

Sufficiency of Disaster Risk Mitigation for Heritage Sites in Malaysia: Review on Conservation Management Plan

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ABSTRACT

Cultural heritage places worldwide are more exposed to natural disasters and climate change, threatening their survival. These disasters damage heritage sites physically and devalue them historically, culturally, and significantly. Losing cultural and historical connections affects present and future generations, which is distressing. Despite awareness of the risks, risk mitigation initiatives for cultural heritage assets in natural disaster-prone areas are insufficient. Comprehensive heritage management strategies are needed to safeguard heritage assets. Disaster risk indicators are often neglected in heritage management strategies. The Conservation Management Plan (CMP) in Malaysia guides heritage management; however, its monitoring and risk assessment guidelines for disaster risk mitigation are ambiguous. This study evaluates Malaysia's heritage management plans' risk assessment criteria to remedy the gap. Content analysis is utilised to analyse the CMP's disaster risk management plan in this qualitative study. The result suggested that the CMP's structure prioritises disaster risk mitigation inadequately. The lack of policies and methods for preserving Malaysia's cultural, historical, and socially significant heritage sites, despite changing environmental issues, must be addressed. This will ensure the current enjoyment and the future protection of these cultural heritage sites.

Keywords: *Disaster risk reduction; cultural heritage; conservation; resilience preservation; climate change adaptation*

INTRODUCTION

Climate change and natural disasters threaten cultural heritage sites worldwide. Heritage sites in seismic zones, coastal locations, and floodplains have long been threatened by earthquakes, floods, hurricanes, and wildfires (Jigyasu 2013). Increased extreme weather events, rising sea levels, and changing temperature and humidity have accelerated heritage structure deterioration due to climate change (Markham et al. 2016). Venice in Italy for instance, is threatened by rising sea levels, which flooded and damaged historical buildings and artifacts (UNESCO 2020). Climate-induced stressors often worsen existing vulnerabilities like material degradation and neglect, resulting in permanent cultural, historical, and archaeological loss.

Despite clear concerns, heritage site disaster risk management (DRM) approaches remain poor globally. Many countries lack disaster and climate change plans and resources to conserve cultural heritage (Forino et al. 2015; Barros et al. 2020). Historic preservation is often neglected in DRM frameworks that prioritize human safety and infrastructure (Jigyasu, 2013; Sesana et al. 2021). Traditional conservation efforts may also overlook climate change effects, leaving places vulnerable to long-term challenges (Markham et al. 2016). Underdeveloped nations may struggle to execute comprehensive cultural site DRM programs due to financial and technological restrictions (Fatoric and Seekamp 2019). Long-term disaster risks to heritage sites are not addressed by structural and non-structural remedies without climate-informed policy and technology. This highlighted the necessity for transdisciplinary climate adaptation approaches tailored to cultural preservation (Sesana et al. 2021).

Additionally, resource constraints, institutional silos, and lack of localized strategies limit the implementation of global frameworks like the Sendai Framework for Disaster Risk Reduction 2015-2030, which emphasizes disaster risk reduction in heritage management. Studies emphasize cross-sector collaboration and proactive, risk-informed methods to mitigate disaster effects on cultural heritage (Jigyasu 2013; Ripp & Rodwell 2015).

ADEQUACY OF CONSERVATION MANAGEMENT PLAN

Since the early introduction of conservation efforts worldwide, conservation rules and regulations have experienced numerous changes, especially in the conservation doctrine and the requirements that have been integrated over time. Although heritage management plans are internationally acknowledged as vital for preservation, there is still a significant lack of these documents for heritage sites globally, indicating the execution of conservation plans is still inadequate (Brit Anak Kayan 2015). The deficit is particularly evident in developing regions and for local heritage not recognized by UNESCO, where the lack of a formal heritage management plan frequently results in uncoordinated “reactive” interventions instead of sustainable, long-term care. The disparity is often ascribed to a “resources-capacity gap,” in which local authorities do not possess the financial resources or specialized expertise necessary to create and execute such intricate strategic documents (ICCROM 2024).

In Malaysia, various laws and policies have been enacted to safeguard heritage sites, notably the National Heritage Act 2005 (Act 645), which provides a legal framework for the conservation, preservation, and management of cultural and natural heritage. This legislation empowers the Commissioner of Heritage to designate, protect, and conserve heritage sites while also mandating the establishment of conservation management plans. The act establishes as a framework for heritage protection; however, its ability to mitigate disaster risks is limited. The act highlights the importance of preservation and conservation; however, it does not include specific provisions for disaster risk reduction (DRR), such as risk assessments, emergency preparedness, or recovery planning. As a results, many heritage sites lack the necessary preparations to endure natural disasters like floods and landslides, which frequently occur in Malaysia (Hassan et al. 2023).

Thus, for this article, a detailed content review will investigate Malaysia’s heritage management plan monitoring criteria’s risk assessment requirement. The research questions (RQ1) guide this paper as follows:

RQ1: How sufficient are the risk assessment requirements in the current established Malaysia’s Conservation Management Plan (CMP)?

METHODOLOGY

This study uses qualitative research methodology, with Content Review serving as the primary data collection tool. In qualitative research, content review is an essential method because it enables researchers to examine a wide variety of pre-existing information and offers a non-intrusive approach to the investigation of social phenomena. It is notably helpful in research that tries to investigate historical trends, organisational practices, or societal narratives without directly interacting with individuals (Bowen 2009). Additionally, content review enhances the rigour of qualitative research by allowing for triangulation with other data sources, which ultimately results in an increase in the dependability and validity of the findings (Patton 2015). This method’s versatility makes it beneficial to a variety of fields, including sociology, communication, and cultural studies, which expands the scope of qualitative research and makes it more applicable to a wider range of situations.

In this research, content review is especially crucial in the evaluation of the criteria in the Conservation Management Plan (CMP) research, as it enables a systematic evaluation of the comprehensiveness, quality, and presence of disaster risk reduction (DRR) elements. The method, which provides a systematic approach, assists in the identification of patterns, gaps, and inconsistencies among the many CMPs, which in turn assists in the comprehension of the manner in which DRR is dealt with.

CONTENT REVIEW

According to Krippendorff (2018), content review, which involves the examination of both textual and documentary data, discloses implicit assumptions and priorities in CMPs. This information lends support to the idea that evidence-based policymaking is essential in the field of heritage conservation. In addition to this, it makes it easier to conduct comparative research in order to assess the degree of adherence to international frameworks such as the Sendai Framework and to develop standards for the most effective practices (UNISDR 2015). The researcher can conduct an analysis of the inclusion of disaster risk reduction measures, such as risk assessments, mitigation plans, and climate adaptations, through the process of content review. This analysis will allow the researcher to find the potential for improvement in the protection of

heritage sites from the dangers of disaster impacts. Thus, for the purpose of this study, the author has conducted a thorough content review on eleven (11) CMP documents that have been published by the National Heritage Department of Malaysia, namely: 1) Carcosa & Seri Negara CMP, 2) Bangunan Sultan Abdul Samad (BSAS Block A) CMP, 3) Bangunan Sultan Abdul Samad (BSAS Block B) CMP, 4) Bangunan Masjid Negara Kuala Lumpur CMP, 5) Bangunan Dewan Panggung Bandaraya Kuala Lumpur CMP, 6) Stadium Negara CMP, 7) Fort Cornwallis CMP, 8) Muzium Negara CMP, 9) George Town Special Area Plan, 10) Melaka Special Area Plan, and 11) CMP and SAP for Melaka & George Town: Historic Cities of the Stratis of Malacca.

Figure 1 illustrates the methodology for selecting documents to be included in the content review using PRISMA 2020 tools. A literature review was performed to identify existing CMPs utilizing Google and the official

website of the National Heritage Department. The search employed terms including “Conservation Management Plan”, “Malaysia’s Conservation”, “CMP in Malaysia”, “Special Area Plan”, “Heritage Management Plan”, and “Rancangan Kawasan Khas”. A total of 46 heritage management plans have been recognized through this approach. The author performed a physical document identification at the office of the National Heritage Department, where nine CMPs were stored for safekeeping, and another two documents were downloaded from the UNESCO portal archive.

The researcher subsequently screened the documents multiple times, concentrating exclusively on including the CMPs for cultural heritage sites designated as National Heritage and World Heritage Sites. This process resulted in the final selection of eleven (11) CMP to be considered as the subject matter.

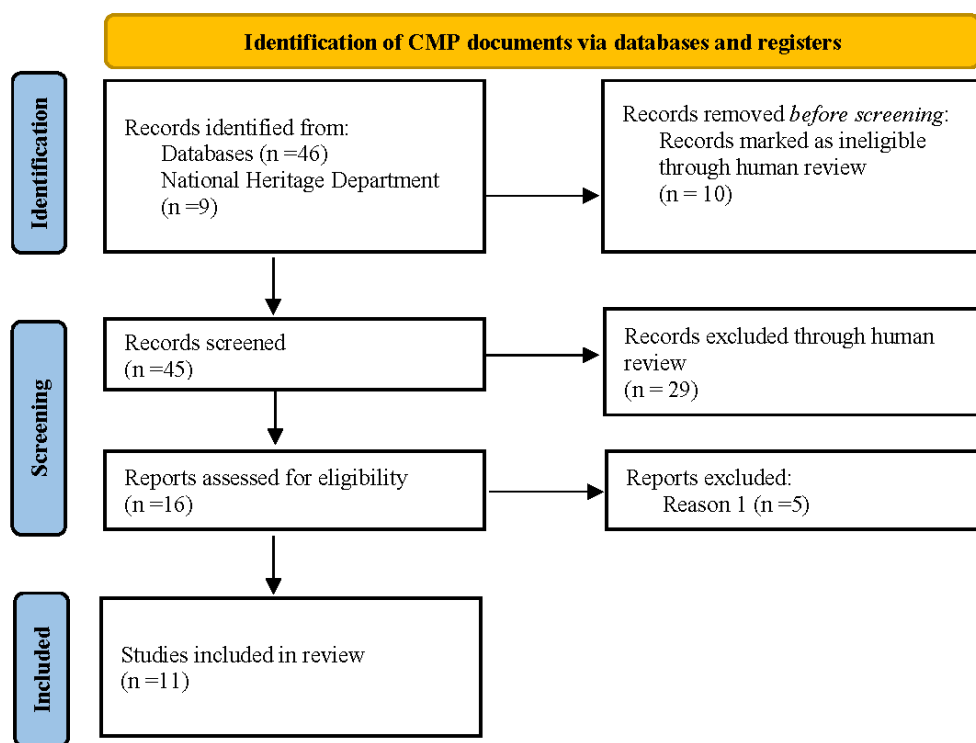


FIGURE 1. Determination of Documents to be included in Content Review using PRISMA 2020 tools.

RESULTS AND DISCUSSION

The content review procedure took two months and was carried out within the National Heritage Department because the records are not permitted to be moved outside of the department due to the confidential status of the documents. Before beginning the content review process, the author received permission from the department to

evaluate the documents in advance through official letter submission. After getting the approval, the author scheduled the reviewing procedure in three separate sessions as each of the documents took a longer time to complete the reviewing session.

The content review was conducted in accordance with the comparative analysis of the monitoring criteria found in the CMP documents. The author examined the level of

DRR integration in the risk assessment components of the CMP. The results were then summarised in table form to demonstrate how the DRR components were incorporated into the overall monitoring criteria in Malaysia's CMP guidelines.

The CMP document's contents were generally drafted in accordance with the Burra Charter Process, which outlines the planning procedure for managing the significance of heritage sites, as illustrated in Figure 2.



FIGURE 2. Burra Charter Process in The Burra Charter.

The document was prepared for the CMP. The Burra Charter Process provides a systematic approach for the exploration, decision-making, and management of heritage sites. The process begins with identifying the location and ensuring its safety, followed by the gathering and recording of documentary, oral, and physical information to determine its significance. A formal statement of significance is crafted to express the cultural importance of the site after assessing its heritage value. This statement details the identification of legal, environmental, and social obligations that guide the development of effective conservation strategies.

The process includes evaluating various factors that influence the site, such as resource availability, stakeholder needs, and physical conditions. A policy is created, evaluated, and formalized through a statement that outlines management strategies. The policy regulates the site through careful planning and detailed records of changes made. The last step involves ongoing monitoring and assessment to ensure that conservation strategies remain

effective and can adapt to new challenges as they arise. The iterative nature of the Burra Charter Process allows for adjustments based on further research, thus enhancing sustainable heritage management.

Meanwhile, Table 1 outlines the components of the *Garis Panduan Penyediaan Pelan Pengurusan Pemuliharaan Tapak/Bangunan Warisan*. This document is the primary resource for evaluating the monitoring criteria described in the guidelines that were officially published by the National Heritage Department in 2021. The eleven established CMP documents will be used to validate the results of the document evaluation. The comparative analysis will be conducted taking into account these components.

TABLE 1. List of Content in CMP Guidelines by the National Heritage Department

No.	Description
1	Executive Summary
2	Introduction of Sites / Heritage Buildings
3	Historical Background of the Sites/Heritage Building
4	Physical Assessment
5	Cultural Significance Assessment
6	Issue, Analysis, and Recommendations
7	Policy
8	Impact on the Environment
9	Information Management
10	Maintenance Schedule

The consistency of monitoring criteria to be included in the CMP documents is illustrated in Figure 1 and Table 1. The author has conducted a comprehensive evaluation of the ten (10) monitoring criteria to evaluate the presence of suitable risk assessment components. Section 6 (Issues, Analysis, and Recommendation) technically encompasses risk management concerns. Nevertheless, this component was given the least attention in the guidelines, as the interpretation of the risk only expressly emphasizes the necessity of establishing a Fire Safety Management Plan for heritage buildings. The subsequent section delineates the components that must be described for each requirement in the CMP guidelines that have been provided.

EXECUTIVE SUMMARY

This section provided a concise explanation of the CMP documents' contents as well as their intended purpose. When it comes to the preparation of the CMP documents, this part also provides an explanation of the requirements for referring to other legislation and guidelines established by the local authority.

INTRODUCTION OF SITES/HERITAGE BUILDINGS

This section serves as the foundational narrative that establishes the identity, scope, and contextual understanding of a heritage sites. This section typically outlines the background of the site or buildings, including its location, historical development, architectural characteristics, ownership, and current condition. It provides a concise yet comprehensive overview that frames the significance of the heritage asset within its cultural, social, and physical context. Importantly, the introduction is not merely descriptive; its function is to define the baseline for all subsequent conservation decisions by defining why the place matters and what aspects require protection. In the Malaysian context, this section often incorporates historical timelines, archival references, and site descriptions that reflect the evolution of the building or site, ensuring that conservation planning is grounded in accurate and well-documented knowledge.

This approach aligns closely with the principles of the Australia ICOMOS Burra Charter, which emphasizes the need to first understand a place before making any conservation decisions. The Burra Charter highlights that a thorough understanding of cultural significance, including fabric, setting, use, and associations, is essential in guiding appropriate interventions. Similarly, the CMP introduction section acts as a preliminary stage of “understanding the place”, ensuring that all relevant historical, physical, and contextual information is systematically documented. This alignment reinforces a key conservation principle: informed decision-making must be based on a comprehensive understanding of significance. Both frameworks therefore underscore that without a well-structured and critically informed introduction, conservation efforts risk being superficial or misdirected, potentially compromising the authenticity and integrity of the heritage sites.

HISTORICAL BACKGROUND OF THE SITES/ HERITAGE BUILDINGS

The purpose of this section is to provide a complete analysis of the historical background of the heritage sites that have been recognized, including an examination of their development. The full chronology of the heritage sites will also be emphasized in this section, along with all of the data that was retrieved, including the validity of the resources. For this particular section, the study and interpretation of the data requires close collaboration with historical experts and a solid understanding of the local community.

PHYSICAL ASSESSMENT

One of the most significant features of this section is that it will concentrate on the entire structural assessment of the heritage buildings and sites. This assessment will be comprised of the following three components:

1. The identification of modifications that have been made to the interior space, including the building structure and elements of the buildings, with regard to the preservation, prevention, strengthening, restoration, rehabilitation, removal, reconstruction, and implementation of adaptations for reuse.
2. The identification of the fabric that will be examined for its age (whether it is actual or estimated), examples of repairs, design and composition, production processes, and changes in material use and transformations.

The CMP document must include a clear statement regarding the evaluation of any archaeological evidence that may be present. Individuals conducting the archaeological inquiry should have prior experience in archaeology, which is strongly recommended.

CULTURAL SIGNIFICANCE ASSESSMENT

The assessment of cultural significance needs to include a thorough examination of the historical, social, artistic, and scientific characteristics of the assets. In this case, the value of the heritage site or buildings has to be taken into consideration. The assessment of cultural significance is carried out in accordance with the principles that have been set in the ICOMOS Burra Charter. The charter indicates that the assessment must take into consideration four (4) criteria, which are as follows: 1) In terms of historical significance, 2) In terms of aesthetic significance, 3) In terms of scientific significance, and 4) In terms of social significance. Furthermore, the comprehensive cultural importance assessment is in accordance with the obligation that is outlined in Section 67 (2) of the National Heritage Act 2005 (Act 645). By highlighting the importance of understanding the cultural significance of heritage assets to the community and the consequences of failing to undertake important safeguarding measures for these historical assets, this section emphasizes the necessity of understanding these factors.

ISSUES, ANALYSIS, AND RECOMMENDATIONS

This section addresses any obstacles that the heritage sites or buildings encountered during the investigation. The information will be thoroughly addressed, including the current condition of the cultural sites or buildings, the status of their functionality, the identification of difficulties that may impede the proper preservation of the heritage assets, and other significant topics. In most cases, this section will concentrate on the financial limitations and previous conservation efforts that have been made for the heritage assets that are being investigated.

In addition, the fire safety management plan will usually be recommended in this section, and the external variables that could have an effect on the vulnerability of the site, such as pollution, traffic flow, and other factors, will be identified in this section.

POLICY

The provision of guiding principles for the preservation of heritage sites and buildings is the objective of this section for the purpose of providing guidance. The preceding sections are taken into consideration by these principles, which include increasing the level of care and management, making appropriate use of the property, offering advantages to the community, and a variety of other considerations. In order to prepare the guidelines, the following components will be identified according to the requirements of the mentioned existing legislation in Malaysia:

1. The National Heritage Act of 2005 (Act 645);
2. The Town and Country Planning Act of 1976 (Act 172);
3. The Local Government Act of 1976;
4. vi) The Roads, Drains, and Building Act of 1974;
5. The Uniform Building By-Laws of 1988;
6. The Melaka State Conservation and Restoration Enactment;
7. The National land Code of 1965 (Act 56);
8. The Buildings and Common Property (Maintenance and Management) Act of 2007;
9. Policies and Guidelines of the State Government and the Federal Government;
10. Legislation and Other Acts.

The policy will analyze the methods of conducting appropriate conservation for heritage sites, the process of establishing Heritage Impact Assessment documents for any new development at heritage sites, the improvement of the sites' access and circulation to incorporate the universal design and emergency evacuation route as

required and approved by the BOMBA, and the public facilities.

IMPACT ON THE ENVIRONMENT

This section emphasizes that heritage conservation must extend beyond the physical fabric to include the broader environmental context that sustain a site's cultural significance. This section requires assessing how environmental factors such as climate conditions, flood risks, drainage, pollution, vegetation, and urban development affect the integrity and longevity of heritage assets. It also considers how proposed interventions may alter the surrounding landscape, visual setting, and ecological balance. In Malaysia, where many heritage sites are located in flood-prone or rapidly urbanizing areas, this environmental consideration is critical in addressing risks such as moisture damage, structural deterioration, and loss of setting authenticity. Therefore, conservation strategies are expected to be environmentally responsive, ensuring that both the heritage structure and its contextual relationships are preserved in a sustainable manner.

Even the Burra Charter defines cultural significance as encompassing not only the physical fabric but also setting, use, associations, and meanings. The Burra Charter advocates a cautious, minimal-change approach while stressing the protection of a place's setting as integral to its value. It further promotes preventive conservation through ongoing maintenance and environmental management to mitigate risks before damage occurs. Both the Malaysian CMP guideline and Burra Charter, therefore, share a holistic conservation philosophy integrating environmental sensitivity, contextual integrity, and risk awareness, ensuring that heritage sites are not only preserved physically but also sustained within their evolving environmental and cultural landscapes.

INFORMATION MANAGEMENT

This section focuses on systematic collection, documentation, storage, and updating of all data related to a heritage site or building. This includes archival records, historical documentation, architectural drawings, condition assessments, maintenance logs, photographic records, and records of past interventions. The purpose of this section is to ensure that all information is centrally managed, accessible, and continuously updated to support informed conservation decisions over time. In the Malaysian context, this component is particularly significant given the current use of GIS and BIM in many Conservation Management Plans. Effective information assessment is especially important in disaster-prone environments, where accurate and up-to-date data are essential for preventive conservation

strategies and emergency response planning.

This emphasis aligns strongly with the principles of the Burra Charter, which underscores the importance of knowledge and understanding as the basis for all conservation actions. The Burra Charter advocates for the retention and careful recording of evidence, emphasizing that decisions must be guided by adequate information about the place's cultural significance, fabric, and changes over time. It also highlights the need for accountability in conservation practice. Both the Malaysian CMP guidelines and the Burra Charter, therefore, promote a knowledge-driven approach, where information management becomes a critical mechanism for sustaining heritage values. By ensuring that data is well-organized and continuously refined, conservation practitioners are better equipped to implement preventive measures, evaluate risks, and make decisions that respect the authenticity and integrity of heritage sites within their evolving environmental and cultural contexts.

MAINTENANCE SCHEDULE

This section outlines a structured and systematic programme for the routine care, inspection, and upkeep of heritage sites and buildings. This section emphasizes that maintenance should be planned as a continuous and cyclical process rather than ad hoc or reactive interventions. It typically includes schedules for periodic inspections, minor repairs, cleaning, monitoring of material deterioration, and drainage maintenance. The objective is to prevent the escalation of minor defects into major structural issues, thereby safeguarding both the physical integrity and cultural significance of the heritage asset. In the Malaysian context, where many heritage buildings are exposed to tropical climate condition and recurring riskst such as flooding and humidity, a well-defined maintenance schedule is critical in minimizing deterioration and reducing long-term conservation costs. It also ensures accountability by assigning responsibilities, timelines, and documentation procedures for each maintenance activity.

This preventive approach closely aligns with the principles of the Burra Charter, which strongly advocates for maintenance as a fundamental aspects of conservation practice. The Burra Charter defines maintenances as continuous protective care and emphasizes that it is essential for retaining cultural significance, as it avoids unnecessary intervention or replacement of original fabric. It promotes a cautious approach doing as much as necessary but as little as possible. By prioritizing regular upkeep over major restoration works. Furthermore, the Charter highlights that maintenance should be informed by an understanding of the place, supported by proper documentation, and

responsive to environmental conditions. Both the Malaysian CMP guidelines and the Burra Charter therefore reinforce a shared philosophy of preventive conservation, where systematic maintenance serves as a key strategy to prolong the life of heritage assets, reduce risks, and ensure the sustainable preservation of their authenticity and integrity over time.

The content review focused on eleven (11) Conservation Management Plans (CMPs) adopted in Malaysia as shown in Table 2, which includes heritage sites designated as national Heritage Sites and World Heritage Sites in Malaysia. Despite their shared UNESCO World Heritage Sites status, George Town and Melaka Historical Cities must nevertheless produce distinct heritage management, as required by UNESCO. Although both cities formed their CMPs in 2008, during their nomination as World Heritage Sites, later in 2011 both cities had issued updated CMPs as a result of rapid development in both cities, necessitating an updated management plan to limit the development within or near the designated heritage core zone areas.

As for record, the National Heritage Department (NHD) has formally registered 311 cultural heritage sites for 2024 (JWN,2020). Five of these sites have been declared UNESCO World Heritage Sites (UNESCO,2024), indicating significant worldwide significance. Despite these achievements, the National Heritage Department's statistics show that only sixteen cultural heritage sites, or less than 10% of Malaysia's recognized heritage assets, are currently protected by CMPs.

TABLE 2. List of the Conservation Management Plan is included in the content review

No.	Name of CMP Documents	Year of Produced	Site Status
1	Carcosa & Seri Negara CMP	2021	NH
2	Bangunan Sultan Abdul Samad (BSAS Block A) CMP	2022	NH
3	Bangunan Sultan Abdul Samad (BSAS Block B) CMP	2022	NH
4	Bangunan Masjid Negara Kuala Lumpur CMP	2017	NH
5	Bangunan Dewan Panggung Bandaraya Kuala Lumpur CMP	2016	NH
6	Stadium Negara CMP	2017	NH
7	Fort Cornwallis CMP	2016	NH
8	Muzium Negara CMP	2016	NH
9	George Town Special Area Plan	2008	WHS
10	Melaka Special Area Plan	2008	
11	CMP and SAP for Melaka & George Town: Historic Cities of the Straits of Malacca	2011	

Note: NH=National Heritage, WHS=World Heritage Sites

This limited coverage is mostly due to budgetary constraints, which continue to be a major impediment to the widespread deployment of CMPs (Jusoh, 2016; Azmi et al. 2021; Halim & Tambi, 2021; Hasan et al. 2019; Zolkafli et al. 2018). Furthermore, the bulk of these CMPs have focused their efforts on the preservation and repair of

historical structures. Despite its significance, this narrow scope fails to account for the broader variety of cultural assets. As a result, many additional notable sites lack conservation or management strategies (Hasan et al. 2019). A large number of heritage sites remain neglected and do not receive proper protection, complicating Malaysia's efforts to maintain its cultural significance.

TABLE 3. Inclusiveness of Disaster Risk Reduction in Malaysia's CMP Documents

No.	List of Conservation Management Plan / Heritage Management Plan	DRR Components in CMP
1	Carcosa & Seri Negara CMP	X
2	Bangunan Sultan Abdul Samad (BSAS Block A) CMP	Brief history of flood event in the area
3	Bangunan Sultan Abdul Samad (BSAS Block B) CMP	Brief history of flood event in the area
4	Bangunan Masjid Negara Kuala Lumpur CMP	X
5	Dewan Panggung Bandaraya Kuala Lumpur CMP *CMP for Kompleks Bangunan Mahkamah Lama Mahkamah Seksyen/ Majistert for DBKL	X
6	Stadium Negara Conservation Management Plan	X
7	Fort Cornwallis Conservation Management Plan	X
8	Muzium Negara Conservation Management Plan	X
9	Georgetown Special Area Plan	X
10	Melaka Special Area Plan	X
11	CMP and SAP for Melaka & George Town: Historic Cities of the Straits of Malacca	X

LACK OF CONSIDERATION ON DRR IN CONSERVATION GUIDELINES

According to the list in Table 3, only two (2) out of the total eleven (11) CMPs have been evaluated that featured the disaster risk components in the overall CMP monitoring criteria. Ironically, even the explication of the disaster risk in the Bangunan Sultan Abdul Samad CMPs is extremely low, as it only briefly discusses the history of flood events that occurred in Kuala Lumpur and the heritage sites themselves. However, the impact of the disaster risk on the heritage sites and the protection plan from the disaster risk is nowhere to be discussed in the CMP documents. Deeply concerned about this lack, the author verified the outcomes with the Commissioner of Heritage from the National Heritage Department, where it was confirmed that the CMP does not contain any components that pertain to the reduction of the disaster risk, as indicated in the following statements;

"The requirement to conduct a risk assessment has been indicated in the CMP guideline provided by Jabatan Warisan Negara, however, the scope of risk is very narrow, where it merely focuses on fire risk assessment and mitigation. That is why the appropriateness of risk assessment and mitigation is yet to be established in any CMP that exists in Malaysia's heritage sites, especially in the context of disaster risk. Furthermore, most of the consultants did not include any disaster risk assessment due to unnecessary and based on a case-by-case assessments."

By looking at this statement, the author has also re-examined the general monitoring criteria that became the basis of the CMP documents, which were also adopted from the heritage management planning in the notable Burra Charter, to look into the potential of considering risk assessment criteria in the CMP guidelines. Table 3 indicates the list of monitoring criteria as provided in the *Garis Panduan* (Guidelines) *Penyediaan Pelan Pengurusan Pemuliharaan Tapak/ Bangunan Warisan*, which was officially established by the National Heritage Department in 2021.

TABLE 3. Consideration of DRR in Malaysia's CMP Monitoring Criteria

No.	Description	Monitoring Aspect	Level of DRR	Remarks
1	Executive Summary	Summary of the heritage sites' significance and the purpose of the CMP document	Poor	-
2	Introduction of Sites / Heritage Buildings	Explanation of the heritage sites' gazetted status, the location, and the current condition of the heritage sites.	Poor	Only the CMP for Bangunan Sultan Abdul Samad had featured the flood history that hit the heritage sites.
3	History Background of the Sites/ Heritage Building	Explanation of the history of the existence of the heritage sites, their functions, and historical events involving the heritage sites.	Poor	Only CMP for Bangunan Sultan Abdul Samad had featured the flood history that hit the heritage sites.
4	Physical Assessment	Assessment of the current condition of the heritage sites/buildings with supporting photographic evidence and detailed elaborations.	Poor	Insufficient explanation of the underlying causes of damages, particularly those resulting from disaster risks such as flooding or fire.
5	Cultural Significance Assessment	Identification of the cultural significance of the heritage sites, and the efforts to be taken to protect the significance value.	Poor	The cultural significance assessment could differ with consideration of the disaster risk impact.
6	Issue, Analysis, and Recommendations	Highlighting any issues that occurred that might have impacted the heritage sites/buildings' conditions, and proposing relevant actions to be taken.	Minimal	Identification of issues in regard to safety and disaster, but most of the CMP had focused on the fire safety management plan.
7	Policy	Identification of the involved policy to be referred to during the preparation of the CMP for specified heritage sites/buildings.	Poor	Only involved the policy in regard to town planning and heritage management.
8	Impact on the Environment	Identified the impact on the environment during the undertaking of the conservation works.	Poor	Mostly explained the initiatives to be taken to protect the environment when the conservation work is done.
9	Information Management	Highlighting the issues regarding the lack of resource management and references.	Poor	Generally discussed on how to manage the resource and information in regards to the heritage conservation works.
10	Maintenance Schedule	Proposed maintenance schedule to support the conservation works to be done for the heritage sites as recommended in the CMP document.	Poor	Only focusing on the repair efforts.

Note: The level of DRR consideration in CMP is measured according to; Poor (Absence of DRR), Minimal (Minimum feature of DRR), Average (Briefly incorporated DRR), Good (Incorporated DRR with future recommendation in plans)

The findings presented in Table 3 clearly indicate that the integration of disaster risk reduction (DRR) components within the Conservation Management Plan (CMP) framework in Malaysia remains largely inadequate across all ten assessed sections. Most components including Executive Summary, Introduction, Historical Background, Physical Assessment, and Cultural Significance are categorized at a "Poor" level of DRR integration, suggesting that disaster-related considerations are not systematically embedded in the core structure of CMP documents. The analysis reveals that these sections predominantly emphasize descriptive and historical narratives, with minimal reference to hazard exposure, vulnerability factors, or potential disaster impacts. For instance, while the Introduction and Historical Background sections provide essential contextual information, only the

CMP for Bangunan Sultan Abdul Samad incorporates flood history, highlighting a lack of consistency in recognizing environmental risks across heritage documentation. This indicates that CMP preparation still prioritizes conventional conservation approaches rather than adopting a risk-informed perspective aligned with contemporary disaster resilience needs.

Furthermore, the Physical Assessment and Cultural Significance components demonstrate critical gaps in linking observed building conditions to underlying disaster-related causes. Although these sections include documentation of deterioration and significance values, they often fail to attribute damage to specific hazards such as flooding, fire, or climate-related factors. This limits the ability of conservation practitioners to develop targeted and preventive interventions. Similarly, the "Issues,

Analysis, and Recommendations” section shows only minimal DRR integration, with most CMPs focusing heavily on fire safety while overlooking other recurring hazards such as floods. The Policy section also reflects a narrow scope, primarily referring to planning and heritage regulation without incorporating disaster risk management frameworks. These findings suggest a fragmented approach where disaster considerations are treated as secondary concerns rather than integral components of conservation planning, thereby weakening the effectiveness of long-term heritage protection strategies.

In addition, the final components; Impact on the Environment, Information Management, and Maintenance Schedule further reinforce the reactive nature of current CMP practices. Environmental considerations are largely limited to managing the impact of conservation works rather than assessing how environmental risks affect heritage sites over time. Information Management focuses on documentation processes but lacks integration with risk monitoring systems or digital tools for hazard mapping and predictive analysis. Meanwhile, Maintenance Schedules are primarily oriented toward repair work instead of preventive maintenance strategies that address recurring disaster risks. The case of Bangunan Sultan Abdul Samad, despite its location within a flood-prone confluence of the Klang and Gombak rivers, illustrates how even high-risk sites are not adequately supported by risk-based conservation planning. Overall, these findings underscore the urgent need to embed DRR principles holistically within CMP components to shift from reactive conservation practices toward a preventive and resilience-based framework for heritage management in Malaysia.

CONCLUSION

Research on heritage management is lacking in one important area: the incorporation of disaster risk reduction (DRR) measures into existing strategies for the management of heritage sites. Frequently, the gap is caused by an insufficient amount of multidisciplinary collaboration between specialists in the field of heritage conservation and experts in disaster management. Heritage management plans usually place an emphasis on the preservation of cultural and historical values of sites; nevertheless, they frequently fail to include comprehensive risk assessments that take into consideration vulnerabilities to natural disasters such as earthquakes, floods, and other climate-related disasters. Back in 2002, Jigyasu makes an observation that many historical conservation frameworks have a tendency to be reactive, with an emphasis on post-disaster restoration rather than proactive risk mitigation

strategies. A similar issue, again, was brought up by Cassar et al. in 2020 where the current heritage managers still depend on reactive rather than proactive actions, which not only leads to the possibility of losing the cultural values but also can result in very expensive restoration efforts.

Furthermore, disaster risk reduction measures typically fail to take into account the unique characteristics and vulnerabilities of heritage sites. Instead, typically apply generalized mitigation strategies that may unintentionally compromise the cultural significance of the sites. According to Menoni et al. (2018), the absence of site-specific hazard mapping and vulnerability assessments results in inadequate preparedness, which in turn makes heritage sites especially susceptible to the impacts of natural disasters. Therefore, there is a need to relook into the current monitoring criteria for the CMP guidelines to be more considerate of the protection of heritage sites that are highly exposed to disaster risk, especially for those located in disaster-prone areas, and this has signaled a crucial multidisciplinary knowledge transition between heritage and disaster management experts in safeguarding the vulnerable heritage sites for future generations.

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