

The materials used in the Filipino house are found near the site. The materials may differ depending on the ecology of the area. The major building materials are: bamboo (*kawayan*), rattan (*yantok*),

native palms like *palma brava* (*anahaw*) and nipa palms, cane, and cogon, which is a long grass for thatching. Stone and clay are sometimes used.

Construction

The early Filipinos could build a hut in just a few hours. These Pre-Hispanic Filipino lowland houses had a light structure on top and heavier materials on the bottom. This helps in resisting earthquakes. The light structure leaves the occupants with minimal injuries if the house was toppled by earthquakes or typhoons.

The early Filipino house was built without the use of nails or pegs, which were not available. The frame was tied together with rattan or other materials.

The walls were made of bamboo and nipa, dried grass, wood, or siding made from split and pounded green bamboo halves. The materials were lashed or woven to keep water from seeping in. The floor was made of bamboo slats (*tinilad*, *tilad*) with convex sides up, spaced a bit apart to increase ventilation and allow dirt to fall through. The roof was made of nipa shingles or cogon thatch.

The houses were either built by the head of the family, the whole family, or the family and their friends. Most early Filipinos were capable of building their own houses and could finish them in a couple of days.

In addition to the nipa hut, houses built in the trees were another form of architecture in the Philippines. The Bagobos and Kalingas from the northern Philippines used this type of house for protection from enemies and wild animals on the ground.

In the south, the Muslims of Mindanao had a distinct architecture of their own, brought along with their religion. The *datu*, the chief, lives in a *torogan* and is a symbol of power for the Moro people. Built off the ground on posts, these posts of the *torogan* sat on top of rocks which served as rollers to prevent damage in an earthquake. The roof was made of palm frond thatching with three tiers. The three-tiered roof symbolized the Javanese and Balinese Mt. Meru, the temple building representing the cosmic mountain in the Muslim religion. The brightly painted wood carvings under the gable of the *torogan* emphasized the religious and hierarchical significance of the architecture.

From Bahay-kubo to Bahay-na-bato

The Filipino style has modernized through the centuries. The history of modernization begins with the single-room *bahay-kubo* built on stilts, of wood, bamboo and thatch—the prototype Philippine house.

When the Spanish came in the 16th century, they introduced a building technology that improved and expanded the *bahay-kubo*, changing its thatch roof to terra-cotta tile.

Stone construction, unknown in the hardwood-growing tropics, was introduced. The house's ground floor, previously open to the elements, was now enclosed with a thick, protective stone wall.

The main living floor, also elevated, was sealed off from the elements by a series of sliding windows. The *bahay-kubo* modernized into *bahay-na-bato*, literally “house of stone,” and continued to modernize over the centuries, alongside lifestyle changes and technological advances that improved construction processes.

The American colonial period beginning in the late 19th century gave a new twist to Philippine lifestyle, seeing a change in architecture from the heavy stone-based proportions of the *bahay-na-bato* to more graceful houses built in the traditional style of tropical hardwood. In place of stone were concrete and steel, the latest technological breakthrough.

The *bahay-na-bato*, as a 20th-century American colonial variant, became the single-story, wood-and-concrete “chalet,” followed by the post-World War II bungalow, after which a succession of architectural adaptations evolved.

Nostalgia

Although each variation picked up the latest architecture style of its time, each evolution retained a bit of Filipino style and feeling, never cutting off the comforts of local tradition.

Filipino comfort and local tradition reinterpreted in 2008 as Filipino Modern are best seen in leisure architecture. Hotels, particularly resorts, are the best examples. They require the latest amenities in an architectural style that has traditional feel and character.

Having to provide the global traveler with a memorable local experience prods resort developers to update traditional Philippine architecture as an expression of identity. Some establishments design their properties around the *bahay-kubo* with new variations while retaining traditional materials such as bamboo and nipa.

Not all architects can do it well, or can do it at all. Architects who do this style best have taken the time to understand Philippine culture.

Understanding and imbibing heritage is essential because the Filipino Modern style reinterprets in

a contemporary manner the architectural traditions—distinctively sloped tile roofs; large window openings; the Filipino's love for wide, highly polished planks of tropical hardwood; wooden *calado* cutouts (fretwork); and other trademarks of the traditional Filipino house.

Nostalgia is an impetus to update Filipino traditions. Recycled architecture material—floors, doors, wooden carvings—are gathered from old structures. These aged details are fitted into the new construction, to give it an old look and feel.

Gene Gonzalez's stunning Café Ysabel and the late Larry Cruz's cafés pioneered the nostalgia look.

Ambiguous Layouts

Layouts of Filipino homes could be ambiguous. Traditionally, rooms are multipurpose. A living room by day becomes a sleeping area at night. In other houses, the family hangs out and sleeps in one room, thus the need for large master bedrooms.

Interior spaces become transparent through elaborate wooden cutouts (*calado*) installed between the upper portion of interior walls and the ceiling. Windows of sliding wooden lattices covered with translucent *capiz* (*Placuna placenta*) shells diffuse the sun's glare and let in gentle, translucent light.

Great architects, such as National Artist Pablo Antonio, whose career spanned 1935-65, and Leandro Locsin, whose career spanned 1960-1990, produced sophisticated architecture that could be considered Filipino Modern.

Their architecture, devoid of superfluous recycled traditional details or architectural clichés, demonstrated a Filipino response to the global architectural style of their era. Theirs is proof that Filipino Modern has always existed.

Cultural Discovery

Only a handful of architects have taken a cultural discovery journey not usually experienced in architecture school. They are the select few who have the sensitivity to produce Filipino Modern architecture.

Because Filipino lifestyle constantly evolves, historically there has always been a Filipino Modern style. This style is shaped by personal taste and judgment. From here arises dispute.

With around 80 million Filipinos today, expect 80 million highly individualistic interpretations of

Filipino Modern.

It should be an interesting task to document the Filipino Modern in a book—Filipino social history seen through contemporary architecture.

II. SPANISH COLONIAL ARCHITECTURE

As you travel in the Philippines, you will see old wooden houses that line the streets especially in out of the way provincial towns. A few years ago I began to notice that many of these houses were either abandoned or disappearing altogether—victims of changing family fortunes, good and bad, or the ravages of nature and time.

In their places, new houses are being built of concrete, cinder block and stucco. The dwindling use of wood in construction can be blamed on the loss of the great forests that once covered the islands with a seemingly endless supply of lumber. Along with the change in building materials, the shift in architecture has moved toward western influences—both European and American. I've seen subdivisions that could have been named "California-kitsch."

After colonization, the Spanish brought their architecture but quickly learned that stone buildings do not last very long in an earthquake-prone country. As towns and plantations grew, more substantial homes were being built by the rising upper-class. These *principalia* and *ilustrados* combined the structural features of the *bahay-kubo* with stylistic elements from Europe and Asia. The result was the *bahay-na-bato* that served as the model for townhouses from the 19th century until World War II, and for many is considered the quintessential Filipino house.

The old houses are as unique as the families that lived under their roofs and there is a wide range of styles between the *bahay-kubo* and the mansions of the *hacenderos*. There are also some regional differences but they all have some features in common. Vents above the windows, protected by the roof eaves, let air in even when it is rainy. Small shuttered windows below the large windows, called *ventanillas*, are screened with balusters or grillwork and can be left open when the large windows are closed such as at night.

As the name implies, the lower walls of the classic *bahay-na-bato* were traditionally finished in stone or masonry. More modest homes have wood walls for both levels and in more recent times, cinder blocks have been used to enclose the lower level. This space, the *zaguán*, was used to store the family carriage and processional cart in the old days and nowadays often functions as office, shop or the family's *sari-sari* store.

Like an endangered species, these wood and stone houses are vanishing toward certain extinction. What once embodied the character of the urban landscape and the heart of Filipino life will be blown away by the winds of progress. Already many towns are looking like cluttered strip malls, and subdivisions provide homes without character. The *capiz* that naturally filtered light has given way to glass, and the large open windows have been replaced with air-conditioning. Homes that shared a street or square are now isolated in gated compounds. Such is progress.

After noticing the demise of these old homes, I thought it would be an interesting photo subject and quickly used up a roll of film on one trip. Afterwards, I did some research and found the book "Philippine Ancestral Houses," Zialcita and Tinio, 1980, which covers the subject in wonderful detail. This is a book to peruse with its many photos and drawings for anyone interested in the subject. Another good book is "Filipino Style" with a chapter about traditional houses, also written by Zialcita.

You can find good examples of these homes in the quieter provincial towns. A few towns have made an effort to preserve their architectural heritage. One such place is Vigan in Ilocos Sur. The National Museum in Manila has a display of photos and architectural drawings of Vigan's ancestral homes (as of July 2000). The town of Taal in Batangas is also notable for its preserved buildings. Good examples of the *hacendero* lifestyle can be found at the Balay Negrense in Silay, Negros Occidental and Villa Escudero in San Pablo, Laguna. There are still some fine old homes in Quiapo and Binondo, parts of Manila that were not destroyed in World War II.

III. INVOLVEMENT IN HERITAGE CONSERVATION

Intramuros: "Within the Walls"

When the Spaniards arrived and colonized the Philippines they constructed high stone walls to improve their defenses from the invasion of the Chinese and Japanese.

The walls stretched to 4.5 kilometers in length enclosing a pentagonal area of approximately 64 hectares. The area consisted of residences, churches, palaces, schools and government buildings. Entry was made possible through gates with drawbridges which were closed before midnight and opened at the break of dawn.

It was in this manner that the city earned the name Intramuros, meaning "within the walls." Honored by King Philip II with the title *Insigne y Siempre Leal Ciudad* (Distinguished and Ever Loyal City), it served as the political, cultural, educational, religious and commercial center of Spain's empire in the East. The riches of Asia were gathered in the *Ciudad Murada* or Walled City (as Intramuros was later

known), and loaded on galleons for transport to Acapulco, Mexico.

But the walls did not discourage other ambitious European powers. Dutch pirates were driven off several times from Philippine waters.

War Time

At the end of World War II, much of Intramuros was damaged by the returning American military forces.

In 1942, when the Japanese forces invaded the Philippines, U.S. forces led by General Douglas MacArthur realized that Manila was indefensible so he declared it an Open City. He regrouped the USAFFE forces in the Bataan peninsula, only to be trapped there by the advancing Japanese army.

Upon their return in February 23, 1945, United States forces, including Philippine Commonwealth troops, shelled Manila, including Intramuros, to flush out remaining Japanese soldiers. Intramuros was in ruins following the fighting, and the only structure that survived was the San Agustin Church; almost no other building remained standing.

Present Time

Under the direction of former Philippine First Lady Imelda Marcos, the Intramuros Administration restored the city in the 1980s. At present the walled city is the only district of Manila where old Spanish-era influences are retained. Much of the development of present-day Manila occurred outside the gates of Intramuros, leaving the surviving walls, streets and churches of Intramuros minimally touched by modernization. The old moats that surrounded Intramuros have been filled up and transformed into a golf course. The garrison that was Fort Santiago is now a tourist spot where visitors can enjoy the nostalgic romance of a bygone Spanish legacy within its gardens. In 2003, during Visit Philippines Year, Tourism Secretary Richard J. Gordon cleaned up Intramuros with the help of student and civilian volunteers, and also raised funds to light up the place and built a light and sound museum.

Intramuros now houses some of the higher educational institutions in the Philippines. These are the city-owned Pamantasan ng Lungsod ng Maynila, the technical school Mapúa Institute of Technology, Lyceum of the Philippines University, Colegio de San Juan de Letran, and high schools such as Manila High School and Colegio de Santa Rosa.

Following the design of medieval fortifications, along the massive walls of Intramuros are strategically located *baluartes* (bulwarks), *revellins* (ravelins) and *reductos* (redoubts). Entrance to the city is

through gates or *puertas*, most of which have been restored or rebuilt. Most of these features have names such as: Baluarte de San Diego, Baluarte de San Francisco de Dilao, Baluarte de San Gabriel, Baluarte de Sta. Barbara, Baluarte de San Andres; Puerta Real, Puerta Isabel II, Puerta del Parian, Puerta Almacenes, Postigo del Palacio, Puerta Sta. Lucia.

Intramuros Administration

The Intramuros Administration (IA) is a national government agency created by Presidential Decree in 1979 to restore and develop the Walled City of Intramuros as a monument to the Spanish period in Philippine history. It was attached to the Department of Tourism by virtue of Executive Order 120 in 1987, with the task of developing it into a prime tourist destination.

IA's objective is to make this "city within a city" socially, economically and culturally viable again while keeping pace with modernization. IA intends to enhance the potential of Intramuros as a main center of tourist activity in the City of Manila. It is involved not only in restoration but also in urban renewal and income generation.

Today, IA provides a more enjoyable visit to the Walled City for its guests. With ninety percent of the walls restored, Intramuros has become a busy cultural center featuring the performing arts, exhibits, flea markets, book fairs, music and art contests, and religious activities. Restored chambers of the gates have been converted into commercial establishments like food stalls and souvenir shops. Tourists can also visit antique and handicraft stores.

An urban renewal plan has been effected to meet the requirements of contemporary life, while preserving the unique character of Intramuros. IA has ensured that business offices and residences have locational clearances, and that they follow designs of Philippine colonial architecture to recapture the Fil-Hispanic ambiance of the Walled City. Land use and zoning should also conform to the Intramuros Development Plan, the blueprint for the rebuilding of Intramuros.

Time has changed the Walled City. It is no longer the Manila it was during its reign of glory in the 18th and 19th centuries. But with IA as its handmaiden, Intramuros may relive within its imposing walls the dramatic moments of the Philippine past.

Other Tasks

Intramuros Administration has also assisted in the planning and design of newly-constructed as well as old buildings in order for them to conform to Filipino-Hispanic designs. Intramuros was the first site in the country where international laws on heritage conservation and urban planning were applied.

Archival documents were also acquired, which are used in supporting and authenticating decisions on restoration and zoning plans. These are stored in IA's Fr. Luis G. Merino Library. Research materials are published to enrich public knowledge of Intramuros.

IA is also recovering the treasures of our cultural heritage. To date, it has an impressive collection of antique furniture, period décor, paintings, jewelry, icons and other items of the Philippines' past. Some of these are exhibited at Casa Manila Museum.

A unit in IA takes care of the wooden furniture to preserve this priceless collection for the next generation.

Filipinos have to make an effort to recognize the importance of heritage in their locality. Because their main priority is livelihood, they take for granted the things they see, hear, use and encounter everyday.

Some local government officials, though, have successfully launched awareness campaigns, which have made a significant impact on the peoples' appreciation of cultural heritage. It is proof that when you preserve and protect something, it will have a positive effect.

IV. RESTORATION / RECONSTRUCTION APPROACH

"Houses have their own ways of dying, falling as variously as the generations of men, some with a tragic roar, some quietly, . . . while from others . . . the spirit slips before the body perishes."

(Howards End, E. M. Forster, 1910)

The Reconstruction of Intramuros

Architectural conservation when done scientifically must move very slowly. This disciplinary approach commits to the preservation of existing buildings and neighborhoods by maintaining the original look of the structures without allowing alterations. The original look is determined through meticulous research.

However, in World War II the entire area was flattened leaving no structures standing except the San Agustin Church. IA had to reconstruct the structures that the war destroyed. Prior to reconstructing the walls and buildings, IA undertook detailed, scientific research, establishing its own archives documenting the original appearance of the structures. After the research period, the actual

reconstruction of the walls and buildings that once lined the Intramuros streets began.

Today, ninety-seven percent of the walls and fortifications have been reconstructed by faithfully duplicating the designs and materials of the Spanish builders. However, the approach to buildings differs slightly. Instead of duplicating the original buildings (as done by Warsaw in the reconstruction of its historical center demolished by World War II), Intramuros chose to build new structures that loosely resemble the design of the original ones. Therefore, Intramuros today may not look exactly like old Intramuros, but it has the ambiance.

Some think that to preserve ambiance, Intramuros or any other historical center, like Vigan or Taal for that matter, should be “a living museum.” That concept was popular over a generation ago but is outdated today. The “living museum” concept rewinds and freezes a site and its inhabitants into the past by turning it into a fantasy land of people dressed in old costumes, performing old crafts and serving old food for the benefit of the tourists. It trivializes the historical center, transforming it into a heritage “theme park.”

Today’s concept of urban preservation looks beyond just carrying through a nostalgic theme. It rises above nostalgia; it links old, historical districts to the mainstream of modern urban life.

Reconstructed buildings following today’s concept provide the necessary space to house our everyday activities such as banking, offices, retail shopping, or residential units. The updated, improved infrastructure of the district supports and enhances these activities.

The only difference is that in Intramuros, the energy is contained within low, reconstructed 1890’s buildings instead of within skyscrapers. Strict building codes assure that the ambiance of the district is maintained. Intramuros is mandated to enforce a particular ambiance. Its method of preserving its ambiance is basically no different from what other private developers do. It governs construction through a building code that stipulates minimum setbacks from the street and between neighboring structures, limits building proportions, size, and height. In return, its property owners and residents are assured of a controlled environment, where structures will be in harmony with each other without threat of an existing two-story structure being dwarfed by a neighboring skyscraper.

As one of the caretakers of Intramuros, I feel very lucky and proud to be part of the preservation team of this one-of-a-kind historical site in the heart of Manila. We must find more brilliant ways to bring back the lost glory of our heritage.

Aguinaldo Shrine

This Cavite mansion mirrors a unique period in the country's history. Its assembly, which contains secret passages and hidden slots, showcases how revolutionary zeal infused even the comfort of Filipino homes.

First built in 1845 from wood and thatch, Aguinaldo's residence became the site of the proclamation of Philippine Independence in 1898. On its first floor is a museum containing architectural fashion of the past eras. Its main section is emphasized by a pyramid-like structure capped by a spire tower at the very top. The second floor housed Aguinaldo's bedroom, the grand hall, dining room, kitchen, a conference room and azotea.

Acuzar Museum

The Ciudad Real de Acuzar's museum of colonial homes in Bagac, Bataan is a community of restored old houses and buildings. They were brought from their original location and transferred piece by piece to the town. Restoration was then painstakingly done to resemble the original state. There are more than twenty houses and buildings already restored, with a few awaiting furnishings.

The Fine Arts School of the University of the Philippines, called Escuela De Bellas Artes, is the best example of conservation of architecture in this museum.

Built in 1867, the two-story *bahay-na-bato* structure was designed by Felix Rojas, the first Filipino to earn an architectural degree. It also served as the residence of the first dean of the school. The school eventually moved from R. Hidalgo St. in Quiapo, Manila to Padre Faura campus also in Manila, dooming Bellas Artes to a dilapidated state of neglect, disrepair and abandonment.

To save this important structure, a team of architects moved each brick, stone and mortar to the Acuzar Museum, reconstructed and restored it to its former glory.

Transferring colonial houses and other notable structures is another brilliant way of preserving and protecting our National Cultural Treasures. It will create a great dramatic effect because of the great landscape of the place.

At the moment, I think it will take a lot of hard work to realize this project. The team must be careful in the rebuilding process in order to preserve the authenticity of the structures. Once they add to or deviate from the over-all design, the value of the structure will decrease.

It would be best if they transport the structures by sea. It will shorten travel time and avoid heavy traffic on land.

Historic Structures of Vigan

The conservation of Vigan entails more than just taking care of the old structures, but requires that the life which continues to go on within those structures be protected.

Almost 190 historic structures were listed in the inventory in 1987. However, it does not take an inventory to see that a good number of the heritage homes in the town have disappeared and are endangered. A walk through the center of the town gives enough evidence of the destruction.

Now that the destruction is being controlled, more people have become aware of the need and have become involved in conservation today than the handful crying out in 1987. Now conservation is one of the primary topics of conversation for many in Vigan. What makes the Vigan conservation noteworthy is that it has always been spearheaded by concerned groups called NGO (Non-Governmental Organization), but always with strong municipal support that continues to grow with so much enthusiasm and vigor.

The special allure of the town, as all Filipinos know, is that Vigan is where the country's largest collection of Hispanic era architecture still stands along straight, narrow streets. What many Filipinos do not know is that Vigan has an equally significant, but smaller, collection of early 20th century American period architecture as well.

Over the centuries, the historic, cultural, and geographic forces that shaped Vigan developed a special lifestyle that is unique in the Ilocos region and in the entire country. The lifestyle should continue into the next century. It provides the human touch that continues the flow of energy of the ages into the heritage buildings.

Preservation of Wooden Structures

In response to the frequent visits of earthquakes and fires, the *bahay-na-bato* (or house made of stone) emerged as the best structure to withstand these kinds of disasters. The structure of stone and wood in combination became the symbol and pride of our past. The roofing system and the whole of the second floor were made of wood. The wooden part of the structure is first to decay, and preserving, restoring and bring back the structure to its old form is a big challenge. The all-stone structure proves to be a disaster when an earthquake of high intensity is experienced. To prevent the collapse of the structure, wood was used because it weighs less than stone, and at the time it was one of the popular materials available.

The importance of wooden structures, and the ongoing discovery and acquisition of a noteworthy array of works of carpentry which are disseminated all over the world, together with their general poor state of conservation, the widespread belief that “new” materials such as reinforced concrete, steel and titanium are better and more reliable than wood, the frequent use of alien techniques to “repair,” and the continuous destruction of valuable works, are just some of the reasons why an extensive review of these issues should take place. More specific motivations include the progressively growing awareness that load-bearing structures are an essential part of the monuments and very significant heritage elements. They are the bearers of immense values such as creativity and inventiveness, and embrace the aesthetic and technological sphere as well. Furthermore, a vast number of ancient wooden structures still perform very well.

While the principles that guide repair are similar for different cultures, the practice of replacement is still very widespread, especially in those areas where wood and wood craftsmanship is cheap and readily available.

Today, new technologies and new materials such as composites are employed extensively to repair ancient structures, but the behavior of wood and composites, when combined, is still not fully known.

V. BRIEF OVERVIEW OF THE ACHIEVEMENTS IN CULTURAL HERITAGE PROTECTION

The Cultural Heritage Program in the Philippines was strengthened when Republic Act 4846 was enacted in 1966, providing for the protection and preservation of Philippine cultural property. It is this act that expressed the idea of National Cultural Treasures. The focus even then was on the tangible aspects of culture, meaning physical cultural properties.

In an effort to create an omnibus cultural legislation out of the generic concept of “cultural property,” Senate Bill No. 540 was created in order to further distinguish the difference between “tangible cultural property” and “intangible cultural property” (referring to the people’s learned processes). These include the oral traditions and expressions, performing arts, social practices and festive events, knowledge and practices concerning nature and the universe, and traditional craftsmanship.

The National Museum is tasked with designating cultural properties as National Cultural Treasures (NCT) and Important Cultural Properties (ICP). NCT are cultural properties that are unique and found locally, possessing outstanding historical, cultural, artistic and/or scientific value which is significant and important to this country and nation. ICP are cultural properties that are singled out from among the innumerable cultural properties as having exceptional historical or cultural significance, but are

not sufficiently outstanding to merit the classification of NCT.

The important aspect in the preservation of our cultural heritage is the awareness of the people in embracing their past, being proud of their own culture and accepting it as their own identity. There should be concerted efforts in educating the next generation to put their hearts and minds into appreciating and protecting their cultural heritage. They have to be reminded that priceless and irreplaceable assets should be protected for future generations. To ensure protection, there is an on-going commitment to preserve and sustainably manage these natural and cultural properties. This commitment involves not only local communities but national authorities as well. The national government has passed laws to protect and preserve the natural and cultural heritage.

Most developed countries had their own series of problems before they succeeded in preserving and protecting their National Treasures. They have a well-thought plan in preserving their cultural heritage. Once they have the financial resources, the most important thing is the effort and sincerity of the government in understanding that their heritage is the identity of its nation.

VI. MAKING CULTURAL HERITAGE ALIVE IN CONTEMPORARY PHILIPPINE CULTURE

Heritage Education

This is always my first answer in addressing cultural heritage preservation. Heritage studies, to be effective, must not only be taught in school, but also promoted in informal venues.

Heritage Legislation

Legislative and regulatory measures for protection and perpetuation of the cultural heritage of the Filipino nation at the national and local levels are essential. These should assure the survival of these heritage sites and their protection against development and change that will negatively affect the significance, outstanding common value, authenticity, and integrity of these cultural goods. And yet, it is not enough that legislation is in place. It is imperative to enforce legislation which truly affects how Philippine society appreciates and values its own heritage. Such legislation is not only effective but affective.

At present, we are on the threshold of attaining a beginning to this kind of legislation at the national level. While there are a number of municipal and provincial ordinances regulating heritage use (though within the end-all and be-all context of tourism), a newly proposed bill, the Philippine Heritage Law,

is being heard in the Philippine Congress. On April 21, 2008, a roundtable symposium was organized by the Heritage Conservation Society at the National Commission for Culture and the Arts (NCCA) to flesh out this bill so that the stakeholders of Philippine heritage will have a say. There have, of course, been heritage laws crafted by the Philippine Legislature since the beginning of the American civil governance of the Islands.

The Philippine Heritage Bill now pending in Congress intends to harmonize discordant Philippine laws and jurisprudence concerning the proper care and stewardship of the nation's cultural patrimony.

Community Advocacy

This is an essential component to making heritage alive in contemporary Philippine culture. Individuals in the community and the entire community itself need programs of advocacy for, and not just instruction about, cultural heritage. For starters, communities need basic orientation kits to be able to take concrete and effective action in protecting their patrimony.

Heritage conservation and management are fundamentally basic housekeeping. If the community and its leadership learn stewardship, then they can keep their house in order. Let no unsympathetic remodeling of heritage take place. Let no destruction occur. Do not let tackiness compromise the authenticity and integrity of heritage, but let what is genuine and integral be ensured, for these are what make value.

I believe today we are in possession of a mature insight on the conscientious stewardship of the cultural patrimony of the Filipino Nation. To summarize in a few words this very difficult and frustrating work of heritage conservation, advocacy, and sensitivity: we apply conservation measures today to our cultural heritage because it is a resource of knowledge useful for bridging the past and the future. As provocateur of memory, heritage contains the seeds of nation-building. Because heritage is knowledge resource, heritage contains everything that is essential in nation-building, on the condition that the resource content is authentic and integral—nothing fake, nothing fancy, and nothing fraudulent.

Samoa

Mainifo VILIAMU

Culture Officer

Ministry of Education, Sports & Culture

Problems and Needs for Cultural Heritage Protection and Restoration in Samoa

INTRODUCTION

Samoa is in the South Pacific, south of the equator and east of the International Date Line, in the Polynesian group. It is in the southern part of the Torrid Zone. The Independent State of Western Samoa officially changed its name to the Independent State of Samoa in July 1997. It covers nine islands and lies 2,600 miles southeast of Hawaii, 1,800 miles from New Zealand and 2,700 miles from Sydney, Australia. The total land area is 2,842 square kilometers. The population is estimated to have exceeded 170,000. Additionally, over 100,000 Samoans live and work overseas (in New Zealand, Australia, America), and contribute with their remittances to Samoa's economy. There are two larger islands, Upolu and Savai'i, with Upolu the most developed and densely settled, having an estimated population of 120,000. The capital Apia is located on Upolu. Savai'i is the largest island and the next most populated, with about 45,000 residents.

Samoa is an independent country with a parliamentary system of government incorporating some aspects of its traditional chieftdom structure. It is divided into 11 administrative districts with 362 villages, and until 1990 only Samoan men and women of chiefly status, who have been conferred with matai titles, could vote for members of parliament. Today, with universal suffrage, anyone over 21 years of age can vote, although only matais can serve as members of parliament.

Samoans are the second largest group of full blooded Polynesians in the world after the Maori of New Zealand. They are also considered one of the most traditional and conservative of the Polynesian societies, and resist outside interference including that of their own government in village affairs. Samoa is often called the cradle of Polynesia, and as such it maintains its culture and tradition by practicing "living culture." Many of its cultural activities are an integral part of everyday living. The people continue to maintain strongly the links of the extended family (aiga), and when they return to it, they come into safety net of the aiga. This guarantee of a place to fall back in Samoan villages, into the loving arms of the family, gives strength beyond the Western system based on individualism. In Samoa, or for that matter throughout the Pacific, village life is regulated at the village level.

Each family selects a suitable person to be a leader, or what we called a matai. That person must be conferred with a title, either as an orator or a high chief. He is the one to represent his family in the village council. Village councils have the legal right to impose fines and bans on villagers. The chief as head of an extended family also manages the family's customary land; customary land ownership covers 80 percent of Samoan land. Village councils make the rules for the villages to follow and obey. Sunday is a special day for all Samoans, both those living in Samoa and people who live overseas. Shops close, no one works, and people spend the day going to church in white clothes. Our people respect this day.

The way of living in Samoa has changed as the years passed. The people of Samoa have adapted to the European way of living in almost every aspect of life. However, the islands of Manono and Apolima have preserved the Samoan lifestyle of the sea. There are no cars on either island. Dispersed over the islands are several renowned graves and monuments, reminders of the past when the Manono fleets played a great role in Samoan politics and warfare. Many legends and oral histories are connected to the islands. Large, mostly uninvestigated ancient structures, including a star mound, are situated inland on the island of Manono. Despite the nine different islands of Samoa, one dialect is used throughout, and there is also unity in the culture. In olden days the people of Samoa traveled from island to island using *va'aalo*, or outrigger canoes. Nowadays we still use these when our people go fishing, and also when islanders travel from Manono to Apolima.

CANOEING IN SAMOA

People who first arrived in our country named Samoa the Navigator Islands, as we display very considerable skill in the construction of our canoes. The largest of our canoes are from thirty to sixty feet in length and capable of carrying from four to ten paddlers, beside a steersman. There is no regularity in the length or breadth of the planks. On one of the edges of each plank a ledge or projection is formed which serves to attach the sennit, and to connect and bind it closely to the adjoining one. The many pieces thus laboriously joined receive an application of gum from the bark of the breadfruit tree, to make them stick closely together and prevent leakage. On the outside the pieces are neatly joined and require close examination before the seams can be detected, and this perfection of workmanship is the more astoshing when it is considered that the only tools we use are a gimlet or piercer, and a piece of iron tied to a staff, forming a sort of adze.

These canoes are long and narrow, and their shape approaches elegance. They are decked fore and aft, as shown in engravings. When propelled with paddles our people sit two abreast, and the canoe is guided by a steersman. The seat of honour is on the forward deck, in the centre of which is a row of pegs, which are covered with the large white ovula shell, by way of ornament. The striking peculiarity of these canoes that they have a rising prow and stern and therefore the sail cannot be shifted without tacking the boat. Our usual fishing canoe is made of single hull with a small outrigger

to balance it. The trees from which these tree canoes are carved are gradually disappearing. There is need for our government to replant these native trees. Also, only handmade tools are used, fashioned by our own people. There are no electric tools to make our work easier. It takes four to five weeks to carve these canoes. No chemicals are used to prevent the wood from decaying, and the wood easily develops leaks, and our way of repair is to use gum from the breadfruit tree. Today our people and our government celebrate our Teuila Festival to attract more tourists to our country, and as part of the programme we have our canoe carving competition and our canoe raising competition.



VOCATIONAL TRAINING

The Ministry of Education, Sports and Culture conducts vocational training for selected schools twice a year. We select certain persons with skills at carving and weaving. Before the programme started some of our office went seeking trees for our work. These trees are not found on Upolu so we had to go to other islands and ask permission from the villagers to cut these trees. The Ministry of Education, Sports and Culture paid for the wood. It took our team four days to transport these logs to

the area where the training was held. Handmade tools were used by our trainers for their work. There are no chemicals used by our people to prevent the wood from decaying. They used the wood to carve our traditional kava bowls, used for preparing the drink at traditional ceremonies. After carving, we put the bowls in a bucket of water for two whole days before we can use them.



HOUSING IN SAMOA

The traditional Samoan house is constructed with strong wood from the forest and it is always round or oval in shape. The roof is covered with thatch, the floor is covered with white clean pebbles from the sea, and the blinds are woven from dried coconut leaves. Today, few examples of this kind of house exist, however in the rural areas traditional houses are a common sight, as they accommodate visitors and are used as meeting places for families. The ceremonial house, *fale* or *fale tele*, and those known as the *fale afolau* (long houses), portray construction techniques which justify them as superb works of artistic and architectural design.

FALE AFOLAU

The *fale afolau* is essentially an elongated house having straight sides and rounded half domes at either end. The length of the *fale afolau* is obviously dictated in large measure by the number of crossbeams (*utupoto*) which lie on top of the posts on the two sides, and which form the platform on which the central part of the roof is constructed.



FALE TELE

The *fale tele* has between one and three posts to which is fixed the vaulted roof. The roof height is dictated by the number of *so'a*, or cross beams connecting these posts to the roof. Commonly a *fale* will have seven different levels of *so'a*. In both types of *fale*, protection from the elements is provided by wall screens or blinds (*polasisi*). The *pola* are made from loosely plaited coconut leaf mats, which are raised or lowered at need on the outer side of the posts on the structure's circumference. When wind and rain blow into the *fale*, the *pola* are lowered on the windward side only. The *pola* are raised when the rain stops.

FALEO'O

These are always located at the back of the big house as a shelter for younger family members, or to house couples and all their belongings. This house is small in size, and is made of simple wooden members which can be replaced regularly.



TUNOA

This is a house made specially for the preparation of food. All cooking utensils are kept in there, and simple woods are obtained for building such a house. No blinds are required for this house.

PROBLEMS

A major problem is the disappearance of skills used to produce cultural heritage objects. Many of the well known master builders are now gone and their knowledge and skills have not been transmitted to the younger generations. Some of the people who hold knowledge about myths and legends are reluctant to impart these stories, because of reasons such as wanting to guard such things for themselves and their own offspring, or suspicions that people who conduct research will use their stories for economic gain. Family taboos which restrict people who are not family members from receiving the knowledge and skills have also contributed to the decrease in numbers of master builders, particularly for ceremonial houses. The problem is compounded by master builders who do not want to transmit the knowledge and skills to any of their family members, or by potential recipients who prefer to take on another profession. Furthermore, families are increasingly more interested in building European houses, leading to gradual loss of the following.

- Knowledge and skills regarding the artistic design of the Samoan house.
- The semantic domain of words related to house building.
- Rituals associated with house building.
- Building materials which are available locally, because people are no longer interested in conserving the trees normally used for building materials.

In spite of the heritage conservation policy, historical buildings have been demolished. The necessary strategies for the implementation of the project have not been adequately developed, and there is insufficient focus on awareness programs in the country to make people realize the importance of their tangible heritage. A related issue is the lack of an inventory of all old and new settlements in Samoa and information on why old settlements were abandoned. This prevents awareness of the historical and cultural value of old settlements. Some of the missionary and early church

establishments have been neglected by the churches themselves, and there has been no inventory of all church sites either.

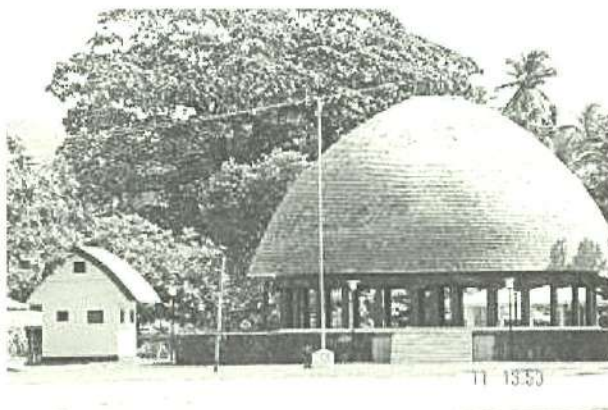
BUILDING MATERIALS

The building materials are mostly items available at hand. A vast quantity of sennit (braided coconut fiber), especially of *niu 'afa* (the ubiquitous coconut palm), is used in tying the whole structure together. The raised stone platform on which the *fale* is erected is traditionally covered with rounded sea pebbles which are cool to the touch and, with a sleeping mat thrown on them, make a remarkably forgiving mattress. Mats are put down on the pebble floors when people enter a *fale* to rest and/or meet. Most mats are 3 x 8 feet, and however many are required to cover the floor are put out. They are occasionally made of coconut leaves, but usually of pandanus leaves. They are rolled up and stacked on shelves or beams when not in use.

In the past a typical Samoan family was always an extended family which consisted of grandparents, uncles and aunts, who have their own small vernacular house, a *faleo'o*. Young ones who are fifteen years and downwards would sleep with grandparents in the family's big house, or *fale tele*. Maidens of each village have a special house for sleeping, and to accompany the *taupou*, or the daughter in the village. The young men of the village, not including the untitled married men, also have a special house for sleeping. Each family has a house for cooking, called *umukuka*. Families always assembled in the main house at times of meals. In the past, to own a *fale tele* or big house meant being rich. This is because hiring for its construction is very expensive, and the process takes a very long period.

ARCHITECTS

Architects are highly respected in our traditions. It is said in our oral history that less than six people were blessed by the gods to carry out the work of architecture in the whole of Samoa. This gift has been successfully passed down from generation to generations. When families consider it advisable to build a *fale*, they thoroughly discuss the matter and decide on the location of the house, and its size and shape. Thought is next given as to who they will employ as master builder, and when this question is settled the builder is approached and asked to undertake the work. Should he accept the undertaking, he is presented by the family with mats and food. The construction of a traditional Samoan house, like other artwork, requires knowledge and skill. However, some knowledge and skills are associated with *tapu*, the practice is done within the confines of the family. The *tapu* knowledge is under guardianship of the family god or spirit. The transference of this *tapu* knowledge to outsiders would incur the wrath of the protecting god or spirit.



CAUSES OF CHANGES TO SAMOAN VERNACULAR HOUSES

The changing style of shelters in Samoa is partly due to the frequent visits of tropical cyclones, as traditional Samoan *fale* can never withstand the strength of nature. The weakest part of a vernacular Samoan house is the roof. This was observed after every cyclone, and it was recognized that while most of these house roofs were destroyed, complete destruction rarely occurs. The plant used for thatching is also disappearing from the islands. Wood and sinnet used in house building are mainly destroyed by termites, often resulting in the rebuilding of the house. Maintenance of a traditional Samoan house or vernacular houses can be very difficult in terms of the short-term materials which are used for the thatch and blinds. The thatching is often renewed every three to four years, while the blinds are renewed every one or two years. To maintain the neatness and the beautiful appearance of the house, pebbles are also collected from the sea every year.

The special species of coconut which is used to produce sennit is also extinct; in addition, the producers themselves, who are always the elders, are now distracted by the influence of technologies which provide entertainment that draws their attention. This prevents them from practicing the braiding of sennit and passing down the knowledge and understanding to the younger generation.

MODERN SAMOAN HOUSES IN COMMON USE: A MIXTURE OF EUROPEAN AND SAMOAN STYLES

Because of the extinction of some of the materials used for building our houses, our people have adapted European materials for house building. We still use the traditional shape, oval and open, of the Samoan house, but the materials are all from overseas. The extinction of some of our native trees used for building houses, including the coconut trees for braiding the sennit, is one of the major problems facing the people of Samoa. It will take time to replant these trees. No chemicals are used to protect the wood from insects and termites. Handmade tools are used for building these houses.

HISTORICAL SITES, COLONIAL SETTLEMENT AREAS AND BUILDINGS

In response to a proposal made by the Department of Lands and Environment (DLSE), now known as the Ministry of Natural Resources and Environment, the establishment of heritage conservation in Samoa was formally approved. The main objective is to preserve the remaining heritage resources and protect them from demolition. There were a number of tasks given by the Cabinet at the time, as follows.

1. The establishment of a Heritage Advisory Committee with official representatives and functions.
2. Identification of four historical buildings for the project to begin with, consisting of:
 - The Supreme Court and Justice building
 - The old WESTEC building at Sogi
 - The customs building which has been demolished
 - The Head of State's Residence at Moto'otua
3. Identification of the implementing agencies and their responsibilities, the DLSE and Public Works.

The Committee, in its first meeting, generally determined for the buildings to be restored as follows.

- The Justice building would be solely for Court and Justice matters.
- The customs building would be restored solely for the Museum and Art Exhibition Centre, where the museum at the Justice building would relocate.
- The Head of State's Residence at Moto'otua would remain the Head of State's official residence.
- The privately owned old WESTEC building would be restored as the official administration for WESTEC, occupying both upstairs and downstairs, and would be leased for retail and commercial purposes.

In strengthening the task given to the implementing agencies and the Heritage Advisory Committee, funding and personnel assistance were requested of the German Consul and the Ministry of Foreign Affairs. Funds were necessary to hire an architectural specialist to assess the buildings. The Supreme Court building, under the Institutional Strengthening Project, was able to receive funds from NZODA. The Justice Department investigation of repair work for their building and the assessment were funded by the Samoa Land Corporation. A Heritage Conservation Policy was drafted, and its final version submitted to the Cabinet. This policy provides the framework for the conservation, preservation, use, allocation and sustainable management of heritage resources. It also seeks to improve approaches to heritage planning by ensuring that the preservation of our natural heritage is fully recognized and taken into account in the formulation and implementation of development programs. Colonial

settlement areas were mostly established in the Apia Town area, with few in Savai'i Island, and they are still sustained and maintained at present as government properties. These include the following.

- The old government area.
- The residence of Robert Louis Stevenson at Vailima.
- Schools such as Malifa compound, not only for the Education Centre and also primary and intermediate schools, Samoa College at Vaivase, Avele College at Vailima, and Vaipouli College in Savai'i Island.
- Hospitals such as Moto'otua and Tuasivi Hospital.
- The police stations at Apia and Tuasivi.
- Prisons such as the ones at Vaimea, Tafa'igata and Vai'a'ata in Savai'i.



These buildings from the colonial period in Samoa, which were first known as the DHPG store, were later named by New Zealand as the Estate Building, followed by WESTEC, when Samoa won her Independence.

MUSEUMS IN SAMOA

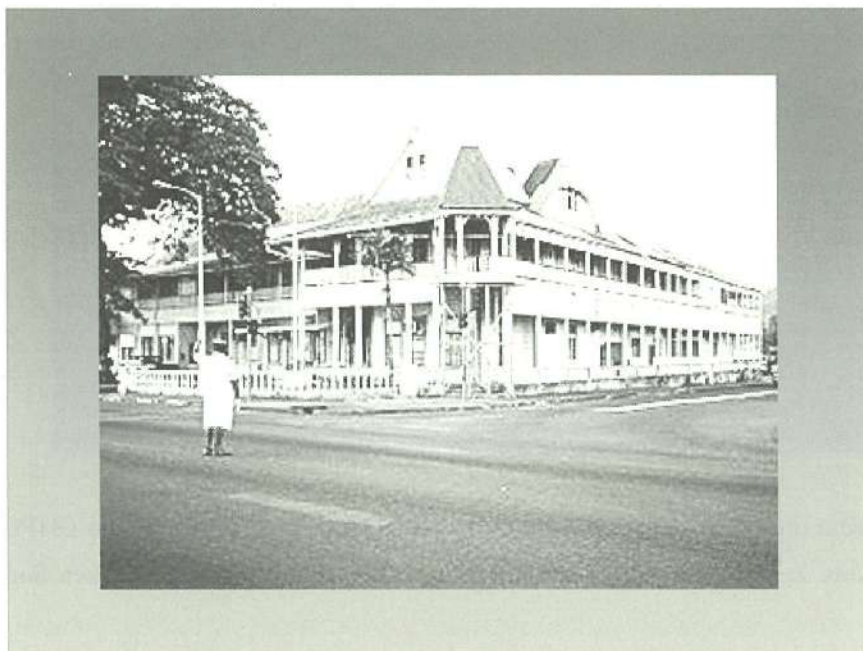
There are two museum-like institutions in Samoa. The Falemata'aga, Museum of Samoa, is a museum of the history, culture and environment of Samoa, run by two staff members of the Culture Section of the Ministry of Education, Sports and Culture.

The Robert Louis Stevenson Museum, the former villa of Robert Louis Stevenson in Samoa, is set up in the original style of his era to show his lifestyle, and is run by a nonprofit organization based in Utah, USA. The world famous author Stevenson lived the last years of his life in this Villa at Vailima. The place was later the seat of the German Governor, and the official residence of the Head of State

of Samoa. Now, the villa has been set up as a museum depicting colonial lifestyle. The mountain behind this villa is a natural reserve with botanical gardens and includes the path up to Stevenson's grave.

The Museum of Samoa is one of the few historical wooden buildings that exist today. This particular building was built in 1906 during the German colonial time (1900 – 1914). It was used as a central office for the German government. The British New Zealand Administration occupied the same building in the time of their colonial rule. When Samoa gained her independence in 1962, the first Samoan Prime Minister and his cabinet occupied the building until 1993, when they shifted to the new government building.

The Museum of Samoa was established on 27 May 1999 with the mission of preserving the country's heritage through collecting and displaying artifacts that depict Samoa's way of life, environment, history and culture, as well as information for visitors, students and Samoans who visit daily.



The work of building an extension for the court house to house the museum has been carried out. Records of the exact dates in which the construction of extensions took place have not been found, except for the recent renovation and repair work done to the building.

On 28 July 2008, the Museum of Samoa closed its doors to the public to relocate to its temporary location at Malifa, which is the MESC headquarters. This relocation came after the Cabinet approved the renovation of the Court House (PK (O8) 279). The Museum re-opened to the public on the 19 August 2008 with a revitalization project that aims to give the museum a facelift by developing new graphic displays.



PROGRAMS AND PROJECTS FOR THE PRESERVATION OF TANGIBLE AND INTANGIBLE CULTURAL HERITAGE

Our mandate originates from the development of cultural awareness and the need to upgrade the museum and archives of Samoa. The programs aim to preserve, promote, develop, safeguard, identify and to disseminate information about culture.

The core functions of the Culture Sector may be summarized as follows.

- Nomination of cultural sites for World Heritage List inscription
- Identification of Intangible Cultural Heritage (ICH)
- Identification of Tangible Cultural Heritage (TCH)
- Vocational training for the production of cultural artifacts
- Development of museum collections and archives of cultural objects
- Development of a national cultural policy
- Assisting the development of cultural industries
- Cultural mapping, to inventory for safeguarding indigenous Samoan heritage
- Audiovisual documentation of cultural programs
- Development of the indigenous language

ACHIEVEMENTS IN THE PRESERVATION OF SAMOAN CULTURAL HERITAGE

Achievements thus far with regard to the above-named functions are summarized as follows. Particular attention will be given here to the role of the Audio Visual Unit, subsequent to the establishment of the

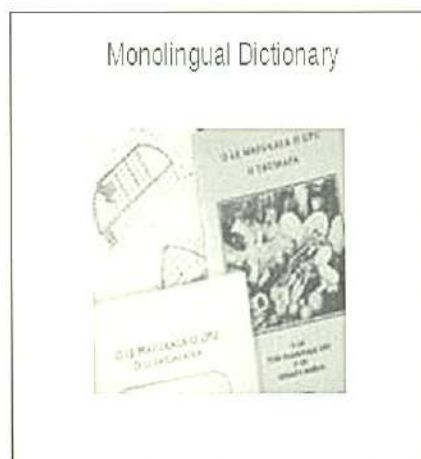
audiovisual documentation program and the procurement of audiovisual equipment with American aid, in the cultural preservation activities that have been carried out by the Culture Sector.

Nomination of Cultural Sites for World Heritage List Inscription

The key government agency for the coordination of this project is the Ministry of Natural Resources and Environment, in partnership with the Ministry of Education, Sports and Culture. The requirement by the World Heritage Committee is to provide evidence, in the case of either natural and cultural heritage, of outstanding universal value. Samoa ratified the Convention in 2003 and is currently awaiting approval for two sites already nominated to the World Heritage List. The task was carried out before the Audio Visual Unit was established, but we had been able to document some of these sites because of their importance in the collection of myths and legends located in those areas.

Traditional Language Revival and Research

Activities related to the revival of traditional language include research on groups of vocabulary belonging to various themes. In this thematic approach, mini dictionaries are developed for words related to particular traditional arts and skills. Currently we have been able to compile four mini dictionaries, covering house building, fishing and marine species, food production, and traditional games. Apart from this work is the development of a Samoan Monolingual Dictionary using a database called Shoebox, introduced by a linguistic expert from the University of the South Pacific, Dr. Robert Early. Specifically, we have been able to collect and define more than four thousand words. The important role of the Audio Visual Unit here is documentation of the custodians of each artwork during the time of the research.



Knowledge and Skills in the Visual and Performing Arts

A variety of programs have been conducted thus far, as listed below.

Vocational training for carving and weaving. This program is an ongoing activity, targeting youths and organizations, especially among the unemployed and those in government secondary schools. Since the establishment of the Audio Visual Unit, we have also been able to conduct five vocational training sessions in government secondary schools targeting students in their eleventh year, especially those who have been identified as perhaps not proceeding to higher academic achievement. These schools include Avele College, Leifiifi College, Vaipouli College, Amoa College and Lepa College. The Audio Visual Unit obtained footage of these training sessions.

Artists' symposium. The significance of this program is not only to create a friendly environment with the custodians of knowledge in arts, but also for the purpose of making an inventory of these custodians and encouraging the sustainability of their work because of the economic potential. The symposium was conducted for the first time at the beginning of the month of March this year, and will become a continuing program at unspecified intervals. Footage of this program is also available from the Audio Visual Unit.

Pacific Arts Festival. The last Festival of Pacific Arts took place in American Samoa from the end of July to the beginning of August last year (2008). Apart from artworks, the Samoa contingent was able to showcase performing arts and music by four groups. The principal audiovisual officer was also a member of the delegation to document Samoa cultural performances at the two week program of the festival. Footage is also available from the Audio Visual Unit.

Collection of folklore songs. Under the Ministry's performance measure, this activity requires the collections of traditional songs together with the notation of each song, and the identification of the composer or composers. The task was undertaken with the use of a dictaphone.

Preservation, Safeguarding and Promotion of Cultural Heritage

It is the aspiration of the Culture Sector that all types of tangible and intangible components making an important part of our cultural heritage be preserved and protected. Some of these include the following.

Myths and legends. This is among the ongoing programs of the Culture Sector. The Ministry of Education, Sports and Culture in Samoa is emphasizing strongly ways of maintaining cultural values as well as the preservation of Samoan culture in all forms. This includes research and collection of myths, legends, and old songs rich in Samoan vocabulary that are most likely to be forgotten in everyday conversation due to some traditions not being practiced anymore. When elders and orators of a village are interviewed about a specific oral history as part of this legend research, the identified legend sites are filmed and photographed. With the assistance of the Audio Visual Unit, we have been able to compile a collection of such myths and legends of Samoa. Currently, there are five

volumes already printed, with each volume containing twenty myths or legends, and they are entitled “The Samoa Ne’i Galo” or “Samoa Lest We Forget.” All the publications are bilingual, both in Samoan and English, which is the reason why the interest of universities and colleges as well as the public is drawn to them, for use as a tool for learning Samoan language and culture. Currently the sixth volume is in the stage of being translated into English. Again, footage of previous research is ready to be provided by the Audio Visual Unit as evidence of the task.



Inventory of cultural sites. Sites identified in this series also cover those sites considered priority areas for conservation.

In addition to these researches, old traditional songs are collected from different districts with the hope of recording and preserving them for future generations. These researches are being conducted continuously, and they have helped us greatly regarding new cultural information of which we were not aware. Through word of mouth (myths, legends, old songs), most of our history was captured before the Europeans introduced the written word.

Some of the elders did not want their oral traditions to be told, so it is a major problem for our research to urge these people to give us the information that we need. Some of the people who have the knowledge about myths and legends are reluctant to impart stories because of reasons such as wanting to guard such things for themselves and their own offspring, or suspicions that people who conduct research will use their stories for economic gain. The integrity of the information given is therefore sometimes questionable. Disputes between members of the local community regarding ownership of the site greatly affects the provision of information about myths and legends. The researchers have to make their own judgments as to who provides the true version, rather than recording whatever versions given and thereby let the readers, so to speak, write the agenda.

Historical mountains, volcanic mountains and mounds. Historical mountains, volcanic mountains and mounds are also important because they strongly link culture with natural resources and the environment. They also have captured the imagination of the people for generations. Historical mountains are also important because they become landmarks connected to some of the myths and legends.



Sri Lanka

Visaka LIYANA ARACHCHIGE

Conservation Research Officer
Central Cultural Fund



Problems and Needs for Cultural Heritage Protection and Restoration Activities in Sri Lanka with Special Reference to Wooden Cultural Heritage

From the beginning (birth) to the end of his life a man has two inherited assets, without which he could not survive in this world. One is nature and the other is culture. Culture has evolved as a result of the existence and efforts of our ancestors. This inheritance is called cultural heritage, which includes both tangible and intangible heritage. This is an effort to discuss the tangible cultural heritage protection/conservation of Sri Lanka, mainly of materials popularly used in the past. Timber was one of the major materials used in the past.

Only a small portion of historically and aesthetically valuable edifices and structures which are built by humans over time remain on earth today. Most of them are lost forever because of various natural and man-made causes.

SRI LANKAN WOODEN STRUCTURES

Having a rich culture from their past, Sri Lankans have inherited an enormous cultural heritage. Immovable tangible heritage includes great stupas, monastic complexes, image houses, *Bodhighara* (tree shrines), temples on pillars (*tam pita vihara*) etc., which are ecclesiastical buildings, and manor houses or *walawwas* (houses of the chieftains), *ambalama* (wayside rests where people can rest during a journey, free of charge), audience halls etc., as secular structures. In addition, being a European-occupied territory from the 16th century, we have inherited other architecturally significant historic structures which took in aspects of Sri Lankan styles and technology. These include houses, estate bungalows, railway buildings, churches, ports, towers, fortresses etc.

Most of these were constructed using stone, brick, timber, and wattle and daub. Among these, timber is the scarcest material at present due to deforestation. But even today, timber members are a most vital component of these structures, specially in the roofs. In Sri Lankan architecture as well, we can find many examples of extensive use of timber. Unfortunately, most of these roofs have been destroyed, except in a few buildings belonging to the Kandyan period in the early 19th century. Some of the roofs were made of bricks as vaulted structures. In other historic buildings we can only guess

the form using columns and beams and remnants of roof tiles found in the soil layers. Stone was used to insulate the timber members from dampness when in contact with earth.

There are many examples of the use of timber for building construction in the past in Sri Lanka.

Temple of the Sacred Tooth Relic, Kandy

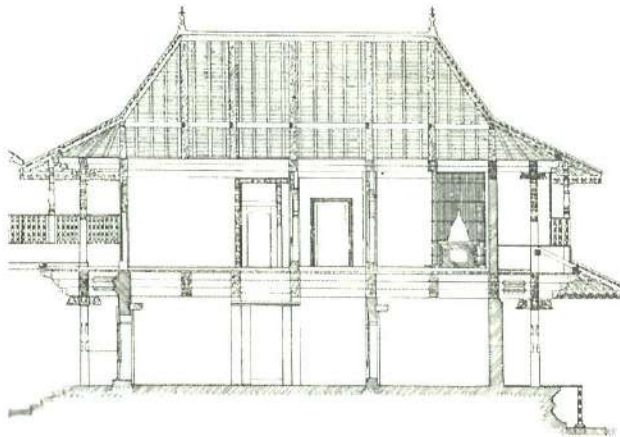


Figure 1: Longitudinal section of the building

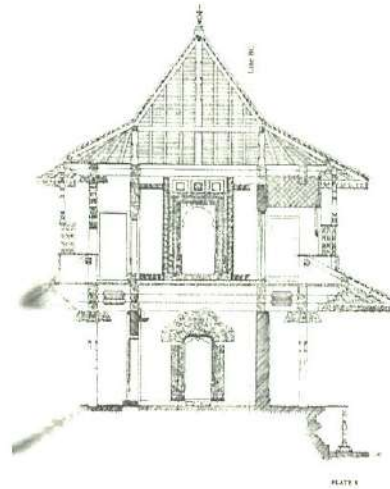


Figure 2: Cross section

The pillars support the heavy beams and a king post roof. The wall plates are elaborately carved. The roof projects considerably beyond the pillars.

Watadage, Polonnaruwa

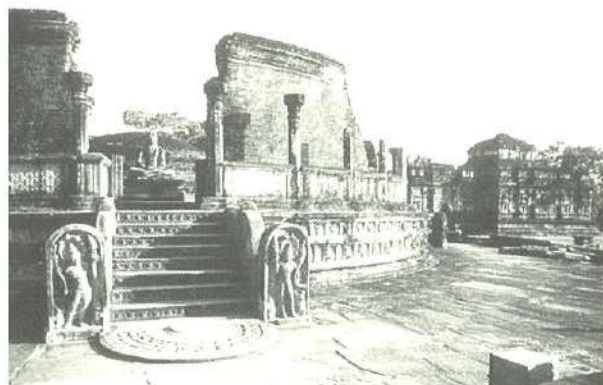


Figure 3: Watadage

This is one of the best examples of Sinhalese architecture, built in 12th-century Sri Lanka. The circular shaped building features magnificently carved stone decorations and images of Lord Buddha

in a seated position, facing the four cardinal directions. Circular sets of timber columns supported the timber roof, which is the only part missing. Every set of circular columns supported a set of timber beams that was interlocked to form a perfect timber ring beam. The innermost ring supported the steeply angled rafters radiating from the timber boss or “Kanimadala”; the other set of timber rafters which are at a shallower angle were supported by concentric sets of timber ring beams.

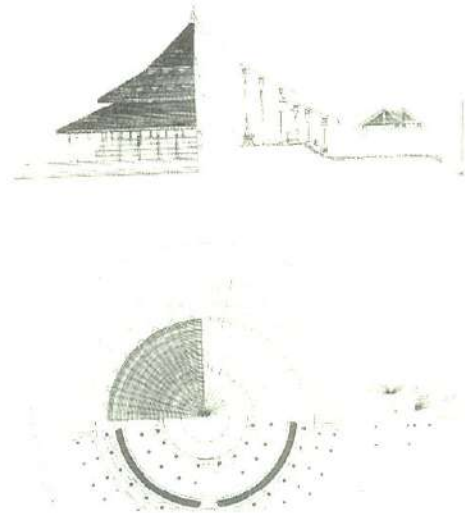


Figure 4: Conjectural drawing of plan, section and elevation of Watadage

Tampita Vihara

The entire superstructure rested on a wooden frame. The wooden frame rested on rock boulders or stone pillars. Wooden planks were placed over the top of the wooden frame. A small image house with one entrance was built atop the frame.



Figure 5: A temple on pillars

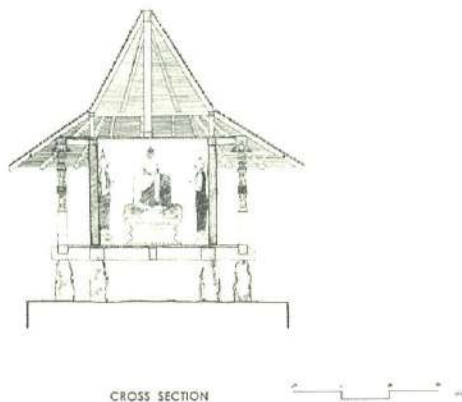


Figure 6: Section of a temple on stone pillars

Bridge, in Bogoda



Figure 7: Wooden bridge of Bogoda

The only wooden bridge left in the present day. The bridge was built about 600 years ago using wooden logs and planks.

Walawwa



Figure 8: A famous manor house

Separation of spaces was done using decorated timber panels.

Ambalama (wayside rest)



Figure 9: Karagahagedara Ambalama

Wooden planks are set on to the large timber beams, which are on stone pillars or foundation stones.

Protection of this vast heritage is a difficult task for a developing country like Sri Lanka, but there have been successful attempts at improving the condition of monuments. The Department of Archaeology of Sri Lanka is the main authority of the government responsible for protecting the archaeological heritage of the country. Under the guidance of the Department, the Central Cultural Fund has the opportunity to carry out conservation and restoration work on cultural heritage.

The edifices mentioned below have been conserved by the Department of Archaeology.

Audience Hall

This is an open colonnaded building. Timber is the major material. Structural timber columns support the heavy beams and a king post roof. The column plates are elaborately carved. The double pitched roof is laid with flat clay tiles.



Figure 10: Audience hall, Kandy

Embekke Devale

This is a wooden temple situated in Ambakka village. It was built in the 14th century by King Wickremabahu III. The temple is dedicated to the Lord Kataragama.

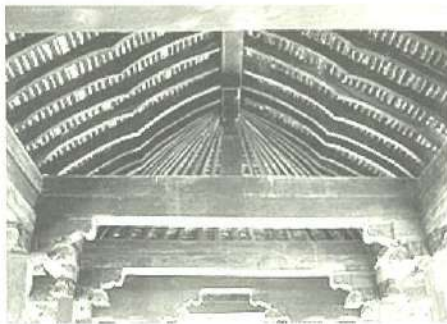


Figure 11: Roof detail of Embekke Devale



Figure 12: A motif of a timber column

An open colonnaded building is an extension to the shrine room dedicated to the God. It also serves as the drumming hall of the *Devala* (shrine of the God). This is one of the best examples of medieval timber craftsmanship on the island, with exquisitely carved motifs on timber columns.

PROBLEMS AND NEEDS

Gravity, man-made causes and natural weathering are the factors mainly affecting Sri Lankan wooden historic buildings. From the excavations of monuments, evidence has been found shedding light on their subsequent construction/restoration stages. After the original construction done at a very early period – some of such monuments date back to the 1st century BC – kings that followed made the monument bigger and bigger. The best examples are the great stupas in Anuradhapura. These were mainly in a ruined state up to the 1980s, and when excavations started, it was revealed that there had been several stages of construction/modification and restoration up to now. Thus, there is a strong reason to protect the past and carefully select the period where we could go without jeopardizing concrete evidence of different phases.

Every item on earth is affected by the pull of gravity. The weight this gives the item improves its stability and keeps it in place. Historical edifices also had the same effect, whether made out of timber, bricks, stone or any other material. Portions standing out from the buildings, or the overall edifice, are gradually pulled down and finally collapse to the ground. Preventing this destruction in edifices will extend their life spans. This is one of the major steps in the restoration process. The strength of the materials used should endure, and there must be steps to be taken to replace weakened parts.

Floods, landslides, lightening and winds are the most common natural disasters in Sri Lanka. Edifices of ancient Sri Lanka may be damaged by any of these natural forces. Much of the damage is never recorded. There is accordingly no proper methodology to measure the ruinous effects to cultural properties. The tsunami in 2004 destroyed a large amount of temples, *kovils*, churches and other culturally valuable structures in the coastal areas of Sri Lanka. Some have vanished completely. But the protective measures are not enough for those left in bad condition after a natural disaster. We have to develop a system to cope with these damaged monuments.

Sri Lanka is an island surrounded by the Indian Ocean, close to the equator. Thus the island has a tropical weather condition, with sunlight and rain throughout the year. This climatic condition has very bad effects on wooden structures. Rain elevates the moisture content of air, which causes many problems. An increase of fungal growth and swelling of timber members are present in the rainy season. Moisture content is also increased due to the wind, which carries a load of vapor from the surrounding ocean. Due to the sunlight throughout the year, the air maintains considerably high levels of humidity. Over 2500 - 5000 mm of annual rainfall occurs in Sri Lanka. Water in all its forms is damaging for timber.

The growth of the plants is also promoted by these weather conditions. Seeds of readily sprouting plants are spread by birds and animals. These kinds of plants may cause major problems for cultural

property. Here in Sri Lanka the *ficus* species of trees is the main readily growing plant, and it has been a threat to Sri Lankan cultural heritage for many centuries.

Animals such as rats, mice, worms and insects also damage the timber members. Fungi growth is also encouraged by the presence of moisture, moderate temperatures and poor ventilation.

Man is a great destructive animal as much as he is a great creator. So far our cultural heritage has been destroyed mainly due to his negligence, lack of maintenance, and disregard for the historic structures, etc. This is a major global issue when it comes to the conservation of cultural heritage. Ignorance about the value of cultural property is unfortunate for a nation. In Sri Lanka the people also neglect heritage in favor of modern ways of living.

High density of population at the sites of ancient cities creates another set of problems. Cities attract people. Lack of space and environmental pollution produce threats to cultural heritage. Anuradhapura has been a great city since the 3rd century BC in Sri Lanka. But it has a dense population along with a vast amount of monuments. Because the modern people of Anuradhapura face the problem of a lack of living space, they have built their dwellings among older edifices. This is a threat to both a monument and to the people living around it. Government institutions make rules to protect the monument, but the struggle of people to live nearby may cause damage to the monument. Removing all of the people from the sacred area is not practical. A dead city without people is not a practical solution for sustainable development. We have to cope with both people and the creations of our ancestors.

War destroys the efforts of generations in a minute. In these circumstances, beautiful monuments big and small get damaged or may be completely wiped out. Recently there are several instances where cultural heritage in the Asian region has been threatened, and on one or two occasions completely destroyed. The war in the North and North East, which has lasted 30 years, is also a destructive factor in Sri Lanka. Many of the edifices remaining from the past may be destroyed completely due to the bomb blasts. We can no longer see them. The value of culture is not taken as an important matter. Destroyed monuments which belong to the people have vanished within a moment and the creativity of our ancestors powdered into dust. Future generations will not be able to see them anymore or experience the materials and creativity. And this will be a start of a new era without roots.

In the protection and restoration of its cultural heritage, Sri Lanka has the benefit of its own legislation and it has also agreed with international charters. But for the moment we are in a serious situation of violation of these measures by the use of political power. From the earliest period Buddhism has had political support and Buddhist monks advised the king. A similar situation in the present has helped to negate the legislation and charters on several occasions.

Dendrochronology is a modern technology for identifying the age of timber through its growth rings. But Sri Lanka is a tropical country which has no seasonal changes. Thus, trees grow throughout the year, with no changes in the growth rings. For that reason dendrochronology can not be used for local timber. For Sri Lankan wooden cultural heritage, there is little chance of dating using timber.

Wooden cultural heritage is easily destroyed, and great pieces of work can be rapidly lost due to problems of usage as well. The best examples are structures known as Tampita vihara (temples on stone pillars) and Ambalama (wayside rests). Tampita vihara, smaller in comparison with modern structures, can be found at Buddhist religious institutions in rural areas. The image of the Lord Buddha is also small. The attitude of the people toward these has changed for various reasons, and these image houses are often deserted. Similarly, the wayside rests of ancient people are neglected and in danger of vanishing. Proper utilization of these spaces is rejected by the people. Simply restoring these timber structures will not help extend their lifespan. Reuse and proper maintenance are a must for keeping the original condition.



Figure 13: Kadugannawa Ambalama

The difficulty of finding suitable sections and species are serious problems for replacing timber members in Sri Lanka. Due to deforestation, suitable and matured tree species are rare and difficult to find. Large timber sections used in the past are not practical at present. So there is a scarcity of suitable sections for timber structures. Other resources and techniques must be used to overcome this problem. But their use causes problems in regards to the authenticity of the structure.



Figure 14: Insulation against dampness and insect attacks

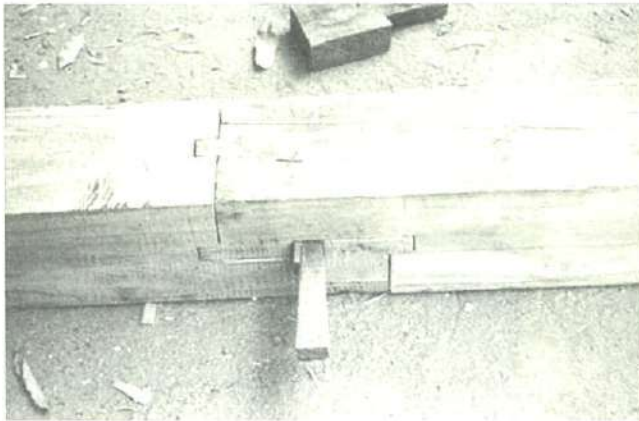


Figure 15: Joint with original and replaced timber sections

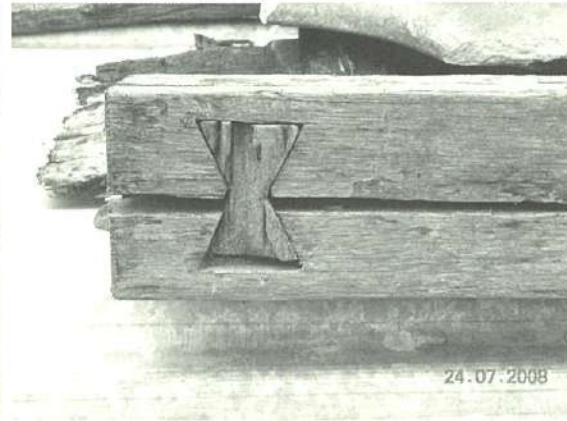


Figure 16: A traditional joint



Figure 17: Use of traditional techniques

According to John Ruskin, the present generation has no right to touch this heritage but must protect it for future generations. Various artifacts/objects made out of range of materials including ivory, clay, pottery, stone, bones, beads, etc., and architecturally significant structures, architectural ensembles and archaeological sites are included in the tangible cultural heritage. They have been created using materials suited to the purpose and climate. Thus to build his structures, ancient man used clay bricks, stone, wood etc., depending on their availability in his immediate environment. Timber was one such major material in his building exercises throughout the past.

The modern movement to protect cultural property started in the mid-19th century in Europe. Cultural heritage should be respected by all, because it bears a message from the past for the future.

In cultural restoration in Sri Lanka, many edifices have been saved from destruction. Among them are many stupas which we found as mounds of soil with vegetation on top. Similarly, the cultural heritage of timber which is headed toward destruction must be replaced or reproduced.

RESTORATION IN GALLE

Within the past ten years the Central Cultural Fund has conducted many conservation programmes. Galle is one of the major cities which developed under the Dutch influence. In the process of conservation we had to face many problems. In this section I will discuss the problems faced during the timber conservation of the Warehouse and the Dutch Reformed Church in the Old Town of Galle. The restoration programs were done with financial assistance from the government of the Netherlands.

Galle

Galle is the main city of the Southern province of Sri Lanka. It has a natural harbor. During the medieval period it was a fishing settlement. Unexpectedly, the Portuguese came and sought refuge for their ships in the harbor, and later built this fort to face resistance of the islanders. Their fortifications were not very strong. Only minimal traces of the early edifices of the fort remain in the Black Fort area.

The Dutch took control of the fort in 1640 after a battle, and they strengthened the ramparts and built more bastions after recognizing its strategic importance. They improved the fort and ramparts. They added seven new bastions facing the sea, while expanding its land area. Gradually the city began to develop and added more and more buildings. Within the fort there were dwelling houses, churches, bastions, a warehouse, and gunpowder houses too. They made a very tidy street system and a remarkable sewage disposal system which coordinated with the tides.



Figure 18: Galle Fort

Galle Fort

In 1795 British took over the control of the fort. They further improved the infrastructure facilities within the fort, and strengthened the fort to suit their requirements.

This fortified city, first established by the Portuguese and later developed by the Dutch, became one of the important ports in the East. Most of the present structures within it belong to the Dutch period, and the present extent of Galle Fort is approximately 82 acres, including rampart walls and bastions. Three sides of the fort are surrounded by the sea. The rampart wall is 1900 feet long and 30 - 40 feet in height.



Figure 19: A street elevation

This is the only fort surviving in Sri Lanka. Most of the dwellings had a mezzanine floor, which justified the high gabled roof. Simple doric masonry columns in the original design made for a cooler environment in the house. Later, the front colonnade was covered with lattice work, separating the

house from the street immediately in front. These houses are very long and narrow. The street on the back was used as a service road. Typical houses have central courtyards to get better ventilation and lighting conditions. Unfortunately these houses are rapidly disappearing due to a lack of maintenance and haphazard additions and alterations, resulting in deformation and deterioration of the historic fabric.

Galle Fort is a unique cultural heritage with dual parentage. Most of the materials were imported, but the craftsmen were Sri Lankan.

Later this unique setup was subjected to uncontrolled additions, etc., to adapt to 20th and 21st century requirements. To increase space inside the house for accommodating increasing numbers of occupants, courtyards were removed, houses edged to the street, and the lattice work replaced with walls. Some houses were converted into other uses. The original owners sold their properties to foreigners. Thus the architectural context of the structures has changed.

Identifying the importance of the Galle Fort, the Department of Archaeology declared it as a protected monument in 1974 under its Antiquities Ordinance. In 1988 it was inscribed on the World Heritage List by UNESCO. Some of the historic buildings within the fort identified as national monuments have been vacated since, to be adopted for more compatible uses.

Dutch Warehouse

The Dutch Warehouse is one such building, which was built in 1669, and vacated to use as a museum complex related to Galle and maritime archaeology. Earlier it was used for government offices belonging to the Education Department, Excise Department and the Land Registry.



Figure 20: Restored Dutch Warehouse

This two-story building is 175 meters long and 13 meters wide. Huge walls and columns support the gabled roof, which is covered with half round tiles. One side wall of the Warehouse is part of the rampart. Huge arches with typical timber doors still provide entrance to the fort. A beautifully carved VOC crest originally over the exterior archway had been removed to the interior wall facing Queens Street by the English, and their coat of arms with a lion

and unicorn fixed over the entrance in its place. Rubble, brick and limestone with mud mortar were used for the construction of the fort. The first floor of the building used timber planks as its floor,

supported by a set of strong columns and timber beams. The elegant stairways still lead people up and down the building.

At present it has completed 300 years of existence and has undergone various changes during its lifetime. The Dutch used this building to store food, ammunitions and trade goods, especially spices.

Government institutions housed in the building paid had no attention to its cultural value, and the building was neglected. Further, they have made haphazard additions to support their needs. The dumping of garbage increased the pathetic condition, and unused spaces became shelters for stray dogs and insects. As a result of damage to the roof, rainwater seeped through the walls. Dampness in the walls made ideal conditions for the growth of small plants, mosses, lichen, and fungi. The timber deck was subject to decay due to the presence of moisture. Though the strength of the walls was not affected, the plaster had disintegrated and was bulging out in many places. Walls were also exposed to high winds and salt action from the sea breeze, while people used them to stick posters and notices.



Figure 21: Damage to the wall

In the first stage of restoration process, government institutions housed in the warehouse were evacuated. After clearing the garbage, the building was fully documented. It was easy to recognize the later additions and they were removed.

Restoration work on the various parts of the structure proceeded as follows.

Roof. Originally the roof was covered with half round tiles on timber rafters and reepers. Later it was replaced by iron trusses, timber ceiling planks (*lunumidella*) and Calicut tiles. The original corbel plates, which supported the roof, were still intact on the walls. About 40 percent of the roof structure had deteriorated and water was seeping through.

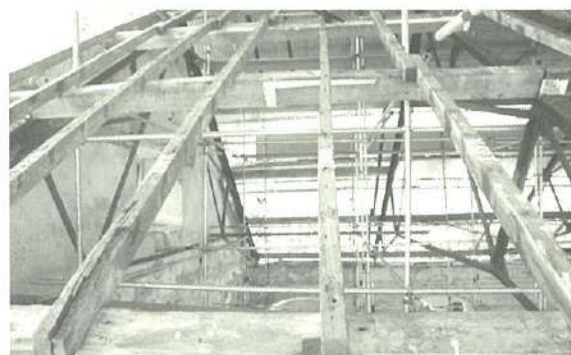


Figure 22: Numbered original timber members

The damaged roof and different types of covering were dismantled after recording and numbering. Damaged roof members had to be replaced. But large sections of timber of the right species were difficult to find, because currently available items are smaller than the originals. These had to be



Figure 23: Use of traditional tools

ordered specially through a timber company, and they were able to find the original timber species. Costs of these sections were accordingly very high. Treated timber and usable sections of the roof were re-used, and roof covering was limited to the original type, namely half round clay tiles.

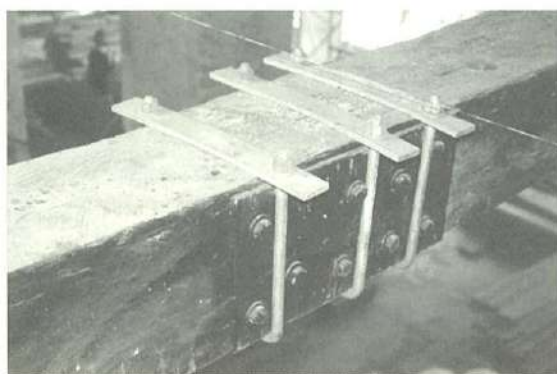


Figure 25: Strengthening

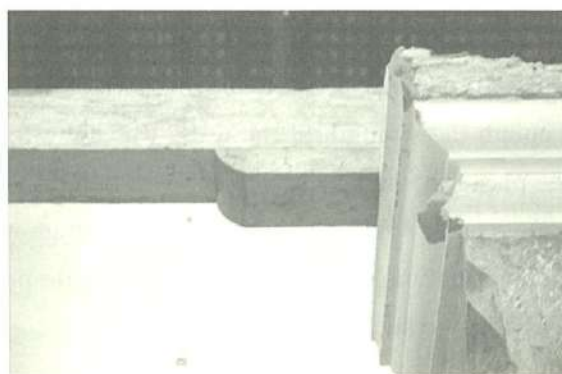


Figure 24: Replacing for deterioration

Timber floor. The same problem was encountered in finding timber for the floor. But the timber corporation again provided the solution. Numbered sections were removed, and structurally sound sections were joined with treated new parts. The original types of joints were used to join them.



Figure 26: Damaged timber floor

Doors and windows. Doors and windows were subjected to change during the use of building. Instances of replacing a door with a window or a window with a door were seen. These were identified at the beginning. Many of the damaged parts were removed and replaced with new members. Completely damaged items were duplicated in the original timber species.



Figure 27: Deterioration of a window



Figure 28: Replacing of decayed parts

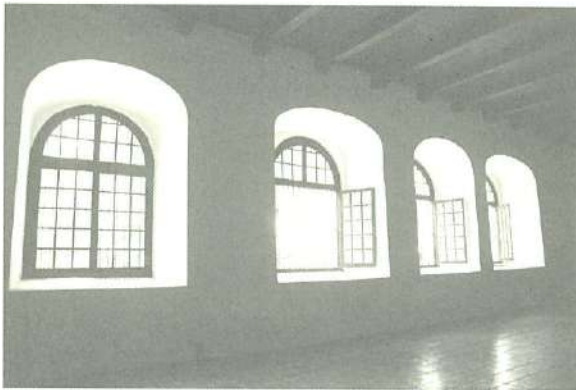


Figure 29: Restored windows



Figure 30: Dismantling of the door

Conservation of iron doors. At the entrance arch were two iron doors installed by the Dutch. Even after 300 years, the remains of the doors show the technology and creativity invested in them. The doors were made of timber and iron. One door sash required over 200 iron nails to fix the timber. The timber planks used to construct the doors are 2 inches in thickness and reinforced with flat iron, using iron bolts. The doors were hung on heavy pivot hinges, fixed to the columns

of wall of the warehouse, on both sides of the entrance road. Eighty percent of the wooden parts of the door were in good condition. Thickness of each door was 0.18 m, and 3 hinges were used to fix it to the frame.



Figure 31: Conservation of the entrance door

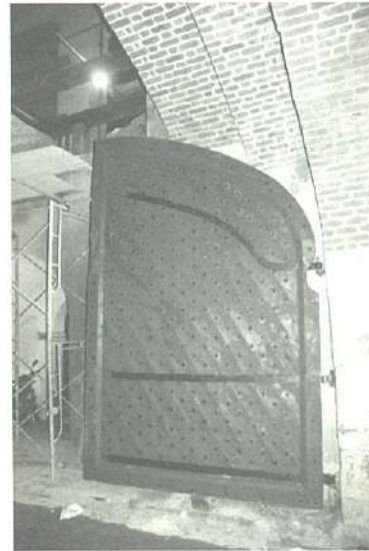


Figure 32: Entrance door after conservation

Staircases. There were two main staircases in the building. Timber was the major material used for them. These main stairs were inside the entrance tunnel, leading in both directions. Decayed parts of the stairs and the layers of lacquer were removed, and they were repainted using varnish.



Figure 33: Decayed wooden stair



Figure 34: Removing decayed parts



Figure 35: Stair after conservation

Conservation of the Dutch Reformed Church

This is one of the major structures in Galle Fort, built in 1755 to establish the Dutch Reformed religion. This significant edifice is the oldest among Protestant places of worship within the island. The church stands out as a religious and historic monument with unique architectural value. Anyone visiting this building would be impressed by the size and architecture of the church.

According to written records, this building is the first gabled roof edifice in Sri Lanka .



Figure 37: Church before conservation

Considering these assets, the church was to be conserved in the first stage of fort conservation. The Dutch Reformed Church was built in the form of a cross. The high vaulted ceiling, painted blue, was studded with gold coloured stars to depict the interaction of the church with heaven. The main timber species used



Figure 36: Church after conservation

for the roof was ironwood. In an earlier restoration (in 1925), seasoned teak was used due to the lack of ironwood. The stained glass windows, organ loft, and pulpit were the most notable features. The

church has a lofty interior without columns. Later, the British added a stained glass window to the west wall of the church. The thick timber doors and stained glass windows which provide light and ventilation are wide, high, and spacious in typical Dutch style. Permission was allowed to bury the remains of nobles in the graveyard of the church.

Pulpit or the preaching chamber is one of the finest pieces of furniture constructed in a hexagonal shape and is the only such model in Sri Lanka. It is made up of finely grained calamander with flowered satin wood panels. Carvings at the bottom show how beautiful this model is. The sounding board is massive and is suspended by iron rods and hooks. Around it are curved wooden tassels. The pulpit is built into the wall and is reached by a stairway served by a hand rail also made of calamander, which is typical of the style at that period. All these indicate the simplicity and sensitivity of the ancient Dutch for wood and carvings. (Franciscus, 1983)

There are several fine pieces of workmanship of timber visible in the church. Mainly ebony, *nadun* and calamander species were used. The conservation programme for the church started in 1999, due to its very bad condition. Prior to this time, no large-scale restoration had been done in comprehensive fashion to all parts of the church building, although in 1904 the roof was repaired and the outer walls re-plastered, and the roof repaired again in 1925.

Roof. The roof consisted two parts, namely the high gabled portion over the nave and the transepts, and the low lean-to roof over the toilet and the back veranda. Both were covered with half round tiles.

Roof timbers that had deteriorated due to rain water seepage were replaced using class I timber of identified sections, textures and character. The techniques and methods originally applied for the roof work were used during the restoration too. Dislocation of the half round tiles was the main reason for the seepage of rain water. This led to the deterioration of roof timbers and other elements within the church. The use of half round tiles for the roofs of buildings in the fort is one of the common causes of damage to these structures. But these tiles have a unique character which

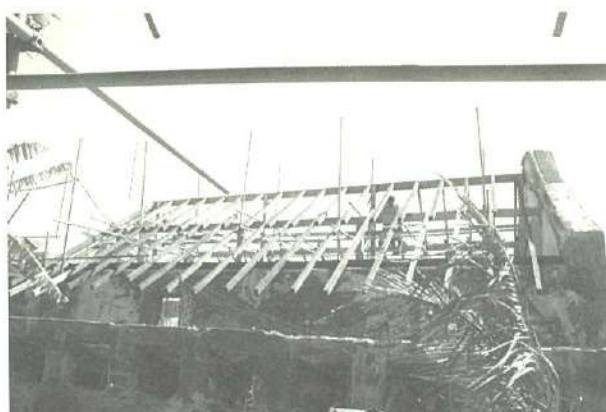


Figure 38: Ongoing conservation of the roof



enhances the ambiance of the building. Therefore, replacing the original tiles with other materials cannot be recommended. Accordingly, half round tiles with hooks were used to prevent slipping. The valance boarding was restored. Timber planks of the ceiling were replaced with class I timber similar in thickness, character, and width to the originals. The ceiling was painted sky blue reminiscent of heaven, according to the original design.

Doors and windows. The original timber work of the church had deteriorated. But to the some extent we could use parts of the doors and windows which were structurally sound. Window sashes with different pane sizes, used during earlier repair work, were removed and replaced with new sashes to match the original.

A major challenge was the identification of the design and the nature of the decorations in three large glass panels which were missing. An archival investigation took place for information on the previous panels before the restoration could be started.



Figure 39: Stained glass window

Furniture and decorative timber works. Badly damaged furniture has been repaired to the original condition, and placed in the original positions.

In the process of conserving the buildings we faced a number of problems. Ignorance of the people was a danger. It is possible to improve their knowledge on the subject, and raise their ability to improve it. Galle Fort is a special city with a unique character. But this uniqueness has been threatened by several problems. The built fabric of Galle Fort was subjected to a considerable amount of change which was mainly motivated by money. People sold their property and changed the spaces inside the houses for better living. And they added unfamiliar elements which are not compatible with the original design.

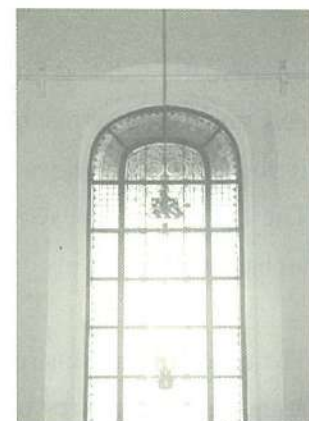


Figure 40: Conserved stained glass window

The Galle Fort conservation programme has been able to change this phenomenon and improve people's awareness about protecting national cultural heritage. Educational programmes and non-government organizing committees are raising the awareness of people who live within the fort's limits. Now there is a new generation which tries to protect the past while living on it. Sometimes financial help for those in need of it has been arranged. A gradual increase in understanding can be seen among residents about repairing damage to the built fabric, and they will give their full support for future restorations too. To my mind it will be very impressive for visitors both local and foreign to be able to sense the entire fort.

Restoration of the Dutch Reformed Church and the Warehouse encountered problems in their conservation, mainly related to timber. These damaged buildings were on the verge of losing their wooden creativity to natural and man-made causes. In the first stages of proposals, we had to imagine the missing parts of buildings which were made out of timber. Then there should be the correct sections, properties, and species used to suit the original. The main problem of finding suitable species and correct sections was the considerably high cost. Being a developing country, Sri Lanka can not use its full resources to protect cultural property. Accordingly a proposal for aid was made to another party. The Royal Netherlands Government agreed to fund the cost of restoration. Finding suitable species of timber was still very difficult due to the deforestation in Sri Lanka. We have no proper supply of timber which is suitable in restoration works. And the craftsmanship for those works is limited due to the lack of support for the workers. Older craftsmen are few, and their work ability diminished. Having used only new technology, the young generation in this field lacks knowledge of ancient tools. So we cannot use them for restoration either, because we cannot allow practice or training sessions on national monuments. Incorrect craftsmanship may damage the monument or cause it to collapse.

Galle Fort is very populated area. Handling of large sections was a difficult task for this reason, too.

Finally, the Central Cultural Fund achieved very impressive results for the benefit of future generations. These fine buildings are not going to be kept aside, but are to be put to proper use. The Dutch Reformed Church is very functional, and local and foreign visitors enjoy this building thoroughly. The Dutch Warehouse is going to display its vast resources on the sea, as a museum for maritime archaeology.

The experience of this restoration process has been highly valuable to the Central Cultural Fund. Now its mission is to carry out its national duty in the North and East, where it will restore the cultural properties damaged by the war.

Thailand

Pongthorn HIENGKAEW

Conservation Architect

Monument Conservation Research Group

Office of Archaeology, Fine Arts Department

Ministry of Culture

Problems and Needs for Cultural Heritage Protection and Restoration Activities in Thailand

1. Introduction to Thailand and Thai architecture

Geography

Thailand is located in Southeast Asia, and has an area of 513,115 km². The climate is tropical, influenced by monsoons from the southwest which produce a rainy season averaging five months a year. There are four main regions in Thailand, with characteristics as follows.

1. Northern. The natural features are composed of mountains and forests.
2. Central. There are several rivers and canals, therefore, this part is lowland created by sediments from rivers, and suitable for agriculture.
3. Northeastern. The land is high and dry.
4. Southern. Characterized by mountains and coasts, with heavy rains averaging seven or eight months a year.



Map of Thailand

History

Pre-historic period. There is archaeological evidence indicating that people were living and developing their culture since 2000 BC in Udon Thani, a province in the northeast. This is known as the “Ban Chieng Culture.” Other archaeological evidence besides Ban Chieng shows habitation from the same period on, until the historic period.



Ban Chieng pottery

Historic period. The historic period is considered to begin with the arrival of Indian civilization brought by merchants, and the diffusion of Buddhism, which expanded around the 6th-7th centuries AD.

Dhavaravati period. This period, from the 7th to the 11th centuries, saw significant developments in art, influenced by the Gupta and Pala art styles of India, and showing Buddhism to be the principal religion. In this period, enormous religious monuments in many cities gave evidence to the religion's spread across Thailand, showing the centre in Nakhon Chaisri district, Nakhon Pathom province, which is in the central part of Thailand.



Khao Klang Nok Sri Tep ancient city, a monument of the Dhavaravati period

Period of Khmer art influence. In the 12th-14th centuries, there was influence from the Khmer art of Cambodia. This came together with the political influence and the Hindu religion, resulting in the

acceptance of political and religious domination from Cambodia. These influences replaced the former culture and religious institutions from India, of the Dhavaravati period.

The influence of Khmer art spread and covered the central and northeastern parts of Thailand, with the main evidence seen in Lawapura, Lop Buri, a province in central Thailand, and in Bhimai, Nakhon Ratchasima, a province in the northeast.



Prasat Bhimai, a monument showing the influence of Khmer art

Sukhothai period. In the 14th-15th centuries the influence of Khmer art declined. The kingdom of Sukhothai arose in a province in now located in the upper part of central Thailand.

In the Sukhothai period, Theravara Buddhism was the principal religion. This period is a noteworthy time in Thai art, culture, and literature. Furthermore, this period was the model for arts developing in the next era.



Sukhothai Historical Park

Ayutthaya period. In this period, the Ayutthaya kingdom was the centre and was territorially strong, absorbing the kingdom of Sukhothai in the 15th century. The Ayutthaya period continued to the 18th century, demonstrating growth in commerce, agriculture, and social institutions. The early art style was a mixture of Khmer and Thai art styles. Eventually, art in the Ayutthaya period developed its own style.



Wat Chaiwattanaram
Ayutthaya Historical Park

Rattanakosin period (Bangkok period). This started in 1782, and continues until the present. The art style began as a continuation of that of the Ayutthaya period, and has developed its own style in some areas. From the mid-19th century, the art styles of western countries were introduced. Therefore, the style of the Rattanakosin period changed over time, and became a mixture of western and traditional styles.



Ubosod Wat Suthas and
Grand Palace, Bangkok

Architecture

Thai architecture shows own style, and can be divided into three groups.

1. Architecture for religious structures, for example, *ubosot*, vihara, *kuti*.
2. Architecture for the royal institution, for example, Thorn hall, Royal mansion.
3. Architecture for ordinary persons, for example, houses.



The differences in these architectures can be classified by styles, materials, decorations, and symbols.

The general factors influencing the shape of Thai architecture may be summarized as follows.

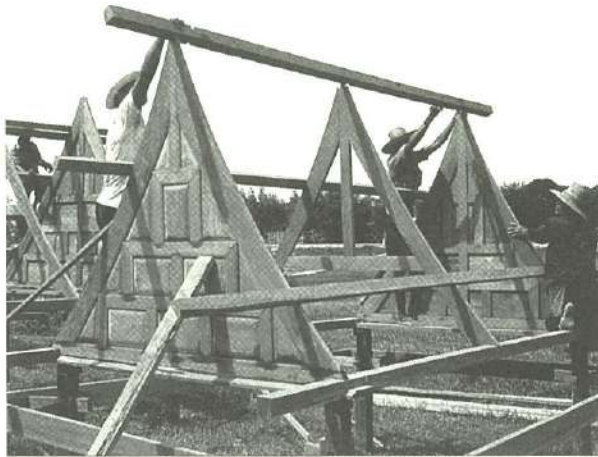
1. Building materials. The main materials are wood and brick. Wood is used in most buildings for at least part of the structure, such as roofs and foundations. The popular wood used is teak. This wood has good quality and beautiful lines, is light in weight and not favoured by termites.
2. Geography and environment. Since Thailand is in a tropical region, extended sloping roofs for blocking sunshine and rain are usually designed. Dry leaves are commonly used as roofing material because air is easily ventilated and little heat is absorbed, thus keeping the house cool. Further, houses are raised high to avoid flooding. Structures and walls are built for ease of assembly and disconnecting for restoration.
3. Customs and faith. Thai architecture is related to the religious faith of its designers or users. Differences in religious faith are always incorporated into architectural aspects, for example, in the direction of a building, its planning, the choice of materials, size, and proportions.

Besides these three sources of influence on Thai architecture, external factors have also affected Thai architectural designs. Indian art exerted influence on pagoda designs in the Dhavaravati period. Khmer art affected the planning of religious buildings and the shape of stupas in the Ayutthaya and Rattankosin periods. Chinese art influenced architectural designs in the early Rattanakosin period. But these external influences have not directly affected Thai architecture, since Thai architects have drawn upon them in accordance with Thai tastes to create their own characteristic style.

Use of wood in Thai architecture

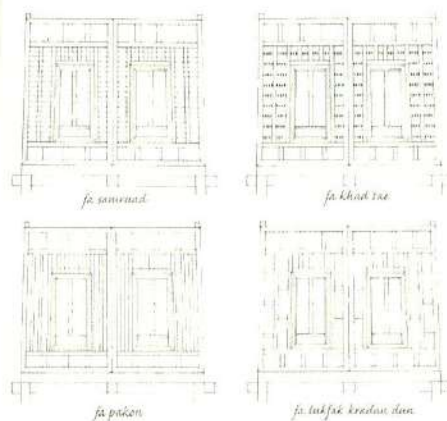
Wood is used throughout Thai architecture, for roofs, foundations, as well as for structural and ornamental components. Wood utilization can be categorised according to the following groups.

1. **Roofs.** Components of roofs in Thai architecture made from wood are as follows.
 - Roof tiles. Wooden roof tiles are seen in the northern part of Thailand.
 - Roof structures. The structures of Thai roofs are composed of laths, battens, purlins, rafters, ridge poles, roof posts. These members are made of wood and are connected to each other to form the frame of the roof. They are bound together with wooden nails, wooden joints, and Chinese metal nails.
 - Gable panel. On religious buildings and royal constructions, this component is usually decorated with woodcarving.
 - Roof ornaments. In Thai architecture, there are several roof ornaments such as *chaofa*, *bai-raka*. Most roof ornaments are on roofs of religious buildings and royal constructions.



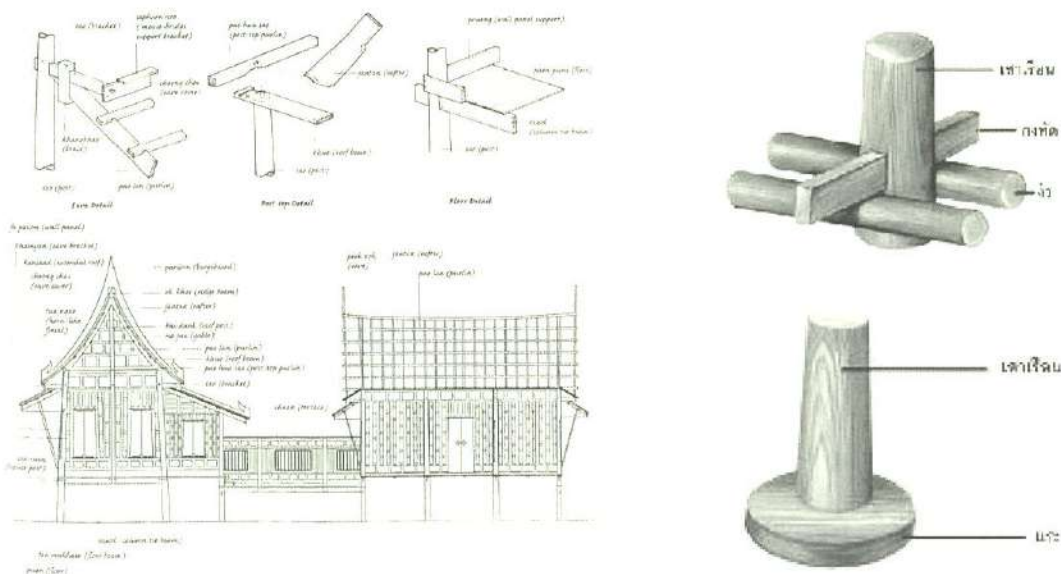
Roof structure of a Thai house

2. **Floors.** The components of floors in Thai architecture are the frame and base. The frames consist of beams and tamarind-pod-shaped clubs.
3. **Panels.** The partitions of palaces, mansions, cells, and houses are made of several sheets of wood connected with wooden nails.



Types of Thai house panels

4. **Doors and windows.** Doors and windows are made from large pieces of wood, and have wooden handles in the centre in the vertical direction.
5. **Foundations.** These divide into two types.
 - Foundations made with wooden poles are the structures of wooden buildings. The foundation consists of the poles and the supports on which they stand.
 - Foundations of structures with load-bearing walls are slabs, cut from a log or whole logs, used as grids before making the walls.



Structures of the Thai house and examples of wooden foundations

2. Organisation and structure of historic monument conservation activities

In Thailand, in the past, protection of ancient monuments and objects was specified under the Tra Sam Duang Law, with the earliest rule issued in the mid-15th century being a law specifying protection for objects and buildings of Buddhism, together with their punishments. Besides the Tra Sam Duang Law, there is evidence in the annals from late in the Ayutthaya period (18th century) about the moving of a Vihara and a giant Buddha image because of flooding. This was a method of protection and was done according to customs supported by the king. After the Ayutthaya period, there was influence from western countries. Methods of protections of ancient monuments and objects have gradually changed. In the year 1911, the Fine Arts Department was established to maintain and protect Thai cultural heritage and customs, both tangible and intangible.

Fine Arts Department

The Department is in the Ministry of Culture and takes responsibility for cultural heritage protection, rehabilitation, continuation, distribution, and development. The divisions and offices of the Department, and their areas of responsibility, are as follows.

1. The Office of Archaeology and Office of National Museums supervise work in archeology, ancient monuments, and museums.
2. The Office of Traditional Arts and the Office of Architecture supervise work in the traditional arts and architecture.
3. The Office of Literature and History, the National Library, and National Archives supervise the literary field and documents.

4. The Office of the Performing Arts supervises work related to music and theater.
5. There are 15 separate local offices giving regional representation for the Fine Arts Department.

Protection and conservation of ancient monuments are an important tasks of the Fine Arts Department. In each fiscal year, the department spends about 30-50 percent of its budget for ancient monument protection and conservation. The main agencies taking responsibility for the protection and conservation of ancient monuments are the Office of Archaeology and the local offices of the Fine Arts Department.

Office of Archaeology

This office is responsible for archaeological work and the ancient monuments in Bangkok. In addition, it provides academic assistance and consultation to the local offices of the Fine Arts Department. There are five major working groups in the Office of Archaeology, as follows.

1. The Archaeological Research Group takes responsibility for archeological investigations and work.
2. The Monument Conservation Research Group takes responsibility for ancient monument conservation.
3. The Painting and Sculpture Conservation Group takes responsibility for the conservation of paintings, stucco, and sculpture.
4. The Ancient Monument Registration and Information Group takes responsibility for the registration of ancient monuments.
5. The Underwater Archaeology Group has specific responsibility for archaeology in rivers and seas.

World Heritage Sites in Thailand include the Historic City of Ayutthaya, the Historic Town of Sukhothai and Kamphaeng Phet, and the Ban Chiang Archaeological Site. This heritage is under the care of the local office of Fine Arts Department in each area.

Supervision of ancient monument restoration activities

Restoration work on Thai ancient monuments is under the supervision of the Fine Arts Department. Any process involving ancient monuments, such as restoration or adjustment, must first seek permission from the Department. The activities of either the Fine Arts Department or the private sector must be proposed in detail to the relevant authority in the Fine Arts Department. If the details are approved, the activities may proceed. The activities from beginning to end are under the control of the Fine Arts Department.

Legislation and regulations

The Fine Arts Department is the government authority having responsibility for protecting and conserving cultural heritage. In these operations, the Fine Arts Department operates under the authority of the Act on Ancient Monuments, Antiques, Objects of Art and National Museums, drawn up in 1961 and amended in 1992, and the Regulations of the Fine Arts Department Concerning the Conservation of Monuments (1985). The contents of these legal measures are as follows.

1. The Act on Ancient Monuments, Antiques, Objects of Art and National Museums (1961, amended 1992), is divided into five chapters:

- Chapter I: Ancient monuments
- Chapter II: Antiques and objects of art
- Chapter III: National museums
- Chapter IV: Archaeological fund
- Chapter IV BIS: Suspension and revocation of licenses
- Chapter V: Penalties

Chapter I of the act deals with ancient monuments. The definition of an ancient monument is immovable property which by its age or architectural characteristics or historical evidence is valuable in the fields of art, history, or archaeology, and shall include places which are archaeological sites, historic sites and historic parks.

Besides maintaining control over such ancient monuments, the Director-General of the Fine Arts Department has the power to do the following.

- cause any ancient monument as he thinks fit to be registered by means of notification in the Government Gazette
- allow particular persons permission for construction and building, according to the law on the control of building construction, within the compound of an ancient monument registered by the Director-General
- grant permission to repair, modify, alter, demolish, add to, destroy, or remove an ancient monument or its parts, or excavate within the compound of an ancient monument

2. The Regulations of the Fine Arts Department Concerning the Conservation of Monuments (1985) provide standards for ancient monument conservation activities. The conservation activities must be correct in the technique, and suitable for social customs. These regulations were written in accordance with the Act on Ancient Monuments, Antiques, Objects of Art and National Museums (1961, amended 1992). There are 21 items in this regulation, which can be summarized as follows.

- Item 1: The name of the regulation
- Item 2: Notification of the date of enforcement
- Item 3: Meaning and definition of conservation methods for ancient monuments
- Item 4: Regulations and methods for initiating conservation activities, such as “must

survey the present conditions of ancient monument physically, in documents, and values in order to decide the direction of conservation”

- Item 5-20: Regulations and methods for conservation, for example:

Item 7: Superb ancient monuments must maintain or increase their stability as possible.

Item 16. Living monument conservation when necessary may restore by structural improvement or a building supplement that is as suitable as possible. The new supplement must harmonise with the old and not destroy the value of the old.

- Item 21: Director-General of the Fine Arts Department has authority and must control methods of conservation according to the regulations

3. Problems and needs in protection and restoration of wooden monuments in Thailand

In Thailand, most ancient monuments are made from wood. Wooden structures are at risk of change or destruction from natural, accidental, and human factors, because wooden materials have limited age. If protection or restoration is improperly conducted, the value of the ancient monument may be destroyed.

Protection

Conservation is the best way to maintain the original status of ancient monuments, since this method can protect the fundamental conditions of the monuments from destruction, physical change, or ruin. Problems and needs regarding the protection of monuments may be summarized under the following topics.

1. Protection of ancient monuments by local governments. According to Thailand's 1997 Constitution, local governments have authority to protect and maintain cultural heritage in the area they administer. However, some local governments lack sufficient staff and knowledge of the laws about cultural heritage protection necessary for administering their cultural heritage.
2. Need for sufficient basic knowledge of multiple aspects of ancient monuments. This is necessary so that the planning, administration, and resolving problems in the protection of the monuments can proceed correctly and without delay.
3. Rapid change in the physical, social, and economical environments in Thailand. These changes cause problems affecting ancient monuments that we cannot avoid. For example, geographically Bangkok is located on a plain. In the construction of new buildings, the land is continually filled up with soil. Consequently, ancient monuments are lower than modern buildings, and are subject to flooding which leaves their structures in ruin. Furthermore, the

humidity is high, leading to infestations of termites.

4. Need for protecting wooden ancient monuments from natural disasters and fires. We need knowledge, practice, and equipment installed in the monuments for fire protection. We also need examination of that equipment regularly.

Restoration

In Thailand, restoration of ancient monuments is conducted by a limited group of personnel. The Fine Arts Department is the principal institute working in this field. The Department's staff is comprised of graduates from universities and colleges, but there is no curriculum in restoration for students. Therefore, the staff must learn and study through conducting restoration work. Besides the staff of the Fine Arts Department, there are a small number of local craftsmen who still have appropriate academic knowledge of ancient monument restoration. The problems and needs of restoration work may be summarized under the following topics.

1. Shortage of suitable wood for restoration. In the past, we had a surplus of teak in our forests, so it was used to build ancient monuments, royal palaces, and houses. In the present, however, there is a lack of teak. Therefore, some teak used for reconstructing ancient monuments is ordered from overseas. Other teak comes from within the country, but the quality is lower and the cross sectional area smaller when compared to teak used in the past. Most of the teak in the country is 20-30 years in age. The situation affects restoration, as we cannot use the same sizes of the teak as in the past. In addition, in restoration teak is sometimes replaced with other woods. These factors force us to change the restoration technique according to nature and size of woods that can be procured for the work. Furthermore, the low quality of teak either from overseas or within the country causes rapid deterioration. This increases the frequency at which ancient monuments need to be restored.
2. Need for correct essential knowledge of restoration. In restoration, information about ancient monuments is necessary for the survey, design, determination, and restoration stages of conservation work. Complete information needs systemic collection, study, investigation, analysis, and storage. These require co-operation from personnel in every field of work. Once compiled, complete information can be applied to further work: for example, information on wood deterioration, information on engineering solutions, studies of materials through scientific methods.
3. Need for skilled craftsmen. Important factors in wood restoration of ancient monuments are, in addition to material maintenance, the original style and building techniques. In Thailand, those having skill in the original techniques are craftsmen. They have knowledge of skills in architecture, engineering, artwork, properties of wood and the materials used together with wood, and other factors related to the work, and they can accordingly provide a good quality building. In Thailand, there is no curriculum to produce craftsmen. In each family, senior

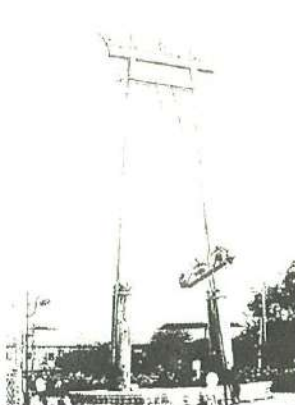
generations teach their juniors who want to be craftsmen, through practice over long periods of time. Therefore, there is a deficiency of good craftsmen in restoration work.

4. Case study in wooden monument restoration: Sao Ching Cha (Giant Swing), Bangkok



History of the monument

Sao Ching Cha (Giant Swing) was built in 1784 in the reign of King Rama I, in the Rattanakosin period. It was built in the center of Bangkok at that time, according to the plan of the newly established capital. Furthermore, according to the Brahman faith, the highest Brahman gods Siva and Visnu visit human in the world in every New Year. The Giant Swing was used for Triyumpawai-Tripawi, the Brahman New Year's Ceremony. Therefore, the royal house arranged that the ceremony be held for the country, to celebrate the visit of the highest Brahman gods and bless the nation with prosperity and wealth.





Triumpawai-Tripawi, Brahman
New Year's Ceremony

Major restoration history

- 1784 Built in the reign of King Rama I
- 1818 Damaged by lightning in the reign King Rama II
- 1920 First restoration, replacement of poles and ornaments in the reign of King Rama VI
- 1947 Accidental fire from incense, left by people paying their respects to monument in the reign of King Rama IX, the present king
- 1970 Second restoration, of wooden members in serious condition from humidity and termites. Each pole was comprised of three logs.
- 2004 Deterioration of the Giant Swing prompted a new restoration

Architectural characteristics and conditions

The Giant Swing is an example of Thai architecture of the Rattanakosin period. The entire structure is made from teak, consisting of two principal poles, four supporting poles, and an ornamentally carved wooden crosspiece on the top. The height from base to the top is 21.15 metres. Each lateral support consist of a principal and two supporting poles, which are connected by iron bolts and rings.

The conditions of deterioration were found to be as follows.

- Deterioration of the poles' cores because of humidity and termites
- Worsening at the areas of the joints of each log
- Rusted iron bolts and rings because of humidity
- Plant growth in cracks and the outer layer of the wooden poles because of humidity



Deterioration of the wooden structure

Restoration processes

The project was carried out through cooperation between the Fine Arts Department, the metropolitan government of Bangkok, and other organizations. The method of restoration involved replacing the wooden poles entirely, due to their deterioration. The problem faced by the project was in finding suitable replacement poles. Therefore, the project was divided into two phases.

Phase I: Increase stability and conduct temporary maintenance of the old condition. Phase I was necessary because no new wooden poles in the requisite 25 m length had yet been located. The details of restoration may be summarized as follows.

- Removing and replacing the deteriorated wooden fabric and outer layer
- Grouting the deteriorated pole cores with epoxy resin

- Changing the iron bolts and rings between lumber sections in each pole
- Increasing the number of iron rings and pressing with carbon fibre
- Painting



A 3D image of the iron rings and carbon fiber pressing positions, Phase I

Phase II: Replace the entire structure and ornaments. In 2006, material for the new poles was found. This was from six teak trees, each aged 80-120 years. The trees showed the size needed for restoration. They were in Phrae, a province in the northern part of Thailand, and the local community allowed the government to use the trees for the Giant Swing. Therefore, the government planted nine teak trees to replace the six trees. In addition, teak tissue cultures were made for one million teaks for restoring the Giant Swing in the future.

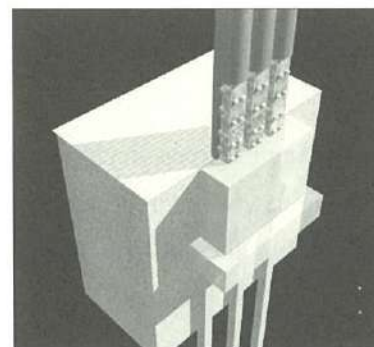
The six teak trees were processed to make them into poles of the required shape and size. The procedures were as follows.

- Processing the trees, drying the logs
- Carving new wooden ornaments for the top of monument
- Dismantling the old structure and conducting archeological investigations
- Building a new foundation
- Assembling the poles and wooden structure
- UV protection and painting

The restoration of the Giant Swing was finished in 2007.



Restoration process, Phase II



A 3D image of the new foundation,
Phase II



Conclusion

Challenging issues in the Giant Swing restoration were the quality and age of the wood that was used. It was found that the age of the available wood was unsuitable. In addition, the environment around the Giant Swing has changed, affecting the ancient monument. It is clear that wood used for the monument's initial construction, and in the two previous restorations, has lasted 136, 50, and 35 years, respectively. The decrease in the length of durability is notable. Therefore, in the current restoration, teak trees are being grown to serve in future restorations.

Uzbekistan

Sukhrobiddin NARMETOV

Senior Specialist

Principal Scientific Production Department
for the Preservation and Utilization of Objects of Cultural Heritage
Ministry of Culture and Sports

Preservation and Restoration of Wooden Structures in the Djuma Mosque in the Historic City of Ichan Kala



General view of the Ichan Kala from the north

There are 7,570 objects of cultural heritage, including 2,487 items of architecture, 3,945 archeological sites, and 1,138 other monuments under state protection in Uzbekistan. In 2007 the capital, Tashkent, was proclaimed Capital of Islamic Culture by ISESCO (Islamic Educational, Scientific and Cultural Organization). In conjunction with this some objects were restored, such as the complex of Hazrati Imam (Great Imam). There are four historical objects in this complex: Barakhan Madrasah (15th century), Muye Muborak Madrasah (16th century), Tilla Sheikh Mosque (19th century), and Namozgoh Mosque (19th century). All of these have been restored. Wooden doors, columns, ceilings have been restored too. In addition, a large new mosque was built. Arabic inscriptions were carved on the wooden columns and doors of the mosque. I took part in this great reconstruction myself.



Registan Ensemble (square)

This year Tashkent celebrated its 2,200th anniversary. For this anniversary it was decided to restore and reconstruct Kukaldosh Madrasah, Suzuk Ota Mausoleum, the archeological city of Ming Urik, and other monuments. Uzbekistan became a full member of the international organization of UNESCO. The monuments "Ichan Kala" in Khiva (inscribed in 1991), Historic Center of Bukhara (1993), Historic Center of Shahrisabz (2000), Samarkand

- Crossroads of Cultures (2001) are included on the World Cultural Heritage List. At present,

applications have been submitted to the Committee of the World Heritage to include 26 additional outstanding monuments on the List, such as the mausoleums Ak Astana Baba, Arab ata, Ishratkhana, Mir Said Bakhrom, Bakhautdin Nakshband, Chor Bakr, Sheikh Muhtar Vali, Hakim at-Termiziy, Rabati Malik, Jarqurgan and Vabkent minarets, Kirk Kiz (Forty Girls) palace, Dam Khan Bandi, etc.

Taking into account the importance of the huge cultural heritage of the Uzbek nation, the President of Uzbekistan, I. A. Karimov, paying tremendous attention to the work of preservation and revival of our culture, spoke to the opening session of the legislature (Oliy Majlis) about the need for "preservation and restoration of the unique historical monuments created by the Uzbek people and being national property . . . represent a major part of our spiritual program. This national wealth was inherited from our ancestors. That means we should also cherish them as the apple of one's eye and transfer them to future generations."

According to Article 49 of the Constitution of the Republic of Uzbekistan, "all citizens of the republic are obliged to preserve the historical, cultural and spiritual heritage of the peoples of Uzbekistan." Protection of architectural monuments has been repeatedly specified by a number of legal acts of the Republic supporting the preservation of objects of cultural heritage. Uzbekistan ratified the UNESCO Convention Concerning the Protection of the World Cultural and Natural Heritage in 1996, and the Convention for the Safeguarding of the Intangible Cultural Heritage in 2007. Official laws on preservation and use of objects of cultural heritage are as follows.

- The law of the Republic of Uzbekistan "On Protection and Usage of Objects of Cultural Heritage," adopted on August 30, 2001. The purpose of the law is to stipulate policy regarding the protection and use of objects of cultural heritage, being national property of the people of Uzbekistan.
- The law of the Republic of Uzbekistan on "The Town-planning Code of the Republic of Uzbekistan," authorized in the 353-II session of Oliy Majlis of the Republic of Uzbekistan on April 04, 2002. Subsequent changes were brought according to the law authorized in the 621-II session on May 30, 2004, concerning the "present code, relations in the field of town-planning."
- The law of the Republic of Uzbekistan on "The State Cadastre," adopted on December 15, 2000. This regulates the handling of the state cadastre, to which monuments of history and culture are entered.

Observance of these and other laws are obligatory for all organizations, corporations, and individuals, irrespective of their economic status or rank. In case of infringement of these laws, in conformity of Article 64 of the "Code of the Republic of Uzbekistan on Administrative Responsibility," and also Article 132 of the "Criminal Code of the Republic of Uzbekistan," infringers are charged with legal responsibility, and for deliberate destruction or damage of monuments of history and culture, may be subject to criminal proceedings.

The government's responsibilities in the field of protection and uses of monuments of cultural

heritage are carried out by the Ministry of Culture and Sports (Principal Scientific Production Department for the Preservation and Utilization of Objects of Cultural Heritage) and agencies of regional governments (regional state inspections on protection and use of objects of cultural heritage). The Ministry of Culture and Sports carries out state control in the field of protection and use of cultural heritage by overseeing the actions of corporations and individuals regarding the use of objects of cultural heritage; approves state programs on research, preservation and restoration of cultural heritage; provides documentation of the cultural heritage and the work done for its protection and preservation; coordinates joint activities of various agencies in the protection and use of objects of cultural heritage; conducts state surveys of objects of cultural heritage; carries out scientific examinations of objects of cultural heritage and determines criteria of selection and granting the status of object of cultural heritage; carries out other tasks according to legislation.

We are currently working on the preparation of legislative documents (positions and instructions) to accompany the law "On Protection and Usage of Objects of Cultural Heritage," in conformity with new requirements of the political formation of society. The positions about protection and use of objects of cultural heritage define the mechanisms by which the law is put into effect.

The instructions concern the manner of registration, the safety, maintenance, use and restoration of immovable objects of cultural heritage. Observance of the rules stipulated by these instructions is obligatory for all state agencies charged with the protection of cultural heritage, plus agencies involved in construction and architecture, as well as private enterprises, other establishments and organizations, and citizens using properties that are immovable objects of cultural heritage. The instructions stipulate the organization of zones of protection for immovable objects of cultural heritage.

The instructions define the basic requirements for delimitation, a mode of maintenance and use of protection zones for cultural heritage: security zones, zones of regulation of building (buffer zones), zones of a protected landscape. The instructions also define the structures built in the protection zones, and order their developments, consideration and the statement. Setting Borders of monuments territories are simultaneously effective to the objects under state protection.

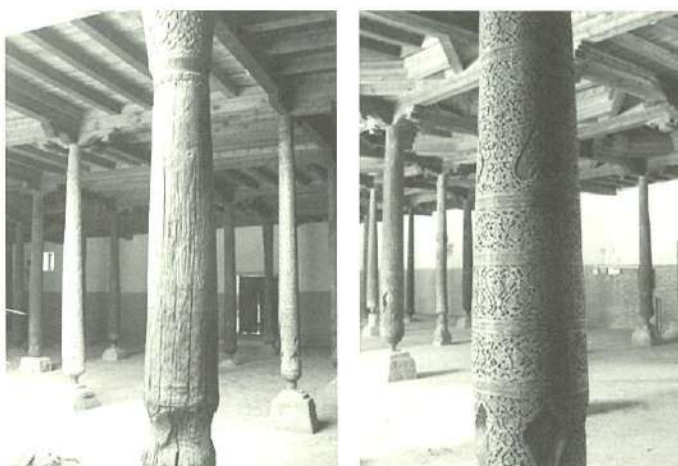
In Uzbekistan, the advanced system functions in the work of preservation of a cultural heritage: Principal Scientific-Production for the Preservation and Utilization of objects of Cultural Heritage of the Ministry of Culture and Sports. The following projects are included: the research and design enterprise, eleven sites for research and production management including art restoration management, carrying out restoration, preservation of unique picturesque works on monuments of architecture. Among the dazzling architectural monuments of Uzbekistan built with raw and burned bricks,



Inside of Djuma Mosque

there are unique buildings, whose main construction compounds are wood units. The Djuma Mosque is one of such monuments in Khiva, and it was inscribed on the World Heritage List. In 2007-2008 our department restored and reconstructed the Djuma Mosque. I took part in this restoration and reconstruction works with other specialists, and followings are about the process of restoration and reconstruction works.

In general, a whole process of restoration of huge wooden architecture differs from that of a stone or brick monument, because, first of all, that timber easily collapses and deteriorates and little countermeasures are developed and implemented in practice on safeguarding and solidifying the structures. The basic difference in construction of great wooden structures from immovable buildings, is that they have no monolithic blocks, and are composed of numerous members which can be analyzed after dismantlement and reassembled again. This characteristic of timber structures allows to execute processes which are not applied to immovable block constructions, for example, complete or partial dismantlement for reinforcement, wood preservation or replacement of separate members; a hanging and ascending gradient of a building for changing the lower frame sets; and a transfer of all wooden structures onto a new place. There are museums for the national architecture in many countries of the world, which houses and displays architectural-ethnographic wooden buildings.



Engraved wood columns of Djuma Mosque

Peculiar "assembling-disassembling" restoration of wooden structures narrates not only the preservation history of the buildings, but also negative impacts due to inappropriate restoration work. First of all, to remove small faults of the buildings, it is rather easily decided to apply small insertions or to level the surface with solution. However, these insertions often give us considerably worst appearance and impression than losses. Restoration of decorative parts and other members of wooden buildings are most easily implemented if they were preserved in good conditions, but sometimes they have decayed or damaged badly. In this case the genuine component parts can be not only a formation sample for the architect drafting, but also a direct model for making an exact copy.

In some cases at the restoration of wooden buildings, it is possible to discover the old reused members from the latest repair works. Monuments of wooden building produce the testimony of great historical value which was attached by architects and artisans in the form of decoration. Therefore the slightest negligence or non-observance of traditional constructive methods should not be permitted. The architects engaging in restoration of artistic monuments, should learn scrupulously, first of all, ancient construction methods so as not to make a serious error and not to distorted the genuine nature

of the architecture.

When the dismantling work of architectural monuments is needed for maintenance and management, special consideration should be taken. First of all, the marking delineations should be developed to separate each unit even if the main footprint of satellite beams of a building has not been recorded. The coding system for management should be accurate and simple. Then, component members including the availability index of product are labeled according to their natures; they should serve as a model for making exact copies. Crib identification marks were made in due course by means of hacks, and in later flags with oily colors. Now for this purpose specially fabricated labels are utilized. Only after a marking compliance test and the marking delineations, the dismantling work can be done. The analyzed component parts are added in systematic order developed in advance, with allowance for singularities of a pattern of a monument.

One of the most typical wooden buildings is Djuma Mosque, and it is possible to trace preservation and restoration procedures. At lighting of the philosophy, for the restoration-preservation work of Djuma Mosque, it was necessary to view the present materials relating to an actual production history of design proposals for safeguarding the monument of the architecture. From 227 wooden columns, 13 ancient pieces were saved, but they were badly damaged including roofing. For saving strings, three alternatives were offered:

1. If on site, to reinforce with bars and to shield a pellet.
2. To transfer and hand down to a museum.
3. To collect them in one place and to make over them roofing.

After an exchange of opinions, it was decided to conduct disinfections, conservation, and reinforcements to preserve strings. The pellets on the monuments were almost vanishing by being exposed to radiation from the sun for a long time. The research on the monument revealed the traces that insignificant repair work on roofing had been conducted. However, the problem on how to preserve ancient wooden columns remained unsolved. The problem was answered by an architect, Sanochkin J.M., who surveyed vast historical-archival and bibliographic data as well as managed to collect the most of present materials on archeology and on constructions and history of Djuma Mosque.



A minaret of Djuma Mosque

By assembling historical-archival and bibliographic data, he cleared the following problems: Monument backdating; Whence ancient carved strings in the 9th to 14th centuries, and what quantity of strings have been brought to mosque; That was saved from ancient appearance of the mosque. According to Sanochkin J.M., Djuma Mosque was built originally in 1080 AD and existing



An engraved wooden door

borders of the mosque was built in 1203 h./1788-79gg.n.e. under the initiative of Abdurakhman Mekhtar. The mosque site in the 18th century was probably determined within southwest borders by mausoleum Yunuskhan built in 1558 and the mausoleum in the 14th to 17th centuries, in which Measles, the reader of the Koran was buried in 1872. At mosque rearrangement in the 16th century, the new minaret was built. Ancient carved wooden columns for Djuma Mosque were brought together by inhabitants from all the khanate. They were 212 pieces, but along with wooden columns in the 17th to 19th centuries and simply repair piles, 16 carved wood columns were restored (except for eight columns which were moved into the history museum of the people of Uzbekistan).

Now from the ancient mosque, following are restored: 16 carved wooden columns in the 11th to 14th centuries, 14 wooden columns in 17th to 18th centuries and double swing carved wooden doors on northern front, a univalve carved wooden door on southern and western fronts of the mosque.

The rotunda in a central part, probably dated back to the 17th to 18th centuries, was reroofed in the 2007 restoration project. The remainders of ancient corduroy (brick by the size 24 x 24 x 15 cm) priming 2cm with a ganch layer were also restored. On a southern wall over the mikhrab, an alcove on ganch facing to the stylized paintings was pres. The flooring, roofing and also ancient columns were in a critical state. All exposed woodworks of the monument, and members of the ancient columns which had considerably deteriorated in a long storage period in a mosque, were damaged by wood fungi by degrees. Supporting girders, lintels and places in southeast and southwest had collapsed under the heavy weight of roofing.

The brickwork in socle parts of walls was damaged under the influence of groundwater. Principal causes of such critical status of the monument were lack of reliable roofing and flooring constructions against ice and rainfall; and lack of suitable drainage system for rainfall. Thus, the main issues on the restoration were to repair the flooring, to restore ancient carved wooden columns in the mosque, to restore the original appearance of the mosque with allowance of its historical development, and to inspire the new life to a unique monument of the architecture as a museum of ancient arts and building showing national creativity of Khorezm. To solve these problems, following restoration-regenerative strategies were proposed:

Flooring - The wooden flooring was completely changed from traditional saw-timbers, a complete refill of constructions of flooring, although the design concept was observed. Supporting girders with sectional view 200 x 180 mm leant by means of shelf brackets, setting plates against strings, on supporting girders were laid down. An inclination was arranged from centre of the mosque and subsequently went to mosque external walls, thereby, creating a mild slope of 2 %. The inclined roof was multilayered by use of modern roofing materials, that, according to authors, would allow

increasing time of its service and a considerably light load on strings.

Wicker floor mats made from a common reed were laid out. Then, a mixture of clay and hay was daubed on the base in 3 cm; the haydite in 15 cm depth; cement screed in 6 cm to the layers of a bitumen on bitumastic; and a corduroy from a burned square brick was applied for the protective purpose. Lastly, it was smoothly finished with cement solutions. The roofing total thickness should not exceed 39-40 cm. Spouting chutes with a unified monolith was installed for a common waterproof device of roofing.

The restoration project in 2008 on Djuma Mosque started from filling work of roofing layer and flooring reconstruction. The roofing dismantlement consisted of following stages: a wood furring (split boards, poplar poles), reeding mats, a filling earth and multilayered clay-hay daubing. All of the roofs, supporting girders and circular section lintels had been damaged by wood fungi, which were not suitable for reuse. Dismantling shelf brackets, strings, and baselines was subsequently proceeded. As it was already indicated, identification marks of strings were not complete as well as those of shelf brackets and baselines.

According to the design, while detaching concrete foundations, plates under baselines of strings on a net 3,150 x 3,150 mm were set. Installation of wooden columns and flooring started from the southeast of the mosque. The team of carpenters under the guidance of Salaev Ruzmat engaged in installation of wooden columns, shelf brackets, the main girders, lintels and other flooring units. In July 2008 in Khiva, Zahidov P. SH. conducted a preliminary investigation in Djuma Mosque and suggested possible renovation plans of floorings over columns of the 10th to 14th centuries and of a wooden ceiling, such constructions as "*chorkhari*", "*khashtak*", etc.

Taking into consideration that the mosque will be subsequently used as a museum "Wood art of building of Khorezm", two sorts of typical Khorezm structures (*chorkhari*) were reconstructed in the northern part of the mosque between shafts A and B, following the proposals during the restoration projects. In addition, the floors and strings of the monument were reconstructed.

The interior dilapidated layers were completely taken out before the brickwork. Misshapen areas of brickwork of the socle parts were investigated before, and bricks were relaid. Then the plain walls were plastered by an alabaster solution in restoration workshops. Wall paintings and a ganch carving, stalactite rows of mikhrab had been chipped away, and the blasted parts were repaired and reinforced by the restoration artists in Uzbek scientific-restoration architectural artistic workshop. Grills were also removed from the alabaster and applied screeds to make luminous openings for the monuments.

All wood baselines, shelf brackets, wooden columns had been chipped away with a saw, and mud was soaked with cotton-seed oil. Supporting girders, lintels, a wooden flooring - vassa, were coated by a preservative solution and paint oil.

The ancient floor height was preserved. By the effort of our department and employees, Djuma Mosque was remodeled as a museum of "Ichankala": Wood art of building of Khorezm. Miscellaneous formation samples of carved wooden columns, shelf brackets, baselines, a wing of gate and doors were skidded.

Safeguarding of wooden monuments from collapse

Wood monuments are usually vulnerable to the attacks by biological agents, such as fungi and partially hexapods, and also to natural disasters as fire and the impact from the environment. The collapse of wooden monuments caused by fungi can be classified normally into two types: chronic and emergent arising in the stage of construction and from operating errors.

The chronic type of deterioration is caused little by little with various factors in slow invisible rate. Typical wood members damaged in relatively high speed, are piles, stilts, sole pieces or the lower frame sets contacting to a ground. The same type with a smaller breakdown rate, is found in the board and lemekh roofing; and with a slow breakdown rate is found in the external walls of block constructions partially protected from humidification. Distinctiveness of chronic collapses is their rather constant rate of deterioration. The chronic type of collapse can be notified and be eliminated only by chemical conservation measures. To chronic damage can be observed in sapwood (carpet), central, soft superficial wood.

The emergency type of deterioration is caused by human factors such as shoddy constructions: the bad waterproof finish from a ground, weak ventilation, small overhangs of roofing, an insufficient guard from condensation; and leakages in a roof or a skin, failure of outfalls, ventilation disturbance, an overgrowing arbors and bushes, etc. The emergent collapse rate is accelerated by the chronic micro organisms' damage. There was a report of a collapse case in which huge wooden architecture within two years of construction broke down due to the slipshod work.

Many wooden columns, doors in Uzbekistan is decorated by Arabian, Persian and old Uzbek epigraphic writers. For example, there is an inscription of the date of 1203 hijra (1788-1789) on the door of the entry in the south. If we want to restore and reconstruct this wooden door, we must carve inscriptions on the new door. Main concerns in the course of restoration of timber structures are to protect the wooden structures from humidity which contributes to develop biological destroyers.

Over 2800 termite species inhabiting in the world and six family groups are known mainly in the tropic areas. While most of them are beneficial for the ecosystem, about 20 species are pestiferous causing significant damage to buildings and trees. Seven species inhabit in the CIS states while four species inhabit in the Central Asian states. Two of these, *Anacanthotermes turkestanicus* and *anacanthotermes ahngerianus* of the family *hodotermitida*, are commonly found in Uzbekistan. It has been reported that in Uzbekistan termites are found in 46 districts, 11 out of 12 regions, including those in Karakalpakstan. The infestation covers an area of 780 km².

In historical city of Ichan Kala (Khorezm region), there are 49 cultural heritage. Termites are found in 31 of them. In our country, the restoration project has been planned and carried out, "Development of the effective system of the protection of the Objects of Cultural Heritage and nearby territories of Khiva against the damage by termites from 2009 till 2020". Now specialists of this project are trying to exterminate termites.

Vietnam

NGUYEN Thi Thanh Tung

Architect

Vietnam National Village for Ethnic Culture and Tourism
Management Project Board N^o 195

Problems and Needs for Cultural Heritage Protection and Restoration Activities in Vietnam (Mainly on Wooden Architectural Heritage) – Protection and Restoration of Traditional Houses in Ethnic Villages in Vietnam –

1. A View of Vietnam

Vietnam (pronounced vi:et'nam; Vietnamese: *Việt Nam*, officially the Socialist Republic of Vietnam (Vietnamese: Cộng hòa xã hội chủ nghĩa Việt Nam), is the easternmost country on the Indochina Peninsula in Southeast Asia. It is bordered by China to the north, Laos to the northwest, Cambodia to the southwest, and the South China Sea to the east. With a population of over 84 million, Vietnam is the 13th most populous country in the world.

The people of Vietnam regained independence and broke away from China in AD 938 after their victory at the battle of Bạch Đằng River. Successive dynasties flourished along with geographic and political expansion deeper into Southeast Asia, until it was colonized by the French in the mid-19th century. Efforts to resist the French eventually led to their expulsion from the country in the mid-20th century, leaving a nation divided politically into two countries. Fighting between the two sides continued during the Vietnam War, ending with a North Vietnamese victory in 1975.

Emerging from this prolonged military engagement, the war-ravaged nation was politically isolated. The government's centrally planned economic decisions hindered postwar reconstruction, and its treatment of the losing side engendered more resentment than reconciliation. In 1986, it instituted economic and political reforms and began a path towards international reintegration. By 2000, it had established diplomatic relations with most nations. Its economic growth has been among the highest in the world in the past decade. These efforts culminated in Vietnam joining the World Trade Organization in 2007 and its successful bid to become a non-permanent member of the United Nations Security Council in 2008.

1.1. Geography and climate

Vietnam is approximately 331,688 km² (128,066 sq mi) in area (not including Hoang Sa and Truong Sa islands). The perimeter of the country running along its international boundaries is 4,639 km (2,883 mi). The topography consists of hills and densely forested mountains, with level land covering no more than 20%. Mountains account for 40% of the area, with smaller hills accounting for another 40%, and tropical forests cover 42% of the total area. The northern part of the country consists mostly of highlands and the Red River Delta. Phan Xi Păng, located in Lào Cai province, is the highest mountain in Vietnam at 3,143 m (10,312 ft). The south is divided into coastal lowlands and peaks of the Annamite mountain chain, and is characterized by extensive forests and poor soils. Comprising five relatively flat plateaus of basalt soil, the highlands account for 16% of the country's arable land and 22% of its total forested land.

The delta of the Red River (also known as the Sông Hồng), a flat, triangular region of 15,000 km² (5,792 sq mi), is smaller but more intensely developed, as well as more densely populated, than the Mekong River Delta. Once an inlet of the Gulf of Tonkin, it has been filled in by the enormous alluvial deposits of the rivers over a period of millennia, and it advances one hundred meters into the Gulf annually. The Mekong Delta, covering about 40,000 km² (15,444 sq mi), is a low-level plain no more than three meters above sea level at any point and crisscrossed by a maze of canals and rivers. So much sediment is carried by the Mekong's various branches and tributaries that the delta advances sixty to eighty meters into the sea every year.

Because of differences in latitude and the marked variety of topographical relief, the climate tends to vary considerably from place to place. During the winter or dry season, extending roughly from November to April, the monsoon winds usually blow from the northeast along the China coast and across the Gulf of Tonkin, picking up considerable moisture; consequently the winter season in most parts of the country is dry only by comparison with the rainy or summer season. The average annual temperature is generally higher in the plains than in the mountains and plateaus, and also in the south than in the north. Temperatures in the southern plains (Ho Chi Minh City and the Mekong Delta) vary less, going between 21 and 28 °C (70 and 82.5 °F) over the course of a year. The seasons in the mountains and plateaus and in the north are much more dramatic, and temperatures may vary from 5 °C (41 °F) in December and January to 37 °C (98.6 °F) in July and August.

1.2. Population

From a recent census, the population of Vietnam is estimated at beyond 84 million. Ethnic Vietnamese, also called “Viet” or “Kinh,” account for 86.2% of the population. Their numbers are concentrated in the alluvial deltas and coastal plains of the country. A homogeneous social and ethnic majority group,

the Kinh maintain political and economic control. There are more than 54 ethnic minority groups throughout the country, but the culture of the Kinh is dominant. Most ethnic minorities, such as the Muong, a group closely related to the Kinh, are found mostly in the highlands covering two-thirds of the territory. Before the Vietnam War, the population of the Central Highlands was almost exclusively Degar (over 40 hill tribal groups). The Hoa (ethnic Chinese) and Khmer Krom are mainly lowlanders. The largest ethnic minority groups include the Hmong, Dao, Tay, Thai, and Nung. From 1978 to 1979, some 450,000 ethnic Chinese left Vietnam.

1.3. Culture

The official spoken and written language of Vietnam is Vietnamese. The culture of Vietnam has been influenced by neighboring China. Due to Vietnam's long association with the south of China, one characteristic of Vietnamese culture is filial duty. Education and self-betterment are also highly valued. Historically, passing the imperial Mandarin exams was the only means for Vietnamese people to advance themselves socially.

In the socialist era, the cultural life of Vietnam has been deeply influenced by government-controlled media and the cultural influences of socialist programs. For many decades, foreign cultural influences were shunned and emphasis placed on appreciating and sharing the culture of communist nations such as the Soviet Union, China, Cuba and others. Since the 1990s, Vietnam has seen a greater exposure to Southeast Asian, European and American culture and media.

Vietnamese cuisine uses very little oil and many vegetables. The main dishes are often based on rice, soy sauce, and fish sauce. Its characteristic flavors are sweet (sugar), spicy (serrano peppers), sour (lime), *nuoc mam* (fish sauce), and flavored by a variety of herbs such as mint and basil.

Vietnamese music varies slightly in the three regions: Bắc or North, Trung or Central, and Nam or South. Northern classical music is Vietnam's oldest and is traditionally more formal. Vietnamese classical music can be traced to the Mongol invasions, when the Vietnamese captured a Chinese opera troupe. Central classical music shows the influences of Champa culture with its melancholic melodies. Southern music exudes a lively attitude.

1.4. Economy

Historically, Vietnam has been an agricultural civilization based on wet rice agriculture. The Vietnam War destroyed much of the economy of Vietnam. Upon taking power, the current government created a planned economy for the nation. Collectivization of farms, factories and economic capital was implemented, and millions of people were put to work in government programs. For a decade, united

Vietnam's economy was plagued with inefficiency and corruption in state programs, poor quality and underproduction, and restrictions on economic activities and trade. It also suffered from the trade embargo of the United States and most of Europe after the Vietnam War. Subsequently, trade relations with partners in the Communist bloc began to erode. In 1986, the Sixth Party Congress introduced significant economic reforms with market economy elements as part of a broad economic reform package called "đổi mới" (renovation). Private ownership was encouraged in industries, commerce and agriculture. Vietnam achieved around 8% annual GDP growth from 1990 to 1997, and continued to grow at around 7% from 2000 to 2005, making it the world's second-fastest growing economy. Simultaneously, foreign investment grew threefold and domestic savings quintupled. Manufacturing, information technology and high-tech industries form a large and fast-growing part of the national economy. Vietnam is a relative newcomer to the oil business, but today it is the third-largest oil producer in Southeast Asia with output of 400,000 barrels per day (64,000 m³/d). Vietnam is one of Asia's most open economies: two-way trade is around 160% of the GDP, more than twice the ratio for China and over four times India's.

Vietnam is still a relatively poor country with an annual GDP of US \$280.2 billion at purchasing power parity (2006 estimate). This translates to a purchasing power of about US \$3,300 per capita (or US \$726 per capita at the market exchange rate). The inflation rate was estimated at 7.5% per year in 2006. Deep poverty, defined as a percent of the population living under \$1 per day, has declined significantly and is now smaller than that of China, India, and the Philippines.

As a result of several land reform measures, Vietnam is now the largest producer of cashew nuts with a one-third global share, and second-largest rice exporter in the world after Thailand. Vietnam has the highest percent of land use for permanent crops, 6.93%, of any nation in the Greater Mekong Subregion. Besides rice, key exports are coffee, tea, rubber, and fishery products. However, agriculture's share of economic output has declined, falling as a share of GDP from 42% in 1989 to 20% in 2006, as production in other sectors of the economy has risen. According to the CIA World Fact Book, the unemployment rate in Vietnam is 4.3%. Among other steps taken in the process of transitioning to a market economy, Vietnam in July 2006 updated its intellectual property legislation to comply with TRIPS. Vietnam was accepted into the WTO on November 7, 2006. Vietnam's chief trading partners include China, Japan, Australia, ASEAN countries, the U.S. and Western European countries.

2. Traditional Houses in Vietnam

2.1. Overview

Most traditional houses in Vietnam are made of wood or have mainly wooden structures. Most of

the houses in Hoi An Ancient Town (a World Heritage Site) have wooden beams, walls and doors. Research conducted by Showa Women's University showed that there are thousands of traditional houses in the Vietnamese countryside that have wooden structures.² Research by the Institute of Urbanization and Architecture, Hanoi Architectural University, revealed that many houses of ethnic minorities are made of wood and natural materials such as bamboo, palm leaves, grass and thatch.³

There are many kinds of traditional houses in Vietnam. Nearly every ethnic group has its own type of traditional house. The Kinh have their traditional houses with wooden beams, walls and doors. They usually have a tile or thatched roof. Traditional houses of the minorities in the northeast and northwestern regions are built on pillars. They are suitable for steep slopes and help protect people from wild animals.



Fig. 1 Kinh traditional house (Tanda resort)



Fig. 2 Muong traditional house (Ethnic village, Hoa Binh province)



Fig. 3 Thai traditional house in Hoa Binh province (Vinaculto- PMB 195)



Fig. 4 Xtieng traditional house (Vinaculto)



Fig. 5 Gietrieng traditional house (Vinaculto)

2.2. Structures

2.2.1. Traditional Kinh houses

In the north of Vietnam. In the north, Kinh houses usually have a rectangular plan and face south or southeast. They usually have three pairs of rows of pillars. From inside to outside, they are the mother pillars, the children and the terrace pillars. The mother pillars are the main pillars. They support layered horizontal beams, while rafters connected to the pillars at the front and back form the incline of the roof. The central space, which is about 2.7 to 3.3 m wide, is considered the main room of the house. In the centre of the room is the ancestral altar, and at the side are benches that could be used to make the space into the master reception area or bedroom. The room on either side is commonly used for storing food or as the bedroom for the wife and children.

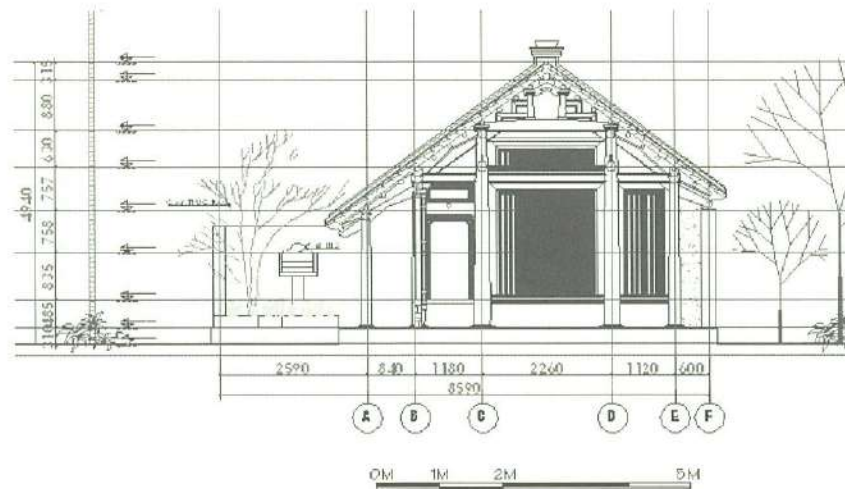


Fig. 6 Section of Kinh traditional house, Son Tay district, Hanoi (Vinaculto)



Fig. 7 Kinh traditional house, Son Tay district, Hanoi (Vinaculto)

Most of the doors and windows of the house face south, while there is no door on the back wall. This keeps the house cool in summer and warm in winter.

In central Vietnam. There are many heavy storms in central Vietnam, so the height of the traditional houses is often quite low, with sloping roofs to shed the rain water. The house is usually small, with one central space and two wings, and in length not more than 8 m. However, every component of the wooden structure is skillfully carved.

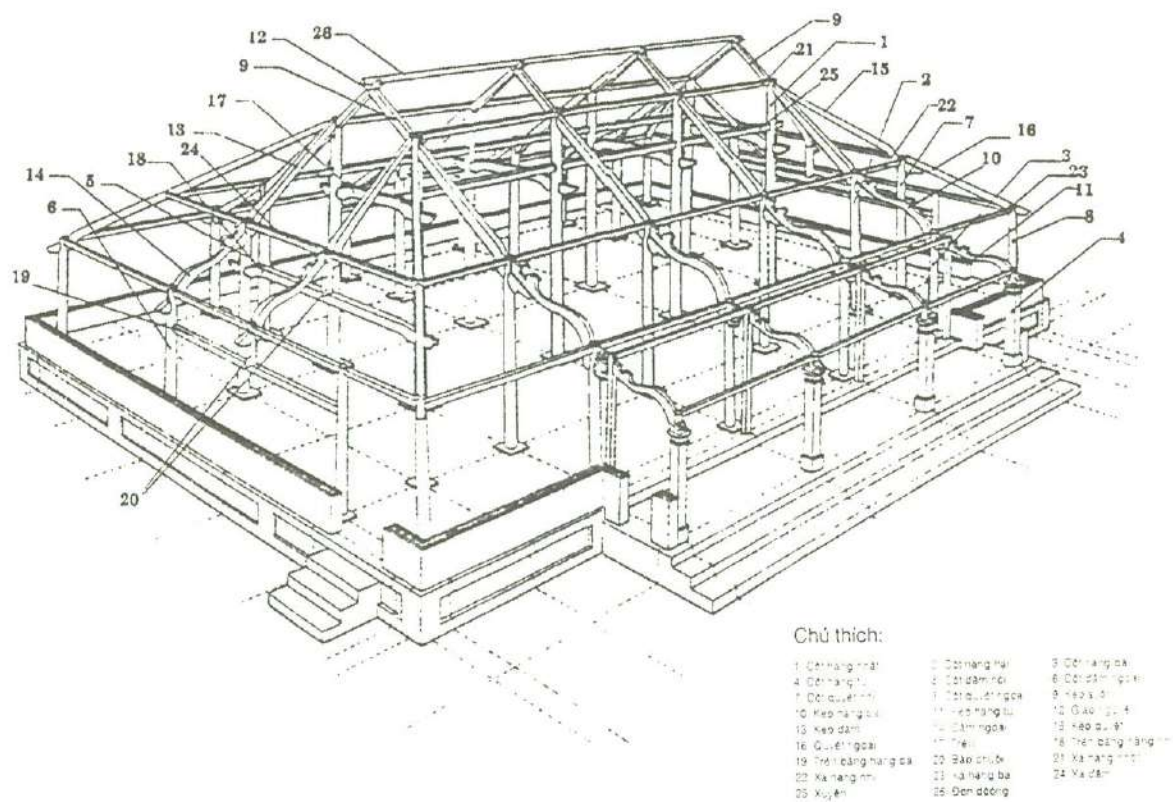


Fig. 8 Model of the wooden structure of a Kinh traditional house, Hue city (Vinacultto)

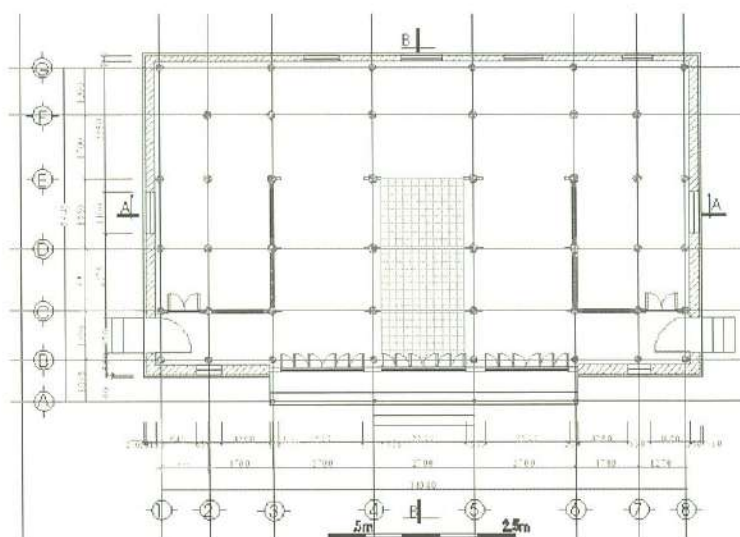


Fig. 9 Plan of *nha ruong* traditional house in Hue city (Vinacultto)

In Binh Dinh province, Kinh traditional houses have a two-layer roof to keep the house cool in summer.

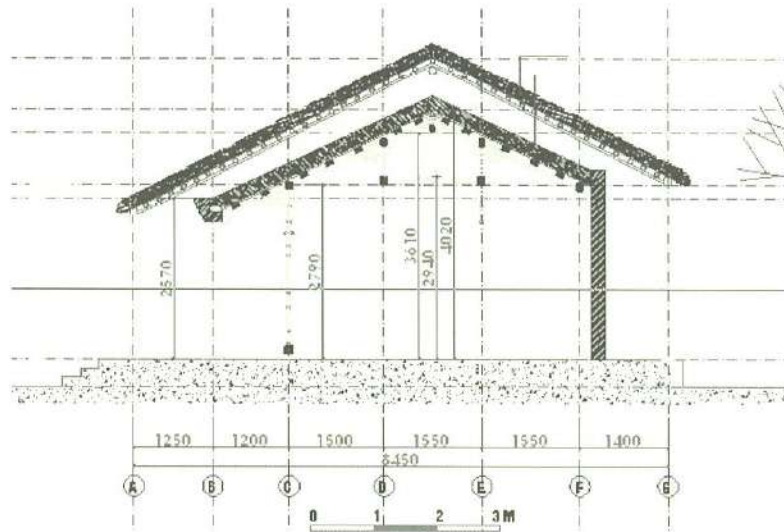


Fig. 10 Wooden structure of a Kinh traditional house in Binh Dinh province (Vinaculto)

2.2.2. Cham traditional house

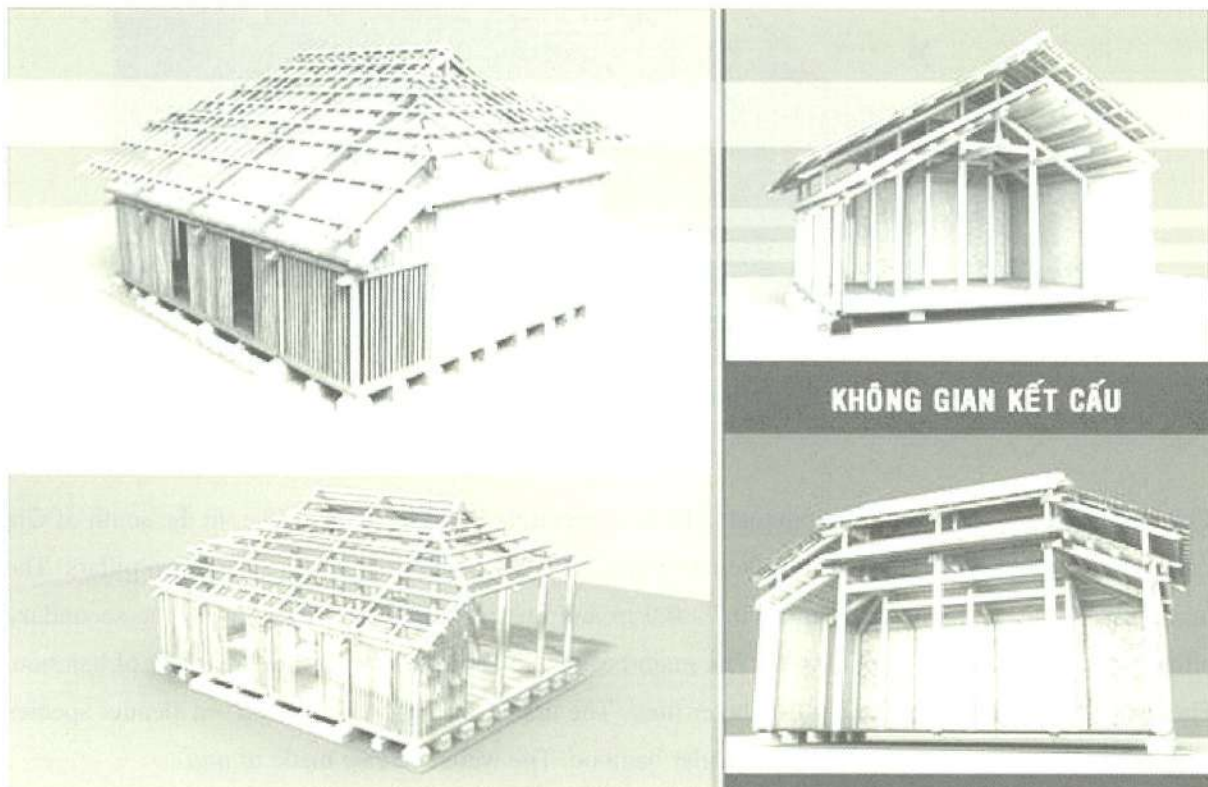


Fig. 11 Model of the wooden structure of a Cham traditional house (Vinaculto)

There are four spaces defined by five rows of pillars. The floor is 0.36 meter above the earth . The steps to the house are made of stone with the size of 270 x 270 x 230 cm. The structure includes pillars, the wooden frame, and external walls that are made of natural earth. In particular, there is a two-layer roof. The Cham use beams and struts to support the title roof in the upper layer. The under layer has the

same structure, but is made of earth. The floor has wooden beams with planks of about 3 cm thickness. There are two main large doors, three secondary doors and one window. All of the doors, windows and partitions are carefully made of wood. There is a large living room, a bedroom and a small storeroom. One of the typical characteristics of a Cham house is the row of bars from the roof to the floor to ensure privacy inside the house, and at the same time provide ventilation.

2.2.3. E De traditional house

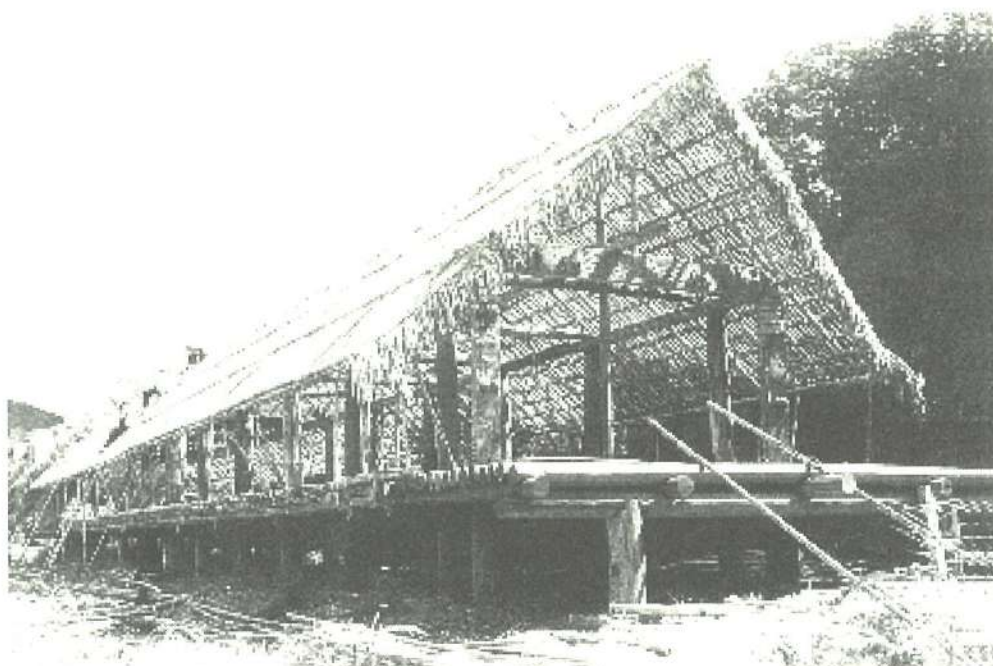


Fig. 12 The E De traditional longhouse being erected (Vinaculto)

The E De live in the highlands of Vietnam. They concentrate in Dak Lak province, in the south of Gia Lai province and Khanh Hoa and Phu Yen province. The E De traditional house stands on pillars. The main pillars have a diameter of about 0.7 - 0.9 m and are buried to the same depth. The secondary pillars have a diameter of about 0.4 m. The main beams are about 0.2 m. Lashes are made of bamboo. The house has a thatch roof and a two-layer floor. The upper layer is made of *nua* – a slender species of bamboo. The under layer is made of regular bamboo. The walls are also made of *nua*.

2.3. The trend for building ethnic villages in Vietnam

In recent decades, there is a trend to build ethnic villages in Vietnam. Not only does the government invest in ethnic villages, but the private sector is also interested in doing so. The Party wants to build a vital and viable traditional culture. In ethnic villages, the beauty and the origin of 54 ethnic cultures can be shown.

In the state sector, Vinaculto is the largest ethnic village. The main objective of the huge project is building a national cultural center – an organic whole where the national cultural heritages of Vietnam's 54 ethnic groups are gathered, presented, preserved, promoted and deployed. In addition, it will display Vietnam's country and people through different historical periods at the same time as displaying world famous cultural heritage. The project is located in a favorable position at the end of Lang Hoa Lac highway, 35 - 40 km from the center of Hanoi. It will be launched in September next year, 2010.

Other provinces such as Gia Lai, Dalat, Thai Nguyen, and Thai Binh are building their own ethnic villages to introduce their unique cultural beauty. The methods of building these houses are different. In some provinces as Thai Nguyen and Hoa Binh, old traditional cottages are bought and rebuilt. In other provinces such as Hanoi and Thai Binh, they build new ones based on the results of traditional house surveys. In general, all of the villages are under construction. Some have been launched, but the visitors are still few.



Fig. 13 Muong village, Hoa Binh province

There is another trend in the display of local culture. Some provinces organize old hamlets to show the landscape, cultivated habits, or culture. They focus on tourism. It is tourism, not agriculture as in the past, that brings the main source of income for the province. Examples include Cat Cat hamlet of Sapa city in Lao Cai province, Don hamlet in Dak Lak province, and Lac hamlet of Mai Chau district in Hoa Binh province. In these hamlets, the cottages are restored to increase the convenience for tourists.



Fig. 14 Lac hamlet, Mai Chau, Hoa Binh province

3. Problems for the Protection and Restoration of Traditional Houses in Ethnic Villages in Vietnam

3.1. Disagreement about the objectives of building ethnic villages

Some people believe that the main objective of building ethnic villages is attracting tourists, while others consider preservation to be what counts. The perspective that is selected will affect the methods of erecting, utilizing and maintaining ethnic villages in the future. If the main objective is the preservation of traditional houses and the ethnic village as an outdoor museum, each house in the village has to be an object for display. At the very least, it must possess an authentic and historical character. Thus, all the materials as well as method of erection must be authentic. However, a historical object is always fragile. It is difficult to preserve and exploit for tourism at the same time. In addition, the budget needed for maintaining and restoring old traditional houses annually is considerable. Building an outdoor museum rarely brings much income except for the cultural aspect.

Some managers reckon tourism as the key factor to keep a tourist area alive and developing. In their opinion, each house must be a medium for displaying culture and cultural activities to attract tourism. To serve a large number of visitors and maintain the housing structures over long periods of time, some traditional materials must be replaced, such as concrete in place of wood, composite in place of grass or thatch. The house is a model of the traditional house rather than an authentic one.

It would cause considerable trouble if the managers changed their minds while the project is ongoing. There are many people taking part in erecting ethnic villages. It is sometimes difficult to reach

agreement with the original opinion. It is necessary to obtain agreement of opinion at first, and work out suitable solutions during the course of the project.

3.2. Lack of guidelines and criteria for surveying and collecting documents, for deciding to build or rebuild, or maintain or restore, folk houses

Subsequent to the approval in 2001 of the Law on Cultural Heritage, there have been no guidelines or criteria developed for conservation work. It is necessary to have guidelines about how to implement a conservation project, what the steps are for surveying, how to proceed with documentation, maintenance and restoration work. As a consequence of this lack, many conservation projects such as Vinaculto and other ethnic villages have operated as normal development projects with ordinary procedures, prices of materials, and methods of building. There are no criteria for surveying folk houses, so that many documents are poor in quality and lack much information about folk houses, statues, lifestyles, and festivals. In addition, the documents are not all collected in a central information facility. That means they are not accessible as data for research, publishing and application in other projects. There are no guidelines about maintenance and restoration work, either. Thus, the managers have trouble knowing how often to maintain, when to conduct conservation and how to estimate sufficient budget. Cultural heritage is always fragile, especially in the case of wooden structures. They need to be taken care of and kept up as cultural properties.

3.3. Lack of experienced conservation architects

At present, there is no institute for conservation architects in Vietnam. In HAU (Hanoi Architectural University) there is a conservation faculty and the students learn conservation as a subject, but not as training for a job. After graduation, architects must learn about conservation through their own work and the experience of other experts. With the lack of conservation guidelines and criteria, their jobs are made more difficult. Each step in preservation needs a conservation architect to ensure this work has been done in the right way so that all cultural, historical, and emotional values of a building will not be lost after preservation or restoration. Most folk houses are situated in remote areas, so that the lack of conservation architects means a lack of advisers and no guarantee for the work.

3.4. Lack of risk preparedness plans

Typhoons and fire are the main risks to folk houses. There are about ten storms each year in Vietnam. They destroy thousands of buildings including traditional houses. At the same time, heavy rains from the storms flood a large area and inundate hundreds of villages. They cause wooden structures to decay and lose their natural roofing materials. In the high mountains, strong winds and floods collapse small folk houses and blow away the roofs of big ones. Such damage happens every year, but there is little useful risk preparedness planning done.

3.5. Lack of guidelines for protecting and preserving wooden structures in ethnic villages

Protection and conservation of wooden structures does not mean halting development and keeping them in a glass box. But with no guidelines in place, questions such as how to attract visitors and get some benefit for management and maintenance, how to protect folk houses and the environment, how to balance between development and conservation, etc., have to be answered through experience, and from consulting other countries and their guidelines.

4. Needs for Protection and Restoration of Traditional Houses in Ethnic Villages in Vietnam

4.1. Need to fill gaps in the current legislation

Under the Law on Cultural Heritage, it is necessary to have guidelines and criteria about conservation work. These are basic to implementing and checking the conservation projects. With wooden structures, sufficient skills in building, maintaining, and preserving are very important.

4.2. Need for enhancing the management board members' knowledge of conservation and restoration of traditional houses in ethnic villages

The decisions of the project management board (PMB) of an ethnic village must be based on knowledge of conservation and restoration. Agreement among PMB members can speed up the projects, and can save budget because the PMB can make logical and reasonable decisions. If the PMB is equipped with good knowledge about conservation work, all the arrangements, decisions and plans will benefit.

In the community, knowledge about conservation on the part of local authorities and the owners of wooden structures plays an important role. It is necessary to make the community understand the value of the wooden structures they have and their responsibility to protect them for future generations.

4.3. Need for a program to document traditional houses in Vietnam

All of the documents on traditional houses in Vietnam must be gathered into a unified system for Vietnamese ethnic villages. They can be a huge source of valuable material for anyone who wants to study about Vietnamese traditional houses.

4.4. Need for inventorying traditional houses, their management and annual maintenance plans

It is necessary to inventory traditional houses, and their management and annual maintenance plans. This can help protect the traditional houses and the immediate environment in ethnic villages. After listing the traditional houses and assessing their values, the relevant authorities can plan conservation policies and budgets needed for protecting them. This can help people recognize the values of the houses and take part in the efforts to protect them.

4.5. Need for intelligent solutions to mobilize all resources to protect traditional houses

The negative aspect of announcing an area as a place of conservation is that people tend to wait for the government to allocate budget for maintaining and protecting their houses. This may quickly lead to the ruin of houses that are not maintained in timely fashion. In an ethnic village, it is more difficult because all the houses belong to the government. Spending some budget for maintaining them annually, or giving them a business to run and exploit becomes a problem for the relevant authority. Accordingly, we need intelligent solutions to mobilize all resources to maintain and protect traditional houses.

4.6. Need for programs to teach future generations the values of traditional houses and the responsibility for protecting them

A program of propaganda is necessary for everyone to know about the cultural heritage in ethnic villages.

5. Conclusion

There are various needs for protection and restoration of traditional houses in ethnic villages in general and Vinaculto in particular. This is difficult work; it needs the participation of many organizations and professionals. The experience from this course on the preservation and restoration of wooden structures will be helpful for Vinaculto and this author.

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Final Reports by Participants

Bangladesh

Khondker Zahidul KARIM

Training Course on Preservation and Restoration of Wooden Structures (8 Sep. – 8 Oct. 2009) and Me

The protection of archaeological cultural heritage in Bangladesh is my main responsibility, as I have been engaged in the field of conservation as an Archaeological Engineer in the Department of Archaeology of Bangladesh. The planning of conservation projects, supervision and management of conservation works, maintenance and exhibition of cultural properties in a proper manner are some of the responsibilities related to my work. The Department of Archaeology is the statutory custodian of cultural properties of Bangladesh. Architectural conservation projects are being conducted by the Architectural Conservation Division through the regional offices of our department.

As I mentioned in my country report, Bangladesh has a very rich cultural heritage, which includes a large number of ancient monuments and sites including a great number of timber structures. It is a great responsibility to conserve and maintain them in good condition. Proper management skills, correct decision making and correct approaches at the right time, etc., are essential to fulfill this task. Having experience in this field is very important for achieving good results. So far I have been engaged in different types of conservation projects in my career to date, and that involvement has helped me gain good experience in architectural conservation in my country. I have also been given an invaluable opportunity to gain further experience at an international level by participating in this training course. First of all would like to thank ACCU for giving me this opportunity.

When we arrived, all the necessary arrangements had been made for the participants of the training course, and the staff of ACCU gave us tremendous support so that we could get maximum benefit from the course. The training course also had been well organized from its inception to completion, and covered all the necessary aspects of the theme. It began with an introduction to the cultural heritage protection system of Japan, giving a preliminary understanding of how that system operates. A step-by-step program followed, covering the themes of the course. Theoretical and practical parts were covered through lectures by Japanese and foreign experts and on-site practical work, study tours, etc., in a well-organized manner. Videos and slide shows etc. were also used in the presentations. I appreciated the organization of the course, which is also something that I can use in my future professional tasks.

I had a good opportunity to gain experience and knowledge in a vast area within the field of

architectural conservation during the training course. I would like to share what I have learned with my colleagues and use it for the benefit of cultural heritage protection after going back to my country. In what follows, I would like to mention briefly some of the things that I have learned and their potential applications in my country.

From the training course I had an opportunity to increase my knowledge about the theories of cultural heritage protection in Japan, as well as the modern and traditional techniques which are being used for conservation. This information was given through lectures by experts in relevant fields, site observations, on-site practical training, etc. I would like to use this knowledge and experience to upgrade our cultural heritage protection activities. We learned about different techniques used for the documentation of different elements of a building. I think these techniques can be applied to the documentation involved in our conservation projects. The organization of these restoration projects also impressed me and I would like to use the knowledge I gained by applying it in our context.

Proper management of the use of both modern and traditional methods in restoration work without harming the traditional quality of a monument is another aspect I found interesting. In this course I was able to learn about modern techniques being used in restoration work. I need to understand the availability of such techniques and their applicability in conservation work. I also got sound knowledge about traditional carpentry techniques in Japan. The tools being used, how they are used and the traditional skills of carpenters, etc., could be observed very clearly. It was interesting to study the similarities and differences in the application of such tools and techniques between Japan and my country.

Site observations and study tours gave me the opportunity to observe massive wooden structures and their complex, marvelous structural patterns, and to study how the wooden members have been connected to form these impressive structures. We were able to see different kinds of wooden structures, such as religious, residential, commercial, etc., and observe how their designs differ according to their location and function. The measures which are being taken to conserve and maintain these buildings were explained to us at the sites. Also, the traditional and modern techniques being used to protect them from natural disasters and fire were observed. It has been a good experience, and it is necessary to identify similar problems in my country and use suitable techniques to overcome them.

On the other hand, as an engineer it has been an invaluable opportunity to visit and observe Japanese architecture. This knowledge and experience will be very useful in my future professional work. The documents which were provided to us will be very useful in this regard.

I was also very interested in the techniques used for maintaining and exhibiting the cultural heritage

of Japan. They systematic techniques which are being used at sites and museums are very attractive. These experiences are very useful for designing interesting ways of presenting the sites and museums of our country.

The designation, selection and registration system for cultural properties, and the variety of measures devised by the national government for the preservation and utilization of them are most effective for the protection of cultural heritage. Such measures include regulations that prohibit alterations to an existing historic building, and the grant of subsidies for its maintenance and repair.

I also had a rare opportunity to meet professionals engaged in the same field from different countries, and to share experiences with them about cultural heritage protection in our respective situations. In this way, we could strengthen our knowledge about the global situation in this field. I got the chance to understand the ways other countries approach the task of protecting cultural properties, and how they solve the relevant problems, through the participants' country presentations and by talking with them directly. I felt as though I have personally visited all those different countries within this period. I would like to use this knowledge and experience for the benefit of conservation works after returning to my country. Meeting these professionals from Japan and other countries was an invaluable and rare opportunity which I gained through my participation in this course. We were also given the chance to discuss various issues after every lecture, and thus we were able to understand the different techniques and approaches applied to solve various problems. The explanations of the experts and the experience and knowledge of the participants from different countries has given me comprehensive knowledge about matters related to conservation.

Conclusion

This training course has provided us an invaluable opportunity to receive knowledge about the cultural heritage of Japan and the Asia/Pacific region. Although it was mainly concerned with the conservation of wooden structures, it covered a vast area and other related topics. We benefited from not only the lectures, but also from the arranged site visits, practical works, etc. For the free weekends, we were provided with all the necessary travel information so that we could to see more things in Japan, and this has provided us with a tremendous chance to get various experiences in this beautiful country.

All the knowledge and experience I got from this training program will be very important for carrying out my duties in planning, managing and conducting conservation projects, and also for my other professional activities as an engineer. Information about the way Japanese conservationists approach their work and their cultural heritage protection system was given to us in a very systematic way. Through this course, we were able to enhance our knowledge about the conservation, management and maintenance of wooden structures.

The problems related to the protection of cultural heritage were discussed throughout the course. Some of them were similar to those in our country, so the discussions gave me good ideas for improving our ways of solving the problems. In this way, this training course has enhanced the knowledge and experiences of the participants who are engaged in the field of conservation, and has created an opportunity for good interaction among them. Therefore it would be appreciated if professionals engaged in the field of conservation are given more opportunities to participate in training courses like this, to share and enhance their knowledge and experiences, and to use them to benefit the field of conservation.

Bhutan

Karma WANGCHUK

Training Course on Cultural Heritage Protection in the Asia/Pacific Region, 8 September to 8 October 2009, Nara, Japan: Preservation and Restoration of Wooden Structures

Comments on: how this training can be applied to my work in my country; identification of problems and comparisons with the current practices in my own country; evaluation of the relevance of this training program to conservation work in my country.

I feel privileged to be one of the participants in this training course held in Nara from 8 September to 8 October 2009. Before beginning my observations with regard to this training course and its implications for conservation work in my own country, I would like to take this opportunity to praise the selection of Nara, among many other places in Japan, as venue for the training, as its many ancient monuments and structures were in themselves a valuable resource for the participants.

During this one month training course, I have been extremely pleased to be able learn from exposure to the following topics.

- (1) “History of Wooden Architecture in Japan” and “Conventions and Charters pertaining to Cultural Heritage Protection,” by Mr. Nishi Kazuhiko
- (2) “International Cooperation for Cultural Heritage Protection,” by Mr. Shimizu Shin'ichi.
- (3) “Restoration of Architectural Heritage in Japan,” by Mr. Tanaka Sadahiko
- (4) “Restoration Systems and Project Planning for Wooden Structures,” by Mr. Kamei Nobuo
- (5) “Risk Management of Cultural Properties,” by Ms. Inaba Nobuko
- (6) “Introduction to Architectural Heritage in Asia,” by Dr. Gamini Wijesuriya
- (7) “Prevention of Insect Damage to Wooden Structures,” by Mr. Komine Yukio
- (8) “Management of Wooden Structures/Safeguarding of Traditional Techniques,” by Mr. Nagao Mitsuru
- (9) “Introduction to Dendrochronology: Tree Species and Annual Rings,” by Okochi Takayuki
- (10) “Future Tasks in the Preservation of Cultural Properties,” by Mr. Ashley de Vos
- (11) Practical training conducted at the Tanaka Family Farmhouse by Mr. Hatano Tsuneo, Mr. Imanishi Yoshio and Mr. Yamaguchi Isamu; visits to temples, vernacular houses and townscape sites, including on-site lectures on “Survey Methods on Conservation of Vernacular Houses and Townscapes” by Mr. Shimada Toshio, and “Survey on Painting and

Plans for Painting Restoration” by Mr. Kubodera Shigeru

Bhutan and Japan are similar in having temperate climates with monsoon seasons, and being blessed with abundant forests. Similarity can also be seen in the use of wood as material for architectural structures, with Japanese wooden buildings ranging from the smallest architectural spaces such as *Taian*, a tea room with a floor space of two *tatami* mats, to one of the largest existing wooden buildings in the world, Todaiji Daibutsuden, a great Buddhist temple hall measuring 57 m in width by 46.8 m in height, with a floor area of 2,880 sq m. Similarly, the architectural heritage using wood as material in Bhutan also ranges from simple farmhouses to monasteries, temples, magnificent palaces, and *dzongs* (fortresses). The oldest cultural monuments of both countries were built in the 7th century.

Japan is one of the most advanced countries in the Asia/Pacific region in the field of conservation of cultural monuments. During our one month's training course here in Nara, I have had the opportunity to observe and learn the procedures for the conservation of cultural monuments undertaken by the central government, and also by prefectural and municipal governments. The system is well developed, starting from the designation of monuments as cultural properties, national heritage sites, and World Heritage Sites, to the conservation work carried out at those sites with a systematic approach that includes the involvement of all stakeholders. I experienced visiting some of the conserved monument sites where everything from documentation to dismantling, woodworking, and completion of conservation work was very systematically carried out.

For the last month, I have had this opportunity to observe and learn about Japanese conservation techniques, and the relevant legislation and social responsibility regarding the cultural heritage. Let me now discuss Bhutanese architecture and our methods of preserving it, before commenting on how this training can be applied in my country, by identifying problems and making comparisons between Japanese and Bhutanese practices.

Bhutan is a Buddhist country with a living culture. The unique and most interesting fact about the architectural heritage of Bhutan, from simple farmhouses to massive *dzongs*, is that there has been little digression from the functions for which these structures were originally intended some centuries back, and they still form an integral part of the day-to-day lives of Bhutanese people. Wood is the oldest and most commonly used material in Bhutanese traditional architecture, from centuries past until the present day, along with stone and rammed mud walls. With almost two-thirds of the country's area covered by forest, timber is intimately associated with traditional Bhutanese culture. Timber is used as material for items ranging from furniture to extremely complex structures, including its use for roofing. This can be understood from the non-availability of alternative materials, and at the same time the natural abundance of timber.

From the past until the present day in Bhutan, while conservation of timber in heritage buildings has been carried out, the techniques and materials used are very traditional, and most of the time it involves totally reconstruction or replacing timber members with new ones. This practice of restoring the cultural heritage is mainly due to Bhutan's being a Buddhist country where the use of chemicals or preservatives against insects is discouraged by the people. Also, conservation of the cultural heritage is relatively new and modern concept to Bhutan; there is not even any legislation in place to protect this heritage from losing its value and authenticity.

The restoration of cultural heritage or a monument is carried out when the structure is in critical or deteriorating condition. In some cases, repainting or adding additional structure is carried out by people to accumulate good acts or as a public ritual for a good harvest, timely rainfall, and good health for the community. In some cases people do it as welfare work, as in the case of repainting monuments for the benefit of their deceased relatives' souls.

Preservation and maintenance of the historic monuments that embody our thriving culture is an uphill task everywhere in the country. To my understanding, most architects, engineers and managers who implement such conservation projects experience negative reactions and substantial interference, starting from top decision makers to the general public and end users of the heritage sites. When I say interference, I do not mean to be inconsiderate of the views of end users, but most of the problems faced in Bhutan in such circumstances arise because people in various places want the same design of timber members in the monuments, which in my view totally changes the authenticity, history, and cultural and traditional value of a particular monument in its particular setting.

In Bhutan, we lack an advanced systematic approach such as that of Japan. A brief survey and documentation are carried out, followed by conservation or restoration work which hardly takes more than a few months for smaller structures, and about four to five years for larger structures, or much less time in comparison with Japan for a similarly sized structure. We lack a system for recording and doing research on old structures or members, which are commonly burned as firewood. In the past, the wooden members of monuments were completely replaced with new ones during restoration. At present we are trying to improve the system, and to a certain extent efforts have been made to incorporate the concept of conservation and preservation of cultural monuments.

Now to compare the methods used in my country with those of Japan, for example in the case of wooden members, I would prefer conservation in a manner similar to that of Buddhist temples in Japan, but not the practice for some Shinto shrines of totally reconstructing every twenty years with new timber. I prefer replacing only structurally unsound members, as this has a major impact on the resources of the country, the preservation of ancient monuments, the continuity of knowledge of craftsmen, and employment for the people, etc. When we conserve those structurally sound timber

members and reuse them, we directly reduce the requirement for new timber, which gives direct benefit for the economy of the country. Similarly, it will help in preserving the skills of the craftsmen, as we will be required to do this work every few years.

The major impact will be on preserving the natural resources which are quickly being exhausted in every country. Although no studies have been carried out in Bhutan on the impact to the forests from felling trees used in conservation of monuments and other purposes, statistics from the Forest Department show that thousands of trees are felled every year to meet this demand. Between June 2007 and June 2008, Bhutan felled 60,178 trees or about 165 trees every day, to meet the demand for timber. This excludes the 550 trees felled daily for other uses. Although Bhutan's verdant forests are mandated by the Constitution to exceed 60 percent coverage of the nation for all time to come, they are under tremendous pressure from the soaring demand for timber for conservation of monuments and other construction.

Officials say that without policy intervention, Bhutan's rich forests will deplete faster in the coming years. Bhutan has 72.5 percent of its area under forest coverage, but only 14 percent is available for timber production, as the rest of the area is designated as a national park in which extracting timber is prohibited. In such circumstances, I think the best way would be for conserving timber members, which would ultimately help in preserving not only the cultural heritage but natural resources too.

As stated above, Bhutan does not have proper legislation for the protection of cultural heritage or a standard system for such work with respect to the living culture of the country. The most important thing at the moment for Bhutan is to make strong legislation for the protection of cultural heritage, which should include the ability to accommodate the cultural, spiritual and traditional values of the country and people that have been passed down for generations. Bhutan will or may have different legislation from Japan and the rest of the world considering its living culture, traditions and religion, etc. (which are also part of the cultural heritage), but Bhutan has many things to learn and adopt from the Japanese system. So in this field, Bhutan can adopt some of the best of the Japanese system, as both the countries have similarities in terms of the materials used, and also in the culture of present Bhutan and ancient Japan being similar. Though there may also be some differences in culture, and in the techniques and ways for dealing with cultural monuments, Bhutan can adopt some of the precautionary measures such as fire hydrant systems from Japan, which are among the best in the world.

Bhutan can also adopt methods of documentation of cultural monuments from the Japanese system, such as having a standard surveying and documentation system throughout the country. The survey and documentation practical training carried out at the Tanaka Family Farmhouse is a good example for all the participants to adopt and follow in our respective countries.

Lastly let me take this opportunity on behalf of the Division for Conservation of Heritage Sites, Department of Culture, Ministry of Home and Cultural Affairs, the Royal Government of Bhutan, and on my own behalf, to convey my deep appreciation and gratitude to the Cultural Heritage Protection Cooperation Office, Asia/Pacific Cultural Centre for UNESCO, Nara, for providing this opportunity to participate in the month long wooden conservation training course. The training course is very relevant and useful to me and my country. On my part I will use the knowledge gained from this training course for improving the conservation of cultural heritage in Bhutan, by sharing it with my colleagues and using it in my daily work.

Indonesia

Kosasih Bismantara

Final Report, Training Course on Cultural Heritage Protection in the Asia/ Pacific Region 2009: Preservation and Restoration of Wooden Structures

1. Introduction

Every country, including especially Indonesia and Japan in the Asia/Pacific region, has a history of past life, including the history of the religious, economic, social, and political background of present-day life. The past life of a place or country can be seen in the cultural heritage which still remains. Cultural heritage is comprised of both immovable and movable heritage. Movable heritage includes arts such as dance, games, traditions, social life, etc. Immovable heritage is the physical legacy that can still be seen, including: the buildings of temples, mosques, churches, and traditional houses; other structures such as earthworks, fortresses, and bridges; the non-structural items such as inscriptions, paintings, sculptures, bowls, cups, archives, weapons (krises, samurai swords, spears), and others.

Cultural heritage must be preserved to bequeath it to future generations, and this preservation is the duty of the present generation. Cultural heritage preservation can be done through conservation and restoration. Conservation is done to the maximum extent possible while still maintaining the building's materials, function, and its location. One type of material of cultural heritage is wood. For the care of wooden cultural heritage structures in accordance with the principles and methods of preservation, training courses are needed for the relevant personnel. Such training course can be conducted through comparisons of preservation and restoration activities of several countries, noting the causes of damage, the techniques and materials used, the problems, and the policies of various governments and the public attention given to the preservation of cultural property.

With regard to the preservation and restoration of wooden heritage structures in particular, the Asia/Pacific Cultural Center for UNESCO (ACCU) Nara has offered this "Training Course on Cultural Heritage Protection in the Asia/Pacific Region 2009: Preservation and Restoration of Wooden Structures" from 8 September to 8 October 2009, in Nara, Japan. The training course was attended by representatives of sixteen countries, namely Bangladesh, Bhutan, Indonesia, Iran, Lao PDR, Mongolia, Myanmar, Nepal, New Zealand, Pakistan, Philippines, Samoa, Sri Lanka, Thailand, Uzbekistan, and Vietnam.

2. Application of this training in Indonesia

2.1. Indonesian government policies and the principles applied in Japan and participating countries

In Indonesia, most wooden heritage buildings are owned by the community, which is obliged to maintain them. If the owners conduct preservation and restoration of cultural property, the costs are borne entirely by the owner, as the Indonesian government does provide subsidies for the preservation and restoration cultural property. Based on Indonesian law, if the owner cannot afford to maintain cultural property because of the cost for preservation and restoration, the owner can do one of the following.

- give up the right of use and/or management, either partially or entirely, in exchange for protection and maintenance by the government
- make an outright transfer of the rights of ownership to the government

According to Indonesian government policies, based on the degree of priority given to a particular cultural property, and on studies of the amount of damage and the function of the property, the entire cost of preservation and restoration of community cultural property may be borne by the government.

2.2. The procedure and methods of restoration and preservation of wooden structures

After listening to the presentations on preservation and restoration activities in the participants' countries and being exposed to the training provided by the instructors and the visits to various sites, it appears that all countries take nearly the same basic approach to the preservation and restoration of wooden structures, regarding the procedures, methods, and materials used. This is based on principles of cultural property conservation, which call for maximum maintenance of old materials and minimal use of new materials. Procedures and methods have similar general characteristics before preservation and restoration, to determine the activity which will be done, and then during and after the conservation work as well. The first step is the collection of data on the cultural property and its environment (historical data, damage, material, ownership, climate, insects, etc). At the time of dismantling, each member of the building is marked for ease of reassembly. After dismantling excavations are carried out to find information on the structure, the soil conditions, and relevant background factors. The finds from the excavation are stored in the storage room.

Conservation work and the use of building materials are adapted to the methods (tied with ropes, nails, or wooden pegs, etc.) and the materials used when the cultural property was first built. Documentation (photographs, drawings, and verbal descriptions) is done before, during, and after the preservation and restoration.

In Indonesia, particularly in the preservation and restoration of the mosque of Demak, the old poles were removed and then treated with preservative, and after soaking were put back and reinforced with exterior layers of new wood (old pole in new timber). Long pole or mast sections are replaced, preserved, and stored in the storage room or a site museum. In Japan, long poles may be drilled down the center from top to bottom, and new wood put in the hole.

In Indonesia, where there is wood carving or bas relief that has been damaged and must be replaced with new wood, the wooden replacement is not given the same relief or carving (the new wood remains unworked). The use of chemical or inorganic preservatives in Indonesia still needs to be tested to assure there is no negative impact on the wood. The use of chemicals is usually carried out on wooden material that has experienced weathering and is damaged by insects. The use of chemicals is done by spreading, injecting, or spraying the wood containing the insects, or by soaking the wood in order to preserve it.

3. Identification of problems

Indonesia and Japan have similar problems in the handling of wooden heritage structures.

3.1. Government policy

In the repair or construction of buildings financed to any degree by the government, the Indonesian government has issued a policy that repairs or construction work must be performed by contractors (although current contractors in Indonesia very rarely have experience or specific knowledge in the field of culture preservation of property) within a limited time and with workmanship equal to the repair or construction of new buildings. Indonesia does not have guidelines on procedures and methods of preservation and restoration of wooden structures, so preservation and restoration activities are conducted on the basis of past experience on wooden buildings.

3.2. Ownership

Most of the wooden heritage buildings in Indonesia are owned by the community. Due to the need for more space from an increase in family members, the owner often makes changes or expands the cultural property. Changes or extensions are usually not based on the original architecture, materials, and quality. Owners often make changes to the architecture by replacing wood with stone or concrete as a material, in order to make the building stronger.

3.3. Climate

The Indonesian territory lies across the equator and experiences a tropical climate that is hot and has two seasons, namely a dry season and a rainy season. Climate change is difficult to avoid, and it affects the various aspects of life and materials, including wood. The rainy season in Indonesia lasts

on average for six months with relatively high rainfall. The rain accelerates the weathering process of wood and wooden building materials

3.4. Insects

In Indonesia there are many kinds of insects, ranging from very small sizes up to 1 cm in size. Insects are one of the main causes of damage to wood, and as insects cannot be eradicated, treatment is simply to slow the damage to timber, and treatment for other insects usually must be done again if the deterrent against one type is effective.

3.5. Natural disasters

Indonesia has a long wet season and many mountains. In the rainy season, high rainfall results in flooding of residential areas, causing damage and loss of cultural property washed away by floods.

Earthquakes. Other natural disasters include earthquakes that hit Indonesia, although wooden heritage structures can usually withstand the earthquakes and suffer only minor damage.

Tsunami. One of the worst natural disasters occurred in 2005, when the province of Banda Aceh and North Sumatra Province were hit by a tsunami, and significant amounts of cultural property, both stone and wooden structures, were damaged or washed away by the sea waves.

3.6. Fire

Wood is a highly flammable material, and fire is a cause of damage and destruction of cultural property, especially one that burned an area of traditional houses in West Sumatra. The dense population residing in cultural property neighborhoods is especially a problem for protection from fire disaster.

3.7. Environment

Local environmental conditions affect the sustainability of cultural property, for example, whether it is located in a densely populated neighborhood, on the riverbank, the beach, the hills, in forests, etc, with each type of location having its own problems.

3.8. Substitute materials and cost

Preservation and restoration costs for cultural property are significantly high, and with many cultural heritage structures owned by the community, some are unable to finance the preservation and restoration. Currently the price of wooden material is quite expensive, and the implementation of preservation and restoration involves specific methods and procedures that require more processing time than would new building improvements, thus making the cost more expensive. In addition to the high price of wood, good timber that is more than 4 m in length is hard to find in either big cities

or rural areas. Traditional homes and community-owned structures use wooden members longer than 4 m, and especially in the traditional homes of most of Borneo ironwood is used, which is very expensive.

4. Comparisons with the current practise in Indonesia

In order to conserve cultural property, good training programs have been started by the government and by non-governmental organizations for the owners and community members around cultural property locations. The training aims to ensure that handling of cultural property both by owners and the community is done properly, and to instill a growing awareness in society of the need to care for and protect cultural property. Some of the training focuses on general conservation principles and theory, with materials provided on government policy and conservation management activities. Other training is based on the needs for handling specific cultural property materials, focusing on only one or two aspects of conservation. Some examples of such training are as follows.

4.1 Disaster management training

In this course participants are taught how to stand in preparation for the rescue and protection of cultural property in the event of disaster, such as fires, earthquakes, floods, tsunamis, etc., The course covers how to prepare for saving before a disaster, how to react in the event of a disaster, and what to do after a disaster. In the training, participants simulate rescues in disaster situations, and practice the use of disaster prevention equipment and techniques for the protection of cultural property.

4.2 Training in cultural property conservation

Conservation in Indonesia is part of the maintenance cultural property, namely the handling by using materials to preserve material cultural property. In this training the participants experience the following.

- Introductions to the types of materials that can be used to preserve cultural property materials, such as alcohol, glue, epoxy resin, paint thinner, etc.
- Manufacture or mixing of raw materials for preservatives
- Handling of cultural property, as in the application or injection of materials for strengthening, camouflage, gluing, etc.

4.3 Training in the identification cultural property

This training aims to promote recognition of objects, especially immovable ones, as cultural property. The material taught is the history, characteristics, types, functions, materials, and ages of cultural property.

5. Evaluation of the relevance of this training program for conservation in Indonesia

The “Training Course on Cultural Heritage Protection in the Asia/Pacific Region 2009: Preservation and Restoration of Wooden Structures,” held in Nara, Japan, is very beneficial for the participating countries because each country has its problems and different ways of dealing with the protection of wooden heritage structures. The subjects covered in the training course can be used as reference in the preservation and restoration of wooden structures in each country. For future training courses or next year, more practical subjects getting the participants directly involved in preservation and restoration should be given. Some proposals for future training courses might include, among others: excavation, in which participants get practice in excavation at a site, analysis of the strata and structure of the soil, handling of the findings; painting restoration, in which participants make the selection or mixing of materials to be used for painting restoration, and practice painting techniques in making restorations.

Iran

Anahita MOSAVI

Final Report: Training Course 2009, Nara

Introduction

What have I experienced in this training course in Japan? How can I apply it in my country and, in my case, to the “Guilan Rural Heritage Museum?”

What I have experienced in Japan is not only participation in the lectures and site visits, but also, during the one month stay in Japan, the opportunity to observe Japan's architecture, lifestyle, culture, religion and ceremonies, and above all, to perceive and compare Japan's method of conservation with that of my country. It is very useful to perceive the methods of other countries, as in this training course in Japan, with the participants from sixteen countries adding their knowledge of different conditions, cultures, and methods of preservation and restoration of historic buildings.

What do we do about preservation and restoration of wooden structures in Iran, and what is done in Japan and the fifteen other countries? What are the similarities and differences between wooden structures and the conservation methods in different countries? What is the purpose? All of us have a common purpose: the preservation of cultural and historic buildings (in this case, wooden structures). What is our wooden heritage? Why we should preserve it? How can we do it?

If we find the answers, we can preserve our heritage, our culture, our history. We can transfer it to future generation. This is our duty. When we look at our cultural buildings we feel pleasure and admiration for our ancestors, because of their knowledge and culture.

Importance of wooden heritage

Iran is a country rich in cultural heritage, and architecture in Iran has a long history. According to archaeological studies, wood has long been used for constructing buildings, specially in covering them with roofs and in constructing doors. It is worth mentioning that the cultural heritage in Iran is known to include ancient cities, castles, palaces, mosques, shrines and magnificent houses, for most of which the important structural materials are stone, mud and brick, with decorative wooden doors and windows. In some cases these buildings were built over a thousand years ago, and they show the history of architecture in Iran. Also, there are cultural villages in my country such as Masouleh in the

north, Abyaneh in the center, and Kandovan in the northwest.

The Guilan Rural Heritage Museum is a brilliant example of conservation and preservation of wooden rural structures in Iran. Guilan is located on the southern seashores of the Caspian sea, and it is the only geographical domain in Iran where wood has a main role in the structure of indigenous buildings. Of course, in some parts of the western regions of Iran, in the foothills of the Zagros areas, there are semi-forested areas in which wood was used to build buildings.

The Guilan Rural Heritage Museum has revived what was being destroyed. It was very difficult to convince people of the importance of rural heritage and culture. There are sometimes rural buildings, constructed with traditional methods, which are about fifty years old, but people would not recognize them as cultural properties. Modernism has encouraged rural people to build new houses, and we cannot force them to live in their old buildings. We tried instead to reassemble rural buildings in the museum and we found we could attract the attention of people, who were satisfied and glad when they visited the museum, saying "it's similar to our fathers' houses," and "we were born in these buildings."

Our heritage is important and its preservation is important. That is the answer to the question of "Why preserve it?" It also raises the questions of "What to preserve?" and "How?" Research in museums includes architectural and anthropological studies which are applied to tangible and intangible cultural properties. We try to combine both. We try to revive traditional ceremonies and festivals. In this case we celebrate traditional ceremonies and festivals on different occasions. Some of these had been forgotten, but we could revive them, and I should say that people enjoy these ceremonies and find them attractive.

Training course

The training course was very effective for me for improving my knowledge about wooden structures and the restoration of wooden heritage. I learned new techniques of restoration, preservation and management. There are both similarities and differences in the thinking and methods employed in different countries. These arise because of the similarity in wooden architecture in all parts of the world, and from differences between the social situations, equipment, knowledge, and technology related to wooden structures.

It was very interesting for me to observe the survey methods of conservation in Japan. What we do at the Guilan Rural Heritage Museum is similar to what I experienced in Japan. First, we identify buildings, then we collect documents including architectural and anthropological studies, make drawings (plans, sections, elevations, details, site), take photos and videos, study the changes in buildings at different periods, and the relevant history, customs and culture. Then, after marking

and disassembling, the last process includes reassembling, furnishing the building, completion and classification of documents including layouts in three phases, preparing digital layouts (using an auto CAD program), pictures and videos, writing architectural and anthropological reports and collecting all of them in the office. As I also experienced in Japan, documents are very important for us. But our drawing is different from the Japanese method, as we use level lines. It means before we start to draw, we post level lines on all four sides of a building and all of the measuring is done from these lines. This method is very precise and the probability of mistakes is slight. Layouts include floors plans, beam plans, roof plans, elevations and sections of all rooms and porches. In some cases the number of layouts is more than 25 sheets. Also, the layouts of details are drawn in this stage. The process of drawing lasts between 7 to 10 days depending on the size of building. Materials which are used in the building are identified in this stage. We specify the materials in sections.

What I experienced in Japan about drawing was different, in that additional information about the wood species, quality, preparation process and shape of the materials used was collected in this stage, which I think is very useful because we can use this information in subsequent stages, and it is necessary to complete our information in the museum. We can apply this method, and add it to our documentation process in the museum.

Another point is the identification of decayed wooden members for restoration or replacement, which is done in the dismantling stage in Japan. We identify decayed wooden timbers in the reassembling stage after transferring the materials to the museum. Sometimes at this stage we do have not enough time to procure the same wood for restoration, when we are forced to replace decayed pieces with the sound ones. We use old pieces which we take from similar buildings. We buy these buildings to use their materials when reassembling the main building. If we apply the Japanese way, and identify the decayed members and think about what we can do for restoration of those members in the dismantling stage, we can keep a lot of decayed members and restore them. We will have enough time to prepare the same materials.

I learned about international organizations for cultural heritage and about charters. I will try to apply these in accordance with conditions in my country and the project's purpose, such as "new members or parts of members should be discretely marked, by carving, by marks burnt into the wood or by other methods, so that they can be identified later" (Article 11, under the section "Repair and replacement," of the 1999 ICOMOS charter, "Principles for the Preservation Of Historic Timber Structures").

The Guilan Rural Heritage Museum has restored Guilan rural heritage which was being lost. So far four villages, of the eastern plain, the central plain, the western plain and western foothills (mountainside), are under utilization, and villages of the western mount and the eastern foothills are under construction. The Guilan Rural Heritage Museum is a bridge between the past and present.

We face the challenge of how to preserve it for future. What aspects should be conveyed, what parts are most important to preserve for future generations? The important point is preservation, and transferring this knowledge to future.

We recognize the problems, as I said in my country report. According to what I have experienced in the training course, the lectures and site visits, I have learned the importance of risk preparedness and risk management, and the identification of potential disasters. It is important (in my case) to rebuild the buildings and to add them in order to complete the museum, but it is also important to protect the reconstructed buildings against damage, such as from fires, earthquakes, heavy snow, rain, insects and other risks.

I am thinking about designing a flowchart that must be completed, after classification of all disasters and damages which we are faced with.

In Japan, structural analysis is conducted of wooden structures. I saw in restoration sites the foundations of buildings that are reinforced with modern materials. This is one of the problems in our museum, because we do not conduct structural analysis of wooden structures. I think we should apply the methods of advanced countries against earthquakes, because in Iran earthquakes are frequent.

I learned about insect damage and the methods for its prevention. We need experts in this area for the identification of harmful species. After that we must think about the measures and materials that we can use for prevention.

The method we currently use in the museum is to monitor wooden elements constantly, and replace the decayed wooden members with sound ones. Also, in some cases the decayed members are restored. The replacement of decayed members is done with the same type of wood as the original member. In this way, the decayed part is removed and then replaced with new wood. We try to restore the rebuilt buildings and to reassemble other buildings to complete the museum.

It was very interesting for me in Shirakawa Village when I saw a picture of students working in rice fields and re-roofing buildings. In similar manner, we hold activities for students such as a day for planting trees, and on other days students can visit the museum for free. We want to improve these kinds of activities in the future.

Guidance for visitors to heritage sites is very well organized in Japan, as there are many maps on the streets and at each site, which help visitors find their way easily. In front of buildings and sites there are written explanations about the historical background. In our museum we display written information in front of each building. But we need more information and maps to give better guidance for visitors.

The Japanese way of keeping the townscape is very attractive. I know in Guilan there are a lot of buildings designated as national cultural properties, but we do not preserve the townscape. I want to explain the concept to my city's government, and I hope to achieve this in the old center of my city.

I learned about the survey of painting, the history of wooden architecture in Japan, the architectural heritage in Asia, dendrochronology, conservation science for wooden materials, and I visited restored sites, towns and wooden buildings in Japan from which I learned a lot. I will try to apply all I learned in the training course and I hope to do similar work. It will take some time to organize all I have learned and apply the experience in the best way.

Acknowledgment

The training course in Nara was very beneficial for me for improving my knowledge and learning about preservation, restoration and conservation, and it was also a great pleasure for me to participate in the 2009 training course. I am thankful to Dr Mahmoud Taleghany, the manager of Guilan Rural Heritage Museum complex, for nominating me for this training course and for all he has taught me in five years with the Guilan Rural Heritage Museum.

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Lao P.D.R.

Amphol SENGPACHANH

New Experiences in Cultural Heritage Protection

1. Introduction

Cultural heritage is the legacy of physical artifacts and intangible attributes of a group or society that are inherited from past generations, maintained in the present and bestowed for the benefit of future generations. Often though, what is considered cultural heritage by one generation may be rejected by the next generation, only to be revived by a succeeding generation.

Physical or “tangible cultural heritage” includes buildings and historic places, monuments, artifacts, etc., that are considered worthy of preservation for the future. These include objects significant to the archaeology, architecture, science or technology of a specific culture.

“Natural heritage” is also an important part of a culture, encompassing the countryside and natural environment, including flora and fauna, scientifically known as biodiversity. These kinds of heritage sites often serve as an important component in a country’s tourist industry, attracting many visitors from abroad as well as locally.

The heritage that survives from the past is often unique and irreplaceable, which places the responsibility of preservation on the current generation. Smaller objects such as artworks and other cultural masterpieces are collected in museums and art galleries. Grassroots organizations and political groups have been successful at gaining the necessary support to preserve the heritage of many nations for the future.

Significant was the Convention Concerning the Protection of World Cultural and Natural Heritage that was adopted by the General Conference of UNESCO in 1972. As of 2008, there are 878 World Heritage Sites: 678 cultural, 174 natural, and 26 mixed properties, in 145 countries. Each of these sites is considered important to the international community.

A broader definition includes intangible aspects of a particular culture, often maintained by social customs during a specific period in history. This heritage is comprised of the ways and means of behavior of a society, and the often formal rules for operating in a particular cultural climate. This includes social values and traditions, customs and practices, aesthetic and spiritual beliefs, artistic

expression, language and other aspects of human activity. The significance of physical artifacts can be interpreted against the backdrop of socioeconomic, political, ethnic, religious and philosophical values of a particular group of people. Naturally, intangible cultural heritage is more difficult to preserve than physical objects.

In the Asia/Pacific region there are many remnants of ancient wooden structures, which highlight the long traditions and cultures of individual countries. To preserve this heritage different countries have developed unique preservation/restoration techniques. However, due to a shortage of experts, adequate preservation of historic structures has become a pressing issue. Preservation/restoration techniques need to be passed on to the inheritors of our cultural heritage.

Japan has a long, rich and splendid cultural heritage, which reflects its civilization and its national history inherited from the past. There are numerous wooden structures remaining from the 7th century, many of which have been well preserved due to proper maintenance activities, and restoration projects undertaken in timely fashion, because the Japanese government has very good system for the protection and preservation of cultural properties, and Japan is rich in experience and in the science and techniques of this field. So the wealth of knowledge and techniques thus accumulated in Japan should be shared with other nations of the world, specially in the Asia/Pacific region.

2. Training program

The training program was well organized by its sponsors, and has been very stimulating and covered many important aspects of preservation and restoration of cultural properties, mainly on wooden structures in Japan, with other lectures presented by ICCROM representatives concerned with cultural heritage protection in the Asia/Pacific region as well as all around the world.

The organizers provided useful knowledge to the participants, who are specialists in this field in their individual countries, mainly through four different methods.

- Lectures
- Site visits and on-site lectures
- Practical training
- Participant presentations and discussion

3. Evaluation of the relevance of this training program to conservation work in our country

3.1. Identification of problems and comparisons with the current practices in our country

3.1.1 Policies

In Japan, regulations on cultural heritage protection began in the late 19th century, approximately a hundred years after European countries such as Italy and France, and since that date many laws and regulations regarding this field have been adopted and developed to be applied to heritage from every period of the country's history. Accordingly, after long development and improvement of the protection system, Japanese laws now cover all valuable man-made objects in the entire country.

In our country, the central government always considers our people as a force in term of national defense and development, and while cultural heritage protection activities have been carried out since the ancient period, the first legal regulation began just forty years ago. Obviously this idea is practically limited only to the conservators and technicians who are in charge of this framework, and is still not commonly recognized by the general public, this being a big problem to be solved in the future. Even though the law on national heritage, adopted by the National Assembly and declared by the government a few years ago, has been enacted, it needs time to be enforced for people all around the county.

3.1.2 Human resources

In keeping with the enormous number of cultural objects in Japan, and its long history of experience in cultural heritage protection activities, the Japanese are also rich in experience with scientific methods regarding the preservation and restoration of cultural properties. Thousand of experts in charge of cultural heritage protection, including conservation architects, conservators, skilful craftsman and so on, are specialized in their own fields, and conduct their responsibilities in these activities throughout the country.

In my country, however, there is a deficiency of experts who are specialized in these fields, and while the limited number of officers in charge of cultural heritage protection, who belong to government agencies dealing with cultural affairs, are extending fieldwork activities over the entire country, at present many cultural objects are still not classified or described as cultural heritage as they should be, meaning many of them are not yet properly protected from damage and disasters which might emerge at any time in the future.

3.1.3 Preservation and restoration activities of wooden architectures

In Japan, many items of cultural property have been classified and registered on the list of National Treasures and Important Cultural Properties, and most of them have been protected and preserved in the proper manner. These preservation and restoration activities have been applied to individual objects including wooden artifacts and wooden structures, some of which still survive from the 7th century, and their condition as shown to us during the site visits is incredibly perfect, as if they were built just fifty years ago.

Some of preservation and restoration activities for cultural heritage in my country are successfully carried out in some areas where the idea of heritage protection has become established, for instance the Town of Luang Prabang, the capital Vientiane, Vat Phou and Associated Ancient Settlements within the Champasak Cultural Landscape, where all historic building are classified and listed for protection and maintenance under national and international rules.

3.2 Some ideas and practices gained from the training course that would be most useful in our country

Some of the most valuable knowledge and experiences from this training course could be applied and integrated into our work process in Lao PDR.

3.2.1 The concept of cultural heritage protection

Currently the basic concept of cultural heritage protection in my country is imprecise in comparison with the Japanese system, but of course we have to make it more detailed in various areas, such as civil engineering works, groups of vernacular ethnic houses, superior design, superior techniques, having high academic value, etc. These changes must be carried out in the classification and registering process as soon as possible, as well as being applied to the rules of management that will cover all these areas.

3.2.2 Preservation and restoration techniques for wooden architecture

Each nation has its own methods and techniques for the protection, preservation and restoration of its cultural properties, which should be shared with other countries as well. As I mentioned before, Japan has a rich and splendid cultural heritage, and has numerous wooden structures remaining from the past, many of which have been well preserved due to proper maintenances activities, and restoration projects that have been applied in timely fashion, because the Japanese government has a very good system for the protection and preservation of its cultural properties, and Japan is rich in experience with the

science and techniques in this field. So the wealth of knowledge and techniques thus accumulated in Japan should be shared with other nations in the world, specially in the Asia/Pacific region. As a conservation architect, we should learn how others have succeeded in this field, and select the best to apply to our own situation.

3.2.3 Risk preparedness for cultural heritage

After experiencing destruction and disasters, Japan has developed a very good system for protecting the cultural heritage, and I think it is the first priority for each nation to seriously consider and prepare for the various kinds of disasters that may happen. In my country, due to the low level of development, we are still far away from such preparedness. Accordingly I think that these activities are really needed now so that we will be prepared, and can avoid any harm to humans as well as cultural properties.

3.2.4 Interpretation and presentation of cultural heritage to the public

During on-site lectures and the visit to the Nara palace site, I was very impressed with the ways of interpreting and presenting cultural heritage to the public, and the four different ways of presentation (full-scale reconstruction, half-scale reconstruction, using trees to mark the positions of wooden columns or important building components, and showing the site's archaeological remains as excavated), that were selected according to significance of the remains, and the information made available about them, are very useful for the public to understand the cultural heritage, what it looked like, and its former condition.

4. Conclusion

From my point of view, the ACCU training course on cultural heritage protection in the Asia/Pacific region for 2009, "Preservation and Restoration of Wooden Structures," was very useful for all participants, who are professionals in their own fields in their individual countries, and the knowledge and experiences gained here can be adopted and integrated into the cultural heritage protection activities in their own countries.

Moreover, I personally found that I have gained a lot of valuable knowledge and experience from this training course, particularly in how the Japanese deal with cultural heritage preservation, restoration, and reconstruction through their unique approaches, supported by enormous resources. Although the training course is quite short in duration, the information was presented in an effective way. The program enabled the participants to enhance their theoretical and practical knowledge regarding cultural heritage protection, both in class and through the on-site lectures and practical training. However, regarding language problems that prevented us from understanding the essence

of some subjects, I think that if we speak the same language we would be able to reach much better understanding of those subjects' essence.

Regardless, the knowledge and experiences gained from the course will be shared with my colleagues, fellow conservators and other conservation architects in our country.

5. Acknowledgment

On behalf of the Lao government and Lao people, I would like to express my gratitude to ACCU Nara Office, Japan's Agency for Cultural Affairs (Bunkacho), ICCROM and Nara National Research Institute for Cultural Properties (NNRICP) for giving me this great opportunity to attend the ACCU training course on cultural heritage protection in the Asia/Pacific region for 2009, "Preservation and Restoration of Wooden Structures." This course is of vital importance for me for improving my knowledge and experience in cultural heritage protection issues. My heartfelt thanks are due to Mr. NISHIMURA Yasushi, director of ACCU Nara Office, Mr. Yoneda Masahiro, Mr. Nakai Isao, Ms. Tanda Kaoru, Mr. Kinoshita Wataru, Mr. Yamashita Tsutomu, Ms. Otani, Nishida Michiko, and to Maki, Akiko, Rie, Kattun and all the staff of the ACCU Nara office for their excellent handing of the course from its inception to completion, providing all of the guidance and necessary information. Thanks also to Ms. Hata Chiyoko for very skilful translations of the lectures and other relevant information. I would also like to express my sincere gratitude to all the lecturers of the training course, including on-site lecturers and facilitators who provided us vital information on cultural heritage protection in Japan. I truly consider them my teachers in the field of cultural heritage protection.

Khob-chay !

Arigatoo gozaimasu !

Thanks !

Mongolia

OCHIRSUREN Oyunchimeg

First of all I would like to thank the Government of Japan and the ACCU Nara Director, Mr NISHIMURA Yasushi, for giving me the chance to attend the ACCU training course on Cultural Heritage Protection in the Asia/Pacific Region, 2009, on the “Preservation and Restoration of Wooden Structures,” organized by the ACCU Nara Office in Japan.

This training course on the preservation and restoration of cultural heritage in the Asia/Pacific Region, held from 8 September to 8 October, presented significant and valuable information on the conservation of historic wooden heritage, on preservation and restoration methods and techniques for investigation and analysis, in Japan and other countries of Asia. The course provided an opportunity for studying the preservation and restoration of cultural heritage methods employed in Japan, and comparisons were made among the participants from the Asia/Pacific region.

The program’s main aim is to develop skills in conservation work, and promote exchange between Asian conservators, and also promote mutual understanding among the participating countries and the host country, Japan. The program invites scholars and professionals working on cultural heritage protection in fields related to Japanese wooden structures and buildings, and provides a forum for exchange of information on preservation and restoration of cultural properties among participants from the Asia/Pacific region. A total of 16 participants attended from Asian countries, and every participant talked about his own country’s unique culture and cultural heritage, and about conservation and restoration methods for the wooden cultural heritage, so that all participants could bestow on one another the wisdom and skills that they possess about wooden structures and the problems that we face. Japan is a country very famous for its ancient historical monuments, many of which are registered on the UNESCO World Cultural Heritage list. Before coming to Japan, I had little knowledge of Japanese historic cultural monuments, but now I know for example more about the Japanese establishment and protection of forest or woodland reserves, where appropriate timber can be obtained for the preservation and repair of historic timber structures, which should be encouraged elsewhere. Under its historic conditions, Japan’s architectural technology developed in the direction of wooden construction. Therefore, it is usually the case that buildings designated as cultural assets are made of wood and there are eleven cultural monuments in Japan inscribed on the World Heritage list.

I have been working for the Center of Cultural Heritage in Mongolia since 2000. The Center of Cultural Heritage is a state professional organization in Mongolia for the digital documenting, conservation and restoration of the historic and cultural heritage. We also instruct museums on

methods for the registering and digital documentation of museum objects, immovable monuments, and intangible heritage. Nowadays we are not working on wooden architecture, we only working on wooden portions of temple decorations because we lack modern techniques, technology, and a professional conservator. My duty is conserving, preserving and researching wooden structures and wooden items, using modern advanced technology and traditional methods of conservation for wooden objects.

After the Opening Ceremony was inaugurated at the ACCU office at Nara by the Director of ACCU, we participated in the following lectures in the training course.

- “History of Wooden Architecture in Japan” and “Cultural Heritage Protection System in Japan”
- “Conventions and Charters pertaining to Cultural Heritage Protection” and “International Cooperation for Cultural Heritage Protection”
- “Restoration of Architectural Heritage in Japan”
- “Restoration Systems and Project Planning for Wooden Structures”
- “Orientation for the Practical Training: Overall Processes of Conservation”
- “Risk Management of Cultural Properties”
- “Introduction to Architectural Heritage in Asia”
- “Prevention of Insect Damage to Wooden Structures”
- “Introduction to Dendrochronology: Tree Species and Annual Rings”
- “Future Tasks in the Preservation of Cultural Properties (Theory and Practice)”

I studied about the importance of wooden cultural heritage structures, with every lecture impressing me, as a member of the policy planning committee, with the value of such buildings to the beliefs and social interests of the community in the past and continuing into the future. I hope to implement methods for conserving and preserving vernacular wooden structures as important cultural properties, together with their natural landscaping. The participants discussed many issues related to the content of each lecture, both among themselves and also with the lecturers. It was very kind to give us the respect of equal status with skillful persons in each field.

We also had on-site lectures and practical training, conducted at the following sites.

- “Restoration of Architectural Heritage in Practice,” Chion-in, Kiyomizu-dera temple, Kyoto
- “Survey Methods on Conservation of Vernacular Houses,” Naramachi district, Nara
- “Survey on Painting and Plans for Painting Restoration,” Todai-ji temple, Nara
- “Reconstruction of Ancient Building in the Nara Heijo Palace Site,” Nara
- “Recording and Documentation of the Old Farmhouse of Tanaka Family,” practical training at one of the municipally-designated tangible cultural properties in the city of Nara

- “Damage/Deterioration Survey and Planning for Restoration”
- “Materials Survey for Sustainable Conservation and planning a Management Policy”
- Other practical training focused on basic methods for making restoration plans by making drawings for measurement, surveying on painting and planning for painting restoration, and tasks using the methods and processes current in Japan for analyzing physical elements of the cultural heritage, at real sites such as the Old Tanaka Family Farmhouse (the oldest Horen-zukuri style building, originally located in Horen-cho, Nara) and Todai-ji temple.

In the training I also had the opportunity to visit the following sites, and study them as examples of heritage preservation.

- The main keep, Hikone castle
- Vernacular houses and townscape at Shirakawa
- Vernacular houses and townscape at Takayama

Japanese historical buildings are maintained by very committed people, and because they work together with expert carpenters the results of this process can be very positive, after careful observation is carried out by teams of conservators, working alongside architects, to assure that the original building is strengthened with good prospects for maintaining its authenticity. On my visit to Shirakawa I learned that the main difference between these structures and regular thatched roof farm houses was the huge, multi-story attic area that was used to raise silkworms. Regarding roofing styles of wooden structures, as wood is the main element used in traditional construction for roofing materials, thatch is always used in our vernacular houses as it suits the climate of our country, but it is also one of the materials used by the Japanese on some of their houses. And I found very interesting the thickness of the thatch applied to the roofs. This is a point of weakness in our structures, where we could use the ideas and methods of the Japanese. From observations of and information about the success of this wooden heritage preservation project, and how it is famous for restoring and preserving important cultural properties as well a relocating them in one place, I found it really an interesting process. In fact this process can be adopted by our ministry to preserve and restore our historical buildings and vernacular structures.

At the end of the month long training course, I would like to thank the ACCU because this course is very useful especially for me, and it will contribute in a practical way to the preservation and restoration of wooden architecture in my country.

Myanmar

U Min Min

My Experiences during the ACCU Nara Training Course

Introduction

I would like to thank the ACCU for providing me this splendid opportunity for participating in this valuable training course. I would also like to thank my government for nominating me for this opportunity. The Cultural Heritage Protective Cooperating Office, Asia/Pacific Culture Centre for UNESCO in Nara, Japan, organized this training course on the preservation and restoration of cultural heritage in the Asia/Pacific region, 2009, entitled “Preservation and Restoration of Wooden Structures.” This course lasted about one month, from 8 September to 8 October, 2009. There were 16 participants from 16 countries in the Asia-/Pacific region who took this training, and they will be using the knowledge in improving the restoration, conservation and protection of cultural heritage in their countries. The aim of the course was to introduce concepts and methods of preservation and restoration of various wooden structures, through examples of the treatment of Japanese cultural properties.

I am a conservator with the Department of Archaeology, National Museum and Library (northern branch), upper Myanmar. I have responsibility for the conservation of ancient monuments in upper Myanmar. The monuments are made of stone, brick and wood. Due to disasters, most of the cultural properties all over the world face the danger of deterioration day by day. It is necessary to take immediate measures. Nowadays, every country is trying to protect and preserve its culture properties for the future in various ways. Myanmar is also trying to protect and preserve its cultural properties.

General Overview of the Training Course

The training course began in the second week of September, and finished in the second week of October, 2009. During the month-long course, there were lectures, practical training activities and on-site lectures focused on restoration, preservation and excavation.

In the first week I had a good introduction to the “History of Wooden Architecture and Cultural Heritage Protection System in Japan,” “Conventions and Charters pertaining to Cultural Heritage Protection,” “International Cooperation for Cultural Heritage Protection,” and “Restoration of Architectural Heritage in Japan.” We then had on-site lectures on excavation at the Nandai-mon (South Main Gate) site at Kofukuji temple.

In the second week, we had a great chance to learn about the restoration of a three-story wooden building, the entrance to Chion-in temple, and visit Kiyomizudera temple in Kyoto, among others, where we observed systematic techniques of restoration and conservation of ancient monuments. We had a lecture on “Restoration Systems and Project Planning for Wooden Structures,” which contained essential and precious lessons for us.

In this week, in the three days of practical training at the old farmhouse of the Tanaka family (one of municipally-designated tangible cultural properties of Nara City), I learn about the drawing of floor plans and cross-sections of a farmhouse, and about detailed measurement. Japanese architecture being intact and visible in detail, all participants learned a great idea from this practical training. Apart from the hands-on practical training activities, participants were also given the opportunity to visit prominent Japanese cultural properties in and around Nara, including a visit to Toshodaiji temple. I learned about the restoration of wooden buildings at Toshodaiji, where the materials used were of the same type as in the original construction, and followed the original form and methods. Replacement was only permitted for heavily rotten or damaged members, or members that were changed during previous restoration work. All restoration work and changes made must be fully documented, and beams are mostly used in bent or curved shapes and large sizes.

In the third week, we had a lecture on “Risk Management of Cultural Properties” by Dr. Inaba Nobuko, Head of Project Planning Conservation System Section, National Research Institute for Cultural Properties, Tokyo, and had an “Introduction to Architectural Heritage in Asia” by Dr. Gamini Wijesuriya, Project Manager for ICCROM. Two days were then allocated for all participants to give their country paper presentations on the preservation and restoration of cultural properties. The preservation sessions were coordinated by Dr. Inaba and Dr. Wijesuriya. Each participant presented for about 15 minutes on topics such as “Problems and Needs for Cultural Heritage Protection and Restoration Activities,” “Conservation of Architectural Heritage,” “Treatment of Wooden Material in Cultural Property,” “Preservation and Restoration of Wooden Structures” and “Protection and Restoration of Traditional Houses,” etc., concerning his/her respective country, followed by 25 minutes of discussion. These participants’ presentations were very positive, because the discussion which followed after the presentation allowed each participant to share ideas and comments on issues pertaining to his/her country’s efforts to preserve and restore important cultural properties. Credit should be given to Dr. Inaba and Dr. Wijesuriya for their constructive comments and ideas during the two days of participant presentations. Their expertise and experience on issues related to cultural properties in the Asia/Pacific region made the discussion stimulating.

We then went to Gangoji temple in the Naramachi area. We learned about the background history of Gangoji, and about the “Method for Surveying Private Residences and Urban Streetscapes.” In these lectures, I had the chance to learn about the purpose of the survey, methods of investigation, drawing

protocols, surveys of informative materials, surveys of traditional festivals, clothes, food and lifestyle. We visited the Naramachi area around Gangoji temple. The next day, we had an on-site lecture and practical training in the survey of painting and how to draw up a plan for painting restoration at Jibutsudo of Todaiji, in Nara. This was the first experience of this kind for me, which I found very interesting.

We took three days to visit Hikone castle and its garden, Shirakawa-go Village, and Takayama. The Nakano Yoshimori family house in Shirakawa-go and the World Heritage Site of Shirakawa Village were sites for a good lecture on the preservation of Japanese traditional vernacular houses. The participants were also given on-site lectures at various interesting heritage sites such as the Takayama local museum, and the Yoshijima family house in Takayama. Even though the visits were packed with lectures and walking tours within the designated heritage areas, the participants really enjoyed themselves, especially with every new discovery made during the site visits.

Japan has a long history of protection of its cultural heritage through legislation, currently the Cultural Properties Protection Act, and other means. I learned that the government grants subsidies for national treasures and provides other forms of support for the preservation and restoration of designated cultural properties. In many other countries in the Asia/Pacific region, cultural properties have also been protected by laws for the protection and preservation of cultural heritage since the late twentieth century.

Japanese architecture is shaped by circumstances of climate and geography. In Japan, with its high humidity, seasonal change and plentiful forests, wood has been the traditional building material. Traditional Japanese architecture has good foundations, good water drainage systems, and ventilation with good interior air circulation, slanted roofs, long overhangs and tatami mat-covered floor. Tatami mat flooring is one of the important elements in traditional Japanese architecture. The mats are standard in size, and while different depending on the region, this determines the building size.

In Japan, most of the wooden cultural heritage buildings are more than 500 years old, and were made using different methods and tools of construction when compared to modern buildings. One of the most important aspects I learned is the use of traditional materials and techniques in the restoration of historic wooden buildings. In the restoration of wooden structures, depending on the proportion of rotten material, a wooden member may be reused after being repaired with traditional methods using joints or grafting. Japanese historical structures are mostly made primarily of wood with paper screens, straw mats, plaster and clay for the walls and bark shingles, planks or tiles for the roofs.

The next important aspect of culture asset preservation and restoration in Japan is the disaster preparedness plan. One of the greatest threats to historic wooden buildings is fire, as the outbreak of

fire will destroy everything. It is no exaggeration that the history of preserving wooden structures in Japan is in fact a fight against disaster by fire. Japan has installed modern and sophisticated fire-fighting equipment in most historic wooden buildings.

Conclusion

During the 2009 ACCU training course in Nara, I acquired many skills and new information about the conservation and restoration of cultural heritage. The various sessions and practical trainings will be helpful in my work. In Japan, the level of preservation and restoration of cultural properties is higher than in other countries. Through the training course I gained new ideas, and advanced knowledge with which I can improve my current scope and concepts about the preservation and restoration of cultural properties, which will be helpful for my country in this field. I will share my experiences with other conservators in my department back in my country.

Acknowledgment

I would like to thank the Cultural Heritage Cooperation Office, Asia/Pacific Cultural Center for UNESCO, Nara, and the International Centre for the study of the Preservation and Restoration of Cultural Properties (ICCROM). I would also like to commend our course coordinator and staff; NISHIMURA Yasushi, NAKAI Isao, YONEDA Masahiro, KINOSHITA Wataru, YAMASHITA Tsutomu, OTANI Yasuko, HATA Chiyako, YOSHIDA Maki, AKIKO, TANAKA Rie and SUZUKI Katsuyuki. Thanks to all of you for your support and guidance throughout the entire program. Finally I would like to thank the Ministry of Culture, Department of Archaeology, National Museum and Library, in Myanmar for nominating me to participate in this training course.

Nepal

Suresh Suras SHRESTHA

Training Course on Cultural Heritage Protection: Preservation and Restoration of Wooden Structures

"If Hundreds of People Work for Rescuing People, Only One Person May Contribute for Heritage Rescue"



1. Introduction

The "Training Course on Cultural Heritage Protection in the Asia/Pacific Region, 2009: Preservation and Restoration of Wooden Structures," was organized by the Cultural Heritage Protection Cooperation Office, Asia/Pacific Cultural Center for UNESCO (ACCU) Nara, from 8 September to 8 October 2009.

ACCU Nara had called for applications from 37 different countries in the Asia/Pacific region through the National Commission for UNESCO in each country, first asking for three candidates from each country having certain qualifications according to criteria fixed by ACCU Nara, and then selecting 16 participants among them.

The 16 participants from different Asia/Pacific countries have been involved in their own countries in the field of cultural heritage preservation and conservation.

The international training course on “Preservation and Restoration of Wooden Structures” has included theoretical aspects or principles of conservation and restoration, as well as traditional and modern Japanese practices used for wooden structures, aiming to give knowledge about the traditional practices, modern norms, and advanced techniques of restoration and conservation in Japan.

The raining course was very systematically designed to give young, dedicated professionals, having experience in their own countries, detailed knowledge and practical experience with the Japanese system, as well as theoretical instruction in lectures.

2. The Training and Its Significance

The training was held in a very nice environment, where every trainee could feel free to learn every detail of all the subjects. The lecturers were also very well known, not only in Japan but in worldwide. The attitude of the lecturers and other trainers made the trainees more enthusiastic, and able to learn through participation and involvement in a way that I felt made the training 100 percent successful.

Aspects of the Japanese traditional conservation and preservation system were the principal topics, and we had the opportunity to observe these on site as well as to interact with the relevant technical professionals. It was to our great benefit that the resource persons were either technical practitioners or academics capable of giving training on their entire subjects, either in field observations and practical knowledge, or in principles and theoretical knowledge.

For that reason, the training was broad in scope and will make a successful contribution, in that this training can benefit not only the trainees, but also their home countries. This actually is the significance of this training.

Although most of the Asian countries have similar problems of conservation of heritage, there are some specific problems, which are due to the situation of the country or the time, perceptions of the communities, traditions followed by the communities, climate, etc.

- Problems of management
- Problems of the legal system
- Problems of budget

There are several problems of management for the conservation and preservation of cultural heritage in Nepal. The proper coordination between government and non-government institutions, lack of sufficient manpower, coordination between traditional and modern technology, lack of trained manpower as well as experts, lack of documentation of the heritage, and lack of public awareness about conservation and preservation of the heritage are the major management problems. However,

insufficient budget is the main problem of Nepal regarding heritage conservation, and there are some gaps in the existing legal system for preserving or conserving cultural properties.

Acknowledging these problems in the Asia/Pacific region, ACCU Nara has organized this training program for all countries of the region to share in the knowledge of the existing conservation and preservation system of Japan, where cultural properties are well preserved and conserved using traditional knowledge and some adoption of modern advanced technologies, with advanced community awareness as well as a comprehensive legal system, as I observed during the training course.

To obtain feedback from the participants, on whether the training course can help them in the preservation/conservation of cultural properties after going back to their home countries or not, is the main purpose of preparing this report. Accordingly, the report will be focused on this issue and on an explanation about the knowledge I gained that can help me as a heritage professional.

Practical training/on-site lectures. The training course included many issues involving different case studies from the Japanese context, regarding the conservation and preservation of wooden structures, in classroom lectures at the ACCU office, which was much more appealing to the younger conservators in the profession.

The practical training provided an important opportunity for the participants to learn about real conditions. In particular, the preparation of drawings, the measurements for restoration of historical buildings, as well as the survey and planning for painting restoration, provided practical knowledge on methods and processes for restoration (documentation before restoration) used in Japan. In the same way, the on-site lectures provided another great opportunity to visit and gain practical knowledge on the conservation of excavated archaeological sites and restored historic sites in Japan.

Sharing experiences between participants. All the participants presented their own country papers, which provided a forum for discussion about different issues in their separate contexts, and for sharing their own knowledge and experiences as well. Instead of the discussion on the presentation from the participants, the lecturers provided opportunities for discussion on the many issues of the lecture topics, as well as in the practical and on-site lectures.

3. Limitations

In regards to an evaluation, this report has been prepared with the following limitations.

- The report is prepared on the one-month training course.
- The report is prepared on the basis of entire schedule of the course and instruction given by ACCU Nara (within a 2,000-3,000 word limit).

- It has been prepared with professional experiences on conservation and preservation (wooden structures) in the context of my own country, and knowledge and experience gained during the training course in Japan in Japanese context.

4. Comparison with the Situation in My Own Country

The situation or context varies from country to country around the world, and also depends on the time, perceptions, and the community of the country or place. It is not always the same in the same place, which might be due to temporal and contextual factors. So it is very difficult to apply the same knowledge everywhere, every time, in the same manner.

One of the major features of traditional Japanese wooden structures is that the building is completely constructed with wood, and is reversible so that it can be disassembled and reassembled without damage to any of the members. It is possible to dismantle and repair because of this structural character, making this approach very common in the conservation of wooden structures in Japan.

As I observed in the practical training and on-site lectures, Japanese traditional architecture is close to nature, in that traditional architectural buildings or monuments are harmonious with their existing landscapes, depending on the suitability of climate (thatched and steep roof style in Shirakawa-go Gassho style buildings, tiled roofs in traditional Japanese houses in Naramachi and with other features, etc.)

In my country Nepal, traditional wooden structures are mostly different from Japan. We very rarely have structures constructed completely with wood only, and these do not use heavy and thicker wooden materials. Traditional wooden materials were used only as associated materials, but their role is very significant in the structure: vertical pillars heavily decorated with artistic carvings, windows, doors, horizontal beams, roof structures, tympanums, stairs/ladders, eave boards etc. Those elements have a significant role in the structure although they are used in association with bricks or stones, and with mud mortar. But most of the Japanese wooden structures are found to be only of wood, which are made with massive wooden members, either with carvings or plain.

Although the structures are slightly different, they may be considered similar in that they are vulnerable and must be preserved or conserved at any cost, although it seems that traditional methods of preservation or conservation are different in the two countries.

But once having received this training, both the theoretical as well as the practical aspects, and observed some of the conservation systems in Kyoto and Nara in Japan, I've gained the understanding that we should adopt a system which must be scientific and up to date, regardless of whether we adopt traditional or modern techniques for preservation and conservation.

After going back to my country, I will try to apply the following in my field of conservation and preservation, in addition to requesting the relevant government and non-government agencies to manage and make a systematic mechanisms for coordination concerning these items.

- Regular inspection and reporting on the vulnerability of cultural properties regarding any kind of disasters.
- Regular inspection and monitoring as well as the reporting regarding insect damage and its treatment.
- Amendment of existing laws which lack provision for cultural heritage properties conservators and conservation architects, whereas interestingly Japan has strong provisions for these, which is the reason its cultural properties are protected; inclusion of provisions for community/local residents' involvement in the heritage preservation and conservation.
- Awareness programs to help sensitize local communities to the need for conservation and preservation of cultural properties, which the Department of Archaeology is just beginning to develop, to make the people eager to conserve heritage by themselves.
- Implementation of practical knowledge, learned from technicians in on-site practical sessions, and in some of my observations in field visits to the Kiyomizudera temple area in Kyoto, and the Todaiji temple area in Nara, that would be beneficial for projects on wooden structures in which I am currently involved. I'll try to implement that practical knowledge immediately after going back to my country.
- Application of a survey system for the renovation of cultural properties similar to that existing in Japan, which I found very interesting. When participating in the practical training for the surveys of the Tanaka farmhouse and painting in the Todaiji temple area, I was inspired to introduce aspects I observed to surveys in my own country, which are important in our work, but not conducted in as much detail as in Japan.
- Subsidies for house owners as well as for other monuments, a system very effective for preservation of heritage in Japan, which I will try to promote through a similar system, but easier for the stakeholder, in our context.

Participating in the training program, I have gained important knowledge and ideas concerning issues regarding the conservation and preservation of heritage properties. Although these insights cannot be adequately expressed in words, I will try to enumerate and summarize them as follows.

Conservation is an ongoing, not an instant, process. As we know, and as I have previously mentioned, heritage consists of properties left to us by our ancestors, and we must preserve and conserve it to hand over to the next generation so they can understand about the socio-cultural contexts of prior periods as well, rather than only past techniques and knowledge. Accordingly, conservation is not work done in an instant and finished, but a process that must be done continuously, generation by generation.

Authenticity (workmanship, design and form). Conserve the heritage for the next generation. So they can understand the context through the heritage, we must maintain authenticity in workmanship, design and form; actually the authenticity of the intact heritage means we cannot touch and retouch with our knowledge and current context as I was taught when I was introduced in this field. I have learned a new perspective on conservation and preservation: that we must preserve or conserve our heritage for the next generation with its authenticity, but we can touch or retouch with our knowledge and workmanship in contexts which do not lead to the loss of authenticity, and through our efforts can give some knowledge about it from our perspective. Accordingly, minimum touch or as little intervention as possible means we can make intervention of heritage if necessary and important according to the context, which can provide knowledge and technology of this time/period to the next generation. This knowledge or aspect of conservation and preservation is a completely new idea for me, as well as for the other professionals in my country.

Involvement of the people/community in heritage conservation. This was an important lesson that I learned in this training, which is different from the traditional conservation approach that has been based on the peoples' participation, but now I am always thinking of the difference between "participation" and "involvement." They are completely different terms and approaches, though some professionals think these two terms are similar in content, and in practice as well.

People do not think about their responsibilities, however, only through their participation, if they think that participation is just to be present and see the work of others and do nothing at all themselves. But if they are aware of and understand their responsibilities, they think about why the heritage must be preserved, and involve themselves in the entire work. So it is important for people or the community to be aware of their heritage and be involved in the decision-making process as well, otherwise activities of the government and other conservators will have limited effect.

Wood is a reversible and reusable material (for environment protection). Our ancestors used wood, a very reliable material for construction, which is a precious resource for us these days. Those woods are always reversible and reusable, as previous generations also did in conservation work when they reused the same wood from the structure, and used very little new material for the protection of environment. Accordingly, we must be conscious of this matter, and reuse all of the material which can be used, and should not replace it with new materials so that we can conserve authenticity in the material, as well as consuming less material and sustain our natural environment.

Restoration through total dismantling and relocation. As I understand it, the conservation system in Japan is unique regarding restoration with complete dismantling. If a monument is structurally deteriorated and vulnerable, total dismantling and repair in the same design and form may be adopted. But for partial structural deterioration, it may be dismantled partially when necessary for repair, and

in common cases some regular repair work is done. In many cases, I have realized, relocation is also practiced in Japan as a conservation method. But total dismantling and relocation is a completely new concept for me as a heritage conservator, although I had read in books about these principles, which are not practiced in my country. Accordingly, it is beneficial for me to know that we may practice this system in such a situation for heritage conservation.

Heritage professionals should be dedicated even in disaster situations. I was impressed, when I was listening to the lecture and watching to presentation slides about the Great Hanshin Awaji Earthquake (Kobe Earthquake) by Mr. Murakami, in the International Training Course on Disaster Risk Management organized by Ritsumeikan University, Kyoto, and I thought he is a great and brave heritage professional because he did so much even in such a great earthquake. I was also amazed, during Dr. Inaba Nobuko's lecture when she was explaining the same story about when the earthquake happened in Kobe in 1995, and all communication systems and other mechanisms were damaged/ collapsed, so the central government of Japan was unable to get any information from that area. Dr. Murakami was only the person who had survived all those accidents and he provided information about heritage to the central government, which was a really brave job: "if hundreds of people work for rescuing people, only one person may contribute for heritage rescue in such a dreadful accident, although it is most important to rescue the victims (lives of the people) rather than rescue the heritage, but it is also very important as well." I am really very impressed by Mr. Murakami for his duty as a heritage professional. I will also try to do my best to be such a heritage professional; it was a great lesson learned through this training.

5. Conclusion

The training course was very beneficial especially for me. I will use all the knowledge gained in the training, after going back to my country, in our context as much as possible. Although conservation in Nepal and Japan is not entirely comparable, we learned many aspects of conservation and restoration which can be applied in our context.

We learned the processes of survey and renovation which are practiced in Japan. During the field studies we found the same processes practiced everywhere in the field, which was very curious for me in that for the most part in our country, we learn the principles of survey, conservation or renovation on the one hand, but conduct different practices in the field due to many different factors. There is no such practical training as in Japan, which can be universally practiced or applicable on site, especially in my country regarding heritage conservation. But we found that what we learned theoretically in the training in classroom, and the actual practices on site, are the same when we observed many different restoration sites in Japan during the training course. It has been most important to learn this lesson, and apply in our own country according to our context.

“Why, What and How?” These are the major issues which must be acknowledged by the conservator, as well as by the every stakeholder, related to the heritage conservation. We must answer these three questions before conducting any of the heritage conservation or preservation and restoration. This was also a very important and valuable lesson learned during the training.

I've gained new knowledge and was impressed with how monuments are restored with relocation from another place, when we visited for observations and practical training on site. This was also another new aspect of conservation and restoration especially for me, which I had rarely studied in books about relocation.

The training was on the preservation and restoration of wooden structures, but it trained the participants comprehensively in conservation and restoration, giving broad knowledge of different aspects through the professional experts' lectures; it was thus not limited only to the preservation and restoration of wooden structures, which was the most important part of this training course. I have been refreshed with broad knowledge of conservation and restoration of heritage. We learned to consider traditional knowledge and skills, as well as modern advanced technologies, for conducting conservation and restoration work, which is one of the achievements of the training program.

In this way, I think the training course was very important for all of the participants, and after enhancing their knowledge in this course, they will carry out their conservation and restoration work in their own field situations in a more skilled and expert manner, which will be the major practical success achieved by the training course.

6. Acknowledgement

Preservation and conservation of heritage is the best way to connect between past generations and the next, as we know that heritage is the properties which were constructed by our ancestors for us, and we must preserve or conserve to hand over to the next generation. Accordingly, this has been a great opportunity for me to learn different aspects of preservation and conservation, including traditional knowledge and modern technologies, which have been achieved by the Japanese people, communities and the heritage professionals in Japan.

Although conservation is always an ongoing process, it varies according to the time and context. The “Training Course on Cultural Heritage Protection in the Asia/Pacific Region, 2009: Preservation and Restoration of Wooden Structures,” organized by the Cultural Heritage Protection Cooperation Office, Asia-Pacific Cultural Center for UNESCO (ACCU) Nara, has given me multi-disciplinary knowledge on preservation and conservation, providing an opportunity to participate in this important comprehensive training program for heritage conservation professionals.

I would like to thank the Cultural Heritage Protection Office, Asia/Pacific Cultural Center for UNESCO (ACCU Nara), the Agency for Cultural Affairs in Japan (Bunkacho), the Ministry of Foreign Affairs of Japan, the Japanese National Commission for UNESCO, the International Center for the Study of Preservation and Restoration of Cultural Properties (ICCROM), and the Nara prefectural and municipal governments for organizing this training.

The training program was astonishingly well organized, especially on the management and objectives of the lectures/practical field studies. It was successful due to the dedicated and helpful staff of ACCU Nara, for which I would like to express my gratitude to Mr. Yasushi Nishimura, the Director and Mr. Isao Nakai, Chief of International Cooperation Division, ACCU Nara. I also want to thank to Mr. Masahiro Yoneda, Ms. Kaoru Tanda, Mr. Wataru Kinoshita, the Associate Director, Ms. Chiyako Hata, the translator, Mr. Tsutomu Yamashita, Chief – International Cooperation Section, Ms. Yasuko Otani, Ms. Michiko Nishida, as well as all the other staff of ACCU. I would also like to thank Ms. Maki Yoshida, Ms. Rie Tanaka, Ms. Akiko Kimata and Katuyuki Suzuki, who were always with us during the training period to help, and always took good care of all of the participants.

Special thanks go to all of the resource persons, who always were trying to give us broad knowledge of their field, either in the classroom lectures or the on-site lectures.

I also would like to thank to the Government of Nepal and Department of Archaeology (my office) for nominating and sending me for the training.

Thank you.

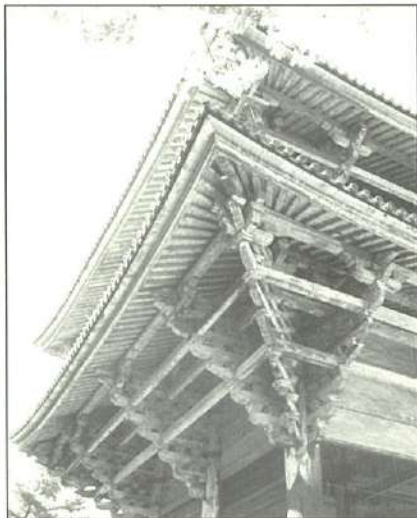
Some eye sight view in my reflection:



Practical training in Old Tanaka Farmhouse



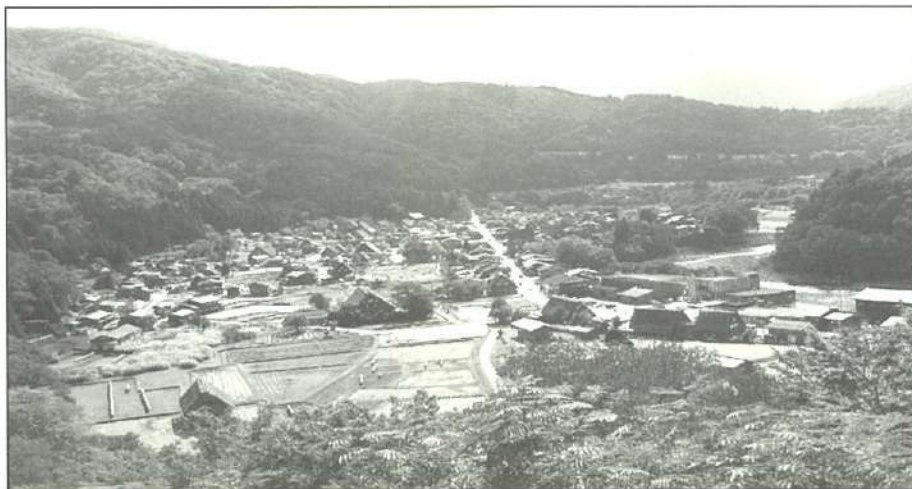
On-site lecture in the conservation site (Conservation after excavation at Nara Castle)



Part of Todaiji temple gate-roof, Nara



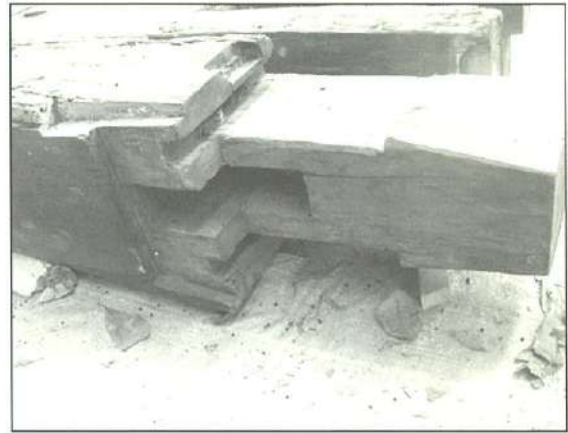
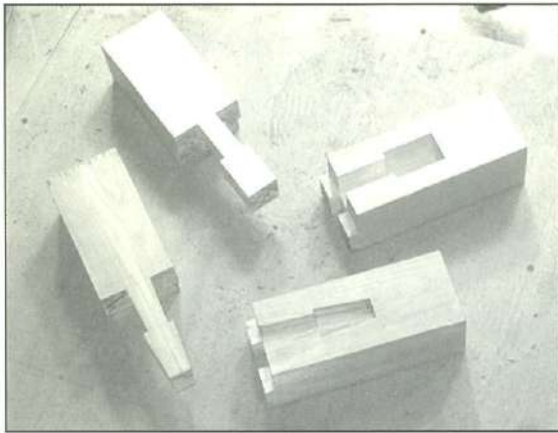
Hikone Jyo (Castle), Hikone City



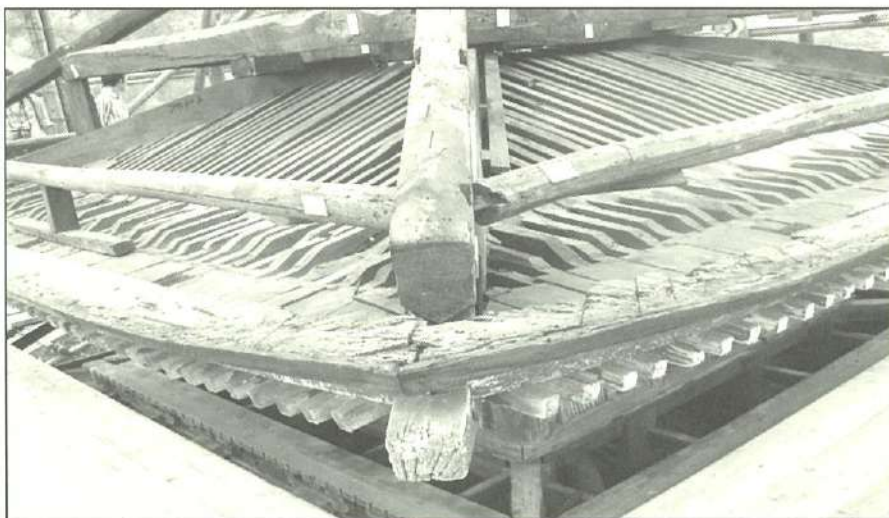
Shirakawa Village, Gifu Prefecture



One of the traditional Japanese houses, Naramachi



Japanese Traditional wooden beam/post joint and lock system



On going restoration of Koyasu pagoda, Kiyomizu dera temple area, Kyoto



A Traditional Gassho Style Japanese (Restored) House, Shirakawa Village



Kiyomizu dera Temple – Main Hall, Kyoto

New Zealand

Atareiria Rowena Akuhata HEIHEI

Final Report: Training Course on Cultural Heritage Protection in the Asia/Pacific Region 2009

Introduction

This report is submitted as a final evaluation of my attendance at the “Preservation and Restoration of Wooden Structures” training course held in Nara, Japan, by ACCU.

The training course itself has been well structured, carefully scheduled and efficiently executed. A tremendous amount of organisation and preparation has been undertaken to achieve an extremely successful result. The various areas that have been covered have all been very interesting and my gratitude to the lecturers for sharing their knowledge and time is great. I believe that there is a need in the international community for this training to continue as it will benefit each country, as I have found to be the case with my own experience in the training course this year.

I have a positive impression of Japan and its culture, and I am most impressed by the Japanese commitment to their heritage and its protection, conservation, restoration, and also to educating the importance of Japanese culture to the people of Japan and the international community. I will discuss some of the key factors that I found not only interesting but which also may have the ability to be transferred and implemented in New Zealand.

Research and Documentation

As with all things it is important to research carefully the subject of interest to you. In terms of the Japanese method of research relating to the restoration and preservation of wooden structures, I find that this method is very detailed and accurate, and all aspects of the background of the restoration subject (from a great temple to a simple farmhouse) are done in a very thorough manner. This was especially evident in our visit to the Tanaka farmhouse where we were shown how to collect very detailed measurements and drawings that would be one part of the voluminous documentation.

The final research contributes to a vast “library” of documentation which helps current planning objectives, but can also inform any future restoration projects. I believe that this would be a very useful model for New Zealand restoration projects of *marae* as many have not kept records of the

restoration projects that have been conducted. I have not seen as detailed information used for *marae* in New Zealand. The continuity of such information is vital for understanding not only the reasons some conservation measures were undertaken, but also to inform later generations of the history of their *marae* buildings and perhaps help with planning in the future. Keeping a detailed photographic library of the buildings and surrounding areas is also a helpful tool of record.

Planning

The detailed documentation is an important part of the overall planning for a *marae* restoration project. I believe that using the Japanese model of heritage planning will help streamline the process and ensure the best decisions are made for *marae* buildings or wooden structures. Sometimes *marae* are destroyed because the *marae* trustees (the officially appointed committee in charge of the decisions made about the *marae*) feel they have no other options available (or perhaps are not aware of other options), that the building is beyond repair, or that the cheapest option would be to rebuild from scratch. In Japan the conservation architect plays a key role in the restoration projects, and not only provides the drawings and surveys for the project but also acts as project manager for the overall process, and writes the final report on completion. In New Zealand conservation architects are employed to write a conservation plan for the building, which includes a history of the building and its environment, the projected costs, and recommendations as to work that needs to be undertaken. The conservation architect does not necessarily manage the restoration project of the building. A related topic is that of funding for the restoration projects. Most *marae* are dependent on government funding available through Lotteries grants (this is derived from money earned from the national lottery). Upon application for funding to restore *marae* buildings and structures, the *marae* must be furnished with a conservation report by a conservation architect. As most *marae* groups are not able to afford the cost of these reports (around \$5-10,000), the Lotteries will fund 100 percent of the commission of this report. Currently *marae* buildings have only a limited pool of conservation architects available to provide this service. In my work I have only seen four conservation architect consultancies working in this specialised area. This causes two problems: first, the lack of choice and availability (due to high demand for the services and low number of service providers), and second, the conservation architects currently available are mainly non-Maori, which adds a difficulty in terms of the Maori cultural values aspect of the restoration project.

Legislation

The Japanese have very strong legislation which supports the preservation of heritage buildings. New Zealand legislation does not currently address some of the important factors addressed by Japanese legislation. The protection of cultural landscapes, and of tangible and intangible properties, has not been adequately addressed. Although each of these areas is touched on in New Zealand legislation, the references to each of these are in different pieces of legislation and therefore administered by different government departments: e.g. cultural landscapes in the Resource Management Act 1991,

administered by the local government (similar to prefecture governments in Japan), and tangible objects in the Protected Objects Act 1975, administered by the Ministry of Culture and Heritage (central or national government in Japan). This structure leaves New Zealand's heritage protection very disjointed and hard to manage, with little or no cooperation or understanding between the different pieces of legislation. Both the Historic Places Act 1993 and the Resource Management Act 1991 are currently under review, with an as yet uncertain outcome for overall heritage protection in the future. I believe that Japan would be a good example for New Zealand policy makers, as a way forward for New Zealand to ensure that our unique Maori heritage is safeguarded for the future.

Education

One of the most impressive aspects of the restoration and preservation of wooden structures is the education of the Japanese people so they can identify with the importance of safeguarding their heritage. The active utilisation of their heritage for the economic and social wellbeing of Japanese culture is a positive message to the international community. This is something that needs to be promoted within New Zealand, and Japan has set an example in this area. I was also very impressed with the fact that many school children were present at most of the sites we visited. I believe that teaching children to respect their heritage from a very early age will help with the retention of such important heritage structures in the future. Maori need to value their cultural heritage as a people and New Zealanders need to embrace it as an example of the unique cultural history of New Zealand

Resourcing

Both the Japanese central and local governments strongly support the protection of heritage (and therefore the historic wooden structures), and this is evident in the levels of subsidy made available to owners of the heritage buildings we have seen. I see this as a positive initiative and I would strongly advocate for a similar model in New Zealand. As explained previously most *marae* are dependent on government funding through Lotteries and fundraising by the *marae* groups. Both of these processes require a lot of time and effort, and the legal and paperwork required can be overwhelming for the *marae* trustees (most of whom have little or no training for dealing with such matters)

Traditional Knowledge and Materials

I think an important lesson for *marae* that we may learn from observing the Japanese method of restoration would be the traditional knowledge and methods of such restoration projects. Currently in New Zealand most projects are funded by the government, and most of the focus is on securing money to undertake the work, with less priority given to the traditional knowledge and methods employed. The focus has changed to resources and economy, and less emphasis on traditional knowledge and methods. It would be a positive step to encourage greater participation by the local community of the *marae* to learn these skills from those "experts" that remain in the wider community, before those skills and traditions are lost. As Maori did not have a written language, it is important to preserve

the skill of carving and its meanings, the method of harvesting the traditional materials, and also to initiate a planting programme (such as the thatch programme at Shirakawa Village) to ensure that a sustainable resource is available in the future. It is also important to continue research into the traditional pigments used in the artwork of *marae*.

Training/Workshops/Specialist Knowledge

It was a privilege to be able to have the time of the experts in each field available to us during our training course. Each provided us valuable knowledge and insights in the various fields. I think that New Zealand would benefit having access to such knowledgeable specialists who may be able to provide training workshops for the people of the local Maori community who have the responsibility and guardianship of *marae* on a day-to-day basis. Currently in New Zealand the NZ Historic Places Trust (NZHPT) (through its Maori built heritage team) provide training workshops for *marae* to teach the basic skills needed during restoration projects, however the limited resources available is a problem (the Maori built heritage has 2.5 fulltime staff dedicated to this area for the whole country). These services are provided to the community free of charge. I realise that experts in Japan were available in a limited capacity as part of a training course, but I think that this arrangement could be readily transferable to complement the current programme run by the NZHPT.

Risk Preparedness

I was very interested in the risk preparedness lecture. It brings up the very real issue of some of the natural/manmade disasters that we face in New Zealand. Japan has a very well structured plan to prepare for risk. I believe all of these are relevant to New Zealand, as we have similar climates and risk factors. New Zealand has undertaken some research in terms of earthquake protection for high rise buildings, but I am unaware of any research or provision for earthquakes in *marae* buildings or structures. We are becoming more aware of the manmade risk of fire to *marae* and the need for provision of sprinkler and smoke alarm systems. Some *marae* groups are looking at the risk to their buildings by flooding, however I do not know of any river management plans at present to control flooding with regard to *marae*. I think the focus tends to be on immediate risk, rather than the long-term or future risk management as I understand is practiced in Japan. New Zealand would benefit greatly from the Japanese example in this area.

Prevention of Insect (and Other) Damage to Wooden Structures

The two main sources of damage to wooden structures in New Zealand are through insect and fungal damage. Although the insects are different from those in Japan, the methods used to prevent insect damage and also the techniques used in the restoration are important lessons to be learned in New Zealand. The key message that I have gained which is relevant to all countries is that prevention is better than the cure. Careful observation will ensure that any problems will be detected before they become major, and this can be included as part of the regular maintenance plans for *marae* buildings

and structures.

Maintenance Plans

Maintenance plans for *marae* are starting to be developed in New Zealand, although they are still not part of ALL *marae* documentation. NZHPT have been actively encouraging the development of maintenance plans, with the launch of a maintenance plan template on our website in July 2009. I have realised there is an even greater importance for these plans from my observations at the training course. A maintenance plan is a great tool for ensuring that the everyday health and wellbeing of the wooden structures are secure, but with careful observation, that any problems are also identified and resolved quickly before becoming large and costly (as in the detection of insect damage).

Shirakawa Village

I believe Shirakawa Village was a very interesting place to visit and I was impressed at the way in which the village functioned (for tourism) while maintaining the historical landscape. I think there are possibilities of ensuring that our *papakāinga* (Maori villages) could be preserved in a like manner with the same tourist potential.

Future Training Course Programmes

It would be a great opportunity to have a training course such as this one available to the young indigenous peoples of the Asia/Pacific region. I could see many positive outcomes for Maori youth in their participation in a training course such as this. It would not only give them exposure to world heritage and its restoration, but they could also learn more about their own culture from the model approach of Japan.

Conclusion

The Japanese have a long and vibrant history which they are lucky enough to enjoy through the physical remnants of their rich cultural heritage in the wooden structures that exist today. It is apparent that the knowledge and wisdom of the techniques and methods to preserve such structures is working, and the structures themselves are testimony to this fact. Therefore I think there are many useful and practical pieces of information that the Japanese method of restoration and protection can provide to New Zealand. The need for New Zealand to work towards such a complex network of experts, knowledge sharing, observation, documentation and practical application may take time, but I believe that we can adopt the techniques and we too can have heritage structures to pass on to coming generations of New Zealanders, as Japan has done throughout the centuries. New Zealand may only have a very 'young' heritage in comparison to Japan, but we can learn greatly from what has taken a millennium for Japan to perfect. The key important messages I have learned in my time in Japan are: that we (Maori in New Zealand) should treasure our heritage, and strive to protect not only the structures but the cultural values related to them; that careful observation is a very important

tool which is freely available to everyone, and immensely important in all aspects of restoration and preservation of wooden structures; that accurate documentation is vital in the sustainable conservation of heritage structures, and provides history of our nation in its own way.

Lastly I would like to thank the staff and all members of ACCU Nara and ICCROM who have made it possible for me to attend this training course. Thank you so much for looking after me while I was here and making sure that I was okay. I would also like to express my gratitude to all the lecturers who gave us their time and expertise both in the lecture room and in the field. *Arigato gozaimasu*. It has been a pleasure to meet everyone and a privilege to visit all the wonderful places in Japan. I have found the experience very interesting and enjoyable. I have learned a lot and would highly recommend this course to all future participants. I hope this training course will continue to add value and insight to expertise on the preservation and restoration of wooden structures of the world.

Kia ora koutou katoa (Thank you to everyone) *Arigato gozaimasu*

Pakistan

Salman MUHAMMAD

A Step towards the Protection of Wooden Architectural Heritage in Asia

INTRODUCTION

This year's ACCU course on "Cultural Heritage Protection in the Asia/Pacific Region: Preservation and Restoration of Wooden Structures," provided an opportunity to know the status of preservation in general and particularly the restoration of wooden architectural heritage in Japan. The forum provided by ACCU, as a gathering of participants from the Asia/Pacific countries with Japanese and international experts, has been an experience of sharing knowledge. Above all, it has been an exposure to the Japanese modus operandi for the protection of architectural heritage. The combination of classroom lectures, site visits and field exercises was key to the success of this course.

The association of Nara with international conservation efforts in the form of the Nara Document of Authenticity is significant, and I think bridges the gap between western and eastern thinking and its applications to the conservation of architectural cultural heritage. The presence of the Historic Monuments of Ancient Nara on UNESCO's World Heritage list is of course an added value to the efforts of Japan towards worldwide recognition for the protection of cultural heritage. And being participant in such a course in Nara is an enriching and fruitful exposure.

Conservation of cultural heritage is an intensive, expensive and time consuming exercise which varies from region to region and culture to culture. It has no standard recipe to practice in all parts of the world in real terms. Efforts of Japan in this regard are in a more advanced stage with respect to other countries in Asia and the Pacific region. Therefore, upon completion of this course I feel that it is critical to reflect and adapt the best practices of Japan to our countries.

CONTENT OF THE COURSE

Week 1. The first week was dedicated to the history of wooden architecture and the cultural heritage protection system of Japan. Further elaborations were also made on the restoration efforts and the guiding principles/charters for these restoration efforts in Japan. The role of Japan as an international player in conservation efforts was also explained by Mr. Shimizu of NRICPT. The site visit at the end of the week to the Historic Monuments of Ancient Nara was a synthesis of subjects presented during the week. This visit was also supplemented by detailed explanations of archaeological excavations and

reconstructions on these sites.

Week 2. The second week started with the site visit to Chion-in and Kiyomizudera temples in Kyoto. This visit was a precursor to the more practical sessions regarding the documentation, recording of conditions and planning of restoration for wooden structures. Three days of practical sessions on documentation of an old farmhouse of the Tanaka family in Nara was the highlight of the week. The hands-on experience in this session provided deep insights into traditional architecture, materials and techniques. Use of simple observations and techniques to gather data for restoration were tested in this exercise.

Week 3. The third week started with the more interactive session on risk management of cultural properties with Ms. Inaba, and a lecture by Mr. Gamini from ICCROM on the introduction to architectural heritage in Asia. I found this week interesting due to the presentations by each participant and the discussions afterwards. Visits to Gangoji temple and Naramachi provided us opportunity to see the old district of Nara and its general state of preservation. The painting survey at a small temple near Todaiji was interesting and useful in terms of recording the painting and its restoration plan by each participant.

Week 4. The highlight of the fourth week was the three-day-long field trip to Hikone castle, the World Heritage Site of Shriekawa-go, and the old merchant townscape of Takayama. Before this visit, interesting lectures were delivered on conservation science and insect damage to wooden structures. The visit to the Nara Palace site was interesting in terms of the display of archaeological findings, and different ways of reconstruction of an ancient site.

Week 5. The last week started with the lecture on dendrochronology and the progress of Japanese expertise in this regard. Two days of lectures by Mr. Ashley de Vos discussed future tasks in the preservation of cultural properties. The rest of the time was devoted to compiling the final report.

PROMINENT FEATURES OF THE COURSE

Participant Reports and Presentations

The assignments of preparing the country reports and presentations provided prime opportunities to showcase the efforts and ongoing progress of each participant's country. These assignments are good tools for sharing our work and knowledge with the ACCU and other participants. In the presence of the ACCU, and Mr. Gamini (ICCROM) and Ms. Inaba as coordinators, the participants got full attention and positive feedback on their presentations. The questions asked by Mr. Gamini before these presentations (Are the various Asian countries different? How we are different? What has been done to preserve the differences?) were fully answered with these presentations. It has been revealed

that the monuments in Asia are not like frozen things or objects, and therefore efforts to create a line between the past and present as in western scholarship should not be accepted. In Asia, most of the monuments associated with religious or cultural activities are like living monuments or the culture which makes us different and unique. Therefore it is important to respect the views of their users for their protection and restoration, because the people are the ultimate users and keepers of these monuments. The examples of a shrine in Zimbabwe and a temple restoration in Sri Lanka were a few of the demonstrations in this regard.

With the example of my projects in the Northern Areas of Pakistan (Gilgit-Baltistan) it has also been revealed how culture and restoration can be localised and used as an important tool for local area development. Involving the local communities, reviving dying traditional building crafts, reusing the monuments for new and adapted functions can trigger ways of development for the poor and increase awareness among the people. Above all these efforts infuse a new life and increase the life of monuments.

Field Exercises/Workshops

The field exercises during the training programme were really helpful in learning some major aspects of traditional Japanese architecture, its main decorative features like paintings, and their way of documentation. The simplest way of documentation, with the help of personal observation and then freehand sketches using coloured pencils and measurements, is effective and helpful in knowing the structure and its decorations. Personally I really enjoyed working in the field on the following exercises.

Documentation and damage recording at a traditional Japanese farmhouse. The documentation exercise at the Tanaka farmhouse in Nara with simple and easy tools gave us experience in studying the important traditional building typology of farmhouses in Japanese architecture. This documentation exercise provided an opportunity to study the traditional spaces in a farmhouse and their use for different functions. The use of tatami mats as a basic scale for rooms was an interesting



Fig. 1 General view of the Tanaka farmhouse house



Fig. 2 Participants working on the documentation

feature of Japanese architecture. The orientation and form of the building were other major subjects of this exercise. The use of traditional materials and traditional building techniques are significant features as well. The use of wood as a basic structural and decorative material reflects the traditional wisdom accumulated over centuries in order to cope with societal needs and earthquakes.

Feedback from the tutors during and after this exercise was a great help. This kind of exercise shows us the importance of documentation before any restoration work and provides opportunity to study the building in detail. This is also a fine restoration example of traditional a Japanese farmhouse, and its reuse as a kind of museum.

Documentation of paintings at an old temple. The use of very simple but effective tools and medium to study the painting in the small temple near Todaiji temple provided an experience of documenting traditional painting and its features in detail. At the end of this documentation, the restoration proposal by each participant gave us an opportunity to reflect our experience in conservation in the form of a restoration plan. Working with Mr. Kubodera and presenting my restoration plan to him was an enriching experience. The reflections I got from Mr. Kubodera were very encouraging and appreciated. The effectiveness of simple tools like pencils and sketches in this exercise was one of the prime outcomes.

In my restoration plan I proposed the following steps.

- Detailed documentation as a first and important step
- Categorising the damage to the painting (for example: 1= stable parts; 2= semi-stable parts; 3= unstable parts)
- Emergency stabilisation of the most vulnerable parts to prevent loss of more damaged parts
- Simple cleaning of the painted surface and areas that had lost paint
- Keeping the original as is, with just cleaning and stabilisation
- Repainting of areas that had lost paint, based on research on contemporary patterns and designs, and (extremely important) using traditional materials and techniques

I have the following rationale for my restoration plan.

- There is a great regional value of this painting.
- The building and its decorative features are subject to research in not only the present time but also in the future.
- Restoration and stabilisation of old remains of paint would provide an opportunity to future researchers to study with advanced tools and equipment.
- The repainting of the missing parts by using traditional materials and techniques is an

opportunity for the present conservationists to demonstrate their skills.

- The repainting of the missing parts by using traditional materials and techniques is an opportunity for the present conservationists to demonstrate their skills.
- Most importantly, not removing the old remains of painting is a kind of respect and tribute to the old artisans and painters who in their time used the best resources and techniques to decorate this temple building.

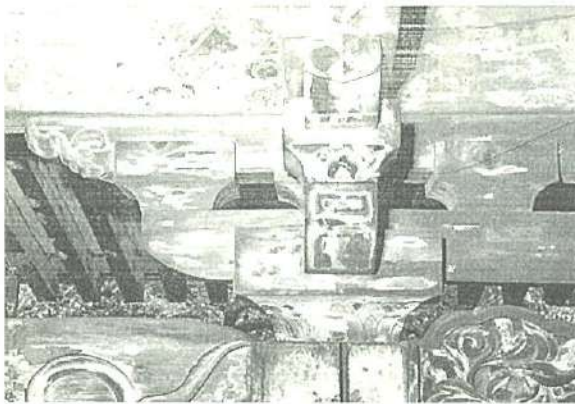


Fig. 3 View of column, capital and bracket detail

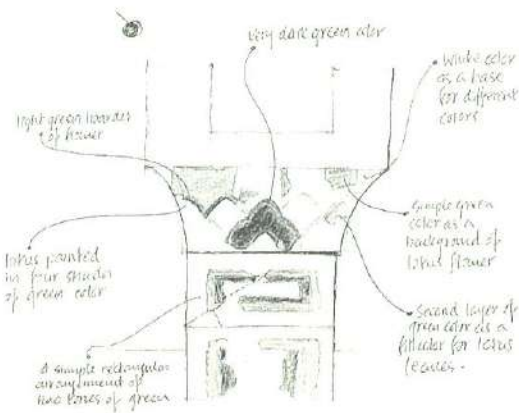


Fig. 4 Detail observations of upper base of the bracket

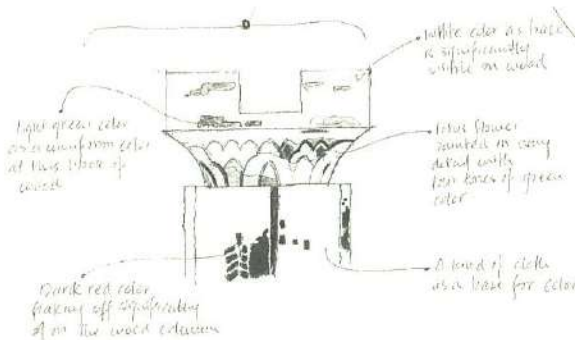


Fig. 5 Detailed observations of base of the bracket



Fig. 6 Detailed observations of the carved capital

Field Visits

Historic Monuments of Ancient Nara. At the start of the course, the field visits to the UNESCO World Heritage Sites in Nara was enriching in terms of experiencing the Buddhist temples and Shinto shrines. The huge Todaiji temple, the largest wooden structure in the world, demonstrates the height of wooden architectural and engineering traditions of Japan.



Fig. 7 Foundation details at the archaeological site

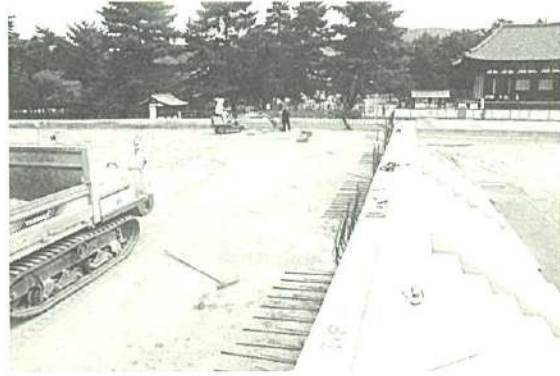


Fig. 8 Reconstruction of a hall above an archaeological site

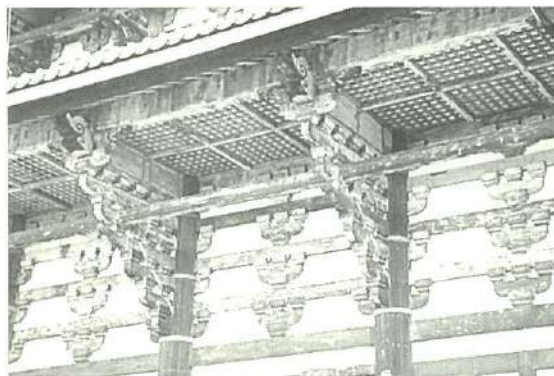


Fig. 9 Detail of bracket supports, Todaiji temple



Fig. 10 A general view of Kasuga Taisha Shinto shrine

The current conservation status of all these monuments speaks of the efficiency and resilience of Japanese authorities towards the protection and conservation of this cultural heritage. The working mechanism of Japan for heritage is very practical and effective, and I think this is the key for its successful maintenance.

Monuments of Kyoto. Some of the prominent features noticed at the restoration site of Chion-in temple are as follows.

- The whole structure is covered with a huge scaffolding and glass shield in order to protect the site from dust, rain, snow and other environmental factors.
- The entire structure has been dismantled (the Japanese way of restoration) for its restoration.
- This process of dismantling is always accompanied by very detailed documentation, and a numbering system for each and every timber member of the structure.
- Earthquake resistant engineering solutions were accommodated under the floor, in the walls and in the roof structure.
- A permanent team of carpenters was working on site on the restoration of different timber elements. At the same time the head or more experienced carpenter was teaching young carpenters on site, a good way of transferring skills to younger people.
- Traditional constructions for the joints and tools were used.

- Reinforced concrete was used in the floor of one of the gates of the temple, which I really do not understand. As we all know concrete is not compatible with traditional materials and techniques, and we really do not know its long-term behavior.



Fig. 11 Demonstration of tile fixing on the roof



Fig. 12 Use of reinforced concrete under a gate



Fig. 13 Earthquake resistant device on the column base



Fig. 14 Carpenters working on the column restoration

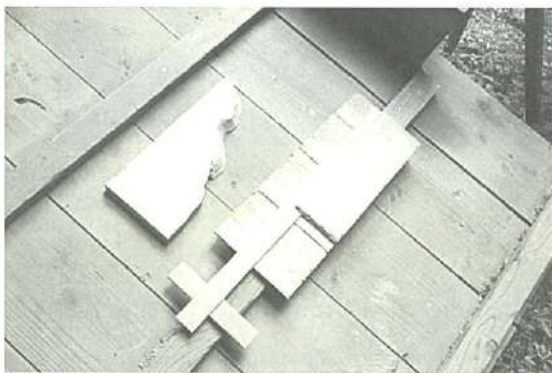


Fig. 15 Earthquake resistant sample of wall infill

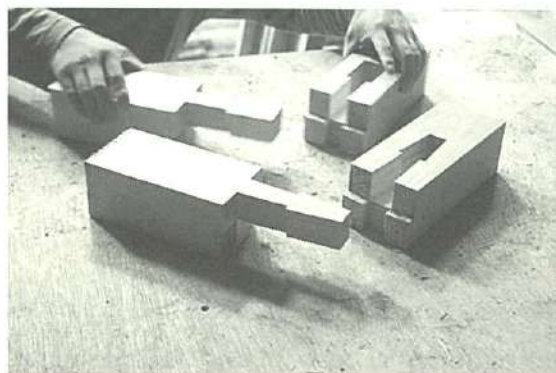


Fig. 16 Mock-up of traditional carpentry joint technique

Some of the prominent activities noticed at the restoration site of Kiyomizudera temple are as follows.

- The old stable structure at the entrance was completely dismantled after its detailed documentation. This site was again enclosed with big scaffolding and covering.
- Due to the settlement in the structure, the base stones of the foundation were consolidated with concrete.

- All the dismantled wooden pieces were stocked at the site with a numbering system for marking each and every member of timber in the structure.
- Again the use of cement based concrete under the floor of this structure was a question mark as we all know this new material is not compatible with traditional materials in the long run.
- The process of dismantling the pagoda was explained by the conservation architect, with the process of documentation for each piece of timber completed on site.

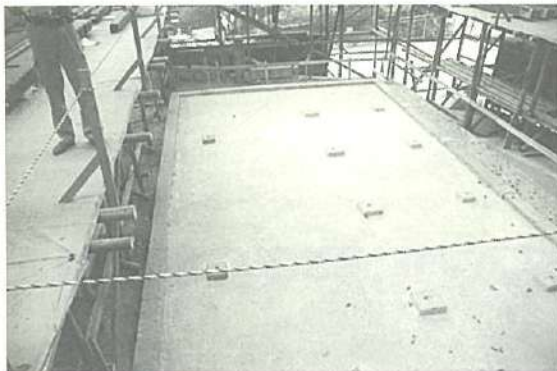


Fig. 17 Complete dismantling of stable structure

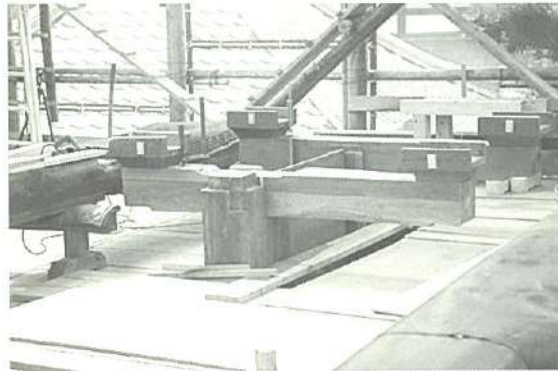


Fig. 18 Restoration of the wooden gate in progress

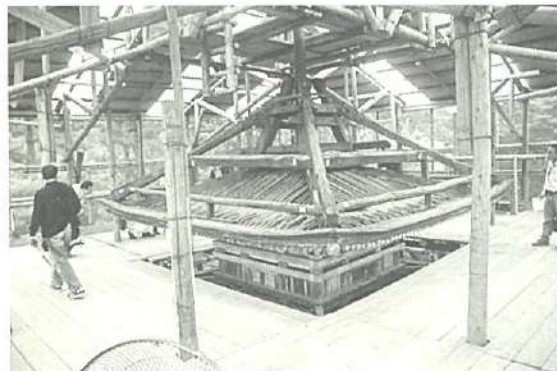


Fig. 19 Pagoda ready for restoration



Fig. 20 Numbering of wooden roof elements completed

Field trip to Hikone, Shirakawa-go and Takayama. The three-day field trip to different sites was one of the fruitful experiences of this training course. Some of the major observations made during this trip are as follows.

- The archaeological excavations at the site of Hikone castle were highly precise and well organised.
- The dismantling of the roof as part of restoration in one of the structures was in progress.
- The maintenance of the castle area was of the highest standard.
- The distorted wooden elements in the roof of castle display the skill of old carpenters and artisans.



Fig. 21 Excavation in progress

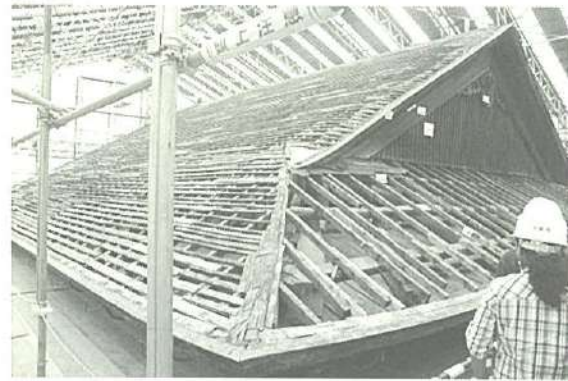


Fig. 22 Dismantling of roof in progress



Fig. 23 A general view of Hikone castle

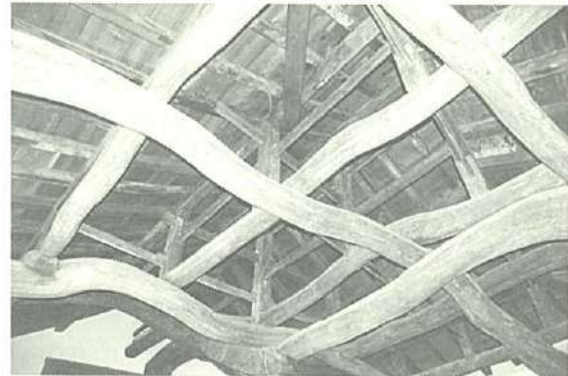


Fig. 24 Wooden roof structure of Hikone castle

- There is a huge volume of traffic and tourists in Shirakawa-go.
- This has affected the pattern of land use change in the village, with more rice fields converted into parking lots and tourist-related facilities.
- The percentage of new and modern structures is higher than old structures.
- The buildings in the open air museum are maintained very well.
- In order to reduce the pressures from tourists, I think, it is important to provide direct and indirect economic benefits to the residents.



Fig. 25 A general view of Shirakawa-go

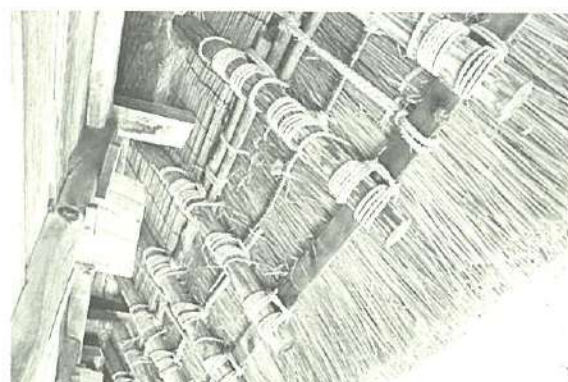


Fig. 26 Simple joint with the help of traditional rope in the roof structure

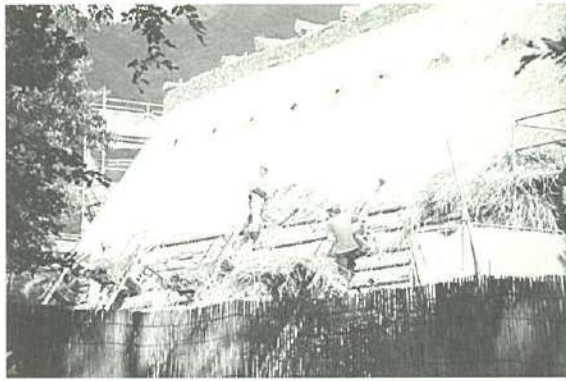


Fig. 27 Roof repair in progress at the museum, Shrikawa-go



Fig. 28 View of a few traditional structures in Shirakawa-go

- There is good balance between the old Japanese houses and the new functions inserted into these houses in the old district of Takayama.
- The pressure of tourism seems very well controlled in this old district.
- Even the new structures in this precinct are designed in keeping with old elements in their facades.
- In order to reduce the visual obstructions in the street, all the modern facilities (telephone cables, electric cable and others) are underground, which resulted in a clean and original look for the street.
- There is great harmony in the standards of shop signs, reducing the look of ugly commercialisation.
- Overall the old merchant district is very well maintained.



Fig. 29 A general street view in the old Takayama district

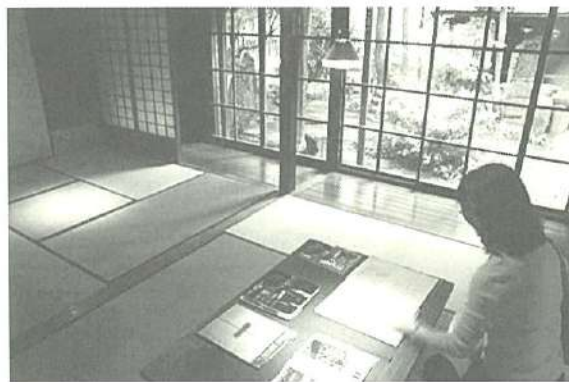


Fig. 30 View of a traditional room in the old Takayama district

CONCLUSION AND RECOMMENDATIONS

This training course provided me an opportunity to experience the system for protecting cultural heritage in general and wooden architectural heritage in particular in Japan. This experience has not only provided me with knowledge of the role of legislation and the authorities, but also experience with

the heritage by interacting with Japanese experts and by visiting the different building sites, villages and old districts in Japan. I think it is important for other Asian countries to learn from the Japanese experience. I think we have seen the best part of Japanese cultural heritage and there is no doubt in my mind that Japan is a role model for other Asian countries.

Japan has been contributing greatly to international cooperation for the protection of cultural heritage, with the prime examples of Bamiyam in Afghanistan and Angkor in Cambodia. I think it is extremely important to create more cultural bridges like these with other Asia countries and share their experience and knowledge. This could be done by exchanging experts in the conservation of architectural heritage.

Here I would also like to recommend some activities which I think are important for this course in order to disseminate knowledge and improve the training course in the future.

Wood seasoning process. Since the course deals with the architectural restoration of wooden monuments, I therefore think it is important to know the process of wood seasoning for the restoration of architectural heritage. A detailed lecture or field visit session could be integrated in order to learn traditional and modern techniques for wood seasoning. As a conservation architect I have been facing this issue in restoration projects in my country.

Laboratory exercise. Wood is a simple organic material to use but at times it becomes more complex when it involves the physical properties of wood. I think a basic laboratory exercise could be included to know the shrinkage patterns in different directions of wood.

Earthquake resistance techniques. Since most of the Asian countries fall in the seismic zone, therefore it is important to know the integration of earthquake resistance techniques during restoration projects. Japan has done a lot in this regard and therefore it is important to share their experience. A lab exercise or a practical training on earthquake resistance techniques for wooden structures could be an advantage for such course.

Scientific dating techniques. Most of the Asian countries have no traditions of old written or iconographical sources and it becomes very difficult to identify the age of the monument only on the basis of oral traditions. I think more detailed sessions on dendrochronology and carbon dating tests would be useful in the future courses.

Non-Japanese case studies. This course revolves mostly around the Japanese approach towards the conservation of wooden structures. I think the integration of a case study from a western country and an Asian country would be an advantage in knowing the different approaches towards the protection of

wooden heritage. This would give the additional advantage of knowing several kinds of international approaches to the protection of heritage.

ACKNOWLEDGMENTS

Upon the successful completion of this course I would like to congratulate the ACCU and its dedicated staff. At the same time I would like to thank the ACCU and its staff, specially Mr. Nishimura and Mr. Nakai, for their tireless efforts for a successful course. I would also like to thank each and every lecturer in the classroom and at the sites who tried their best to deliver and share their knowledge and experience with us. Again, thank you ACCU for accepting me for this course and thank you for the warm hospitality, generosity and cooperation during the course in Japan. I would like to thank each participant for sharing their experience in this forum. Last but not least, thank you Nara for having such a wonderful wooden heritage.

Philippines

Nelson Laxamana AQUINO

The Treasures of Japan

Training Course in Cultural Protection in the Asia/Pacific Region:
Preservation of Wooden Structures

I. INTRODUCTION

The preservation and conservation of wooden structures such as Japan's Important Cultural Properties and National Treasures was showcased in the month-long, compact yet extensive, training course in "Cultural Heritage Protection in the Asia/Pacific Region," conducted by the Asia Pacific Cultural Center (ACCU Nara).

The training course is a comprehensive study about wooden structures, along with other extremely relevant and important information regarding their conservation and preservation. It covers the different problems and solutions in world heritage conservation and the traditional building practices of Asia and the Pacific region. The unique culture of the Japanese, their way of life as a people, and their conservation approach to their national cultural heritage treasures were presented in a very remarkable and exceptional way. The lecture series, the study tours, the practical trainings, the country reports and site visits gave us more knowledge, understanding and exposure about the skills, methods and approach of the government of Japan in taking care of these national cultural treasures.

II. OVERVIEW: JAPAN'S CONSERVATION OF WOODEN STRUCTURES



In Japan most of the buildings listed as cultural properties are made of wood. It is not surprising that almost ninety percent of their National Treasures and Important Cultural Properties are wooden structures. Century-old methods, along with the very latest in modern techniques, can be observed in Japan. Climate, geographical location, traditions and religion influence the style and appearance of the structure.

Japanese wooden architecture is visible mostly in shrines, temples, castles and vernacular houses in various prefectures. Wood was primarily used in the structures because of its availability as a natural resource and the material's flexibility. Wood has also proven to be very durable and flexible in reinforcement and damage repair. The visit to sites on the World Heritage list, such as Todai-ji and Kofuku-ji temples, and Kasuga

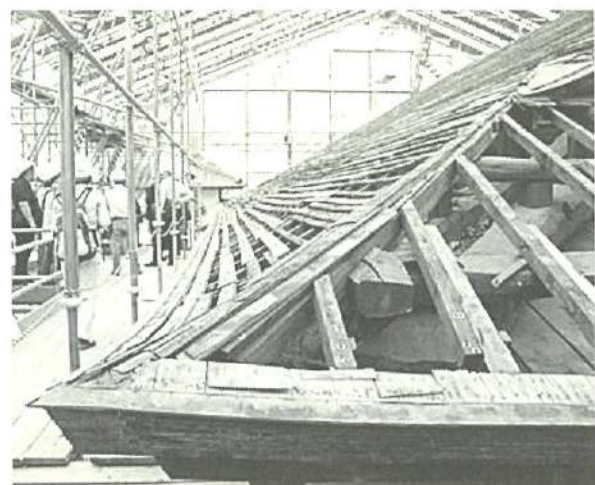
shrine in Nara prefecture, makes one wonder how much money was spent in the conservation and preservation of their built heritage. Other structures, such as Chion-in and Kiyomizudera temples in Kyoto, leave one amazed at the actual restoration of the structures.



The Japanese began preserving architectural monuments as early as 1897. That is why Japan has attained a level in wood restoration unequalled anywhere else in the world. Major restoration of historic wooden architecture is required every 100-300 years. The most common causes of deterioration of structures are damp rot caused by leaking roofs, insect attacks and poor craftsmanship.

However, their concepts of restoration and repair differ from conservation methods employed in other countries. Particularly striking is the different attitude towards the total dismantling of a structure. Since the very beginning of architectural conservation in Japan, there has been a tendency to dismantle a building completely for its restoration. Undoubtedly, the Japanese experts also honor the principles outlined in the Venice Charter. But the practical solution for them is preservation that will prolong the lifespan and the stability of the structure for 100-300 years, when it is time for another restoration.

Japanese restoration work has a wide range of solutions in the preservation of wooden architecture. The devastating Kobe earthquake in January 1995 led to a fundamental change in Japanese conservation approach. Efforts are being made to avoid damage through preventive measures. These include traditional measures such as covering a roof with tiles without the use of clay, bracing the skeleton frame by inserting stainless steel or plywood panels, and even



going as far as installing an independent standby structure not connected to the original building. Poor maintenance work or deficiencies in the original construction method require the installation of reinforcements to their historic structures to improve their load-bearing capacities. Minor repairs such as re-roofing, re-painting and partial repairs on the structural members are considered at intervals between 20-60 years.



In order to sustain these repair and conservation works, Japan needs natural resources such as trees, as well as skilled craftsmen trained in ancient techniques, together with conservation specialists. That is why the respect and effort they practice in relation to the conservation of natural resources is really imposed on the entire Japanese people. That discipline continues to improve as they apply it in their everyday life. The methodical approach in the preservation of their natural landscape will contribute more to its

sustainability and create balance in their natural resources.

I know for a fact that the Japanese are well disciplined. But I am also envious of how the Japanese government takes responsibility for the protection of the cultural heritage. Despite huge advances in technology, the Japanese remain protective of their culture. They always seek better and practical ways to conserve and preserve their historic structures, thus safeguarding their cultural heritage.

III. INFORMATION THAT CAN BE APPLIED IN MY CONSERVATION WORK

Survey methods and techniques. In the Philippines, our structures are mostly a combination of stone and wood. This is the result of the Spanish colonization of our country, and its tropical climate, geographical location, and rich natural resources. The development of our structures parallels the creation of our identity as a nation, and is comparable to other world heritage.

Intramuros Administration's main objective is to make Intramuros, "a city within a city," socially, economically and culturally viable again while keeping pace with modernization. IA intends to enhance the potential of Intramuros as a main center of tourist activity in the city of Manila. It is involved not only in restoration but also in urban renewal and income generation.

Compared to the Historic Town of Vigan, Intramuros is still searching for the right direction, and needs a lot of attention and support to be accepted as one of the important historical sites in our country.

With regard to the training, I think the survey methods and techniques will help me in my conservation work in the preservation of our important historical districts like Intramuros. This will guide us in the gathering of very important data and information about the street landscape and the existing structures. This will assist us in our analysis, evaluation and recommendation of solutions to problems in such historical districts.

Adopting these methods and techniques will thus greatly help in surveying our historical districts. I realized this when we visited the natural cultural landscape of Naramachi in Nara prefecture, and the Takayama Sanmachi preservation district of historical buildings in Takayama, Gifu prefecture, which have the same objectives and approach with regard to the preservation and conservation of each historical district. Both settings have policies similar to those of Intramuros regarding reconstruction. Whereas the main objective is to preserve and develop the district and to enhance its historical value, Intramuros is also a special zone in Manila which is protected by law to regulate development and preserve the spirit and legacy of our colonial past.



The hands-on training we did at the Tanaka farmhouse was really a great experience for me because I learned the Japanese method of documenting important structures. It was surprising to observe such a precise and methodical approach used in carrying out this important activity. I think that in our historical district we have to update our documentation and use this method to better evaluate and assess the current problems.

Observations made at Shirakawa-go. The visit to the breathtaking world heritage site Shirakawa-go was a memorable experience. The clustered village of the Ifugao in the Cordillera mountains and the Historic Town of Vigan in Ilocos Sur have similarities with regard to the settings and protection of the natural landscape. Both areas are listed as UNESCO World Heritage Sites. Shirakawa-go has all the elements as a World Heritage Site not only because of its unique architectural style (*gassho*-style

houses) but also the lifestyle of its people that has been handed down from generation to generation.



The village is located in an isolated valley near the foot of sacred Mt. Hakusan. Typically the first floor of the house was constructed by skillful master carpenters. The massive wood framed structure supports the entire house. The second and third floors are located in the space created by the steep gabled roof of about 60 degrees in slope. Not one nail or pin is used to hold together the framework of this steep roof. Instead, it is tied together with rope. The wide attic was used as a place to raise silk worms, an industry that once supported the lives of the people of Shirakawa-go.



However, from the viewing deck of the World Heritage Site one notices that the *gassho*-style houses are outnumbered by the new houses in the village. The declining number has evidently been brought by development in the area. This has somehow been neutralized through the resiliency of the villagers (Landscape and Settlement Society of Shirakawa-go) and with support from the government of Japan, together with their conservation architects. This World Heritage Site must be protected at all costs and preserved in order to remain as beautiful as it is today.

I am very hopeful that the preservation and conservation approach will not only focus on maintenance of the structures, but also the sentiments and the living conditions of the people of Shirakawa-go. At present, tourism development in the area inadvertently disrupts major aspects of the people's lives. There is growing concern that they will lose their privacy. Their lifestyle will evolve as time passes and conservation problems in that protected area will take their toll. But I am confident that the Agency for Cultural Affairs of Japan and their conservation architects will address this anxiety among the people.

This successful approach and other conservation concerns must also be applied in our Ifugao village in the Cordillera mountains in order to address the pressing problems of this important site, and seek the kind of attention and support of our government in order to preserve the cultural and natural landscape of our World Heritage Site.

Prevention of insect damage. It is surprising to know that simply knocking on a piece of wood, or making keen observations of the premises will give some idea of the existing condition of the wooden structure. In the prevention of insect damage to wooden structures, simple practices and knowledge of the different species of termites may give one enough tools to prevent damage to wooden structures.



Safeguarding traditional techniques. The safeguarding of traditional techniques, and maintaining the relevant conservation experts, are seen as vital practices for preserving important structures. The training for traditional techniques is also conducted in order to have experts in various crafts specialize in different kinds of conservation works. In our country, we recently opened a training school for traditional techniques such as carpentry, adobe chipping, masonry, etc. Called Escuela Taller, this facility has given us hope for safeguarding our traditional techniques. However, we still have to exert more effort to continue such activities in order to make the project successful.

IV. RELEVANCE TO CONSERVATION WORK IN OUR COUNTRY

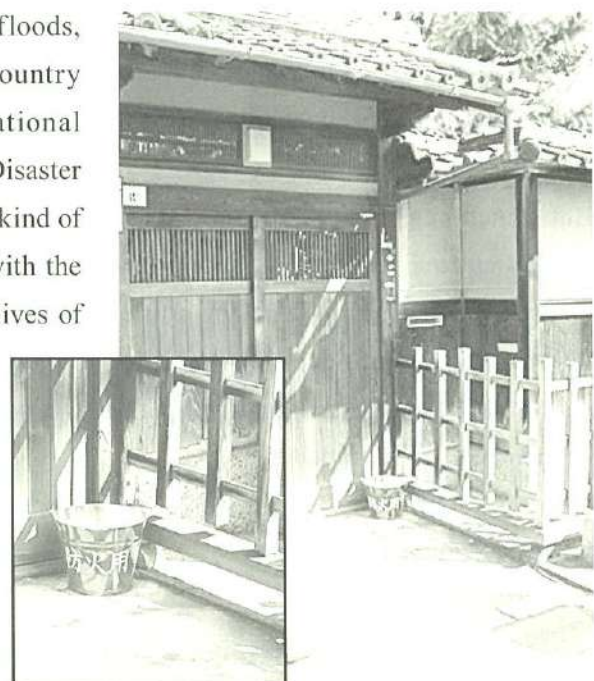
Management and implementation strategy. I think the management and implementation strategy of Japan can also be applied in our country to address all problems with regard to our conservation work. Each prefecture is responsible for its own preservation and conservation approach. The current system in our conservation approach must be studied further to avoid overlapping tasks and indiosyncratic

approaches in carrying out the conservation of important structures. Although our unstable political climate is considered a major issue, I really think that we still have the determination and manpower to address our preservation and conservation problems.

Comparative analysis of different approaches of each country. The different approaches of our neighboring Asia/Pacific countries made me realize that we do not have to depend on Charters that are not really applicable to our conservation needs. The most important thing is that the conservation method is well thought out and accepted by the people, and will benefit not only the people but their cultural heritage as well. Because each country has its own identity, preservation must be carried out in a practical way while considering the priorities and capabilities of the nation.

We really have to learn from not only our successes, but also our failures in our approach to the preservation and conservation of our cultural properties, so that we can avoid repeating our mistakes. The future generations have a right to a heritage they can appreciate, embrace and take pride in.

Risk preparedness. The frequent typhoons, flash floods, earthquakes and other natural disasters in my country are taking their toll on our people and our national treasures. Our immediate response is the National Disaster Coordinating Council (NDDC) which oversees this kind of problem in our country. The Council coordinates with the municipalities affected by natural calamities. The lives of our people are our priority when disaster strikes. The agencies tasked with protecting our national treasures will assess the situation and try to salvage whatever they can.



Japan has very efficient methods in the area of risk preparedness and disaster mitigation approach, to ensure protection for their heritage structures. The detailed and plain approach, such as a red pail with water or a fire extinguisher with a simple casing in front of the structure, is really practical. I hope we can also find easy, practicable and sensible risk preparedness and disaster mitigation solutions.

V. CONCLUSION

All wooden buildings decompose, especially those parts exposed to weather. In the case of modern buildings, full replacement of decayed parts is usually recommended. If the building is contaminated

with wood-destroying fungi or termites, it should be dismantled. However, these recommendations have to be applied carefully in the case of older and historic buildings, which may be masterpieces of wooden architecture. The replacement of all contaminated components and assemblies leads to the loss of important and authentic details. To replace the rotten elements, it is often necessary to dismantle and reassemble the structure.

The degree of decay is an important factor in choosing a restoration strategy for wooden structural monuments. Careless and hasty assessment leads to the destruction of authentic monuments because the restoration strategy fails to take into account the natural conservation of the wood and other important considerations established throughout the monument's life.

Some modern restoration techniques are far from perfect and not all restorers know the methods and instruments of ancient builders. After this sort of restoration, a building can no longer be considered a historic monument. Even the appearance of the monument is often altered during such restoration. Restorers try to reconstruct the "ancient look" of the monument which is rarely documented. This leads to a loss of historic context along with artistic features. It is taken for granted that slight imperfections are often significant in maintaining the authentic features of the structures, and in reflecting the ideas and techniques of our ancestors.

But sometimes after evaluation of the conservation plan through careful study, different ideas and conclusions may be gathered and discussed, and a final decision will guide us in the method that will be used. Each country has its own priorities and must base its decision on the situation at hand. We have to respect each decision according to the particular standards of preservation. As long as the people need heritage in order to have a sense of pride, and acknowledge it because they desire it, it will be embraced and justified.

VI. ACKNOWLEDGMENT

It has been a memorable learning experience in this very pleasant and friendly environment of Nara prefecture. The leisurely walk to the ACCU office is a nature trip at its best. Along the way, one sees the peaceful lifestyle of the surrounding neighborhood. It is really a very remarkable atmosphere and a new experience to all of us participants. We got closer to each other while exchanging our different views on our way to the ACCU Nara office. It was the best time to know each other better.

The very informative lectures, the wonderful food, the exciting site surveys, study tours and the practical trainings were very stimulating, as was the interesting language that we will really want to be able to speak even after we leave. The knowledge that we obtained in the training course will benefit not only ourselves, but also our own countries.

The ACCU staff really took good care of the participants. They were very patient and kind, and helped us with our daily needs. I would like to take this opportunity to thank the very supportive Director Nishimura-san, the very composed and very kind Mr. Nakai-san and the ever efficient Ms. Hata-san, the very accommodating Ms. Yoshida-san, Ms. Kimata-san, Ms. Tanaka-san, Mr. Kattun-san, Mr. Suzuki-san (they answered questions, granted requests and translated lines) and the rest who were behind this special training course. And also I would like to extend my thanks to the indefatigable Mama-san of the New Hotel Takatsuji and the staff for being very cooperative and hospitable to all of us.

Samoa

Mainifo VILIAMU

Evaluation Report

INTRODUCTION

Before going on to write my evaluation report I would like to express my great appreciation to ACCU Nara for this golden opportunity given to us to familiarize ourselves with your country's way of restoration and preservation of wooden structures. We came from different countries and we have different perspectives, but this training course has given us ideas and knowledge of how other Pacific Islanders, such as New Zealand, and the wider Asia region deal with the restoration and preservation of their cultural properties.

This report will focus on some of the relevant topics of the training course that can be applied to my home country, to my duties in the Culture Division. I learned and studied how different my country's situation is from conditions here in Japan. The report is comprised of two parts. The first is an overview of the course in terms of the effectiveness of the delivery methods, as well as the topics that were covered throughout the four week period. The second part focuses on selected topics that can be applied to improve the preservation and restoration of wooden structures in Samoa.

EVALUATION OF THE TRAINING COURSE

The training course took place over four weeks and it comprised many different topics concerning the preservation and restoration of wooden structures. The training course was delivered using various methods, beginning with lectures provided on the following topics.

- History of Wooden Architecture in Japan
- Conventions and Charters pertaining to Culture Heritage Protection
- Restoration of Architectural Heritage in Japan
- Risk Management of Cultural Properties
- Prevention of Insect Damage
- Management of Wooden Structures/ Safeguarding of Traditional Techniques
- Conservation Science for Wooden Materials
- Introduction to Dendrochronology: Tree Species and Annual Rings

Practical training sessions, on-site lectures, as well as the participants' presentations and discussions were other methods used to deliver training. From my observation the overall outcome of the training was successful. The methods used proved to be effective, and the participants not only received theoretical written information but also hands-on practical information, which further enhanced our knowledge of the topics taught. Discussions and questions also proved effective and rewarding, as participants got to fill in the gaps of their knowledge. In summary, the objectives of the training course were achieved, and I have acquired a significant amount of knowledge, practical training in sketching floor plans and cross-section plans, and exposure to painting restorations and wooden restorations.

WHAT I LEARNED THAT CAN BE APPLIED IN MY COUNTRY

Restoration system and project planning for wooden structures. I was so amazed and surprised when I learned that there are still many traditional Japanese houses also under protection as cultural heritage properties. I learned the Japanese way of restoration and preservation of their traditional buildings. I learned that for traditional buildings designated as properties of culture heritage, there is a responsibility to preserve and restore, not only for traditional houses but also some of the temples and shrines we visited. In my country it's quite sad because our traditional buildings and traditional materials used for building are gradually disappearing. Most of our cultural heritage properties are wooden traditional houses owned by the people. They have the authority to repair and restore them any way they want. This training stimulates us to do something; our people should wake up, and there is still a huge amount of value for our people in these traditional houses and building materials. Our people today have adopted more European materials and are forgetting our own traditional Samoan ones. This course has provided some ideas to serve as future reference for what can be done. For instance, our department should have two or three traditional houses built with traditional materials that will be under the supervision of the Culture Division, so it will be our decision to restore and preserve them with our traditional methods. These traditional houses will be for the future generations so they may understand the value of these traditional buildings to our people.

Replacement and repair of wooden structures. Repair and replacement of wooden structures in Japan is so amazing because in my country we do not have those kinds of ideas. If we dismantle a building note everything thing should be used again, for instance if part of the wood is decayed there is no way to restore it, as we have no experts to teach us those kind of techniques. But here in the repair of a historic structure, replacement timber can be used with due respect to relevant historical and aesthetical value, and where it is an appropriate response to the need to replace decayed or damaged members or their parts, or to the requirements of restoration. New members or parts of members should be made of the same species of wood, with the same, or if appropriate, with better grades of material as the members being replaced, and should have similar natural characteristics. The moisture content and other physical characteristics of the replacement timber should be compatible with the

existing structure. If a part of a member is replaced, traditional woodwork joints should, if appropriate and compatible with structural requirements, be used to splice the new and the existing parts. It is accepted that new members or parts of members will be distinguishable from the existing ones. To copy the natural decay or deformation of the replaced members or parts is not desirable. Appropriate traditional or well-tested modern methods may be used to match the coloring of the new to that of the old item, and with due regard for not harming or degrading the surface of the wooden member. New members or parts of members should be discretely marked, by carving, by marks burnt into the wood or by other methods, so that they can be identified. This is an excellent way of saving wood in Japan that can be applied to my country, but the problem is we have no experts to show us how we can handle that kind of situation.

Bamboo used for construction. Bamboo is one building material used for traditional Japanese houses, and I have recognized how significant bamboo is. It is relevant to my country, though we do have bamboo yet we do not use it as a building material, but using it for construction should be done in Samoa. It is crucial to harvest at its greatest strength when the sugar level in the sap is at lowest. I learned from this training that the best time to harvest is at dawn or dusk on a full moon. Because during the height of the day, photosynthesis is at its peak, producing the highest level of sugar in the sap, so this is no time for harvesting. Bamboo should be harvested during the dry season. Doing so reduces beetle attacks. Bamboo can be preserved for more than fifty years by adding some wood preservatives. Our people should also use it for building our houses, not only because it grows well in our land but also because we have a dry season most of the time. We need not spend as much money if we used it for construction, but the only problem that will face us is we do not have wood preservatives, and most of our wooden structures are not treated. We also have no experts to train our architects about various methods and ideas, and guidelines to follow, and what to do. But I have seen some of the houses built with bamboo here in quite the same way we build our houses in my country.

Roofing materials. Seeing how Japanese roofing materials are made has been quite fascinating. We use thatch but in a different way from what I have seen and could recognize. The thatch used here is of good quality which can last for more than thirty years. The Japanese people make it thick and secure, but our thatch is made from the leaves of the coconut or cane tree so that it is thin, and the problem is it can easily be blown away by the wind, so we need to repair it every two or three years. If we adopted Japanese ways we could have our thatch last for more than thirty years so we would not have the problem of replacing it every two or three years.

Risk preparedness. Risk preparedness is a crucial topic that all cultural heritage institutions should be concerned with. There is no doubt that every country is more or less affected by disasters of some kind, whether from natural forces or human interference. Therefore, much was learned from the experiences of the Great Hanshin Earthquake, which affected Kobe prefecture. Inaba Nobuko

emphasized the following needs.

- Having a network of experts and professionals
- Having preventive measures for the response
- Preventive methods involve maintenance
- Rescue teams should be aware of resources
- Heritage can help reduce the disaster

Heritage being an aid during disasters proves to be factual. For instance, a Category 4 hurricane struck our country in 1991 and families and villagers in the village of Falealupo in the Island of Savai'i sought shelter under an ancient rock construction that is now an official Samoan Heritage Site and tourist attraction. Not only that, but unforgettable devastation occurred when my beloved country was struck by 8.0 magnitude earthquake, followed by a tsunami, on 30 September 2009. Being away from my country myself, I just cried at what I saw in the news, it was such a terrible time for my people. Not only did many families lose their loved ones, but there were no homes for a lot of the people.

As we visited from temple to temple I recognized preparation of materials and equipment to protect some of cultural heritage in Japan, for instance in each building they were prepared for accidents to happen such as fire, and have fire prevention measures in most of the temples, shrines and some of the museums, but this is quite different from our situation. If problems like that occur we have to ring the Fire Department and it takes time, so maybe they arrive after half of the building has burned down. That is also a lesson for our country, that we have to have fire prevention measures and plans to respond to accidents quickly.

Wood treatment. In my country one of the problems with our wooden structures is that we have no wood treatment, the kinds of materials involved being very expensive, and when I asked the carpenters who was working for a restoration of some of the buildings here they mentioned briefly that they added wood preservatives to the wood to protect it. However, I learned from other participants how they preserved wood in their countries where they have no wood preservatives or chemicals, and what I learned so far can apply for my people. Smoking the wood is quite a cheap way of preserving it, as there is no money needed to carry this out, but the problem is how long to smoke a log or wood, and if we do it too long, what will happen to the wood. Another idea is soaking wood in water in order to preserve it.

Prevention of insect damage to wooden structures. We have learned a lot about how Japanese conservators control insect damage. It has been significant learning the different aspects of dealing with different varieties of insects, and it is a great help also to apply those ideas and methods to our country. We do have a lot of insects such as termites which damage our wood species, with no

specialized experts or professionals who can deal with that kind of problem, but every country should have their best controls to protect wooden structures from being attacked by insects such as termites.

Legal processes. Having legislation is important for every country, as having good legal processes can help to promote and maintain cultural heritage for coming generations, by requiring individuals to keep it and restore it properly, so it is also a good practice for my country for future reference.

OBSERVATION

Throughout the training course, I was able to make observations on the relevance and the feasibility of adopting new equipment and methods for the preservation and restoration of cultural heritage in Samoa. Areas on which my observations focused are utilizing technology, equipment and tools, facilities such as museums, computer software and programs, and working professionals. All of these areas and perhaps more are contributing factors in developing the preservation and restoration of wooden cultural heritage structures in Japan. My country has very basic resources and the lack of trained professionals makes this experience and observations worthwhile. With the highly sophisticated technical equipment and software programs being costly, and many methodologies being impossible to carry out due to the lack of professionals and experts as well as finances in my country, and as we are deep in a worldwide crisis of recession, I was mentally pressured to weigh my options on what is suitable, cost effective and appropriate towards the maintenance of Samoa's cultural heritage.

CONCLUSION

As I conclude my report, what I mentioned above can help improve the preservation and restoration of wooden structures in my country. Protecting the cultural heritage will be successful if people in the community and the country work together. What can be done to make these dreams come true depends on the people themselves and the government. As we have learned, one of the biggest difficulties facing my country now is the availability of adequate budget. Tourism is the key driver of economic growth in Samoa, which we are heavily dependent upon, and we are currently in trouble. This year a tsunami has literally swept away a large part of our tourism industry, striking at the heart of tourism in Samoa. So my country is in a difficult situation now.

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On behalf of the Ministry of Education Sports and Culture and my country I would like to acknowledge the organizers of this training course for 2009: the Agency for Cultural Affairs of Japan; the Asia/Pacific Culture Centre for UNESCO (ACCU); the International Centre for the Study

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TOFA SOIFUA GOD BLESSES YOU ALL FOR YOUR HELP AND SUPPORT.

Sri Lanka

Visaka LIYANA ARACHCHIGE

The Japanese Way of Cultural Heritage

Although I had learned about Japanese architects who created wonderful spaces in this land, this is the first time I could eyewitness them myself. At the beginning of this program we were given the basic outline of Japanese architecture. Site visits improved that knowledge. I felt similarities between the temples of Japan and the monastic complexes in Sri Lanka. In Anuradhapura (the great city of the ancient period, from the 3rd century BC to the 10th century AD) there are many units of monastic complex layouts similar to those in Japan. The notable features are symmetry, elements of the buildings and spaces, the use of buildings and some of the techniques, etc.

In order to identify problems and needs regarding the preservation and restoration of wooden structures, we had a lecture series covering a variety of subjects. The lectures focused on Japanese methods, and information on other Asian and Pacific countries emerged in discussions after the lectures.

Basically, the history of wooden architecture in Japan was introduced, and after that we learned about international charters pertaining to cultural heritage protection. We gained knowledge of international organizations such as UNESCO, ICCROM, and ICOM, which are involved in cultural heritage protection. We also gained knowledge of restoration systems, project planning, risk management, painting conservation, and prevention of insect damage, management of wooden structures, and dendrochronology. Study tours and discussions improved our awareness. Practical training and on-site lectures promoted better understanding.

Presentations done by each participant, on the problems and needs of preservation and restoration of wooden structures in sixteen different countries, heightened our interest in cultural diversity and at the same time helped us understand how the problems and needs of all countries are more or less same. Sometimes it felt that we traveled to those sixteen different countries.

Sri Lanka

The Department of Archaeology is the responsible government institution for (immovable) cultural heritage in Sri Lanka, and is under the Ministry of Cultural Affairs and National Heritage. Although the Central Cultural Fund to which I have been attached since 1997 is governed by the same ministry, we must apply for permission from the Department of Archaeology for any of the exploration,

excavation or conservation activities within a cultural heritage site.

Sri Lanka has six World Heritage Sites maintained by the Department of Archaeology.

1. Sacred City of Anuradhapura (1982)
2. Ancient City of Polonnaruwa (1982)
3. Ancient City of Sigiriya (1982)
4. Sacred City of Kandy (1988)
5. Old Town of Galle and its Fortifications (1988)
6. Golden Temple of Dambulla (1991)

Within these World Heritage Sites, the Central Cultural Fund is dedicated to carrying out a considerable amount of exploration, archaeological excavation, and architectural conservation. The Central Cultural Fund is equipped with experienced professionals and craftsmen, and carries out joint research with many universities (local and foreign) within these sites. I joined this institution in 1997 and have been practicing as a conservation architect after completing my basic degree in architecture. Throughout these twelve years I have gained considerable experience and knowledge about the architectural conservation practices in Sri Lanka.

But this was the first occasion of having experience with the conservation practices of a foreign country. I gained a better understanding of various subjects through it. Throughout the course on preservation and restoration of timber structures, I have seen many similarities and also contrasts with current practices in Sri Lanka. Considering these facts I would like to point out a few important factors which I noticed during the course and the site visits.

Management of cultural properties

This is the main impressive factor I noticed in this country. The system of protection for cultural properties appears optimal for the purpose of conservation. Categorizing, listing, and recording each property helps to take care all of them under different states of management. And it provides an opportunity for experts to take part in every stage of restoration. A proper national policy without political influence is a remarkable feature. The training and management of cultural experts, coordination and funding are also important factors. Sri Lanka also has a superior management system but coordination among institutions and experts is less than optimal. I think this is a very crucial point in handling cultural properties.

Different approaches

I noticed the use of different approaches (preservation, restoration, reproduction, anastylosis, etc.) for different situations. Also, the manner of flexibility regarding the owner of the cultural property

is interesting and it can help overcome problems with cultural properties. There are some steps which were taken to overcome contradictions of Japanese restoration with the approaches of western countries. Reconstruction of entire wooden structures is limited, and the directions of different approaches can be seen.

In my experience, reproduction of ruined buildings is very limited in Sri Lanka. For example, in some of the monasteries in Sri Lanka, we have ruined buildings made with the same technique of using base stones for pillars. Most of the pillars are also made of stone, but the rest of the roof must have been wooden because there is no evidence for the use of stone beams for the upper floors or roofs. Stone carved door and window frames and slots are the only evidence left for the use of timber, because timber is a more perishable material than stone.

Although we have evidence for the use of timber in the past, there is no building conserved up to roof that was built before the 12th century. Those buildings are conserved just to the surviving top level of the walls or foundations. Also, the knowledge given through the lectures, about complementary and contradictory aspects of western philosophy, will be useful in future conservation approaches, which will be based on context, community and cultural diversity.

Risk preparedness

Japan is a country which should be on the alert to natural disasters. The Japanese are trying their best to reduce the risk of damage not only to people, but to cultural properties. They use traditional and contemporary methods to reduce risk. This is one of the important subjects which should be addressed in our country. Although we had a disaster management plan for people after the tsunami devastation in 2004, it was not helpful in reducing damage to cultural properties. We still have to complete the task of listing the cultural properties in those areas, and assessing the damage.

Sri Lanka has not frequently been badly subjected to natural disasters such as earthquakes, tornados and tsunami. But now we have to face such risk and prepare for it. From the past experience and as I understand during this course, we can prepare better disaster prevention measures for Sri Lanka. I have seen many of the steps taken to prevent fire and to reduce damage from disasters. To prevent damage from fire, for example, there are fire alarms, fire fighting equipment, water storage, sprinkler systems, and water channels, etc. Increasing awareness is still a great challenge and we can see the preparation of the people, who keep at least a little bucket of water in front of their house or shop. During the conservation process, there is a stage for checking risk of seismic damage to a building and finding a solution for it.

Use of materials and technology

In Japanese conservation techniques, the use of materials and technology is highly sophisticated. But I

think we can use our own materials to best advantage to suit our culture and environment.

Site presentation

Although the conservation of wooden structures is limited to wooden members, for the sake of site presentation, they use modern materials and techniques. And the way of presentation is very interesting. Sri Lankans now are trying our very best to care for our heritage sites in comprehensive fashion, with complete archaeological excavation and architectural conservation. To some extent we are capable of presenting them nicely, but there are some areas we should rethink.

Visitor facilities

Japanese cultural sites are very popular with the people. In my site visits I saw many local visitors in addition to foreigners. And the sites are capable of handling large scale gatherings without having trouble. Even persons of differing physical capabilities can use all the places that they want to reach. Compared to Japan, Sri Lanka is in its initial stages and we still have far to go in the development of visitor facilities.

Infrastructure development

Infrastructure development is not directly related to cultural heritage. But this has major effects on people when they seek to visit sites. Better road and rail networks are very helpful, and the situation here is one of the best in the world. Sri Lanka has far to go in that regard. Due to the civil war of the past thirty years, we have had problems in the development of the Northern and Eastern parts of the country. But now, we are going to develop infrastructure and other facilities in those areas, which will be helpful in the management of cultural properties there as well.

Reuse of wooden structures

There are different ways of using buildings after conservation. Some of them are museums, and still other wooden structures are used for the original religious purpose or for dwelling. But some adjustments in the interior can be seen. Examples include castles that serve as museums, farmhouses which may serve their original or other purposes, and temples still used for their original purpose.

The effective use of a conserved building for its original purpose helps to continue the cultural heritage. But sometimes it is not possible due to various reasons. In that case, it should be used for another purpose because we have to keep it for the future, and also regular maintenance of the building or structure will help to reduce decay.

The same procedure can be observed in Sri Lanka, and many conserved structures are used for the original purpose, with few exceptions. But in some other cases we have cultural properties not used for the original purpose. The wayside rests in Sri Lanka were used as free resting places during a journey

on foot or horseback in the past. But nowadays people do not use them as resting places, because they can travel long distances without rest due to new transportation facilities. So there is a problem in having conserved wayside rests used for the original purpose. They cannot easily be used for other purposes because of their small structure. We should introduce some other use for these structures for the sake of keeping and maintaining them.

Conclusion

The ACCU Nara and ICCROM institutes organized this training course to promote the handling of cultural properties in the best way for each country. As I understand it, we now have a task to complete in our countries. They have showed us the Japanese way. But we should choose our own way, which fits our particular country, after making comparisons with others. The cultural diversity of the Asia/Pacific region was seen through the presentations, and it helps to understand importance of each culture. And we have to respect it always. I think now we have a better understanding of handling cultural properties than before. As cultural experts we should make the best decisions on behalf of our countries and people.

Acknowledgement

As a participant in this course, I entered Japan with mixed feelings and it was the first journey to the outside world from my island in the Indian Ocean. Although I was very tired after the long journey, it was a pleasure to receive the warm welcome of the ACCU Nara officials, even at late hours of the night. I experienced great help, care, and a friendly environment throughout this entire course.

I would like express my gratitude to the government of Japan, Nara prefectural government, ACCU and ICCROM for selecting me for this course in Japan. And I sincerely thank Dr. Yasushi Nishimura, Director of ACCU, Mr. Isao Nakai, Director of the International Cooperation Division, who have been very helpful in assisting us in everything in order to make the training programme perfect. I would like to send my regards to all the lecturers for sharing their knowledge with us, and to Dr. Gamini Wijesuriya, Project Manager ICCROM, and Archt. Mr. Ashely De Vos, who held fascinating discussions with us.

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Thailand

Pongthorn HIENGKAEW

Learning from Japan

Introduction

Historic monuments are cultural heritage received from our ancestors. There are historic monuments in every country. Each country utilises historic monuments in different ways; for example, some countries maintain them as religious monuments, others utilise them as symbols of prosperity or travel destinations. However, there is one thing about historic monuments that is similar in every country. That is the value of each historic monument, which is of international significance. It can be stated that historic monuments are world treasures that we must protect, preserve, and maintain in order to save as a valuable world record. People taking responsibility for historic monument preservation must have knowledge and good skills, and continually update their knowledge in order to improve their work.

The “Training Course on Preservation and Restoration of Cultural Heritage in the Asia/Pacific Region, 2009” has been arranged on the topic of “Preservation and Restoration of Wooden Structures.” The course has been held from 8 September – 8 October 2009 at Nara, Japan. It was operated by several organisations: Asia-Pacific Cultural Centre for UNESCO (ACCU), Japan’s Agency for Cultural Affairs (Bunkacho), Nara Research Institute for Cultural Properties, and ICCROM. There are participants from sixteen countries, including this participant from Thailand. The contents of the course are aimed at providing knowledge of wooden historic monument protection and restoration on the basis of Japanese work in conservation, in both theory and practice, in addition to visiting historic monuments. Every topic is useful and covers procedures for practicing conservation architects.

The current report summarises the contents of the training with respect to the theory, practice, and visits, from my vantage point and opinions as a participant from Thailand. Furthermore, comments on the application of knowledge from the training are included.

Training Curriculum

The duration for the training is one month. The training can be divided into four parts, discussed separately below: class lectures at ACCU, on-site lectures, on-site practical training, and presentations and discussion. The contents of the course cover knowledge of historic monument protection and restoration in all aspects, beginning with the compositions of wooden historic monuments, to the cooperation of communities and old town areas. I have received new knowledge, understandings, concepts, and vision from the course training, as described in the following sections.

Class lectures. In the first week, the contents were basic knowledge and understanding of Japanese historic monument conservation; for example, the history of wooden architecture, the laws and regulations regarding historic monument protection, and classifications and levels of historic monument registration. These contents were in the lectures on “Cultural Heritage Protection System in Japan,” “International Cooperation for Cultural Heritage Protection” and “Restoration of Architectural Heritage in Japan.” The knowledge from these lectures prepared us for the site visits.

In the second week, “Restoration Systems and Project Planning for Wooden Structures” was taught. The information was useful for practical training at the Tanaka family farmhouse.

The third week was the week for us to give our country report presentations. Dr. INABA Nobuko from the National Research Institute for Cultural Properties, Tokyo, informed us about “Risk Management of Cultural Properties,” and Dr. WIJESURIYA Gamini from ICCROM lectured on the “Introduction to Architecture in Asia.” The lectures emphasised the philosophy of cultural heritage conservation. At the end of the lectures, details of conservation were presented, for example the prevention of insect damage, wooden materials conservation science, dendrochronology, and safeguarding traditional techniques. The contents of lectures were well prepared and the lecturers had the ability to provide knowledge about all aspects for the trainees. The lecturers could show us how to relate the class lectures to the site visits and practical training.

The class lectures were interesting, and the following topics impressed me in particular.

- The Japanese system for protecting tangible cultural heritage. It is strong and the system continuously develops according to the circumstances.
- Restoration methods for historic monuments in Japan. They are performed in relation to Japanese culture and are able to maintain and show the value of historic monuments.
- Consideration given to data and documentation for historic monuments.
- Consideration given to wooden historic monument maintenance in systematic and continuous fashion.
- Operational system for historic monument restoration; for example, operation planning, roles and responsibilities of workers.

On-site lectures and site visits. The contents of on-site lectures and visits were related to the class lectures and showed us real working systems and processes. In the first period of site visiting, participants visited two important wooden historic monuments to observe the restoration of such structures. The two monuments are Chion-in and Kiyomizudera temples, both in Kyoto. Participants learned the history of construction and restoration of both temples, in addition to visiting a restoration project. In the visit, the operational steps, systems, and techniques used in restoring Japanese wooden

historic monuments could be observed.

In the third week, participants had a chance to learn about the maintenance and protection of the old community of Naramachi. Furthermore, at Todaiji temple, we had an opportunity to participate in a survey on painting, practising the collection of preliminary data about the painting, and planning for its restoration.

In the last period, there was an on-site lecture at Hikone-jo castle, dating from the 16th-17th centuries. In addition, there was a site visit focusing on vernacular architecture protection in traditional communities, at Shirakawa-go and Takayama in Gifu Prefecture. Moreover, there was a study of methods of presentation of structural features at the Nara Palace Site.

The lectures and visits to the places mentioned above enabled me to learn from real situations and brought me to understand the working methods, steps, concepts, and processes that were involved. Furthermore, the results of conservation and restoration in Japan could be observed. There are many interesting aspects, and I was particularly impressed with the following.

- Techniques of restoration
- Human resource development in suitable fashion for the work
- Choosing equipment and materials in suitable fashion for the work
- Using traditional techniques in restoration
- Collecting and studying historic monument data systematically and in detail
- Analysis and interpretation of data from archeological investigation and historic monument conservation and restoration, the subsequent presentation to the public in an attractive manner, instilling thereby knowledge and understanding that influences public views of cultural heritage protection in Japan
- Formulating lively ancient communities under proper development

On-site practical training. Participants had a chance to engage in training at the old farmhouse of the Tanaka family, a municipally designated tangible cultural property in Nara. At the site, we surveyed, measured, drew, and recorded the deteriorating ancient monument. Even though there was limited time, we learned fundamental processes in data collection that are the basis for a restoration plan. We also learned Japanese working techniques. In my opinion, basic techniques of restoration in Japan are similar to those in Thailand, but there are differences in the details. Besides learning the techniques, we also understood the history of the ancient monument, the architectural characteristics, house structures, and functions of old Japanese farmhouses.

I was impressed during the on-site practical training by the following.

- The care taken by the three lecturers, Mr. HATANO Tsuneo, Mr. IMANISHI Yoshio, and Mr. YAMAGUSHI Isamu, in teaching, advising, and correcting mistakes during the practice.
- The care taken by the community and Nara city for the old farmhouse of the Tanaka family. Although the farmhouse is a small structure, it is maintained as a symbol of information for people nowadays and in the future.
- The good maintenance of the environment around the ancient monument. It exhibited harmony with the farmhouse.

Presentations and discussions. This section consisted of country report presentations from all participants. Dr. INABA Nobuko and Dr. WIJESURIYA Gamini conducted the sessions. We learned from one another about the basic history, architecture, historic monument conservation, and problems and needs of historic monument conservation. In addition, there was an example of historic monument conservation from each country. Questions and the exchange of knowledge were included. In each country, there is something similar and something different in the work, problems, and needs of ancient monument conservation.

In this section, the things that impressed me were as follows.

- Helpful advice from the lecturers. They assisted us in thinking about what aspects were similar or different, how they were the same or dissimilar, and what the appropriate direction for historic monument conservation in each country is.
- Gaining an understanding of the work of ancient monument conservation in each country. I hardly knew about the conservation activities of some of the countries, but in class I learned much about it.
- The support given one another in the presentations, preparations, and seminar.

Conclusion

During the month of training, I have learned a lot of things in and out class. Furthermore, I have understood Japanese lifestyle and culture. The feature that I really admire is the ability of Japanese culture to adjust to social change and high technology. Furthermore, there are firm standards of social regulation. From training, observation, and communication, I have learned about the thinking and working processes in Japanese historic monument and cultural heritage conservation. The knowledge and experience I have obtained during the course will prompt me to devise new concepts, and I will apply the knowledge from the training in my work, particularly in problems and needs in historic monument and cultural heritage conservation in Thailand.

At the present time, the people of Thailand are adjusting their basic concepts to fit a theory of development for the country held by the present king, King Rama IX. That theory focuses on

improvement of knowledge of Thai cultural heritage in order to protect and conserve ancient monuments.

The knowledge from the course that is closest to my working practice and can be applied in my work involves the utilization of materials and original construction techniques, developing a sufficient database for cultural heritage conservation work, improving systemic standard regulations in cultural heritage work, concentrating on maintenance, monitoring, and risk prevention from dangers such as fire. However, there is knowledge from the course that is far from the common practices and concerns in Thailand. In my opinion, that information is still good though it needs much modification for application in our work. This may take a long time, since I have to develop connections in cultural heritage protection and to continuously push the concept of cultural heritage conservation in Thailand.

The current training course has greatly energized me to work on cultural heritage prevention and conservation for Thailand.

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I would like to thank ACCU and supporting organizations that gave this chance for me to take the course on “Preservation and Restoration of Wooden Structures.” I have obtained a variety of valuable knowledge, understandings, and experience.

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Uzbekistan

Sukhrobiddin NARMETOV

My Study in the Training Course on “Cultural Heritage Protection in the Asia/ Pacific Region 2009: Preservation and Restoration of Wooden Structures”

Introduction

The Cultural Heritage Protection Cooperation Office, Asia/Pacific Culture Center for UNESCO (ACCU) in Nara, Japan, organized this training course on the preservation and restoration of cultural heritage in the Asia/Pacific region for 2009, focusing on the preservation and restoration of wooden structures. This wonderful course lasted 30 days from 8 September to 8 October 2009. There were sixteen participants from different countries of the Asia/Pacific region. I participated in this training course from Uzbekistan. I would like to thank the government of Japan and the staff members of the Cultural Heritage Protection Cooperation Office, Asia/Pacific Center of UNESCO (ACCU) for giving me the chance to take part in this month-long course, and also like to thank my department and particularly Mr. Alisher Ikramov, Secretary General, National Commission of the Republic of Uzbekistan for UNESCO, for nominating me as a candidate.

Cultural heritage is an issue of great national and historical pride for every nation for its future generations. Each nation has cultural heritage that consists of historic buildings and ancient monuments that are exposed and in ruined condition. Among the many countries of the Asia/Pacific region, Uzbekistan is considered one of the richest in terms of cultural heritage. There are 7,570 items of cultural heritage, including 2,487 monuments of architecture, 3,945 archeological sites, and 1,138 monumental buildings under state protection. Uzbekistan ratified in 1996 the UNESCO Convention on the Protection of the World Cultural and Natural Heritage, and in 2007 the Convention for the Safeguarding of the Intangible Cultural Heritage. Uzbekistan has become a full member of the international organization of UNESCO. The monuments Itchan Kala in Khiva (1991), the Historic Centre of Bukhara (1993), the Historic Centre of Shakhrisayabz (2000), and Samarkand - Crossroads of Cultures (2001) have been inscribed on the List of World Cultural Heritage.

The course, which was attended by representatives of sixteen different countries, provided opportunity to learn the methods of preservation and restoration of cultural heritage employed in Japan, and to compare the different ways of protection of monuments in the countries of the Asia/ Pacific region. The course enabled participants to learn from Japanese heritage professionals and to exchange their own experiences.

Training Course Content

During this training course I have learned many matters on the management, preservation and restoration of architectural monuments in general as well as how to preserve each kind of monument. I have also learned much on preservation methods for all kinds of architecture, and the materials used in handling relics (especially wooden architectural relics). The experiences in the restoration, management, and steps in the restoration process during the lectures and on-site work will be very useful to me. In addition, I also participated in some stages of restoration work in order to understand more about the carefulness of restoration.

In the first week of the training course we learned about the history of wooden architecture in Japan. Wooden architecture has a long history in this country. The most important building material in Japan is wood. When I visited Gifu prefecture I saw that Japan has extensive forests. I think that is why wood is the most important building material in Japan. Also, we visited the Historic Monuments of Ancient Nara. I was surprised as I have never seen large wooden monuments like those of Nara.

Second Week of Training

On Monday we visited to Kyoto. We had an on-site lecture on “Restoration of Architectural Heritage in Practice.” We learned restoration work at Kiyomizudera temple. There was a pagoda which had been restored. It interesting to learn that this pagoda can withstand earthquakes. Because when we touched it, it shook and I thought that was good, because it will shake but not break.

We had three days of practical training at the Tanaka Family Farmhouse. This practical training course gave me a chance to study more closely Japanese farmhouses. In this practical training we prepared a floor plan sketch and cross sections of the farmhouse of the Tanaka family, recorded the wood species, quality, and configuration of the materials used in this house. All participants, working in groups, measured the dimensions of the cross-section and floor plan. I was with participants from Sri Lanka, Thailand and Vietnam for these tasks. It was the first experience for me. Until that moment I had never drawn a floor plan sketch or cross section. It was difficult for me. But Mr. Hatano, Mr. Imanishi and Mr. Yamaguchi helped and taught me how to do it. I tried to draw better. But I want to apologize if I could not draw the floor plan sketch and cross section of this house as the teachers and staff members of ACCU expected. It was my first step in architectural work.

During the practical course we visited Toshodaiji temple. This temple was built in the 8th century. The most recent restoration work continued for 10 years, and 30 billion yen was spent. I would like to thank the government of Japan for its taking care, protecting and giving the restoration works of cultural heritage properties so much money and attention.

Third Week of Training

On Monday we had a lecture about “Risk Management of Cultural Properties.” Dr. Inaba Nobuko gave information about various risks to cultural properties. And also we got information about the Great Hanshin Earthquake in Kobe in 1995. In that earthquake thousands of people died and cultural

properties were destroyed. Afterwards plans were devised for improved protection of cultural heritage properties. Uzbekistan is also in a seismic zone. In 1966 in Tashkent there was an earthquake, and several cultural heritage properties were damaged. This lecture was very useful and I understood what can I do.

On Tuesday and Wednesday all participants made presentations of their country reports. It was very useful for me. I live in Central Asia and my country is located far from the rest of the East Asian and Pacific region. I have little information about the cultural heritage properties of these countries. These two days of presentations gave me the chance to learn more about other countries. We discussed various problems. I think all countries have similar problems regarding cultural heritage properties.

Like the other participants, I also made a presentation about my country. My presentation was about the restoration of wooden structures at the Djuma Mosque in the historical city of Itchan Kala (Khorezm region, Uzbekistan). This cultural heritage property is inscribed on the UNESCO list of World Heritage. The mosque site as rebuilt in the 18th century was probably delineated on its southwest borders by the mausoleum Yunus Khan built in 1558 and mausoleums of the 16th-17th centuries, in one of which afterwards was buried Measles, reader of the Koran, in 1872. During the mosque rebuilding in the 16th century a new minaret which has survived up to now was built. Ancient carved wooden columns for Djuma Mosque were brought together by inhabitants from throughout the sovereign domain. There were 212 pieces, but along with wooden columns of the 18th-19th centuries, and simply repaired pillars, 17 carved wood columns have been saved (except for 8 columns which are in a museum of history of the people of Uzbekistan). Currently from the ancient mosque there are 16 carved wooden columns of the 11th-14th centuries, 14 wooden columns 17th-18th centuries, and 135 building pillars, with double swinging carved wooden doors on the northern side, and a single carved wooden door on the southern and western sides of the mosque, which have been saved.

On Friday we had an on-site lecture on "Survey on Painting and Plans for Painting Restoration." We copied on paper part of temple colors that remained. It was interesting for me because it is old Japanese cultural heritage. And also the colors have some history. During painting, I felt myself to be returning to that time. I think that temple at first was painted white, then painted green. At the same time, the temple needs paint restoration.

For the painting restoration I have the following suggestions.

1. I think the remaining paint should be removed from the columns and beams. Then repaint all of them. But the pigments should be saved. The paintings of the temple were old, and when we touched them the pigments separated. That is why it is necessary at first to clean away the old paint.
2. Rafters may be repainted without removing the remaining paint. The rafter's paintings were in good condition. They do not need removing.
3. I think it better not to paint the ornaments. It is better if they are coated with dry oil.

4. Before painting it will be useful if the surface is coated with dry oil, and not cleansed with cotton. This is because the wood of the temple is very dry. And oil is useful against insect damage. These were my opinions.

Fourth Week of Training

On Monday we had a lecture on "Prevention of Insect Damage to Wooden Structures." In this lecture we learned about different types of insects, ways to identify their damage to wooden structures, and measures for prevention and extermination. The lecturer, Mr. Komine Yukio, showed us various types of insects and their damages. This lecture is very important. In my country as well we have insect damage like this. Over 2,800 termite species representing six families are known to inhabit mainly the tropics. While most of them are beneficial for the ecosystem, about 20 species are pests causing significant damage to buildings and trees.

Seven species inhabit the Commonwealth of Independent States, while four species inhabit Central Asian states. Two of these, *Anacanthotermes Turkestanikus* and *Anacanthotermes Ahngerianus* of the family *Hodotermitidae*, are present in Uzbekistan. It has been reported that in Uzbekistan termites are found in 46 districts of 11 out of 12 regions, including those in Karakalpakstan. The infestation covers an area of 780 sq. km. In the historical city Itchan Kala (Khorezm region) there are 49 objects of cultural heritage. In 31 of them termites were found. Our country received a project for the "Development of an effective system of protection for objects of cultural heritage and nearby territories of Khiva against damage by termites from 2009 till 2020." Specialists with the Institute of Biology of the Academy of Sciences, Republic of Uzbekistan, are conducting research in this project. Japanese specialists have more experience with extermination and insect damage. In Japan there are two types extermination: chemical and non-chemical. I was interested in fumigation. I think it is a useful treatment for insect damage. And also in my country, after analysis, we can use fumigation. I hope in the future Uzbek and Japanese specialists can cooperate in this area.

For three days we had a study tour in other prefectures. The first day we visited Hikone-jo castle in Shiga prefecture. This castle was built about four hundred years ago in the Edo period. In the history of Japan, Edo was a period of peace and development. The walls of moats surrounding the castle were made with big stones. Usually in my country, castles are surrounded with structures of soil and bricks. On the second day of our study tour we visited Shirakawa-go village. This village is well known not only in Japan but also in many other countries. This village is inscribed on the UNESCO list of World Heritage. We got acquainted with old traditional Japanese houses and restored roofs. The Shirakawa-go village was very beautiful and wonderful. On the third day we visited Takayama. In Takayama we got acquainted with old and new traditional houses, and how to protect them from fire. We got information about water tanks and water guns and how to use them.

Conclusion

This course was a tremendous combination of theoretical and practical approaches in training. My

knowledge has improved in such a way regarding my profession that I can see a new light in thinking about my field of experience. My stay at ACCU helped me exchange views with the participants from different countries, which enriched me a lot. This riveting memory will show me a new track for the future regarding my work. There is proverb in the Uzbek language, *Yoshlikda olingan bilim-toshga o'yilgan naqshga o'hshaydi* (Knowledge obtained in youth looks like an ornament carved in stone). I will use all the knowledge I gathered in my future job. And also when I return to my country I will continue to improve my knowledge.

Acknowledgments

First of all I am happy very much to have participated in the training course held in Nara, on Preservation and Restoration of Wooden Structures (8 September - 8 October 2009, Nara, Japan) conducted by the Asia-Pacific Cultural Center, UNESCO. I have been able to gain knowledge related to the subject, especially new information, approaches, and technology. The whole program was meticulously arranged and conducted, and the ACCU office in Nara should be specially commended for a job well done. I would like to express my gratitude to the ACCU Nara office for giving me this important opportunity to further my knowledge on the preservation and restoration of cultural heritage, particularly on historical wooden structures.

I am also grateful to the government of Japan, ICCROM, and the Nara prefectural government for giving me this opportunity to participate in this year's program. I would like to thank the director of ACCU Mr. Yasushi Nishimura, and the staff of the international corporation department, beginning with its director Mr. Nakai Isao, staff members Ms. Otani Yasuko, Yoshida Maki, Yoneda Msahiro, Kinoshita Wataru, Yamashita Tsutomu and the young beautiful girls Kimata Akiko and Tanaka Rie, and also to Suzuki Katsuyuki and all the other staff of the ACCU office for their excellent handling of the course from its inception to completion, providing all the guidance and necessary information. I also would like to thank Ms. Hata Chiyako for her very skillful translation of the lectures and other relevant information, and to the lecturers and experts especially for their expertise and instruction. Thank you very much.

Vietnam

NGUYEN Thi Thanh Tung

Final Report: Preservation and Restoration of Traditional Houses in Ethnic Villages in Viet Nam

I have always dreamed of going to Japan to see with my own eyes Japan's colourful culture and modern technology. Thanks to ACCU Nara (Cultural Heritage Cooperation Office, Asia/Pacific Cultural Centre for Unesco), ICCROM (International Centre for the Study of Preservation and Restoration of Cultural Properties), Vinaculto (Vietnamese National Village of Ethnic Cultural and Tourism), my dream has come true through participation in the course on "Preservation and Restoration of Wooden Structures" in Nara, from Sep. 8 to Oct. 8, 2009.

Upon attending this course I submitted a report about "Preservation and Restoration of Traditional Houses in Ethnic Villages in Vietnam." Through my work in Vinaculto and my observation of many villages in Vietnam, I remarked there are two kinds of ethnic villages. One is a village that has been built with government budget as an outdoor museum where folk houses of ethnic minorities have been collected, kept and displayed. The building methods of this type village can include reconstruction based on survey documents (Vinaculto with 54 groups of folk houses), or buying old folk houses and reconstructing them in other places (Thai Nguyen Ethnic Village, Hoa Binh Muong Ethnic Village). These villages usually are situated in suburban areas, and connected with other leisure parks as an amusement and entertainment combination. Others are some old villages in remote areas that have valuable folk houses and beautiful landscapes, such as Lac hamlet in Hoa Binh province, and Cat Cat hamlet in Lao Cai province. These villages originally specialized in agricultural products but now focus on tourism services. They are the living heritage that needs to be preserved and spread as cultural properties.

1. The ideas or practices seen in the Nara training course that would be the most useful in Vietnam in general, and in Vinaculto in particular

1.1. Principles of conservation and restoration

According to the Nara Document on Authenticity, heritage properties must be considered and judged within the cultural context to which they belong. Also, all cultures and societies are rooted in particular forms and means as tangible and intangible heritage. This means that it is better if conservation and restoration of folk houses is done in their original contexts, and if their unique cultural values can be maintained completely. Thus, the groups of ethnic houses and wooden structures need to be analyzed,

classified, and registered as national or local cultural properties at the same time as making guidelines for, and introducing measures aimed at, their conservation and preservation.

1.2. Method of conserving wooden structures

According to the Japanese experience, regular replacement of decayed material may become necessary. In some cases, a building requires minor repair, in other cases, if the wooden framework has become loose after many years or if the building starts to lean due to the foundations subsiding, it is necessary to undertake major repairs that involve total or partial dismantling of the building, and rebuilding of the structure from the ground up. A building must be examined for conservation before dismantling by measuring, taking photographs, and recording all the relevant data and documents. The state of damage is also examined to find out the appropriate repair method. Prior to dismantling, each of the members to be removed is tagged with a label containing its name and location. All members have to be dismantled in order, from the roof to the foundation, from outside to inside, and after repairing all the decay, they will be reassembled in the opposite process. This means that regular observation and monitoring is necessary for every folk house in an ethnic village where all of the structures are made of wood or other natural material. By doing this, small amounts of decay will be repaired in timely fashion and will not cause more serious damage. If there is extensive decay and the conservation of all the building is necessary, the method should be the same way as in Japan. By this way, the authenticity of the house can be preserved. Similar action should be done in the case of buying old houses to reconstruct in other places, such as an outdoor museum or a leisure park.

1.3. Method of surveying

Methods of surveying have been introduced carefully through the lessons and practical sessions. The survey results in Duonglam village in Vietnam, published in 2009, are modeled on a hamlet conservation project. The experience shows that, the preparedness prior to the implementation of the survey is very important. All survey methods, evaluation methods, and policies of the hamlet conservation system have to be examined. It is necessary to gather all information about maps, structure of the village, buildings, tools and techniques, carpenters, life in the past and present, archeological research, landscape data. All information has to be analyzed, synthesized and kept in photos, drawings, text, and recording tapes. Thus, all tangible and intangible values will be taken into account and the conservation plan can include all aspects. It is necessary to have a skilful surveyor, at least one person in a three-person group. The tools for measuring and recording can play a part in the success of the survey. If every folk house in an ethnic village is surveyed carefully like this, not only we will have all the essential documents for conservation work, but we also have documents for research and for conveying cultural values to future generations.

1.4. Method of restoring wooden structures

The Japanese opinion about restoration is interesting. Buildings are not necessarily restored to the

original condition. Rather, they should be restored in such a way that they provide the most value as cultural properties and can be maintained and used without undue effort. According to this opinion, many buildings have been restored, such as those at the Nara Palace Site, and Chukon-do (Central Buddha Hall). In fact, many temples in Japan were restored after fires, earthquakes, typhoons. The five-storied pagoda at Kofukuji was reconstructed seven times, Kyomizudera has been visited by disaster nine times and was rebuilt each time. All evidence from the past are kept buried under a protective layer of earth (in Chukon-do), and the new building is erected following recorded documents. This method provides visitors the opportunity to contemplate the cultural heritage in the best condition. On the other hand, the success of restoration work depends greatly on skilful and experienced conservators and conservation architects. Thus, training conservation architects and skilful workers like carpenters is very important.

1.5. Practice in conserving living heritage in Naramachi, Shirakawa-go, Takayama

Japanese experts have a lot of experience in conserving living heritage in places such as Naramachi, Shirakawa village, and the old Takayama district. It is useful to learn from Japanese opinion. "Responsibility for cultural heritage and the management of it belongs . . . to the cultural community that has generated it" (Nara Document on Authenticity). This means that the most important thing is improving knowledge among the community about the conservation of cultural heritage. Everybody should understand the values of the buildings they are living in and their responsibility to protect them, how to maintain and preserve them. They should recognize that conservation does not mean underdevelopment and poverty, and that it is possible to preserve historical value at the same time as improving living conditions. In addition, it is necessary to complete the legislation system on living heritage conservation with the necessary guidelines and introduction. On the other hand, subsidies from the government and other NGOs have played an important role in the conservation of living heritage.

2. Actions to help the preservation and restoration of traditional houses in Vietnam

As of 2005, there are three living heritages that have been preserved in Vietnam. They are the Hoi An ancient town, Hanoi ancient quarter and Duonglam village. There are some traditional houses that have been preserved, but they do not form a group of buildings or community. In fact, there are many ethnic villages and hamlets in regions all over Vietnam that have rich wooden structures. They are evidence of Vietnam's colorful culture and are associated with the intangible heritage of ethnic groups. Vietnam National Village of Ethnic Culture and Tourism (Vinaculto) is a place for recreating tangible heritage and displaying intangible heritage which have formed over thousands of years. The objective is education about tradition, and it also reflects the policies and efforts of the Vietnamese Party and government in cultural aspects, in addition to improving the economy, to promote cultural traditional conservation and the extension of cultural exchange between other regions in Vietnam and the world. To help the preservation and restoration of traditional houses in Vietnam, Vinaculto can take part in

some actions as described below.

2.1. Gathering, collecting and displaying traditional houses

All examples of traditional houses of 54 ethnic groups will be completed in 2015. All the houses have survey documents for everyone to research. In the future, Vinaculto will be not only a leisure park but also an ethnic research centre where documents of all ethnic villages in Vietnam are gathered.

2.2. Studying and teaching about conservation work

All experiences from the project, including the implementing, surveying, and building, should be gathered for teaching about conservation work. This means not only documents about what has been successfully achieved, but also about the failures in this procedure, so that other ethnic village can learn from this experience. In addition, the Vinaculto experts always have to go to remote areas to collect information about ethnic life, and can find out about valuable ethnic villages that should be preserved. They can share knowledge of conservation and the reasons to preserve in order to improve the knowledge of the community. Vinaculto can contact other conservation organizations around the world to exchange cultural and conservation experience, so that it can spread this information to other ethnic villages in Vietnam.

2.3. Taking part in conservation works

With experience in building an ethnic village and the Nara course, Vinaculto can take part in conservation works as an expert contributor.

3. Conclusion

The course about the preservation and restoration of wooden structures, held from 8 Sep to 8 Oct 2009, was prepared carefully with regards to content, methods, documents, and lecturers. This course is very useful for conservators and conservation architects. All participants benefited not only from the conservation theory and practical experience, but also the opportunity to see Japan's unique culture, and especially the friendly Japanese people.

However, all of the knowledge gained in one month can not be enough for the full scope of conservation work. I hope ACCU and Vinaculto will cooperate more in the future in the conservation and restoration of wooden structures.

Appendix

- A. List of Participants
- B. List of Lecturers
- C. List of Interpreter and Tutors
- D. List of Staff Members, ACCU Nara

A. List of Participants

Bangladesh

Khondker Zahidul KARIM

Archaeological Engineer

Department of Archaeology, Ministry of Cultural Affairs

F-4/A, Agargaon Administrative Area

Sher-e-Bangla Nagar, Dhaka-1207

Tel: (+88) 2 9113387 Fax: (+88) 2 9114689

darchaeology@yahoo.com



Bhutan

Karma WANGCHUK

Engineer

Division for Conservation of Heritage Sites

Department of Culture, Ministry of Home & Cultural Affairs

Post Box: 233, Thimphu

Tel: (+975) 2 322694 Fax: (+975) 2 321285

karma_wangchukw@hotmail.com



Indonesia

Kosasih BISMANTARA

Head of Protection Sub-division

Directorate for Archaeological Heritage

Directorate General of History and Archaeology

Ministry of Culture and Tourism

Kompleks Depdiknas, Gedung E, Lt. XI,

Jalan Jenderal Sudirman, Senayan, Jakarta 10270

Tel: (+62) 215 725 061 Fax: (+62) 215 725 048

kosasihbismantara@yahoo.com



Iran

Anahita MOSAVI

Head of Workshop / Manager of Architectural Group

Architectural Department, Guilan Rural Heritage Museum

No.9 Niloofar Alley, Modarres Boulevard, Rasht, Guilan

Tel: (+98) 131 323 9490 Fax: (+98) 131 323 7905

musee_du_guilan@yahoo.com



Lao P.D.R.

Amphol SENGPHACHANH

Chief Architect (historic monument)

Management Office of Vat Phu World Heritage Site

Ministry of Information and Culture

Nongsa Village, Champasak District, Champasak Province

Tel: (+856) 30 53 45041

vatphu@hotmail.com



Mongolia

Oyunchimeg OCHIRSUREN

Conservator

Center of Cultural Heritage under MECS
210620a, Central Cultural Palace "B" section
Street of Jamyas, Sukhbaatar square 3, Ulaanbaatar
Tel: (+976) 11312735 Fax: (+976) 11312735
cch@monheritage.mn



Myanmar

U Min Min

Conservator

Department of Archaeology, National Museum and Library
(Northern Branch), Mandalay, Ministry of Culture
Corner of 70th and 28th street, Mandalay
Tel: (+95) 67 408 283 Fax: (+95) 67 408 039
minminarch.mdy@gmail.com



Nepal

Suresh Suras SHRESTHA

Archaeological Officer

World Heritage Conservation Section, Department of Archaeology
Ministry of Culture & State Restructuring
Ramshahpath, Kathmandu
Tel: (+977) 1 42 50685 Fax: (+977) 1 42 62856
sureshsuras@yahoo.com



New Zealand

Atareiria Rowena Akuhata HEIHEI

Maori Heritage Advisor

New Zealand Historic Places Trust
62 Kerikeri Road P.O. Box 836 Kerikeri
Tel: (+64) 9 407 3453 Fax: (+64) 9 407 3454
aheihei@historic.org.nz



Pakistan

Salman MUHAMMAD

Conservation Architect

Aga Khan Cultural Service Pakistan
26 Race Course Road, Lahore
Tel: (+92) 42 628 2611 Fax: (+92) 42 628 2615
salmanmuhammadali@yahoo.com



Philippines

Nelson Laxamana AQUINO

Project Supervisor / Historical Sites Development Officer II

Cultural Properties Conservation Division

Department of Tourism - Intramuros Administration

5th Floor Palacio Del Gobernador, Corner Gen. Luna

and Aduana sts., Intramuros, Manila 1002

Tel: (+63) 527 3108 Fax: (+63) 527 3084

nlaquino1068@yahoo.com



Samoa

Mainifo VILIAMU

Culture Officer

Culture Division, Ministry of Education Sports & Culture

P.O. Box 1869 Malifa, Apia

Tel: (+685) 32354 Fax: (+685) 21917

mainifoviliamu@yahoo.com



Sri Lanka

Visaka LIYANAARACHCHIGE

Conservation Research Officer

Development Section (Conservation), Central Cultural Fund

212/1, Bauddhaloka Mawatha, Colombo 07

Tel: (+94) 11 25 00 733 Fax: (+94) 11 25 00 731

ccf-2008@hotmail.com



Thailand

Pongthorn HIENGKAEW

Conservation Architect

Fine Arts Department, Ministry of Culture

3rd Floor Fine Arts Department

81/1 Sri Ayutthaya Rd. Dusit, Bangkok 10300

Tel: (+66) 2 282 2121 Fax: (+66) 2 281 3947

h.pongthorn@gmail.com



Uzbekistan

Sukhrobiddin NARMETOV

Senior Specialist

Principal Scientific Production Department for the Preservation
and Utilization of Objects of Cultural Heritage

Ministry of Culture and Sports

18. Uzgarish street, Tashkent 100027

Tel: (+998) 71 227 0586 Fax: (+998) 71 227 0821

eskishahar@mail.ru



Vietnam

NGUYEN Thi Thanh Tung

Architect

Management Project Board No. 195

Vietnam National Village for Ethnic Culture and Tourism

No.1 Hoalu street, Haibatrung district, Hanoi

Tel & Fax: (+84) 43 553 7590

thtungc@yahoo.com



B. List of Lecturers

Lecturers from Abroad

Ashley de VOS

Chairman / Chartered Architect

Ashley de Vos Consultants

131 WAD Ramanayake Mawatha,

Colombo 02, Sri Lanka

Tel: (+94) 1123 43651 Fax: (+94) 1125 01214

e-mail: advarcht@slt.lk

Gamini WIJESURIYA

Project Manager

International Centre for the Study of the

Preservation and Restoration of Cultural

Property (ICCROM)

Via di San Michele 13, I-00153 Rome, Italy

Tel: (+39) 06585 53388 Fax: (+39) 06585 53349

e-mail: gw@iccrom.org

Lecturers from Japan

HAKOZAKI Kazuhisa

Section Chief

Architectural Feature Section

Dep. of Imperial Palace Sites Investigations

Nara National Research Institute for Cultural

Properties (NNRICP)

2-9-1 Nijo-cho, Nara 630-8577

Tel: (+81) 742-30-6836 Fax: (+81) 742-30-6830

e-mail: hakozaiki@nabunken.go.jp

HATANO Tsuneo

Councillor

The Japanese Association for Conservation of

Architectural Monuments (JACAM)

1-28-10 Hongo, Bunkyo-ku, Tokyo 113-0033

Tel: (+81) 3-5800-3391 Fax: (+81) 3-5800-3390

e-mail: kikaku@bunkenkyo.or.jp

IMANISHI Yoshio

Deputy Division Chief

Cultural Assets Preservation Division

Nara Prefectural Board of Education

30 Noborioji-cho, Nara 630-8502

Tel: (+81) 742-27-9865 Fax: (+81) 742-27-5386

e-mail: imanishi-yoshio@office.pref.nara.lg.jp

INABA Nobuko

Professor

World Heritage Studies, Graduate School of

Comprehensive Human Sciences

University of Tsukuba

1-1-1 Tennodai, Tsukuba, Ibaraki 305-8574

Tel: (+81) 29-853-2111

e-mail: inaba@heritage.tsukuba.ac.jp

KAMEI Nobuo

Executive Director

The Japanese Association for Conservation of

Architectural Monuments (JACAM)

1-28-10 Hongo, Bunkyo-ku, Tokyo 113-0033

Tel: (+81) 3-5800-3391 Fax: (+81) 3-5800-3390

e-mail: nkamei@bunkenkyo.or.jp

KOMINE Yukio

Researcher

Japan Institute of Insect Damage to Cultural

Properties, SK Shinjuku-kyoen Bldg. 6F

2-1-8 Shinjuku, Shinjuku-ku, Tokyo 160-0022

Tel: (+81) 3-3355-8355 Fax: (+81) 3-3355-8356

e-mail: y.komine64@bunchuken.or.jp

KOHDZUMA Yohsei*Head*

Conservation Science Laboratory
 Center for Archaeological Operations
 Nara National Research Institute for Cultural
 Properties (NNRICP)
 2-9-1 Nijo-cho, Nara 630-8577
 Tel: (+81) 742-30-6847 Fax: (+81) 742-30-6846
 e-mail: kouzumay@nabunken.go.jp

mitsutani Takumi*Councillor*

Dating Section
 Center for Archaeological Operations
 Nara National Research Institute for Cultural
 Properties (NNRICP)
 2-9-1 Nijo-cho, Nara 630-8577
 Tel: (+81) 742-30-6845 Fax: (+81) 742-30-6856
 e-mail: takumi@nabunken.go.jp

NISHI Kazuhiko*Specialist for Cultural Properties*

Agency for Cultural Affairs, Japan
 3-2-2 Kasumigaseki, Chiyoda-ku
 Tokyo 100-8959
 Tel: (+81) 3-5253-4111 Fax: (+81) 3-6734-3823
 e-mail: kn@bunka.go.jp

SHIMIZU Shin-ichi*Director*

Japan Center for International Cooperation in
 Conservation, National Research Institute for
 Cultural Properties, Tokyo (NRICTP)
 13-43 Ueno-koen, Taito-ku, Tokyo 110-8713
 Tel: (+81) 3-3823-4898 Fax: (+81) 3-3823-4867
 e-mail: kokusen@tobunken.go.jp

YAMAGUCHI Isamu*Researcher*

Cultural Properties Division
 Nara Municipal Board of Education
 1-1-1 Nijo-ji-minami, Nara 630-8580
 Tel: (+81) 742-34-1111 Fax: (+81) 742-34-4859
 e-mail: yamaguchi-isamu@city.nara.lg.jp

On-site Lecturers**HAYASHI Akio***Manager*

Cultural Properties Section,
 Hikone-shi Board of Education
 1-38 Osue-cho, Hikone, Shiga 522-0001
 Tel: (+81) 749-26-5833 Fax: (+81) 749-26-5899
 e-mail: bunkazai@mx.hikone.ed.jp

KUBODERA Shigeru*Deputy Director*

Operation Division
 The Japanese Association for Conservation of
 Architectural Monuments (JACAM)
 1-28-10 Hongo, Bunkyo-ku, Tokyo 113-0033
 Tel: (+81) 3-5800-3391 Fax: (+81) 3-5800-3390
 e-mail: kubodera@bunkenkyo.or.jp

NAGAO Mitsuru*Specialist for Cultural Properties*

Agency for Cultural Affairs, Japan
 3-2-2 Kasumigaseki, Chiyoda-ku
 Tokyo 100-8959
 Tel: (+81) 3-5253-4111 Fax: (+81) 3-6734-3823
 e-mail: nagao@bunka.go.jp

SHIMADA Toshio*Head*

Architectural History Section
 Department of Cultural Heritage
 Nara National Research Institute for Cultural
 Properties (NNRICP)
 2-9-1 Nijo-cho, Nara 630-8577
 Tel: (+81) 742-30-6812 Fax: (+81) 742-30-6811
 e-mail: shimada@nabunken.go.jp

TANAKA Sadahiko*Specialist for Cultural Properties*

Agency for Cultural Affairs, Japan
 3-2-2 Kasumigaseki, Chiyoda-ku
 Tokyo 100-8959
 Tel: (+81) 3-5253-4111 Fax: (+81) 3-6734-3823
 e-mail: stanaka@bunka.go.jp

IMAI Yuji*Negi (Senior Shinto Priest)*

Kasuga Taisha Shrine
 160 Kasugano-cho, Nara 630-8212
 Tel: (+81) 742-22-7788 Fax: (+81) 742-27-2114

IWATA Takashi*Curator*

Cultural Properties Division
Takayama Municipal Board of Education
2-18 Hanaoka-cho, Takayama, Gifu 506-8555
Tel: (+81) 577-32-3333 Fax: (+81) 577-35-3172
e-mail: t.iwata@city.takaya.lg.jp

KONDO Hisayoshi*Section Chief*

Cultural Properties Section,
World Heritage Division
Shirakawa-mura Board of Education
517 Hatogaya, Shirakawa-mura, Ohno-gun,
Gifu 501-5692
Tel: (+81) 5769-6-1311 Fax: (+81) 5769-6-0016
e-mail: hisayosi@shirakawa-go.org

MITSUO Jiro*Engineer*

Cultural Properties Section
Hikone-shi Board of Education
1-38 Osue-cho, Hikone 522-0001
Tel: (+81) 749-26-5833 Fax: (+81) 749-26-5899
e-mail: bunkazai@mx.hikone.ed.jp

NAKANO Kazumasa*Gon-negi (Shinto Priest)*

Kasuga-taisha Shrine
160 Kasugano-cho, Nara 630-8212
Tel: (+81) 742-22-7788 Fax: (+81) 742-27-2114

SHIGAYA Masatsugu*Section Chief*

Cultural Properties Section
Hikone-shi Board of Education
1-38 Osue-cho, Hikone, Shiga 522-0001
Tel: (+81) 749-26-5833 Fax: (+81) 749-26-5899
e-mail: bunkazai@mx.hikone.ed.jp

SUZUKI Kosei*General Affairs Staff*

Todai-ji Temple Office
406-1 Zoshi-cho, Nara 630-8587
Tel: (+81) 742-22-5511 Fax: (+81) 742-22-0808
e-mail: suzuki@todaiji.or.jp

KITAGAWA Kyoko*Deputy Section Chief*

Cultural Properties Section
Hikone-shi Board of Education
1-38 Osue-cho, Hikone, Shiga 522-0001
Tel: (+81) 749-26-5833 Fax: (+81) 749-26-5899
e-mail: bunkazai@mx.hikone.ed.jp

MATSUMOTO Keita*Architect for Cultural Properties*

The World Heritage Shirakawa-go Gassho
Style Preservation Foundation
2495-3 Ogi-machi, Shirakawa-mura, Ohno-gun,
Gifu 501-5627
Tel: (+81) 5769-6-3111 Fax: (+81) 5769-6-3113
e-mail: matumoto@shirakawa-go.org

MORIKAWA Minoru*Researcher*

Archaeology Section 2
Dept. of Imperial Palace Sites Investigation
Nara National Research Institute for Cultural
Properties (NNRICP)
2-9-1 Nijo-cho, Nara 630-8577
Tel: (+81) 742-30-6832

SAGAWA Fumon

*Dean of Kegon Religion General Affairs /
Deacon of General Affairs / Principal of Todai-ji
Kangakuin / Chief Priest at Todai-ji Tacchu
Hokurin-in*

Todai-ji Temple Office
406-1 Zoshi-cho, Nara 630-8587
Tel: (+81) 742-22-5511 Fax: (+81) 742-22-0808

SHIRAIISHI Etsuji*Engineer*

Cultural Assets Preservation Section,
Kyoto Prefectural Board of Education
Yabunouchi-cho, Nishi-iru, Shinmachi,
Shimotachiuri-dori, Kamigyo-ku, Kyoto
602-8570
Tel: (+81) 75-414-5898 Fax: (+81) 75-414-5897

TAKESHITA Hironobu*Engineer*

Cultural Assets Preservation Section
Kyoto Prefectural Board of Education
Nishi-iru, Shinmachi, Shimotachiuri-dori
Kamigyo-ku, Kyoto 602-8570
Tel: (+81) 75-414-5898
e-mail: h-takeshita78@pref.kyoto.lg.jp

TANAKA Akira

Chief Editor of Takayama-shi History
 Takayama Folk Museum
 75 Kami-ichinomachi, Takayama
 Gifu 506-0844
 Tel: (+81) 577-32-1205 Fax: (+81) 577-35-1970
 e-mail: akira-t@mbk.nifty.com

TANIGUCHI Toru

Deputy Division Chief / Section Chief
 Cultural Properties Division
 Hikone-shi Board of Education
 1-38 Osue-cho, Hikone, Shiga 522-0001
 Tel: (+81) 749-26-5833 Fax: (+81) 749-26-5899
 e-mail: tooru@mx.hikone.ed.jp

YABUNAKA Ioki

Senior Manager
 Kofuku-ji Temple
 48 Noborioji-cho, Nara 630-8213
 Tel: (+81) 742-22-7755 Fax: (+81) 742-23-1971

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Gassho Style
 Important Cultural Properties, Yoshijima House

C. List of Interpreter and Tutors

HATA Chiyako (Interpreter)

Training Coordinator

TANAKA Rie (Tutor)

Graduate Student

Master's Program in World Heritage Studies, Tsukuba University

KIMATA Akiko (Tutor)

Graduate Student

Master's Program in World Heritage Studies, Tsukuba University

SUZUKI Katsuyuki (Tutor)

Graduate Student

Master's Program in World Heritage Studies, Tsukuba University

D. Staff Members, ACCU Nara

NISHIMURA Yasushi, *Director*

YONEDA Masahiro, *Deputy Director*

TANDA Kaoru, *Director, Planning & Coordination Division*

NAKAI Isao, *Director, International Cooperation Division*

KINOSHITA Wataru, *Deputy Director, International Cooperation Division*

YAMASHITA Tsutomu, *Chief, International Cooperation Section*

NISHIDA Michiko, *Assistant, Planning & Coordination Division*

OTANI Yasuko, *Assistant, International Cooperation Section*

YOSHIDA Maki, *Assistant, International Cooperation Section*