Historic Preservation and Disaster Risk Preparedness:

Critical Approaches in Managing Cultural Heritage in Indonesia

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ABSTRACT

Cultural heritage is increasingly threatened with destruction both by the natural causes and human-caused disaster. The key to effective protection of a cultural heritage at risk is advance planning and preparation. Furthermore, these threats indicate the need of risk preparedness for cultural heritage management. This article deals with questions on relevant heritage considerations within a property's overall disaster prevention strategy and suggests an integrated conservation approach. As unveiled by the investigation of Institut Teknologi Bandung's campus facilities, this article will argue that besides the formal qualities the importance of disaster risk preparedness should be considered in managing highly valued cultural heritage.

Keywords: *Historic Preservation, Disaster Risk-preparedness, Vulnerable Structures, Institut Teknologi Bandung.*

INTRODUCTION:

Cultural and natural heritage sites are increasingly threatened with destruction not merely by the natural causes of decay, cataclysms/calamities, earthquake, landslides and volcanic eruptions, but by human-caused disaster such as changing social and economic conditions, as stated in the 1972 UNESCO convention. Moreover, it is argued that cultural heritage sites are increasingly threatened by human-induced hazards, such as arson, armed conflict and civil unrest More recently, heritage preservation in Southeast Asia is facing the following contemporary challenges: inappropriate adaptive re-use design and implementation of old structures in relation to new architecture, rapid economic and urban development resulting from greed and speculative development, mass tourism and commercialization of heritage.

Efforts of historic preservation are predominantly addressing only human-caused disaster and human-induced hazards. Therefore the cultural heritage of historic and heritage buildings confronts various kind of risks too (Hajialikhani, 2007).

Generally, considerations in managing immovable cultural heritage through historic preservation and architectural conservation are primarily still defined by the formal qualities of the artifact. In the Indonesian context, like in many Southeast Asian countries, lack of official understanding of cultural heritage resulted in only monument-centered preservation and does not consider many significant non-monumental aspects of heritage as worthy protection (Jigyasu, 2003). To some extent, the considerations of human-caused disaster have partially been taken into account in the management of cultural heritage. However, it is commonly agreed that cultural heritage is at risk not only from disasters themselves but from the emergency and post-calamity recovery and even reconstruction phases. Jigyasu (2005) also notes that many post-earthquake reconstruction measures have ended up destroying significant components of cultural heritage instead of protecting them. As elsewhere expressed by the author, the case of urban heritage conservation and post-earthquake reconstruction in Kotagede, Jogjakarta served as one of the examples (Martokusumo, 2012). In accordance with that, the key to effective protection of cultural heritage at risk is advance planning and preparation, especially disaster mitigation plans and programs (cf. Meier, Petzet and Will, 2007). Hence, advanced planning for cultural heritage properties should be conceived in terms of the whole property and provide integrated concern for its buildings, structures, and their associated contents and landscape.

Unfortunately, until now, there is neither legislation nor guidelines on risk preparedness for historic and heritage structures in Indonesia. In fact, according to Ikaputra (2011), a lack of attention and awareness has also contributed to the loss of many structures. He also reported that the protection of cultural heritage, especially mundane historic structures is considered very low on their list of priorities. Currently, historic and heritage structures are not yet explicitly included in the Law no. 24/2007 on Disaster Mitigation. In the current debates, increasing risks to tangible and intangible cultural heritage due to various natural and human-caused factors will also be as important as the issues on globalization, uncontrolled development, loss of traditions and collective memory as well (cf. Martokusumo, Tambunan and Sujatmiko, 2013).

Preventative conservation and maintenance of historic buildings and artifacts are important steps in protecting them from natural disasters such as earthquakes, floods and fire. This refers to what Hajialikhani (2007) elucidates, that heritage sites are continuously threatened by different risks, which means that they have different probability of occurrence and different impacts on the heritage site. Following the critical notions above will lead to an understanding that consideration of risks also indicates a swing from reactive to a preventive approach for conservation that seeks to put emphasis on risk reduction and preparedness (cf. W. Martokusumo, 2012).

Commonly practiced historic preservation mechanisms, especially in the making of conservation policy, is the focus of this article. This article is based upon an on-going research that is focusing on preservation and fire protection in relation to the role of safety management at *Institut Teknologi Bandung* campus. The evidence indicates the need of risk preparedness for cultural heritage management. This research, funded by the Ministry of Education and Culture, also deals with questions on relevant heritage considerations within a property's overall disaster prevention. That strategy must address human-caused disasters and be integrated in the conservation approaches. For this purpose, some historic and landmark buildings of ITB, including the West and East Assembly Halls and the Faculty House Kerkhoven in the Bosscha observatory of ITB are used as case studies. Based upon the high value of cultural significance of these ITB facilities, the making of conservation policy must include possible changes or damages that would reduce the value. Given the facts that building materials are mostly made of timber, thus the fire risk of those prominent buildings of ITB is also considered very high. The article highlights disaster risk preparedness of those historic buildings on ITB campus and indicates necessary aspects regarding the requirements for retention of their significance. Moreover, the article puts forward an argument that, besides the formal qualities, the important aspects of risk preparedness must be taken into account in managing the highly valued cultural property.

According to the Burra Charter (1999), two unique phases are required to develop conservation policy. Each phase consists of several stages. The goal of phase one is to state the cultural significance of conservation. The goal of phase two is to make a conservation policy. The first phase is initiated by gathering evidence, coordinating and analyzing evidence, assessing significance according to aesthetic, social scientific and historic aspects.

As indicated in the above template, the second phase will be making a conservation policy. Information for the second phase is gathered by making observations of the following: the client's requirements or feasible uses, physical conditions, external requirements evidence, and the requirement for retention of significance. The consideration of those four aspects will lead into the next stage, developing the conservation policy. Then stating of conservation policy will follow. The last stage is preparing a strategy for implementing the conservation policy that includes monitoring and reviewing the stages. All of the phases/sequences, decisions and actions of the Burra Charter Process is illustrated in Fig. 1.

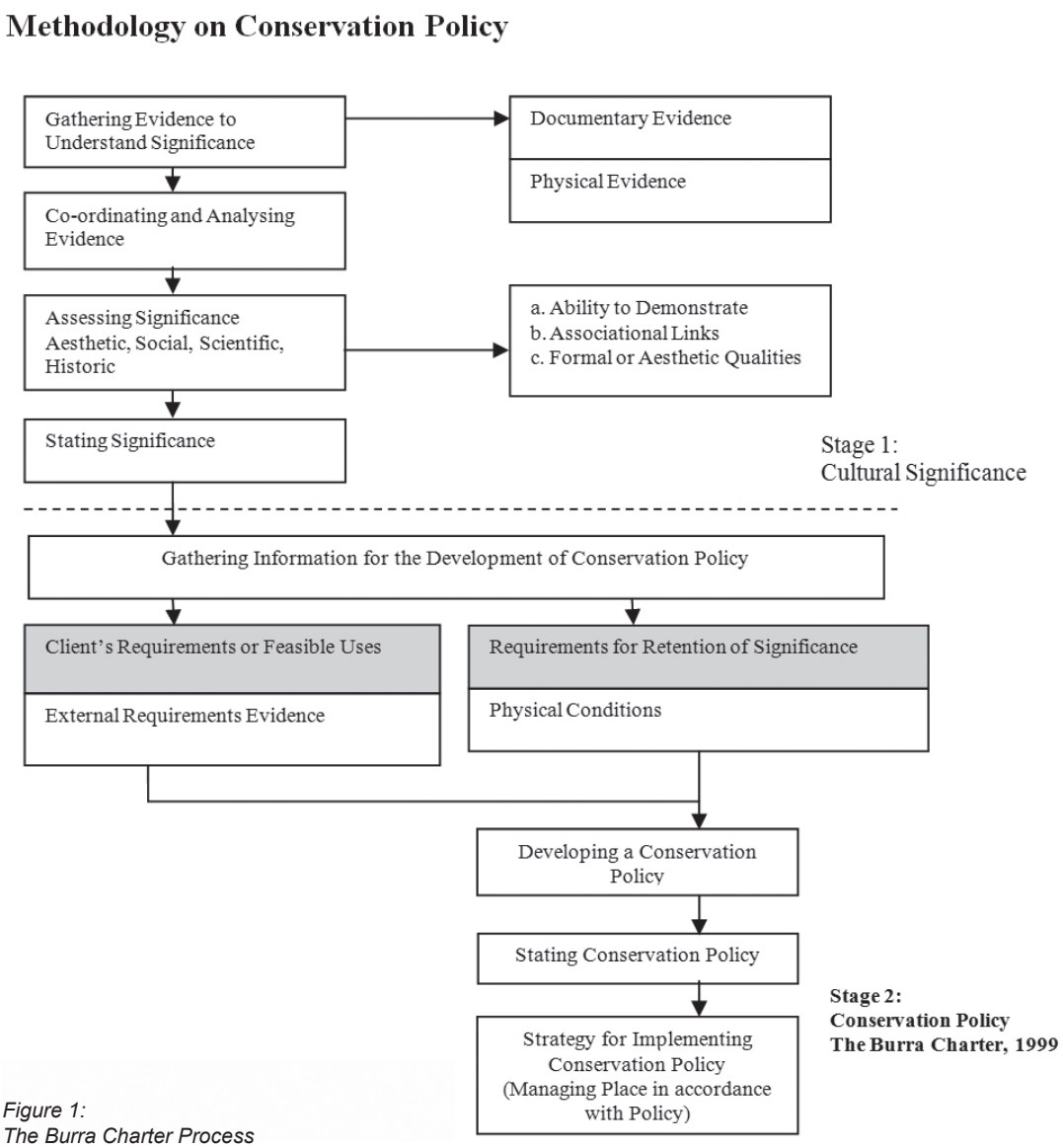

Figure 1:
The Burra Charter Process

The first four observational aspects in the beginning of the second phase are very critical. This phase puts emphasize on the requirement for retention of significance and on the physical building/structure condition. This can be understood that the physical conditions of the artifacts will certainly be critical. Sometimes this will be the basic argument for physical interventions. Nevertheless, common practices often concentrate more on the requirement for retention of significance. Generally it deals with how proposed interventions would lead to the destruction of cultural significance. Attention will be given to the external requirements, such as building codes and standards, but the considerations of disaster risk preparedness, be that natural or human-caused/human-induced disaster, have not been properly addressed. Preparedness requirements should be met in historic or heritage buildings by means which have the least impact on heritage values.

PROBLEMS OF DISASTER RISK PREPAREDNESS

One may argue the ability and the readiness to react to disasters with preventive measures depends not only on the objective natural events themselves, but also on public perception of the disaster as something that is not necessarily far away (Meier, Petzet and Will, 2007). According to Stovel (1998), in the last two decades, the discourse on the importance of disaster risk preparedness for cultural heritage has commenced. These initiatives have been trying to strengthen existing frameworks for preparedness, response and recovery. There are some problematic circumstances due to different perspectives among professionals working in the field of historic preservation and disaster risk preparedness. Moreover, despite the low awareness of risk preparedness, a lack of comprehensive understanding in regard to management of immovable cultural heritage has been significant. Compared to prevention, interventional approaches are likely to be more practical and visible. Professionals are accustomed to carry out planning for intervention. In accordance with that, he elucidates as follows:

> *"Many of the barriers to achieve desired improvements are attitudinal in nature, which are rooted in perceptions prevalent among professionals dealing with heritage and to a lesser extent, those on the disaster-preparedness field. Moreover, in regard to need to strengthen interest of built-heritage conservation professional in the value of preventive approaches, many professionals are accustomed to planning for intervention than for prevention. Interventions are visible and dramatic, and permit explicit exploration of various conservation philosophies; approaches focused on maintaining the existing state of the resource rarely carry the same professional appeal or interest. On the contrary, preventive approaches extend the life of cultural heritage at a smaller longterm cost; authenticity is maintained at higher levels if periodic restoration or refashioning episodes can be avoided."(Stovel, 1998, p.3)*

According to Will and Meier (Meier, Petzet and Will, 2007) as symptoms continue to indicate natural disasters will gradually increase worldwide, the question of preventive measures arises, often in the field of cultural heritage. This is especially true in a time of increasing natural disasters. Thus, characteristically immovable cultural property, historic buildings, historic cities, open spaces and cultural landscapes, is mostly endangered by human intervention (human-induced hazards). Experiences in this field are still comparatively scattered and there is a great need for explanation of fundamental issues and for fostering the awareness. These include several aspects as follows: a) risk assessment; the possibilities and limitations of technical adaptation and retrofitting of historic buildings to withstand disasters, b) the paradox of endangerment through prevention, c) ethical aspects of potential conflicts between the urgent protection of people and the protection of cultural property (Meier, Petzet, and Will, 2007: 9-20).

It is increasingly becoming clear that preventive conservation and maintenance play a critical role in the sustainability of historical buildings and artifacts from the ravages of disasters (cf. Wohlleben, 2003). In the case of natural disasters, where the hazard could not be avoided in any way, the preventive approach is used to minimize risks during and after the disaster took place. As for the case of human-induced hazards preventive measures intended to

minimize risks are primary. As an example, in the case of fires the focus is on preventive measures to prevent fires. Should the prevention fail, measures should be in place as to how to take action during and after the fire. Risk may not be zero, since there are risks involved in every stage of events, starting from the onset of the disaster, during, and after a disaster. However, it can be minimized through effective disaster risk preparedness management plan. A disaster preparedness or emergency response plan, commonly known as a disaster plan, is a series of written policies and procedures that prevent or minimize damage resulting from disasters (either manmade or natural). To effectively protect the historical buildings or sites, the disaster plan must include disaster prevention and mitigation plan, disaster response plan and disaster recovery plan.

International Center for the Study of the Preservation and Restoration of Cultural Property (ICCROM) has compiled a manual that could be used as a reference to draw up risk preparedness plans. The manual is designed primarily to assist those who are responsible for heritage value management. The concepts point out how to integrate the heritage value in the development and implementation of property-specific risk preparedness strategies and guidelines. It is also designed to further conservation professionals' understanding of basic concepts of risk-preparedness. It is also used to introduce risk-preparedness professionals to the ideas and practices which underlie the conservation fields. The manual is intended to help policy-makers and administrators, working at all levels, to better integrate concern for cultural heritage in existing risk-preparedness planning (Stovel, 1998). The implications of each principle in risk planning, response and recovery are likewise considered and described in the manual. Accordingly, ICCROM generated the following to create an appropriate risk management policy:

a. the heritage attributes, the risks, and appropriate response measures of the risks must adequately be identified in order to design and install the disaster-protection systems or mechanisms which has least-impact on heritage values

b. the ability of property managers is required to work with inhabitants, administrators and planners in order to develop integrated conservation and risk protection strategy appropriate to local needs, abilities and resources

c. the cultural and use significance, and the relationships of the structures or elements to their setting must be recorded to establish priorities of protection and its sensitive areas

d. the complete record about the performance of a structure or property during past disasters must be compiled in order to plan for the future

e. maintenance programs must include the analysis of all possible human and natural sources of decay and loss, the level of risk associated, and appropriate measures to reduce or mitigate risk

f. the involvement of occupant and users in developing the response plan must be supported to increase their understanding and effective response

g. the involvement of qualified conservation professionals, experienced in post-disaster assessment in concern with actual condition assessment of damaged buildings and elements, is inexorable

h. relevant building code and standards should be applied flexibly in the post-disaster assessments.

As previously expressed, both Stovel (1998) and Meier, Petzet and Will (2007) also summarize the basic principles of risk preparedness for cultural heritage. They advocate the integration of cultural heritage assets into existing disaster management plans. At the same time it is important to use preventive approaches which improve or maintain the condition of heritage assets to ensure survival of the heritage and its significant messages during and after natural disasters.

CASE STUDIES:
The Historic Campus of ITB

Institut Teknologi Bandung (abbreviated as ITB) was established in Bandung, West Java in 1920, as the first engineering/technology-oriented school called *Technische Hoogeschool te Bandoeng*. The campus site, which covers an area of ca. 30 ha, is situated in the area of well-planned northern part of Bandung. During the Japanese occupation, from 1942-1945, it became Kogyo Daigaku. Soon after the birth of the Republic of Indonesia in 1945, the

campus housed the Technical Faculty (including a Fine Arts Department) of *Universitas Indonesia*, with the main campus in Jakarta. In the early fifties, the Faculty of Mathematics and Natural Sciences, also part of *Universitas Indonesia*, was established on the campus. Indonesia's first president Sukarno inaugurated the present ITB on 2 March 1959, as an institution of higher learning in science, technology, and fine arts. He charged that its mission was education, research, and service to the community.

For this discussion three important buildings have been observed. The first two are the on the main campus of ITB, the West and East Assembly Halls. The third building is the exposed timber framed Faculty House Kerkhoven, located at the Bosscha observatory, Lembang.

The West and East Assembly Halls of ITB

The West and East Assembly Halls were erected during the period of 1919-1920. Those are the first wide span buildings at that time, designed by Dutch architect, Henri Maclaine Pont. He was born in Meester Cornelis (now Jatinegara area of Jakarta City) in 21st June 1884. The inauguration of those buildings took place in the morning of 3rd July 1920, and was attended by the Governor General of the Netherlands Indies, J.P. Graaf van Limburg Stirum, the mayor of Bandung, Mr. B. Coops, the first Rector Magnificus of the new Technische Hoogeschool te Bandoengor Technical University Bandung (hereafter, ITB), Prof. Ir. J. Klopper and the

Figure 2a:
West Assembly Hall, view from outside and inside the building.
Source: L. Tambunan (2013) and W. Martokusumo (2013)

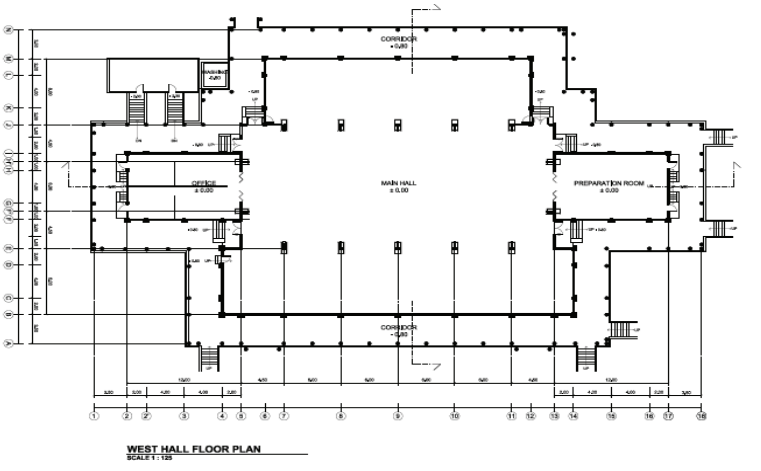

Figure 2b:
Ground floor of West Assembly Hall
Source: Measured drawing (2013)

prominent society of Bandung. Unfortunately, due to serious dysentery illness, Maclaine Pont was absent at the official ceremony. Thus, his wife represented him at the ceremony, which was then reported to be the most festive celebration, as described by van Leerdam (1995).

The buildings of West and East Assembly Hall have an unusual appearance, especially the form of the roofs, which dominate the buildings' silhouettes. The new compound of the buildings' complex, which was also dominated by the row of columns made from local stones, plus the unique roofs' form was conceived as an expression of hybrid architecture that was influenced by traditional/local building archetype. All of that was reported meticulously in the local newspaper Preangerbode of 24th July 1920 (van Leerdam, 1995). Local materials, such as natural stone and construction timber, are used for these two buildings. It is the first wide span building, built at the beginning of the 20th century in the Netherlands Indie. The renowned Dutch architect, H.P. Berlage, also praised the building when he visited the country in the early 1920s. He observed that there had already been two leading streams in the architecture on Java; the first stream was vigorously influenced by the European tradition of building design from the 19th century with less influence from the local building tradition, while the other stream was developed from the local, original Javanese (regional) building culture. The architect Maclaine Pont belongs to the second stream. Through his long experiment with Javanese traditional architecture, he developed a unique hybrid architecture,that is commonly known as the Indisch architecture. (Fig. 2a and Fig. 3a)

According to Martokusumo, Tambunan and Sujatmiko (2013), the following attributes articulate the cultural significance of these historic buildings. From the historical perspective the buildings exemplify a specific building form and style which was established at the beginning of the 20th century. The very distinctive style of architecture was derived from various sources of building traditions, especially the hybrid of local and European tradition. The spatial form and the typology of the building itself are considered extraordinary, in which the use of local materials, pattern of roof's form, the corridors and tropical imperatives were very explicitly expressed. However, the two buildings have a slightly different ground floor; the East Assembly Hall has an attic/ mezzanine, while the other does not (Fig. 2b and 3b). Generally, traditional architecture was part of the development in the long journey of appreciating the local culture and regional imperatives.

Faculty House Kerkhoven

The Faculty House Kerkhoven is located at the famous Bosscha Observatory, Lembang, West Java, approximately 15 km north of Bandung. The Faculty House used to be the director of the observatory's house. After the 2007 rehabilitation work, as part of important facilities in the observatory, it was named after Rudolf Albert Kerkhoven, a close relative of the well known famous Karel Albert Rudolf Bosscha, a philanthropist. This former director's house was erected near the great Zeiss telescope building. The construction of the house was initiated by Prof. Dr. Anton Pannekoek on 14 May 1926. He was an important Dutch astronomer, who had then been assigned as a scientist at ITB. The Bosscha observatory has been inaugurated as a national architectural heritage since August 2004. Rehabilitation work of the Faculty House took place for the first time in 2007.

Figure 3a:
East Assembly Hall, view from outside and inside the building
Source: W. Martokusumo (2013) and L. Tambunan (2013)

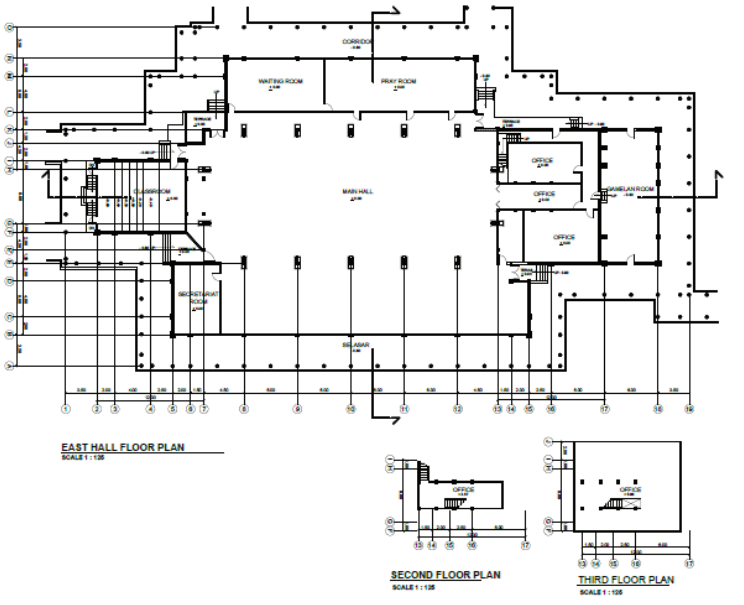

Figure 3b:
Ground and attic/mezzanine floor of East Assembly Hall
Source: Measured drawing, 2013

Figure 4: Combustible materials, inappropriate students' activities, insufficient emergency exit, lack of detection system and sprinkler, insufficient exit signage and lack of maintenance of electrical installation/wiring in the Assembly Halls
Source: L. Tambunan (2013)

Presently, the Faculty House has already met the requirement as a heritage building (more than 50 years old). In terms of architectural merit, it represents a unique style of architecture. The traditional timber exposed construction (German: *Fachwerkhaus*) was modified in response to the tropical or local context. The house style is also an example of some of the European building traditions which were implemented in Indonesia during the colonial period. This architecture is originally found

in the European countries of France, Germany and Switzerland. According to the National Preservation Act No. 5/1992 (now Act No. 11/2010) and the National Building Act No. 28/2002, this building has met all requirements of an historic building or heritage in terms of history. Furthermore, due to its role and function, this building is also considered to have important and valuable contributions in developing the science of Astronomy. All of the above explanations constitute the statement of cultural significance of this unique timber exposed building.

In 2013 the Faculty House has almost reached the age of 90 years and currently consists of a meeting room, library, museum, VIP guest rooms. These re-configurations of the space are due to the changes in operations. One important facility of the observatory is the Zeiss Refractor building, it is still the biggest telescope building within Southeast Asia. During the last nine decades many new tools and devices have been developed due to the dynamic process in the studies of Astronomy. Furthermore some significance changes have also been taking place in the change of systems; from mechanic-based to electronic-based, and the revolution of media data from analogue to digital system. One of the reasons of the rehabilitation of the former director's house into Faculty House Kerkhoven was to accommodate new requirements and to exhibit the old and memorable items including tools, devices, historical documents, and telescopes of different types and functions. These irreplaceable, collected items are exhibited in small museum as a way to document and to appreciate the long history and development of ITB's Bosscha Observatory.

During the rehabilitation work, landslides and earthquakes, already damaged the part of the building.[happened while restoring or during restoration damage was discovered?] Parts of the building, especially the timber structures, were deteriorated due to the high impact of humidity. The timber is therefore very vulnerable to high humidity. Due to a limited budget, the repairs mainly focused on the severely damaged parts of the building. A preventive approach was implemented due to scope of work and the priority of repairs. Not all of the targeted repairs were successfully achieved. During the rehabilitation, the exact dimension of the work was sometimes hard to predict and determine. This is actually quite common in rehabilitation/renovation work. A new plumbing system, due to the functional requirements, and the mechanical/electrical system and their components were respectively installed (Fig. 5a and 5b).

A need for comprehensive risk preparedness requirements for this building is also inevitable, due to natural and human-caused hazards. In addition to the requirements of formal and functional qualities, new installments of communication devices, electricity cables and physical adjustments, need to be carefully designed and carried out, without jeopardizing its cultural significance (the requirement for retention of significance).

The case studies reveal that the West and East Assembly Halls are already more than 90 years old, while the Faculty House Kerkhoven is presently 87 years old. They have been places for many activities, and are mostly used to accommodate seminars, symposium, exhibition, discussion, musical performances, ceremony of ITB's anniversaries and other special events. As mentioned, there is a lack of regulation nationwide regarding disaster mitigation. According to Adhisakti (2011) and Martokusumo (2012) the national building regulation to some extent is very generic; it is focused on the post-cataclysms, and is by nature prescriptive. Historic buildings have certain characteristics that cannot be assessed by such regulation. In case of fire, the rehabilitation of artifacts would be very difficult, since the loss due to fire could be very destructive. There is no appropriate building mitigation regulation, especially when it deals with historic and heritage buildings. Thus, protection for historic buildings against human-induced hazards (arson) and natural-caused disaster is not prepared yet (Fig. 4).

It has to be borne in mind that the observations of the existing historic buildings at ITB campus unveils vivid example of the gaps that have to be filled by rigorous adequate programs and strategy in regards to disaster risk-preparedness. Currently in the case of ITB there has not been any optimal program and/or efficient strategy regarding disaster risk-preparedness. Given this circumstances, a comprehensive database of the heritage property would be invaluable. In order to use a risk mapping as a basis for appropriate disaster planning, response and recovery, heritage properties, their significant attributes and the disaster-response history of the property must be clearly documented.

Figure 5a:
The Faculty House Kerkhoven, Bosscha Observatory Lembang
Source: W. Martokusumo (2007)

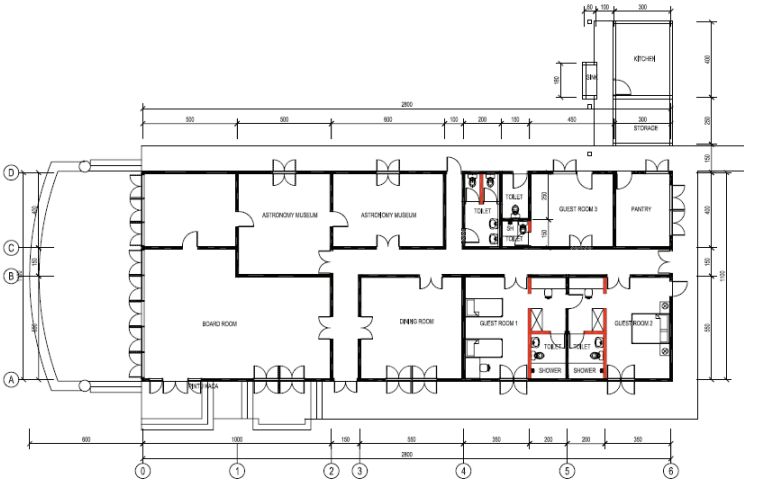

Figure 5b:
Groundfloor of the Faculty House Kerkhoven
Source: Doc. W. Martokusumo (2007)

DISCUSSION: Some Challenges in Indonesia

In the context of historic building, disaster risk prevention plan should be part of the conservation plan, to avoid a conflict between the goals of protection and conservation purposes. Based on requirements abstracted from ICCROM's manual it can be concluded that comprehensive and integrated disaster prevention plan rests on two important elements, 1) historic significance values, and 2) level of risks. Assessment of significance value and the level of risk of historic buildings demand the existence of complete resources to ensure the success of the plan. However, this stipulation will pose some issues in Indonesia as a developing country. Observations of several historical buildings in Indonesia indicate the significant challenges described as follows:

Challenges in Assessment of Significance

Assessment of the significance is the basis of risk assessment, so that the risks can then be evaluated, quantified and prioritized within a conservation context (Pishief, 2004). In general, assessment of the building significance consists of two phases.

Definition of Historic Buildings

Building significance can be assessed by using the definitions contained in the national policy set by the government or authority having jurisdiction. There are some national and local regulations and documents in Indonesia that outline the definition of heritage properties. However, this definition does not include the environment, regional or heritage collections. Moreover, there are a number of heritage properties variations related to form, function, location, history, and age. Clear classification of heritage properties in Indonesia is still needed in order to determine the precise definition.

DESCRIPTION OF THE BUILDING AND ITS SIGNIFICANT FABRIC

Building descriptions such as general layout, floor plan, use of building, construction and materials of building, significant fabric and contents of building are required for the assessment of significance. Although the building may be registered or listed, a detailed record of the significant areas or fabric of the building may not have been undertaken as a requirement for retention of significance. In connection with a fire disaster, it is important to understand the materials and construction techniques of the building in order to assess its risk from fire. As for earthquakes, construction and detailed data about the structure of the building are very important.

The list of historical buildings' data contained in the regulation or official documents issued by government is not equipped with detailed data on construction, material and structural strength of the building. Data limitations will result in inaccurate decisions about which parts of the building that can be intervened without jeopardizing the historical value of the building. In addition, if the building is of an outstanding heritage value, a heritage building consultant or professional is also required to conduct the assessment. This will cause problems due to the imbalance between the number of professionals required and the large number of heritage buildings in Indonesia. Availability of relevant data and the presence of educational programs that produces specialist appraisers are the responsibility of the government. It is, however, undeniable that this also requires funding and substantial resources. This is a great challenge for Indonesia as a country with limited resource capacity.

CHALLENGE IN RISK ASSESSMENT

Risk assessment is the overall process of risk analysis and risk evaluation. Risk analysis is the systematic use of information to determine how often specified events may occur and the magnitude of their consequences. Risk evaluation involves comparing the level of risk found during the analysis process with previously established criteria (Pishief, 2004). Risk assessment consists of two components; the process of risk analysis and risk evaluation. The results of the risk analysis are used as the basis for identifying risk areas which need special attention. To perform a risk assessment on historic buildings, guidelines covering methods of probability and consequences of risk analysis, risk ranking, and risk evaluation are needed. Guidelines have been issued by countries such as New Zealand, Switzerland and Japan that include two generic types of disasters, natural and man-made, for various types of building. However, Indonesia has no respective guidelines. The lack of good guidelines indirectly implies the

scarcity of critical data required to perform risk assessments on historic buildings. The following discusses important data that must be available and included in any assessment.

DISASTER HISTORICAL DATA

To perform disaster risk analysis, historical data about any disaster ever experienced by the building and its contents, and the damage occurred are needed. While in the case of fire risk, data sources containing the causes of fire, fire duration, the amount of loss, and number of casualties of heritage properties are also required. Information about disaster and post disaster condition is very limited, and is generally published by electronic media or newspaper after a disaster strikes. Currently, Indonesia has issued a national building regulation no. 11/2010 about Cultural Heritage. Some regional governments also have their own regulations. For example, Bandung Municipal Government has issued regulation no. 19/2009 about the Management of Historic Building and Sites. In Chapter II, section 2, some rules to protect and preserve the area and/or heritage buildings from destruction and obliteration, such as human actions or natural processes, are already stated. However, specific official data for historical building is still needed in the risk assessment. The lack of historical data will obstruct the risk assessment process. Although there are some alternatives methods, such as expert judgment through Delphi methods, it is still not easy to do since the number of competent experts available in Indonesia is limited.

DISASTER SOURCES DATA

Sources of disaster that would pose a risk to heritage property need to be identified in order to conduct risk analysis. Various causes of disasters -nature, building and its contents, activity of building renovation, or negligence, or arson should be compiled as the basis for establishing the probability and consequences of disasters. In the Indonesian context, an area, mapping of natural disaster-prone areas in both regional and local scales in relation to historical buildings is a must. State Ministry for National Development Planning and National Disaster Management Agency (BNPB) has published reports and guidelines about action plan for disaster risk reduction. The existence of several dominant disaster hazards in Indonesia, such as earthquake, tsunami, landslide/soil movement, volcanic eruption, flood, and drought are studied. However the guide does not covers man-made disasters (human-induces hazards) sources such as fire. Furthermore, the action plan does not explicitly mention the historical building as well (cf. State Ministry for National Development Planning, National Action Plan for Disaster Risk Reduction 2010–2012).

The description of the challenges faced in risk preparedness efforts on historic buildings in Indonesia provides an insight that there are two key facilitators that hold the important roles: the management and the government. Management is responsible for preparing a comprehensive Disaster Risk Preparedness Plan, including the action plan, training plan, response plan, recovery plan and maintenance plan, as part of a Conservation Plan. They ensure that the plans are carried out. Good management is a prerequisite for the successful implementation of the plan. There are several requirements that must be met to achieve a good management, as expressed by Pishief (2004), i.e.: (1) there should be a management structure and clearly defined management roles in place for effective management actions to occur, (2) the management of the organization should instigate policies to manage the risk while maintaining a clear understanding of the appropriate conservation standards at every stage of the management process, (3) expertise in conducting risk assessment.

Lack of good management can result in the limitation of knowledge and skills of the management team. These limitations have an impact on how to strengthen the building so it can withstand natural disasters, or how to make the building resistant from fire. Human behavior can threaten the safety of historic buildings and lead to fire disasters, such as smoking, cooking, or terrorism. Lack of good management will not be able to override or regulate the behavior of building users precisely, as well as generating no decisive action for violations.

Good management without support of good governance is nonsense. Government or authority with jurisdiction is responsible for providing the official and complete guide to help owners, institutions or historic buildings' management to draw up strategic plan and conduct the risk assessments. The government should provide data of significant value of historic buildings, data of disasters sources, construction details, materials, structure and the

content of the historic buildings in order to formulate a Disaster Risk Preparedness Plan appropriate with Conservation Plan. Lack of national policies for guiding the local heritage agencies, the owners or managers on how to identify and prevent the disaster risks will increase the vulnerability of heritage properties. Besides disaster sources, the government is required to complete data covering the damaged parts of the building and the extent of damage, the number of fatalities, and restored part and restoration techniques applied. The government is obliged to promote education and research that produces specialists with knowledge of to record and aid disaster struck historic buildings. These efforts will need substantial funding that might pose new challenges for Indonesia as a country with emerging economics.

CONCLUDING REMARKS

This article is written as part of the on-going research, focusing on preservation and fire protection in relation to the role of safety management. Two buildings at the main campus of ITB, the Assembly Halls, and the Faculty House Kerkhoven at the Bosscha Observatory have been chosen as case studies. The current investigation indicates a serious lack of risk preparedness for cultural heritage management. Unfortunately,there is neither sufficient detection system nor protection device. This circumstance unveils nationwide the big picture of the management of cultural heritage in the country. Based on questions on heritage considerations within a property's overall disaster prevention strategy, this paper suggests immediately an integrated conservation approach to tackle natural and human-caused disaster, especially in the making of heritage conservation policy.

As argued, prevention is still the best strategy in Indonesia to protect historic buildings from the risk of disaster. In contrast, post-disaster rehabilitation requires an excessive amount of financial support, it is also time-consuming, and will not be able to restore the authenticity of the building and its intrinsic values. Therefore, for the preparation of an effective prevention plan a comprehensive risk analysis is required. In the context of human-caused disaster, such as fire, risk analysis will be used in identifying both technical factors -due to the limitations of the protection system- and social factors in the disaster risks level. The result can be used to determine the most appropriate protection system, especially in the conservation plan. Such Conservation Plan is necessary to provide strategic direction and the most appropriate policy to protect the historic structures. In the case of the Assembly Halls and the Faculty House Kerkhoven ITB, risk analysis is likewise used to identify levels of vulnerability, and how significant is the vulnerability to the existence of those landmarks.

Disaster risk prevention plan that complies with the conservation principles require appropriate management and governance as the key elements. Availability of guidelines, completeness of data, including the risk mapping of heritage and historic structure, and the availability of professionals is part of government's responsibility too. In addition, management task is inevitable in order to establish disaster risk preparedness planning and maintenance plan, and to ensure the effectiveness of the plan at every stage of disaster. Referring to the results of risk analysis, the campus manager can composed an Emergency Plan as a reference for the preparation of Conservation Plan. Regarding the Conservation Plan, it is strongly recommended that a Fire Risk Management (FRM) must be developed in consultation with architects, curator, and fire engineer to strategize how to prevent risk disaster without jeopardizing the significance value of the historic landmarks. Inclusively, the FRM will regulate requirements of all activities, such as building operation, procedure of repair and restoration activities, maintenance guide, and evacuation. Under no circumstances, limited financial resource will be obstacle. On the contrary, this must create more challenges for the management of existing historic buildings in the campus of ITB. Despite of ongoing investigation of the buildings, emergency drills and capacity building for campus community will enhance the public awareness on the historic preservation and its relations to the disaster risk management. Last but not least, comprehensive preparation and strong willingness of the campus policy would supportively guarantee efforts to protect historic buildings from losing in disasters.

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