

# ICRP

---

# 2018

---

## PROCEEDING OF 3<sup>rd</sup> INTERNATIONAL CONFERENCE ON REBUILDING PLACE (ICRP) 2018

*Towards Safe Cities & Resilient Communities*

**13 & 14 SEPTEMBER 2018**  
**IMPIANA HOTEL, IPOH, PERAK**

**ORGANIZED BY :**



UNIVERSITI  
TEKNOLOGI  
MARA

**F|S|P|U**  
Fakulti Senibina, Perancangan & Ukur  
Faculty of Architecture, Planning & Surveying

<https://icrp2018.wixsite.com/icrp18>

# PROCEEDING OF ICRP 2018

## 3<sup>rd</sup> INTERNATIONAL CONFERENCE ON REBUILDING PLACE (ICRP) 2018



UNIVERSITI  
TEKNOLOGI  
MARA



USM  
UNIVERSITI SAINS MALAYSIA

APEX™



京都工芸繊維大学  
KYOTO INSTITUTE OF TECHNOLOGY



GRESAFE\_CITIES  
Green Safe Cities, Research Interest Group



Malaysian Institute of Planners

*Towards Safe Cities & Resilient Communities*  
13 & 14 SEPTEMBER 2018 | IMPIANA HOTEL, IPOH, PERAK

eISBN 978-967-5741-63-0

### **COPYRIGHT**

Faculty of Architecture Planning and Surveying

### **ORGANIZED BY**

Faculty of Architecture Planning and Surveying  
Universiti Teknologi MARA, Perak Branch  
Seri Iskandar Campus,  
32610, Seri Iskandar,  
Perak Darul Ridzuan, MALAYSIA

ICRP2018  
3rd International Conference on Rebuilding Place

13-14 September 2018  
ISBN 978-967-5741-62-3 eISBN 978-967-5741-63-0

# HOW TO SAVE IT AND HOW IT SAVES US: BUILT HERITAGE AND DISASTER

Erna Meutia<sup>1\*</sup>, Cut Dewi<sup>2</sup>, Izziah<sup>3</sup>, Muhammad Saleh<sup>4</sup>

<sup>1, 2, 3</sup> Architecture Department, Engineering Faculty, Universitas Syiah Kuala, Indonesia

<sup>4</sup> Law and Society Department, Law Faculty, Universitas Syiah Kuala, Indonesia

Email of corresponding author \*: ernameutia@unsyiah.ac.id

**Abstract** -Banda Aceh is the capital of Aceh province that is located on the north end of Sumatra, Indonesia. As one of the cities lies above the Indo-Australia tectonic plate, on December 26, 2004, a tectonic earthquake with magnitude of 9.2 scales Richter caused tsunami waves, which caused destruction of the whole town. The connection between cultural heritage and disaster has always being linked with cultural heritage, which is seen as a burden and something that has to be protected. Protecting the cultural heritage from destruction such as from disaster has always been associated with the continuity of the society's identity. However, the cultural heritage is not always a passive victim in a disaster, cultural heritage can also play an active role in giving power and helping people to rise from difficult times after a disaster. This study is part of the whole project of mapping and zoning built-heritage in Banda Aceh by using a digital humanities approach combining several methods such as mapping, GIS, interview, and participant observation. In this paper we present a partial finding of interview with 252 repondents in Banda Aceh about their perception of heritage and their stories of heiritage and disaster. The goal of this study isto understand how cultural and disaster protection are linkedin the perspective of cultural heritage as active agents.

**Keywords** - Tsunami, Cultural Heritage, Active Agent

## 1 BACKGROUND

Indonesia is one of the countries that often experience disaster that is caused by natural and non-natural factors. Indonesia lies geographically at the confluence of four tectonic plates of the Eurasian plate, the Indo-Australian plate, and the pacific plate. These tectonic plates are known as the ring of fire; the meeting of each plate can cause an earthquake. This plate encounters lanes which are under the sea, thus, a large earthquake with shallow depths can potentially become the main cause of tsunami.

Banda Aceh is the capital of Aceh province, located on the north end of Sumatra, Indonesia. As one of the cities lies above the Indo-Australia tectonic plate, on December 26, 2004, a tectonic earthquake with magnitude of 9.2 scales Richter caused tsunami waves that had destruction to the whole town.

Based on the massive earthquake and tsunami of Aceh in 2004, some researchers suspected the massive ancient earthquake and tsunami that occurred in Aceh has some effects to 2004 earthquake. Pale seismologist research has successfully revealed that the earthquake-tsunami disaster that occurred in Aceh in the past, around the year 1390 AD and 1450 AD (Hilman, 2015) has some effects to 2004 earthquake. The events of tsunami during the 1450s indicate the occurrence of a massive earthquake and tsunami marked by the disappearance of the Pasai Ocean Kingdom (Hilman, 2015). This has also been explained by Lombard, on his way to Aceh, describing a city that is geographically unfavorable, locating below the surface of the sea, often experiencing flood and has swampy areas. In addition to the unfavorable natural conditions and floods, Aceh also often experienced earthquakes (Lombard, 1991). Some of the travelers who took a trip to Aceh, namely Beaulieu who visited Aceh around 1620-1630 stated there has been a big earthquake that occurs three to four times a year. In addition to the earthquake, flooding also occurred repeatedly. Beaulieu recorded a major earthquake that occurred on March 7, 1621 and had caused panic (Lombard, 1991).

The long-term history of disaster has led to a change in the center of Kota Banda Aceh (Lombard, 1991; Kamal, 2008). Based on the history of Banda Aceh, which was divided into 4 most prominent periods that has caused changes in the history of the architecture of Banda Aceh, the Islamic period, the period of Tamaddun Islam, the Colonial period and the Postcolonial period (Kamal, 2008). This can be seen from the traces of the cultural heritage in Banda Aceh. However, the physical evidence of history cannot be found in urban spaces. This may be due to damaged or lost due to disasters, wars, conflicts, new developments and other natural processes of destruction (Kamal, 2008). In addition to these historical buildings, Banda Aceh is also known for other historic sites that are important, interesting and have unique backgrounds.

All along, the relation between cultural heritage and disaster is constantly linked with cultural heritage as a burden and something that must be saved. Of course, saving the cultural heritage is very important for the continuity of the society identity itself. But the cultural heritage is not always a passive victim in a disaster, cultural heritage can play an active role in giving power and helping people to rise from difficult times after a disaster. According to Rico (2014), the cultural heritage is a witness of the history of a great occurrence. After the 2004 Tsunami, Banda Aceh's presence as a disaster-prone area was the concern of many parties. This was reflected by the increasing research on tsunami disaster and the possibility of occurrence.

Based on the explanation above, this study aims to examine on how people's perceptions of the relationships between cultural heritage building and disasters. This study discussed how a cultural heritage building can become an active agent in disaster, especially the 2004 Tsunami Disaster in Banda Aceh.

## 2 LITERATURE REVIEW

### 2.2 Post-disaster Cultural Heritage in the city of Banda Aceh

As mentioned above, geographically, Banda Aceh is one of the main cities in disaster prone areas such as earthquakes, tsunamis, floods, and others. As the historical record of a traveler who came there was at least some disasters that were recorded (Lombard, 1991). Disaster history whose traces can be seen from the heritage of the Banda Aceh City heritage has led to a physical changes in the city center of Banda Aceh (Lombard, 1991 and Arif, 2008).

As an old city, which has been standing for more than 800 years, Banda Aceh has a long history. Banda Aceh is known as the center of the largest Islamic empire in Southeast Asia, so it has an important role in the history of spreading Islam. However, there is not much historical physical evidence that are found in urban spaces which are thought to be damaged or lost due to disasters, wars, conflicts, and new developments, and other natural damage processes (Arif, 2008). The 2004 Tsunami disaster has caused more severe damage to the cultural heritage; it is also believed that an ancient tsunami has caused the change and displacement of kingdom (Hilman, 2015).

So far, the inventory of Cultural Heritage Buildings in Banda Aceh has been carried out by the Culture and Tourism Office who issued "List of Sub-District Sites in Banda Aceh City in 2013", *Badan Pelelarian Cagar Budaya* issued "List of Historical and Ancient Relics that have been Defined as Protected Cultural Heritage Law No. 5 of 1992 concerns Cultural Heritage Objects, while Law No. 11 of 2010 concerns Cultural Heritage. As of December 31, 2012", Aceh Heritage Community has also published their list and Unsyiah Architecture Department has also conducted research and inventory of cultural heritage buildings in Banda Aceh in year 2012 in collaboration with the Culture and Tourism Office. The process involved the identification of cultural heritage in Banda Aceh into three basic periods, the pre-colonial, post-colonial, and post-tsunami periods and recommends that protection is needed for this cultural heritage. Below are the location of built-heritage in Banda Aceh.

Among the relics of the historical sites of the kingdom of Aceh Darussalam are historic buildings that have high architectural values like the Baiturrahman Grand Mosque which is a religious symbol, courage and the nationalism of the Acehnese as well as center for religious education in archipelago during Sultan Iskandar Muda's reign. Other buildings inherited from the kingdom of Aceh Darussalam which also has historical values are Gunongan and Pinto Khop which were

initially located near the Aceh Keraton and was built by Sultan Iskandar Muda around the 16th century. During the Dutch colonialism between the end of 19th Century to early 20th Century, this keraton was destroyed and the Dutch rebuilt a new building called pendopo Governour (the Dutch Governor's residence). These sites along with the family and the kings of the Aceh Darussalam Sultanate's graveyard complex, the graves of Acehnese clerics, the tombs of the Gampong Pande kings, the ancient tombs, Kerkhoff burial complex, which is the burial site of 2200 Dutch soldiers, and the Dutch Governor's residence, have survived several catastrophic events of war, conflict, new development, and other natural damage processes that occurred in the city of Banda Aceh.

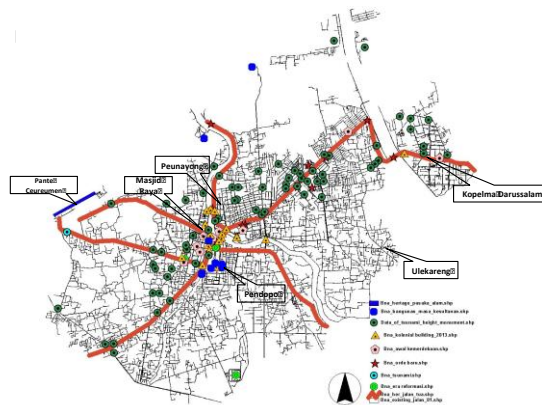


Figure 1 Spreading Point of Cultural Heritage buildings in Banda Aceh

In addition to these historic buildings, the city of Banda Aceh also has many other historical sites with important, interesting and unique to disaster. The occurrence of the 2004 tsunami has left a number of historical traces that have emerged naturally and artificially. A study conducted by Rico (2014), a larger vessel, the Floating PLTD in Punge Blang Cut, and a smaller fishing boat in Lampulo, standing permanently on the second floor of a house, are among real traces of tsunami. There was hope that the remaining tsunami boats in 2006 could be nominated to achieve World Heritage List status. The PLTD Apung was brought from Kalimantan and used as an electricity generator to supply Aceh from the port of Ulee Lheue, the trip ended unexpectedly about 4 km to the mainland from the place it was moored. In 2007, there was a discussion about returning it to the sea, but in mid-2008, a decision to build a Tsunami Education Park on the land adjacent to the ship was made. Additionally, tours are offered on the deck of the ship, from where the entire city can be observed. The smaller of the famous boats have landed at the second level of a house in Lampulo. The current position of the ship is a real symbol of the great strength of the tsunami wave. The boat saved 59 people in this incident. These sites were changed to the destination of tourists and tsunami visitors. In 2009, both ships showed the effects of an authentic and unforgiving weather that is the characteristics of Sumatra.



Figure 2 PLTD Apung and Museum Tsunami Aceh

Museum Tsunami which has become one of the tsunami tourism buildings appeared in the aftermath of the disaster. This Tsunami Museum was designed by architect Ridwan Kamil through the

Aceh Tsunami Museum Competition held by the Aceh Rehabilitation and Reconstruction Agency (BRR) in cooperation with the Aceh government and IAI Aceh in 2007.

Each of cultural heritage has its own characteristics that have the potential to be superior, but has not been managed in an integrated manner so that it can be a source of reference for disaster (Rahardjo, 2013). Therefore a special approach is needed for the rebuilding of areas and buildings of cultural heritage in disaster-prone areas (Dewi, 2017). This shows that the management of cultural heritage is important for people living in disaster-prone areas.

To save Banda Aceh's cultural assets that are still lagging behind in the form of cultural heritage buildings as well as to protect and revive the public memory of areas that have played an important role in the history of the city of Banda Aceh is important during the process of disaster mitigation.

### **2.3 Role of Cultural Heritage as an Active Agent in Disaster**

From several studies on the role of cultural heritage buildings after the 2004 Tsunami disaster, it was found that cultural heritage objects have an important and active role in the emergency, reconstruction, and following periods. Cultural heritage buildings are not only passive victims who are waiting to be saved, but are one of the active agents that help the community to survive (Dewi, 2017; Rico, 2014; and Dewi and Rauzi, 2018).

The community considers Masjid Raya Baiturrahman to have an important role for survivors to survive because it has served as a refuge and decision-making places during the reconstruction period (Dewi, 2017). In addition, Masjid Raya Baiturrahman has helped create resilience in the community. The community interprets religious buildings as shelters for rescuers in times of disaster, and as a sense of security during critical times. Mosques are significant in the post-tsunami Aceh context. For example Mc Coughney (2017) quoted one of Banda Aceh's residents' expression, "Take a look at UleeLheue Mosque ... as we can see it still stood up [in the tsunami] while the surrounding buildings were smashed to pieces." Many residents expressed both practical and spiritual reasons that the mosques are attractive for evacuation; in the words of one resident: "I am not sure that the building is strong enough. It might collapse, if it is God's will. So, I will go to the mosque first, go together with others. We can read the Quran there." In the words of another resident, "God knows everything, the people inside of [the mosque], maybe will be saved as well, because there were many mosques that survived the disaster". This expression clearly expresses the role of cultural heritage, especially mosque, as place of refuge during disaster.

Therefore, according to Rico (2014), the study of post-disaster heritage has dimmed the association of heritage as an endangered species and more emphasis on factors of heritage management which covers a much more productive line of inquiry. Furthermore, heritage at risk management has to pay attention to formalization of local ideas and networks.

It then remains to be further discussed whether heritage can ever be constructed separately from its state of ongoing and inevitable decay, considering the mobility of heritage value as it is able to migrate in and out of a state of tangibility.

## **3 METHODS**

This study is part of the whole research project using a digital humanities approach by combining several methods mapping, GIS, interview, and participant observation. The combination of the method provides social and cultural context as well as spatial understanding of the relationship between cultural heritage and society. In this paper we present partial data of the real study and the focus was to understand how cultural and disaster protection are linked in the perspective of cultural heritage as active agents. It is necessary to explore the perceptions of communities about cultural heritage and their relationship to disasters. The number of interviews has been conducted with 252 respondents. Besides gaining basic information such as age, occupation, ethnic group, and education, we asked several main questions such as: What is a cultural heritage in Banda Aceh?, and Why do they to them as heritage? What is the meaning (function) of the cultural heritage related to disaster? Data analysis is done by coding or grouping the results of interviews conducted into several

categories. The results of this analysis showed how the community's own understanding of cultural heritage in the context of tangible objects and how cultural heritage can play an active role as an instrument that is able to withstand the tsunami

#### 4 RESULTS AND DISCUSSION

The distribution of the sample is illustrated in Table 1. The majority of the respondents were dominated by women and students between 18 to 24 years old. Most of them have lived in the city more than five years. The detail of data is shown below:

Table 1 Summary of Data

Item	Evacuation Building	Memory	Disaster Mitigation	Ruin Old Cultural Heritage	Emerging New Cultural Heritage	Local Wisdom	Do Not Know
<b>Sex</b>							
Female	20	14	25	3	2		73
Male	19	12	22	6	1	2	53
Total	39	26	47	9	3	2	126
<b>Age</b>							
<17		1	2				5
18-24	19	12	28	5	3	2	55
25-34	10	5	12	1			32
35-44	7	3	4	1			23
45-54	1	4	1	1			10
55-64	2	2	2	1			6
>65							
<b>Duration in Banda Aceh</b>							
<5	11	7	18	3	2	2	53
5-9	8	6	11	2	1		20
10-15	5	1	4				11
16-20	3	3	3				15
21-25	2	3	2	2			11
>25	10	6	9	2			16

From the results of data processing Table 1 shows that people's understanding of cultural heritage objects are: Rumah Aceh, Masjid Raya Baiturrahman, Pendopo, Pintu Khop, natural cultural heritage: Blangpadang, Gampoeng Pande, fortresses, tombs, and also tsunami cultural heritage: floating PLTD ships and Aceh Tsunami Museum.

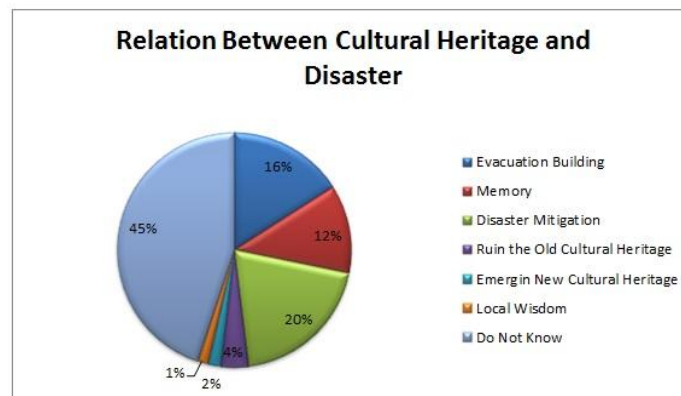


Figure 4 Relation between Cultural Heritage and Disaster



24% respondents stated that Rumoh Aceh is a cultural heritage object that contains historical value and needs to be protected. Aceh Traditional House is a wooden house in the form of a stage, erected on a number of round poles that are placed on a stone foundation, and the connection between the pillars and not rigid beams is the main factor that the building is able to anticipate earthquake loads (Meutia, 2016).

Based on the cultural heritage and disaster relations, 49.0% out of the 252 respondents did not see any relation between cultural heritage and disaster. This perception has two possibilities. Firstly, not all interviewees were in Banda Aceh when the tsunami strikes because in the set of questionnaire there is no statement which informs the duration of stay in Banda Aceh as criteria. Secondly, the lack of public knowledge on the role of cultural heritage on disaster. Cultural heritage is referred to as an object that is old and is vulnerable and does not have the ability to withstand a disaster. This object will be damaged and lost due to disaster. People still see cultural heritage buildings as victims of great natural events that can kill and eliminate not only these objects but even human lives. However, 21.7% and 17.4% of the total number of people were interviewed, they reported that they view cultural heritage and disaster relations as rescue building as well as disaster mitigation. The ability to understand cultural heritage as an agent of change to disaster, will be able to save the building from disaster. The community believe that building provide them security during the post-disaster period. Here are some examples from the interviews expressed by the respondents in relation to cultural heritage and disasters.

(Male\_Bachelor\_Student\_Acehnese)

Rumoh Aceh tends to be made high and the design of the building is made of wood because we know that in Banda Aceh there were frequent earthquakes or catastrophic disasters, actually the Aceh house was made resistant to disasters such as floods

(Male\_Bachelor\_Student\_Javanese)

Cultural heritage has a role in disaster because in the cultural heritage can also tell about past disasters, if we look at ourselves, Aceh has a distinctive house shape that characterizes the house that was built to avoid earthquakes, floods and animals so the point is that cultural heritage is one of the ways humans protect themselves from nature.

Cultural heritage as an object has memories of past events such as the great power of a leader of the region and also memories of grief in the 2004 tsunami event. There are very few respondents who viewed cultural heritage and disaster as related. However, the emergence of new heritage, such as a floating PLTD ship weighing 5000 tons which function as a power plant ship in the city of Banda Aceh crossing up to 4 km from its moorings in ulheu-lheu and stopping in the middle of community housing during the 2004 Aceh earthquake and tsunami and other tsunami heritage, has created new awareness on the relation between heritage and disaster. These tsunami debris have more intangible and important values for community to remind them of the tragic event.

In addition, this phenomenal ship had saved tsunami victims from disaster malignancy (Kamal, 2008). Not only the floating ships as witnesses of a major event, the tsunami memorial as a building built after the tsunami by the Reconstruction and Rehabilitation Agency (BRR), an official government institution formed to handle the post-disaster recovery process were also named as new cultural heritage. The community claimed the Tsunami memorial represented in the form of a building that kept memories of tsunami events as objects. These objects are silent witnesses to the tsunami, such as post-tsunami photos, documentary videos which were recorded by the community at the time of the incident. Theoretically, a museum is a building where objects of historical, scientific, or artistic interest are kept; museum can also mean a building where people can go to view works of art or objects of interest to science or history. Below are example from the interviews expressed by the respondents in relation to cultural heritage and disasters as the emergence of new cultural heritage.



(Female\_Bachelor\_AdministrationEmployee\_Chinese-Acehnese)

If it is linked to the disaster, it is loss for our cultural heritage, for example, yesterday's tsunami, many monuments have been lost or it could have caused a new cultural preservation like for example, the PLTD has become a cultural reserve for us, so is the house with a boat, from that disaster another cultural heritage can emerge.

(Female\_Bachelor\_Student\_Acehnese)

Like the Tsunami Museum, there was a disaster in the past and became a tourist object in Banda Aceh.

The rebuilding of the cultural heritage building after the tsunami must also fulfill the needs of the community. Therefore, immediate action to restore the function of architectural inheritance, especially those related to daily activities (communal) such as mosques, meunasah, and others is necessary. This is the center for the people of Aceh after the tsunami. Thus, reconstructing or restoring architectural heritage buildings traditionally damaged is deemed important. Unlike the case with the experts in heritage studies determining the construction of architectural heritage after an extraordinary disaster is the potential to reduce resilience. For example, the idea of returning architectural inheritance in its original form, so that it is possibly delay reconstruction and gains a lot of resources different based on what people want. People, especially in Banda Aceh, really value the authenticity of use or function; not material (Dewi, 2017).

## 5 CONCLUSION

The city of Banda Aceh holds many historical sites, which are important, interesting and have unique background. Currently, the connection between cultural heritage and disaster have always been associated with cultural heritage and is referred to burden and must be saved. But the cultural heritage is not always a passive victim in disaster, cultural heritage can play an active role in giving strength and helping people to rise from adversity after a disaster. The understanding of the community through the respondents has revealed that the Aceh Rumoh and the Grand Mosque as a cultural heritage building are able to become a shelter for victims in the disaster.

## 6 ACKNOWLEDGEMENT

We would like to thank Syiah Kuala University for granting support through Penelitian Unggulan Unsyiah (PUU)/ Unsyiah Priority Research Scheme 2018.

## REFERENCES

- Arif, K. A., Muhammad, D., & Endarmoko, E. (2008). *Ragam citra kota Banda Aceh: Interpretasi sejarah, memori kolektif dan arketipe arsitekturnya*. Bandung: Pustaka Bustanussalatin.
- David, Matthew and Carole D Sutton (2010), *Social Research: An Introduction*, Sage Publication, Los Angeles
- Dewi, C. (2017). *Rethinking architectural heritage conservation in post-disaster context*, *International Journal of Heritage Studies*, Vol 23, No 6, p.587-600
- Dewi C, Rauzi E N (2017) *Architectural heritage in post-disaster society: a tool for resilience in Banda Aceh after the 2004 tsunami disaster* The 7th AIC-ICMR on Sciences and Engineering 2017 IOP Conf. Series: Materials Science and Engineering 352 (2018) 012063 doi:10.1088/1757-899X/352/1/012063
- Lombard D (1991). *Kerajaan Aceh :Jaman Sultan Iskandar Muda (1607 -1636)*, Jakarta : Balai Pustaka
- McCaughy J W, Mundir I, Daly P, Mahdi S and Patt A 2017 *trust and distrust of tsunami vertical evacuation buildings: Extending protection motivation theory to examine choices under social influence* *International Journal of Disaster Risk Reduction* 24462-473
- Meutia E (2016) *Pemetaan Sistem Struktur Konstruksi Rumah Tradisional Aceh Dalam Merespon*

- Gempa, Prosiding Kearifan Lokal Dalam Arsitektur Seminar Nasional 2016*, ISBN 978-602-73691-0-8 Departemen Arsitektur Fakultas Teknik, Universitas Sumatera Utara, Medan
- NatawidjajaHilman 2015 *Siklus Mega-Tsunami Di Wilayah Aceh-Andaman Dalam Konteks Sejarah Mega-Tsunami Cycles Aceh Andaman Region In Historical Context* DannyPusatPenelitian GeoteknologiLipi, ISSN 0125-9849, e-ISSN 2354-6638 *Ris.Geo.Tam* Vol. 25, No.1, Juni 2015 (49 - 62) DOI: 10.14203/risetgeotam2015.v25.107
- Rahardjo, Supratikno (2013), *BeberapaPermasalahanPelestarianKawasanCagarBudaya Dan StrategiSolusinya*, *JurnalKonservasiCagarBudaya Borobudur*, Volume 7, Nomor 2, Desember 2013, pp. 4-17
- Rico, T(2014)*The limits of a 'heritage at risk' framework: The construction of post-disaster Journal of Social Archaeology published* DOI: 10.1177/1469605314527192