International Journal of Thesis Projects and Dissertations (IJTPD)
Vol. 8, Issue 3, pp: (133-144), Month: July - September 2020, Available at: www.researchpublish.com

DISASTER PREPAREDNESS OF THE HISTORIC MUSEUMS IN THE PROVINCE OF CAVITE

Reina Krizzia R. Yanagisawa[1], Chloe Louise G. Soriano[2], Monika Bharti[3], Dr. Jimford Tabuyo[4]

[1,2]College of Tourism and Hospitality Management, Tourism Department

[1,2]De La Salle University Dasmariñas, Dasmariñas City, Philippines

Abstract: **Cavite is a historical province in the Philippines known for its three Historic Museums. First is the Aguinaldo Shrine where the flag of Philippine Independence was first waved. Second, the Gen. Baldomero Aguinaldo Shrine, where the brother of the first Philippine president, Emilio Aguinaldo, took residence. These two Shrines are both located in the town of Kawit. Lastly, the Bonifcacio Trial House, which served as the military court for Andres Bonifacio's trial. All these historic museums are under the management of the National Historical Commission of the Philippines (NHCP), which also reports that historic museums are disaster vulnerable because of their old-aged structures. This study assessed the disaster preparedness of the historic museums. The method is qualitative in nature and utilized interview as the instrument of the study. The respondents are representatives of each historic museum. The result shows that NHCP is aware of the disaster vulnerabilities of the three historic museums. Moreover, they have conducted restoration projects and soundness test as precautionary measures. However, soundness test has not been conducted again for some time. The NHCP and the local government coordinate when it comes to disaster preparedness. Response is an issue because historic museums are not considered priority and because of the geographic features, that made the historic museums vulnerable. The historic museums are important because they are part of culture, history, and identity. The historic museums were disaster- prepared because of restoration and modernization projects which were done roughly 5 years ago. Disaster preparedness is important because the historic museums are old, valued and a part of community. The historic museums are also prone to flooding. While the local government has created plans to mitigate flooding, floods can be prevented so long as government programs are implemented. More importantly, regular monitoring of water level is a key component in flood control. The historic museums are prone to ground shaking (earthquake). This risk could be due to construction. There is also coordination within NHCP and the local government in disaster preparedness for ground shaking. Nevertheless, ground shaking cannot be prevented; hence, precautionary measures such as regular structural checks are conducted.**

Keywords: **Cultural Heritage Site, Disaster, Disaster Preparedness, Historic Museum.**

I. INTRODUCTION

Calamities and disasters can strike anytime which could cause considerable damage not only to the structures but also to the lives of the people. Therefore, different establishments and structures should be disaster prepared. While the old structures are more prone to damage when a disaster strikes, old structures such as shrines that serve as a cultural heritage site should have disaster preparedness plans.

Disaster Risk Management Plan has been an important element in minimizing and reducing the damage hazard, either natural or man-made. There are various disaster risk management plans that have been adapted: from large scale frameworks of different countries to a small-scale application of disaster risk management to business establishments,

schools, hospitals and etc. Nevertheless, the main objectives when it comes to disaster management are to save lives and reduce human suffering, protect and restore livelihoods, and to reduce the risk faced by communities affected by disaster (wvi.org, 2019).

Occurring disasters, whether natural or man-made, cause a serious disfunction to the normal functioning of a society and the community. A disaster could have various effects like economic loss, environmental damage, and it also affects the socio-cultural in terms of welfare and wellbeing. Different organizations have adopted disaster management plans either locally, regionally, or internationally. In addition, they have adopted different versions of disaster risk management. The usual disaster risk management plan involves prevention, preparedness and relief, and recovery (wcpt.org, 2016).

The main framework when it comes to the disaster risk management was the Hyogo Framework. This framework was adopted by 168 governments around the world which focuses on guiding principles, priorities for action, and practical means for achieving disaster resilience for vulnerable communities. The Hyogo Framework is a 10-year global plan for natural risk reduction management also adopted by the Philippines as the basis for disaster risk reduction management (UNDRR, 2019).

Cultural Heritage sites are particularly prone to disasters since the structures were already old. These disasters are caused by earthquakes and even wars. An example is Syria, where different heritage sites were damaged. These cultural heritage sites date back long before the time of Jesus Christ and yet earthquakes and man-made disasters such as fire and wars damaged the cultural heritage sites which are neglected by the government due to various reasons. (Azdeh et. al, 2015)

In the Philippines, the main legal basis for disaster risk management is RA 10121, also known as the Philippine Disaster Risk Reduction and Management (DRRM) Act of 2010, which is an act to strengthen disaster management in the country. The law also serves as a framework to roll out resources that will enable the national government, the local government units, and other stakeholders such as the local communities to build communities that can survive disasters (Rey, 2015).

However, the cultural heritage site application in disaster risk management is another law. This is RA 10066, also known as the Natural Cultural Heritage Act which states the need to preserve historic buildings that are over 50 years old, creating the Philippine Registry of Cultural Property.

The disaster risk management of cultural heritage sites is critically important because cultural heritage sites have always been unprotected due to urbanization and agglomeration of economic activity where disaster risk management of such heritage sites was not maintained. The cultural heritage sites are particularly important to a local community because they help them connect with their roots and identity. Heritage sites also help with economic growth and an increase in resiliency within the local community to continue their tradition and social and cultural values (GFDRR, 2017).

There has always been a serious risk in cultural heritage site disaster preparedness that has been neglected for the past years. Cultural heritage sites have been vulnerable to climate change as cultural heritage site preservation needs specific special attention. It is also challenging for the cultural heritage site to be restored due to the cost of restoration and the difficulty to obtain the structure's original material. (Dalisay & Landicho, 2018).

The gap of the research is the application of the Disaster Risk Management to cultural heritage sites because not all disasters, either natural or man-made, are suitable on a cultural heritage site. In addition, the geographic situation of a cultural heritage site plays an important role in which disaster risk management should apply.

The Philippines, on the other hand, is highly prone to natural disasters, both earthquake and typhoons. This problem is because of the geographic location of the country which situates it in the typhoon belt and close to plates' boundary; moreover, the Philippines is also vulnerable to flooding due to numerous coastal areas. An example of a damage to a cultural heritage site due to the natural disaster was the Bohol earthquake of 2013 where many historical churches in the area collapsed and the damage cost was estimated to be 30 million USD.

The province of Cavite has a rich historical background due to different historical events such as the declaration of Independence of the Philippines on June 12, 1898 in the Aguinaldo Shrine located in the town of Kawit. (Cavite Ecological Profile, 2017).

Based on secondary data the researchers have obtained, the municipality of Kawit, Cavite is vulnerable to flooding and ground shaking (earthquake) as all its Barangays are prone to these natural hazards. While in Maragondon, there are 3 Barangays that are susceptible to flooding and other 13 Barangays susceptible to ground shaking (Cavite Ecological Profile, 2017).

The topic of the research is the historical museums properties of the National Commission of the Philippines (NHCP) in Cavite province. There are three historical museums under the management of NHCP. The first is the Aguinaldo Shrine, located in the municipality of Kawit, Cavite. The Aguinaldo shrine served as the residence of the first Philippine President, Emilio Aguinaldo. The shrine has a long history starting in its construction in 1845. The material used in the construction of the shrine is primarily wood. The Aguinaldo shrine was declared a national shrine in 1964. This Shrine had a museum in the ground floor showcasing some of the personal belongings of the first President, Emilio Aguinaldo. The shrine is managed by the National Historical Commission of the Philippines (NHCP). Another Historical Museum that is under the management of NHCP is the Baldomero Aguinaldo Shrine, also located in Kawit, Cavite. The house was built by Gen. Baldomero Aguinaldo, cousin of Gen. Emilio Aguinaldo, during the American Colonial Period in 1906. The house walls are painted in white and sky-blue in the house's second story; the house features late 19th century furniture, furnishings, photographs and drawings, ceramic ware, and other household items. Its ceilings are also decorated with paintings of flowering trellis designs. Lastly, the Bonifacio Trial House, located in Maragondon, Cavite, was built in 1889 and served as a military court where the trial of Andres Bonifacio in 1897 took place. The museum has five galleries which provide background information on Andres Bonifacio and his trial.

The proposed study would attempt to assess the disaster preparedness of the Aguinaldo Shrine, Baldomero Shrine, and the Bonifacio Trial House through an interview with the management of the shrines regarding the disaster risk preparedness of the shrines based on the secondary data on disaster vulnerabilities obtained from the Government of Cavite.

The proposed study sought to answer the following:

1. How do the respondents assess the different site relative to disaster management?

2. What are the disaster preparedness measures of the different historical museum properties of NHCP in terms of disaster vulnerabilities such as:

a. Flood

b. Ground Shaking

3. Based on the findings what enhanced disaster preparedness plan can be proposed?

The scope of the study is the historical museum under the management of NHCP and their disaster risk management plan. Meanwhile, the study will be limited to the disaster hazards vulnerabilities applied as suggested by the secondary data obtained from the Government of Cavite such as Flood and Ground Shaking.

The study will be integral to the management of the Aguinaldo Shrine for them to have an enhanced disaster risk management plan in conserving and protecting the shrine. The study is also important to the local community to become aware of the disasters that Aguinaldo Shrine is vulnerable to and learn how to act once a disaster strikes the Aguinaldo Shrine. Lastly, the study will be important for the tourist so they may become aware to the need for a disaster risk management plan on cultural heritage sites. This plan can encourage tourists to conserve and protect the recreational and historical value of the shrine, which can also be enjoyed by the future generation.

Conceptual Framework

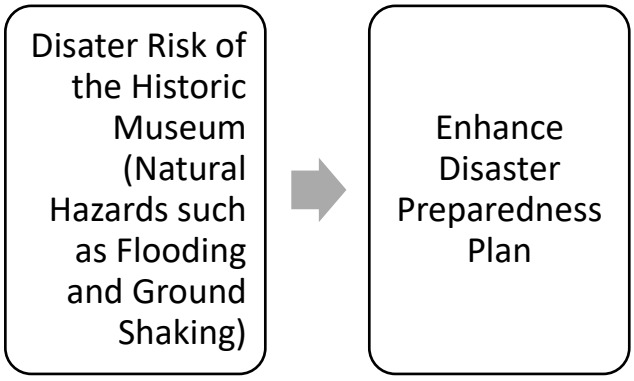

Figure 1: Conceptual Framework

The table above shows the research paradigm of the study. The study's main concept is the disaster risks. The study, which was conceptualized by Jigyasu et al (2015), focuses on the disaster risk management of cultural heritage sites with the application of the secondary data obtained from the Cavite Ecological Profile (2017) on the natural hazards vulnerabilities of the province of Cavite.

The conceptual framework shows the threats to the heritage sites and which vulnerabilities each site must deal with. This is followed by a risk analysis of natural hazards, which is also conducted by the government of Cavite, to arrive with the secondary data in which hazard vulnerabilities are applied into each municipality subject to the study. These municipalities are Kawit and Maragondon, which are both prone to flooding and ground shaking.

II. METHODOLOGY

The study used qualitative method. The study is divided into three phases. The first phase was to do a secondary data compilation on disaster vulnerabilities of the historic museums under the management of NHCP. The second phase was an interview to the representative of NHCP on the disaster preparedness of the historic museums. Specifically, the second phase was the interview with the management of the historic museums with a conduct in-depth discussion with the management. The researchers selected the Aguinaldo shrine as the setting of the study for it is considered as a national shrine with an antiquated structure. Lastly, the third phase is the interview data analyzation and the development of the enhanced disaster preparedness plan for the historic museums under the management of NHCP.

The respondents of the study are composed of the representatives of the NHCP for each historic museum and a representative from the municipal disaster risk reduction office. The first respondents, which is the management, are the representatives of historic museums subjected to an interview regarding the disaster preparedness of the historic museums under the management of NHCP The second respondent are representatives of the Local Government Unit of Kawit and Maragondon, Cavite, particularly the Municipal Disaster Risk Reduction Management office. The sampling technique used in the study is expert sampling. This strategy specifically sought experts regarding the disaster preparedness of the Aguinaldo shrine such as the management and the local government unit.

The study used interview as the instrument for the management of Aguinaldo Shrine and the local government unit representative. The interview design were open ended questions. Moreover, interview questions and checklist were validated by the thesis adviser.

A proposal letter regarding the study that will be conducted in the area is submitted to the management of each historic museum under the management of NHCP which is under the control and supervision of NHCP. The researchers also gathered pictures for photo documentation. The data is then further gathered and analyzed.

The interview with the management was conducted by schedule. The researchers then asked the questions to the management staff of each historic museum sites and they then answered vocally. The researchers then used voice recorders to record the response. After the interview, the data gathered was analyzed further the data gathered will be treated with confidentiality and shall only be used for educational purposes only.

The interview data was transcribed and presented in a narrative analysis approach. The researchers identified the relevance of the responses and then formulated propositions regarding the Disaster Preparedness in which it is described as a deductive approach and a narrative analysis.

III. RESULTS AND DISCUSSION

Table 1: Disaster Preparedness of the Historical Museums

Aguinaldo Shrine	Gen. Baldomero Aguinaldo Shrine	Bonifacio Trial House
The Aguinaldo shrine is vulnerable to disasters because of the old age of the structure.	Gen. Baldomero Aguinaldo Shrine is very prone to disasters because of the age of the structure.	The Bonifacio Trial house is vulnerable to disasters because the structure is very old and old structures are more prone to be damage overtime.
Measurement that is done to ensure disaster preparedness is regular monitoring of structure and a regular soundness test.	The restoration projects are the disaster preparedness measure because it helps in the structural integrity of the Gen. Baldomero Aguinaldo Shrine.	The restoration and modernization projects of the NHCP are the disaster preparedness measures.

The last soundness test was done in 1998. But there is an annual structural checkup.	There is structural checking such as Monitoring the buildings condition and regular soundness test but this occurred a long time ago.	There is an annual structural checkup done by the NHCP.
There is a coordination between the NHCP, LGU of Kawit, MDRRMO, Tourism Office of Kawit when it comes to Disaster Preparedness. There is a participation in local and nationwide drills	There is a coordination between the NHCP, LGU of Kawit, MDRRMO, Tourism Office of Kawit when it comes to Disaster Preparedness.	There is a coordination about disaster preparedness between the NHCP and the local government of Maragondon
The problem when it comes to disaster preparedness is the response because historical museums are not a priority	The problems that is needed to address is the soundness test because it has been done for so long.	The problem when it comes to disaster is the response because the priority in disaster response when it comes to disaster is life and not property
The reason of vulnerability to natural disaster of the historical museum is the geographic location and the structure which is old	The geographic location is a main factor for the disaster vulnerabilities because the historical museum is near the Imus River and Kawit is a catch basin which is very prone to flooding	The geography is the main reason for the vulnerability to disasters
Historical museums are the physical manifestations of our past, heritage and culture	Historical Museums are important because it shows our past it shows the history and our identity	Historical Museums are important because this is a part of history and identity
The Historical Museum is disaster prepared because of continuous restoration and modernization projects that the NHCP has.	The Historical Museum is disaster prepared because of the restoration projects and modernization programs	The Historical museum is disaster prepared because there are regular structural checks
Major structural renovations are done every five years. Last renovation was in 2016. Minor structural repairs are done regularly.	The modernization project which was 2015. Minor structural repairs are done regularly	The last major restoration project was the modernization of the Bonifacio trial house in 2014, minor repairs are done regularly
Disaster Preparedness in historical museum is important because these are old and valuable and needs to be preserved and conserved	Disaster preparedness for historic museum is very important because this needs to survive in the future so that the future generation will enjoy it.	Disaster preparedness for historic museum is important because are vulnerable to natural disasters due to their old age of the structure and it needs to survive because it is a part of the community

Table 1 shows the interview results with the NHCP representatives of each of the historical museums. The result shows that when it comes to the disaster vulnerabilities of the historical museum, the NHCP respondents cited that they are aware of the vulnerabilities of the historic museum to natural disasters. The most cited reason has the theme that the historic museums are prone to disaster because the structures are very old; thus, these structures, overtime, become more prone to damage.

According to Azadeh and colleagues (2015), cultural heritage such as historic museums are at high risk of disaster vulnerabilities. This is because of the structure's old-age for they were built a long time ago; moreover, the materials used in this structures could have been exposed to degradation overtime which explains why cultural heritage sites such as historical museums are prone to natural disasters.

In lieu of the result, one of the ways that can be followed, according to the respondents, to make the historic museums completely disaster prepared is to conduct a soundness test in order to assess the durability of the structure and check for lime and magnesia oxide deposit that potentially affects the structure creating cracks and damages to the overall structure. Another way is the restoration and modernization programs implemented by the NHCP that is essential in disaster preparedness, according to the respondents.

As mentioned by Jigyasu and colleagues (2015), in order for a cultural site to be disaster prepared, there is a need for regular checking on the structural integrity and to do restoration as necessarily in order for a cultural heritage site to be more resilient when it comes to natural disaster.

However, the result revealed that the soundness test that has been conducted on the historical museums had occurred a long time ago. This issue was cited by the NHCP representative of the Aguinaldo Shrine and the Gen. Baldomero Aguinaldo Shire. Meanwhile, the NHCP representative did not present any data on the soundness test conducted in the Bonifacio Trial House. All the representatives of NHCP stated that there is an annual checkup conducted on each of the historic museums.

The most important aspect to have sustainability when it comes to the cultural heritage site is the regular checking of the integrity of the structures which is applicable when it comes to tangible cultural heritage sites (Boccardi, 2015). The soundness test should be regularly done with a frequency of every five years to check for the integrity of the structure. Even though there is an annual checkup on the structure set by the NHCP, a regular soundness test should still be done.

The result also shows that there is a coordination between the NHCP and the local government of each of the location of the Historic Museum when it comes to disaster preparedness. Usually, this coordination between the NHCP and the local government is through drill participations, such as earthquake drills. This is one of the measures for disaster preparedness.

According to Dalisay and colleagues (2018), when it comes to disaster preparedness, one of the keys for disaster preparedness is an excellent coordination between the local government unit and the people in participating in disaster preparedness. In the case of the result, the coordination is between the government agencies and the employees of the NHCP as the people who participate on such drills, practicing good coordination between different stakeholders.

When it comes to the problems of the disaster preparedness of the historical museums, the respondents have varied points of view. However, the most important point of view could be that even if an institution is disaster prepared and a disaster occurred, the priority is not the property nor the cultural heritage sites but the lives of the people. Other issues presented here are the regular checkup needed to be conducted, such as the soundness check.

As mentioned by Ravankhah (2017), a challenge to cultural heritage disaster risk management was the lack of government support for these structures because some lawmakers either do not concentrate on cultural heritage or are less aware on the cultural importance of the heritage site's survival and disaster-resiliency.

In relation with the result, all of the respondents have agreed that the main factor to the disaster vulnerabilities of the cultural heritage site is the geography. The NHCP representatives stated that most of these historic museums are adjacent to a body of water, specifically a river, making them prone to natural disasters, especially flooding.

According to the Cavite Demographic Profile (2017), both Kawit and Maragondon towns are prone to flooding and ground shaking. Specially the town of Kawit, which has an extremely low elevation and acts as a catch basin when heavy rains pour. The flow of water is directed to the town of Kawit consequently making the town highly susceptible to flooding.

However, based on the result, there is no denying that historical museums are very significant because they are a part of history, culture, social identity. They provide both socio-cultural and historical value to the towns of Kawit and Maragondon; therefore, there is a need for these historical sites to survive in the future and that the future generation might enjoy.

Cultural heritage sites, as mentioned by GFDRR and World Bank Group (2017), are a crucial part of a community because they contribute to the richness of the culture and the history of the area. Hence, these cultural heritage sites must be conserved, restored, and protected, for they also provide a sense of unity among the community.

In relation with the result, in terms of the disaster preparedness of the historic museum, the NHCP representatives are convinced that the historic museums are disaster prepared due to the continuous restoration and modernization programs conducted by the NHCP along with the regular structural checks. Overall, these strategies indicate that the historic museums could be well disaster prepared.

In order for a cultural site to be disaster prepared there is a need for regular checking on the structural integrity and restoration as necessarily in order for a cultural heritage site to be more resilient when it comes to natural disaster. This statement means that the restoration and the modernization projects that was done by the NHCP certainly helps these historical sites to be disaster prepared (Jigyasu and colleagues, 2015).

In relation with the result, the major structural restoration and the modernization programs have been conducted recently. According to the respondents of the NHCP, these were conducted five years ago, and the restoration projects are mostly scheduled every five years, while minor structural damages are conducted regularly.

According to Ravankhah (2017) restoration projects for cultural heritage sites (tangible), such as historic museums, are usually expensive and takes a sustained time to finish. Five years is commonly the length of time it takes for restoration projects to be completed strictly followed by the NHCP to maintain and historic museums and make them more disaster resilient.

Lastly, the results on the importance of disaster preparedness for the historic museums revealed that all of the respondents stated that disaster preparedness for the historic museums is very important because such sites are old and have significant value to it. Moreover, historic museums should survive in the future for the future generations to enjoy and appreciate as part of the community.

Stressed by Azadeh (2015), disaster preparedness of cultural heritage sites is especially important because this could help minimize the negative effects in case a disaster happens. Furthermore, it is more costly to be reactive to the damages instead of proactively creating mitigating measures to prevent and be prepared for a disaster. Therefore, cultural heritage sites should pay attention to disaster preparedness and management.

Table 2: Disaster Preparedness on Flooding of the Historical Museums

Disaster Preparedness on Flooding		
Aguinaldo Shrine	**Gen. Baldomero Aguinaldo Shrine**	**Bonifacio Trial House**
The Aguinaldo Shrine is vulnerable to flooding because it is beside the Marulas River.	The Gen. Baldomero Aguinaldo Shrine very prone to flooding because it is and near the Imus River which is a major catch basin.	The Bonifacio Trial House is vulnerable to flooding because there is a river nearby the Maragondon River.
There are times that the high tide can cause water to overflow on some parts of the museum grounds.	There were times the site is flooded especially during high tide and strong rains. Sandbags are mitigation measures.	Luckily there has been no flooding on the Historic Museum.
Recently, thru the initiative of the LGU, the DPWH installed a riprap along the Marulas River to regulate the flow of water due to the changing tides.	The Government of Cavite has a project right now the Imus River flood control project.	There is no information regarding if the local government had a project on a flood control project on the Maragondon River.
Flooding can be prevented with proper mitigation plans from the government which will benefit the site.	Floods can be prevented as long as the flood control projects and implemented and completed.	Flooding can be prevented as long as there are government plans to mitigate flooding.
There is a monitoring on the low tide/high tide to make sure to close the valves inside the museum grounds to secure the flow of water.	Precautionary measures were monitoring of the water level especially during high tides, typhoons and strong rain.	There are no precautionary measures about flooding but there is a coordination with the local government in case of this kinds of disaster.

Table 2 shows the result on the disaster preparedness for flooding. The result shows that all the historic museums are very prone to flooding due to the close proximity of each historic site to a river leading the water to spread inland in case of natural calamities.

According to the Cavite Demographic Profile (2017), both the towns of Kawit and Maragondon, Cavite are prone to flooding, specially Kawit, Cavite. This town lies at a low elevation and acts as a catch basin for heavy rains; moreover, the river capacity exceeds because of the water flowing down from the upland towns to lowland towns such as Kawit, making it susceptible to flooding. Maragondon town, on the other hand, has Maragondon River that runs thru the town. However, not all Barangays in Maragondon are prone to flooding, only those in low elevation areas.

In relation with the result, two of the historic museums have been hit by flooding - those located in the town of Kawit. Mitigation plan for these includes adding sandbags to prevent the water from entering the historic museums.

It shows that flooding, as one of the natural disasters, is very prominent in the past decade due to the global warming which creates different typhoons due to warm weathers. In turn, cultural heritage sites, especially those located in tropical

countries, have been more susceptible to flooding, threatening the survival of those cultural heritage sites. Further, mitigation actions are somewhat not created for the long run and just offer band-aid solutions (UNDRR, 2019).

However, there have been different local government programs in flood control in the town of Kawit. These programs include the already constructed Marulas River riprap which controls the flow of water away from the historical site and prevents flooding on the site, and the Imus river flood control projects which will be finished this 2020 that will prevent the flooding in the area. Meanwhile, there is no program yet for Maragondon river flood control.

In the study conducted by Dalisay and colleagues (2018), government projects on disaster management is a crucial key in making a more disaster prepared and resilient sites as these government projects do not benefit only a few but also many from different stakeholders and cultural heritage sites as well.

The respondents also cited that flood can be preventable so long as there are government programs and constructions beneficial to the historical museums as well. The key factor to prevent flooding in these historical museums is the government programs.

Government programs are a key factor in determining the disaster vulnerabilities and disaster preparedness and management of a cultural heritage site. These government programs, if implemented correctly, will benefit the cultural heritage site in terms of disaster preparedness and disaster management (Jigyasu and colleagues, 2015).

In relation with the result, as according to the NHCP respondents interviewed, the key to have a precautionary measure for natural disasters, such as flooding, is the monitoring of the water level particularly for high and low tides and heavy rains, and coordination with the government in case of flooding.

As stressed by Dalisay and colleagues (2018), flooding can be prevented so long as the government projects and infrastructures to mitigate flooding problem are addressed properly. However, the most crucial factor is still monitoring of the said cultural heritage sites. Monitoring the situations before and after a disaster results to a possibility that the natural disaster damage be mitigated earlier.

Table 3: Disaster Preparedness on Ground Shaking of the Historic Museums

Disaster Preparedness on Ground Shaking		
Aguinaldo Shrine	**Gen. Baldomero Aguinaldo Shrine**	**Bonifacio Trial House**
The Aguinaldo Shrine is vulnerable to ground shaking because the structure is old with five levels.	The province of Cavite is prone to ground shaking adding the fact that the structure is very old.	The province of Cavite is prone to earthquakes where the Bonifacio Trial House was located.
Ground Shaking happens during constructions because of digging activities. Mitigations include requiring the use of smaller machines to reduce the big movements on the ground.	Ground Shaking happens, no strong earthquake yet, just small ones. Still, there is a check on the museum for cracks and possible damages.	There are times that ground shaking happened but not the strong earthquakes, but still there is a check if there are structural damages.
The NHCP has some preventive measures which is Regular structural monitoring.	There are earthquake drills that the NHCP participated to. Structural checks are regularly done.	The local government of Maragondon has a disaster preparedness plan when it comes to earthquakes like practicing earthquake drills.
Ground Shaking cannot be prevented, only preventive measures.	Earthquakes cannot be prevented.	Earthquake cannot be prevented because it does not warn, it just strikes.
The NHCP has a Disaster risk program in case an earthquake occurs.	Precautionary measures are done using regular structural checks.	There is an annual structural check that is done by the NHCP as the precautionary measure.

Table 3 shows the result on the disaster preparedness of the historic museums in terms of ground shaking. The result shows that all of the NHCP representative are aware that the area where the historic museums are located are prone to ground shaking (earthquake). The main reason here is geographic location.

As mentioned by the Cavite Demographic Profile (2017), the historic museums are prone to ground shaking because of the location of the province itself The location lies above the west valley fault and when an earthquake occurs, these historic museums become vulnerable, particularly because of the materials used in their structures and the age of the structure itself.

However, in experiencing ground shaking, there were instances in Aguinaldo Shrine that ground shaking is caused by construction with drilling. Meanwhile, other historic museums have experienced minor ground shaking and have not experienced any major ground shakings yet. On the ways to mitigate the ground shaking, the NHCP requires constructions near the Aguinaldo Shrine to use smaller equipment to prevent ground shaking. For the other two historic museums, structural checks were conducted.

According to Boccardi (2015), when it comes to cultural heritage sites, the most common reason of the destruction of such sites was ground shaking. Due to a limited technology that allows structures resistant to ground shaking, cultural heritage sites are seriously vulnerable.

In relation with the result, the local government of Kawit and Maragondon have some coordination when it comes to earthquake drills as disaster preparedness measures. However, the key here is the NHCP's precautionary measure of regularly checking the historical museums' structures.

According to Ravankhah (2017), when it comes to the disaster preventive measures and management, government agencies should create a program to raise awareness. Certain government bodies must conduct structural checks in cultural heritage sites since these sites are the most vulnerable to disasters such as ground shaking. Based on the results, the local government of Kawit and Maragondon conducted preventive measure in the form of earthquake drills, and the NHCP in the form of structural checks.

However, according to the respondents, natural disaster such as earthquakes cannot be prevented because earthquakes happen without warning. Therefore, it is the responsibility of the NHCP to make the historic museums resistant to ground shaking.

Since earthquakes are one of the major natural disasters that damage cultural heritage sites, earthquakes are unpreventable. However, the key here is to mitigate the impact of the earthquake; hence, one of the important mitigation factors is regular structural checks on cultural heritage site (Boccardi, 2015).

In relation with the result, the respondents stated that the NHCP has disaster risk programs to mitigate the damage of ground shaking through regular structural checks conducted annually.

As stressed by Azadeh and colleagues (2015), the government agencies are responsible in ensuring the disaster preparedness and disaster resiliency of a cultural heritage site. In the case of the research, the NHCP has fulfilled its job to ensure that the cultural heritage sites such as historic museums can manage their disaster vulnerabilities.

IV. CONLUSION AND RECOMMENDATION

Based on the result on the disaster preparedness, the respondents from the representatives of NHCP are aware that cultural heritage sites are vulnerable to natural disasters. The restoration projects and the soundness test conducted by the NHCP are the precautionary measures to ensure disaster preparedness. The soundness test has been done a long time ago, although there is an annual structural check up that was conducted by the NHCP. The NHCP have coordinated with the local government unit of Kawit and Maragondon when it comes to disaster preparedness. The problem of disaster management of the cultural heritage site is the disaster response and the soundness test frequency. The geographic feature of an area is the main reason of the vulnerabilities of the cultural heritage site. The cultural heritage site is socially important because it is a part of history, culture, and identity. According to the respondents, the historic museum is disaster prepared because of the continuous restoration and modernization projects. The most recent major restoration and modernization projects were done on the Aguinaldo Shrine in 2016, on Gen. Baldomero Aguinaldo Shrine in 2015, and on Bonifcaio Trial House in 2014, although minor repairs are conducted regularly. The disaster preparedness is important for historic museums because they are old, and they have significant historic value. In addition, they need to survive for the future as they are part of the community. The result on the disaster preparedness when it comes to flooding shows that all of the historic museums are vulnerable to flooding because of respective nearby rivers. Both of the historic museums in Kawit have experienced flooding. There are flood control projects both on the historic sites in Kawit, Cavite. Flood can be prevented so long as government plans and implements flood mitigation projects. Lastly, the precautionary measure that is crucial in preventing flood is the regular monitoring of the water level. The result on the disaster preparedness when it comes to ground shaking (earthquake) shows that the NHCP representatives are aware of the vulnerabilities of the historic museums to ground shaking. Ground shaking in Aguinaldo Shrine happens with huge constructions that use drills.

On the other hand, a historic museum did not experience strong earthquakes. Further, there is coordination from the local governments of Kawit and Maragondon on earthquake drills and the NHCP is responsible for structural checks. All of the respondents believe that ground shaking cannot be prevented but precautionary measures should be taken and that precautionary measure is the regular structural checks.

Based on the findings, the researchers conclude that NHCP is aware of the disaster vulnerabilities of the historic museums. The restoration projects and the soundness test were used as the precautionary measures; however, soundness test was not conducted again for a long time. There is a coordination between the NHCP and the local government for disaster preparedness. The issue is disaster response because historic museums are not considered priority and because of the geographic features that made the historic museums vulnerable. The historic museums are socially important because they are part of culture, history, and identity. The historic museums are disaster prepared due to restoration and modernization projects conducted roughly 5 years ago. Disaster preparedness is important because the historic museums are old and valued and as part of community. The historic museums are prone to flooding. While the local governments have created plans to mitigate flooding, floods can be prevented so long as government programs and regular monitoring of water level were implemented. Regular water-level monitoring is a key component in flood control. The historic museums are prone to ground shaking (earthquake). This reality could be due to construction. There is a coordination between the NHCP and the local government for disaster preparedness in ground shaking. Finally, Ground shaking cannot be prevented; hence, precautionary measures such as regular structural checks are conducted.

Based on the findings of the study, the researchers recommend the following to improve the disaster preparedness of the historic museums in Cavite, Philippines: Soundness Test on the Historic Museums must be conducted every 5 years. The Local Governments of Kawit and Maragondon should designate a staff for disaster preparedness on the historic museums. Public Awareness on the Importance of Historic Museums must be raised. And Feasibility studies on vulnerabilities and river capacity of the Maragondon River must be conducted.

OUTPUT

Based on the findings, the researchers have created an action plan that will improve the disaster preparedness of the historic museums. There are four objectives to improve the disaster preparedness of the historic museums. The first objective is to conduct a regular soundness test every 5 years. The second objective is for the local governments of Kawit and Maragondon to designate a staff for the disaster preparedness of the historic museums. The third objective is to raise public awareness on the importance of the historic museums. Finally, the fourth objective is to conduct feasibility studies on the vulnerabilities and river capacity of the Maragondon River. Substantially, these objectives will improve the disaster preparedness of the said historic sites.

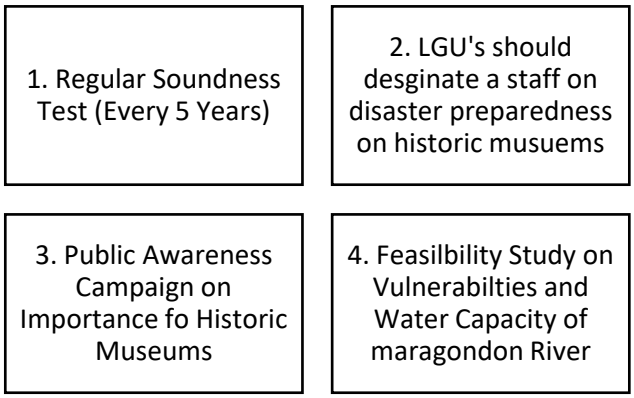

Figure 2: Objectives of the Output

The first objective of the study is to conduct a soundness test. The soundness test should be accomplished every five years This test will assess the historic museums' structure soundness and identify limes and magnesia oxide deposit which could significantly affect structure durability by causing cracks. This test will be done by the NHCP every 5 years and would probably cost around 10,000 Pesos.

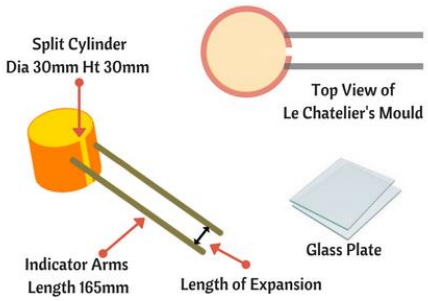

Figure 3: Soundness Test Apparatus (Photo adapted from: http://www.mocivilengineering.com/2020/02/soundness-test-for-cement.html)

The second objective is for the local governments of Kawit and Maragondon to designate a staff responsible for the disaster preparedness and management of the historic museums. This is particularly important to provide quick response in times of natural disaster. The local governement of Kawit and Maragondon would assign a staff to a special task of disaster preparedness for historic museums. This can be accomplished immediately improving the disaster preparedness of the historic museums with solidifying coordination between the local government and the NHCP.

The third objective of the study is to develop a public awareness program on the importance of the historic museums and of disaster preparedness. This can be done via collaboration between the NHCP, the Academe, and the local government. This system will provide lectures, especially in secondary schools, to raise awareness on the importance of historic museums and the disaster preparedness. This can be accomplished within three (3) days and would probably cost around 20,000 Pesos.

Figure 4: Public Awareness Campaign on Disaster Risk Management for Cultural Heritage Site (Photo adapted from: http://www.seameo-spafa.org)

The final objective of the study is to conduct a feasibility study on the vulnerabilities and water capacity of the Maragondon River. This can be done through a collaboration between a reputable tertiary institution and the local government to investigate if flooding in the Maragondon river will be extreme. In addition, this will also determine the water capacity in case of strong rains. Finally, this objective can develop measures in reducing flooding. Further, this will serve as basis for preliminary information in implementing projects that will mitigate the flooding in the Maragondon River. The proposed study will be conducted in a span of 1 year, and would probably cost around 100,000 Pesos.

Figure 5: Maragondon River (Photo adapted from: Explora.ph)

Table 4: Roadmap of Activities

Activity	Time Frame	Implementing Body	Result	Cost
Soundness Test	Every 5 years	NHCP	Improve disaster preparedness because there is additional structural check method.	10,000 Pesos
Designate a Staff that will be responsible for the disaster preparedness of historic museums.	TBA	Local Government of Kawit and Maragondon, Cavite	There will be better response when it comes to disaster management because a staff is designated to it.	N/A
Public Awareness on importance of Historic Museums	3 days	Academe (Secondary Schools), Local Government of Kawit and Maragondon and NHCP	The new generation will be aware of the importance of the historic museums then help to preserve and conserve the historic museum.	20,000 Pesos
Feasibility study on vulnerabilities and water capacity of Maragondon River	1 year	Academe (Tertiary Institution), Local Governemnt of Maragondon	Will Serve as a preliminary information in implementing projects that will mitigate the flooding in the Maragondon River	100,000 Pesos

REFERENCES

[1] Azadeh, V., G. Philip, and R. Jennings. 2015. Damage Assessment and Monitoring of Cultural Heritage Places in a Disaster and Post-Disaster Event: A Case Study of Syria." Durham University, Moores University.

[2] Boccardi, G. (2015). From mitigation to adaptation: A new heritage paradigm for the Anthropocene. In M. Albert (Ed.), Perceptions of sustainability in heritage studies. Berlin/Boston: De Gruyter

[3] Cavite Ecological Profile (2017). Retrieved from the Provincial Government of Cavite.

[4] Dalisay, Soledad and Landicho Madeline (2018). Intangible Cultural Heritage for Disaster Preparedness, Recovery and Resiliency against natural hazards in a community in San Nicolas, Batangas, Philippines. International Research Centre for Intangible Cultural Heritage in Asia Pacific Region (IRCI)

[5] GFDRR and World Bank Group (2017). Promoting Disaster Resilient Cultural Heritage. Retrieved from: http://documents.worldbank.org/curated/en/696061511882383371/pdf/121709-WP-P161985-PUBLIC-DisasterResilientCulturalHeritageKnowledgeNoteENWEB.pdf

[6] Jigyasu, Rohit & Marrion, Christopher & Poletto, Davide & Scalet, Mario & Cavinato, Gian Paolo & Cosentino, Giuseppe & Dimo, Arian & Duni, Llambro & Moscatelli, Massimiliano & Pagliaroli, Alessandro & Pojani, Iris & Qilla, Erjona & Simionato, Maurizio & Xhelaj, Admir. (2015). Disaster Risk Management of Cultural Heritage Sites in Albania. 10.13140/RG.2.1.4194.0009.

[7] Ravankhah M., Chmutina K., Schmidt M., Bosher L. (2017) Integration of Cultural Heritage into Disaster Risk Management: Challenges and Opportunities for Increased Disaster Resilience. In: Albert MT., Bandarin F., Pereira Roders A. (eds) Going Beyond. Heritage Studies. Springer, Cham

[8] Rey, Aika (2015). RA 10121: The PH's disaster management law is up for review retrieve from: https://www. rappler.com/move-ph/issues/disasters/knowledge-base/93941-drrm-act-2010-review.

[9] UNDRR (2019). UNDRR Work programme 2020-2021 https://www.preventionweb.net/files/68235_undrrwork programme20202021.pdf

[10] WCPT (2016), What is disaster management? Retrieved from: https://www.wcpt.org/disaster-management/what-is-disaster-management

[11] WVI (2019), What is disaster management? Retrieved from https://www.wvi.org/disaster-management/what-disaster-management