

ACEH ARCHIVE FOR DISASTER RISK REDUCTION

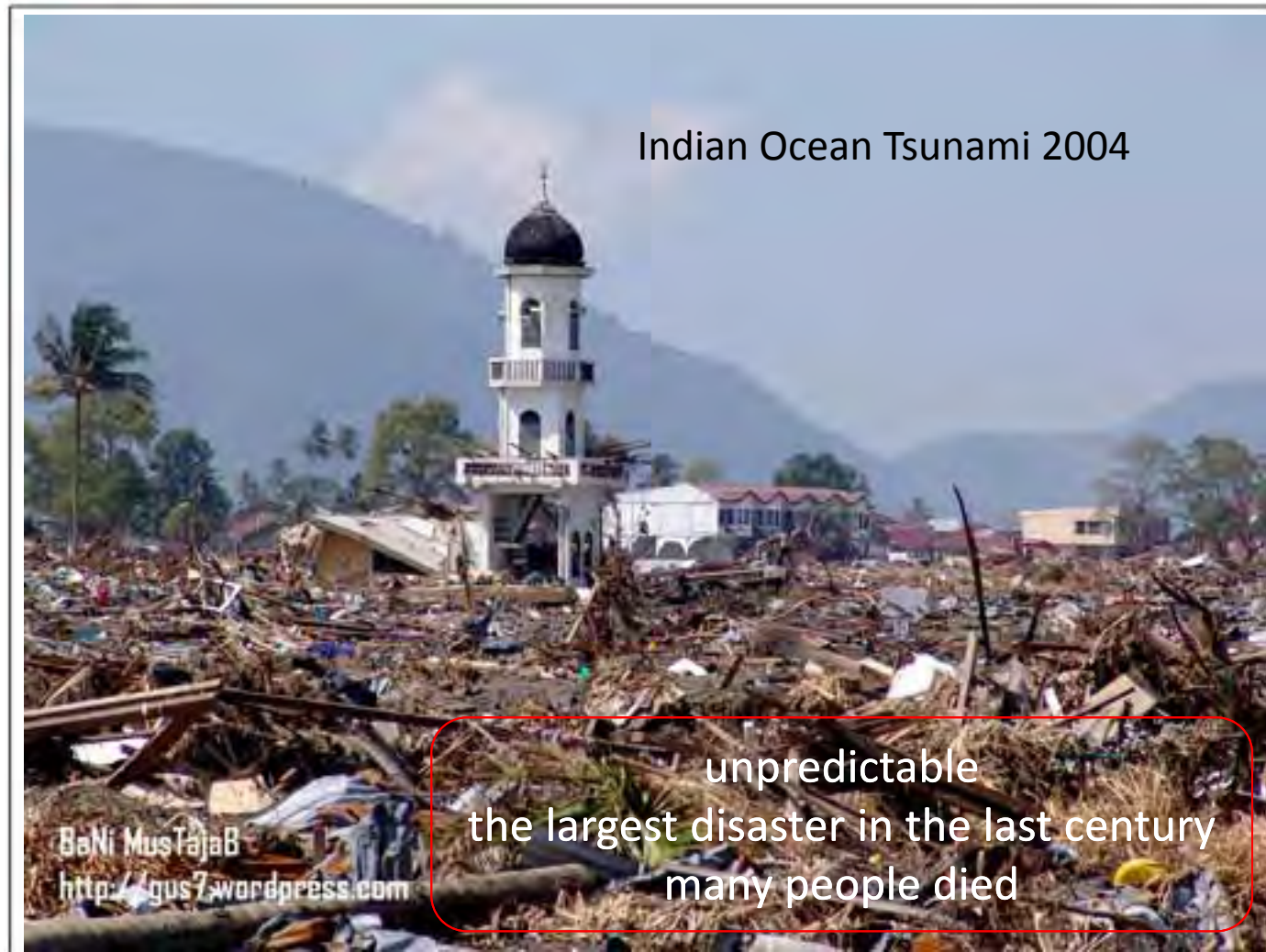
Nurjanah – Ichiko T. – H. Watanave
TOKYO METROPOLITAN UNIVERSITY

Japan Digital Archive Conference, March 9-10, 2018

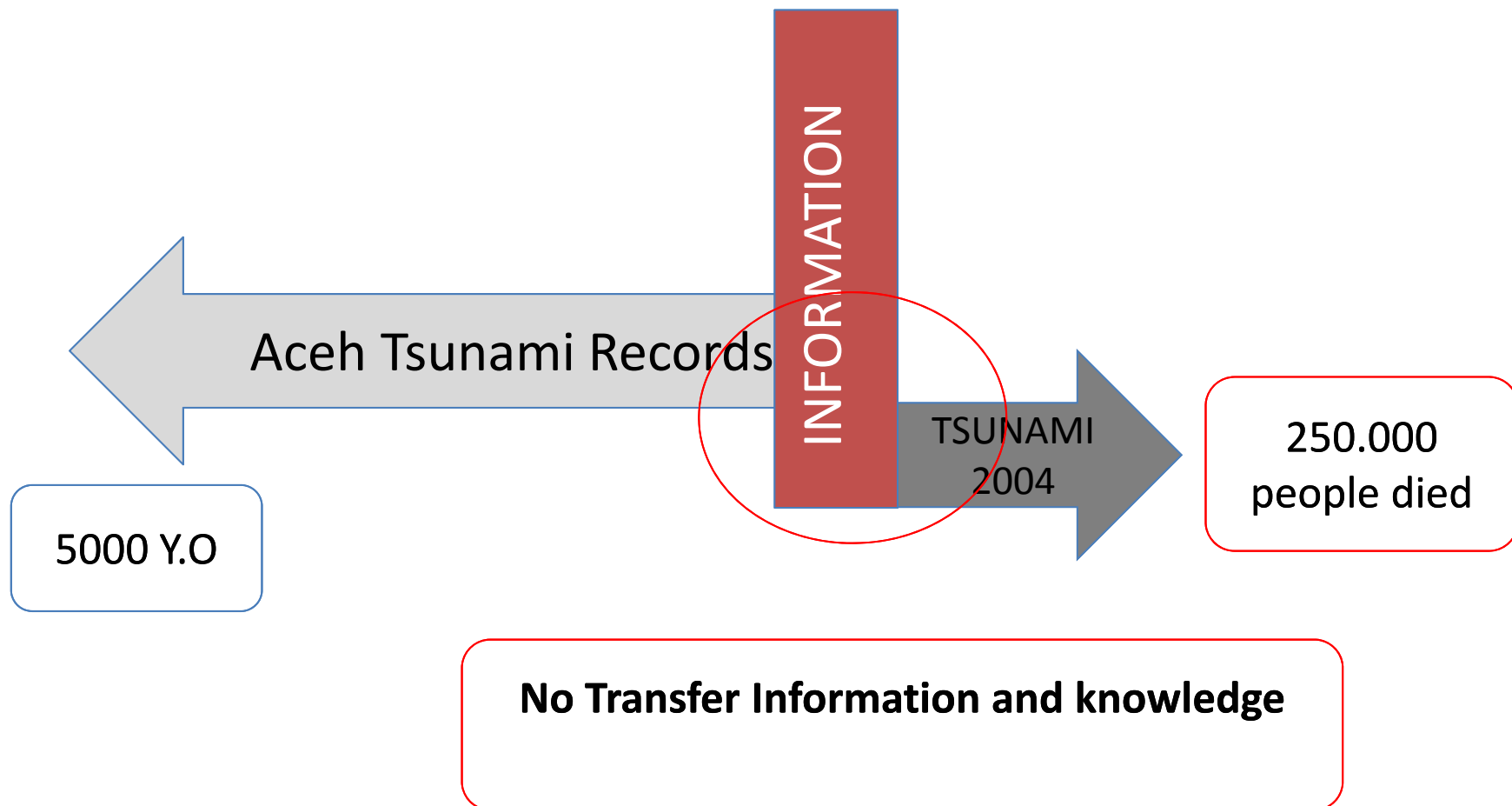


ABOUT THE STUDY

i. Background



Gap information from past disaster



ii. General Objectives

(1) **to collect multimedia data** related to pre- and post-tsunami Aceh 2004;

(2) **to transform** those data onto a **user-friendly visual open-source data platform**, to display **attractively** multimedia for **young generation**

(3) to build local **community for continuing DRR** activities and sharing **global information**.

iii. Related & Previous Study

PREVIOUS STUDY

NURJANAH et al, 2013
Aceh Paleotsunami
Reconstruction by Tsunami
Deposit Sediment and Local
Wisdom for Disaster Risk
Reduction

WATANAVE et al, 2011
Nagasaki Archive: Plural Digital
Archives That Urges
Multiponged, Overall
Understanding about Archive
Event

BACKGR

COMBINATION:

Visualization data in
the same ground,
with the flat
interface for all
material such as
testimonies, maps
and pictures,
Especially perform
3D data including
landscape

UP INFORMATION OF THE PAST DISASTER

RELATED

Taro Ichiko, 2011:
**Collaboration between
community needed** for
disaster prevention.

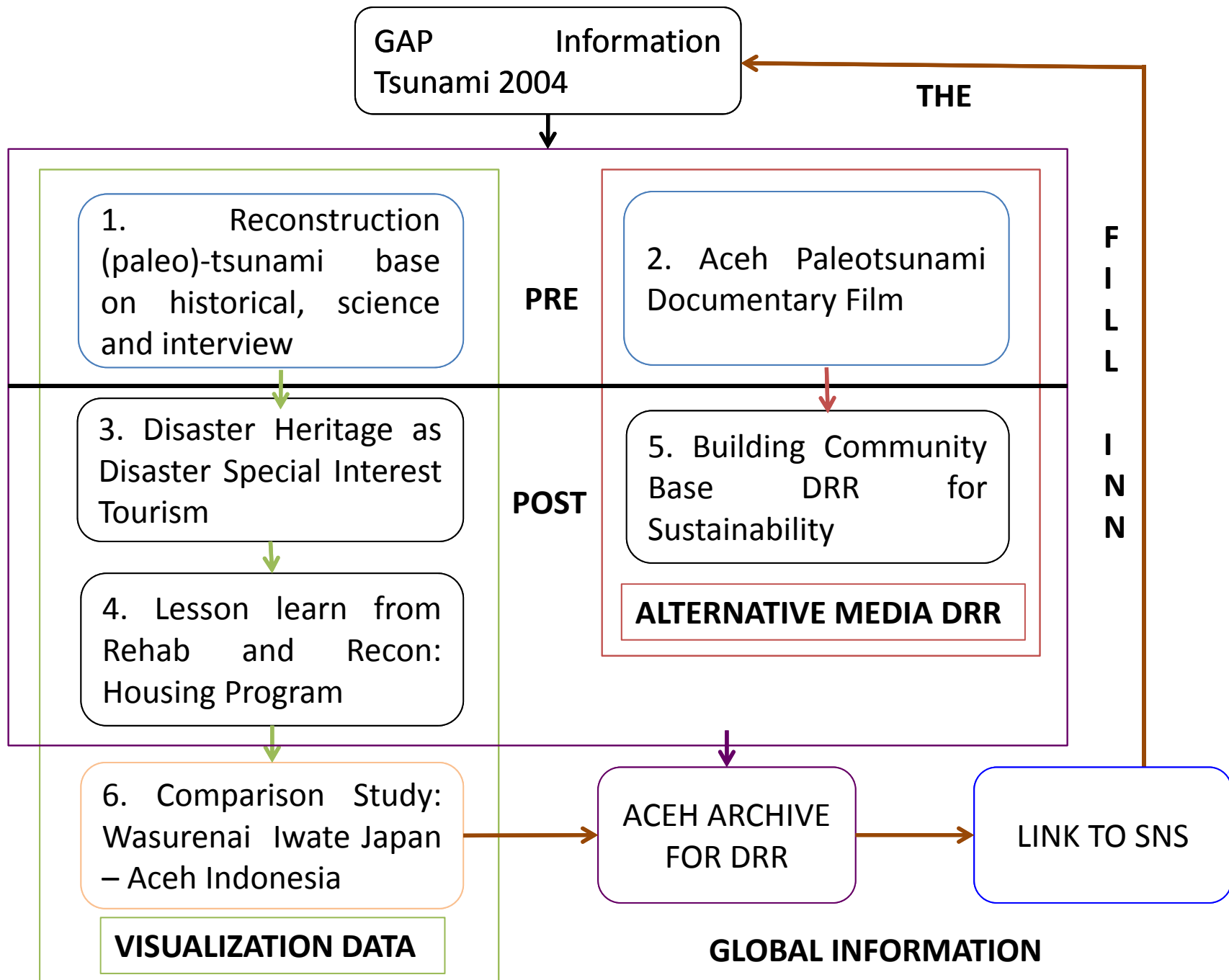
Hidenori Watanave:
Display 3D model, **didn't
use open source platform**

OBJECTIVES

ACEH DISASTER ARCHIVE FOR DRR & GLOBAL
INFORMATION

iv. Framework of the Study

Re-examining lesson learned
of tsunami 2004 :
Sixth points out



v. General Method

3.1.1 Historical approach to collecting data

- ~ Primary data: questionnaire, in depth interview, observation used purposive random sampling.
- ~ Secondary data: literatures

3.1.2 Technological approach

a. to developing the archive:

- ~ Mash-uping & Visualizing data Using open source platform
- ~ Linked the URL with Social Network Services (SNS)

b. to making documentary film

3.1.3 Social approach

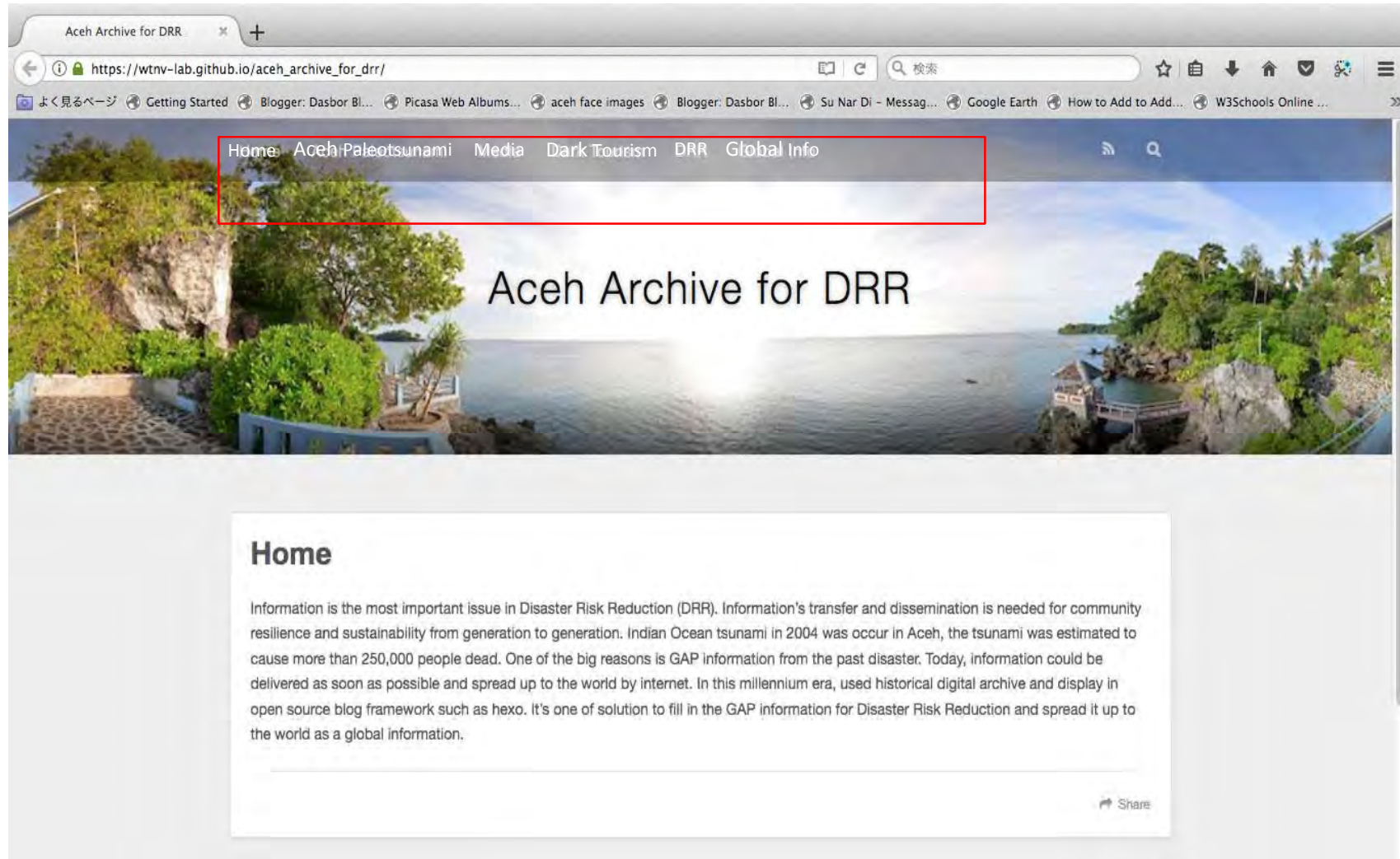
a. to building community DRR:

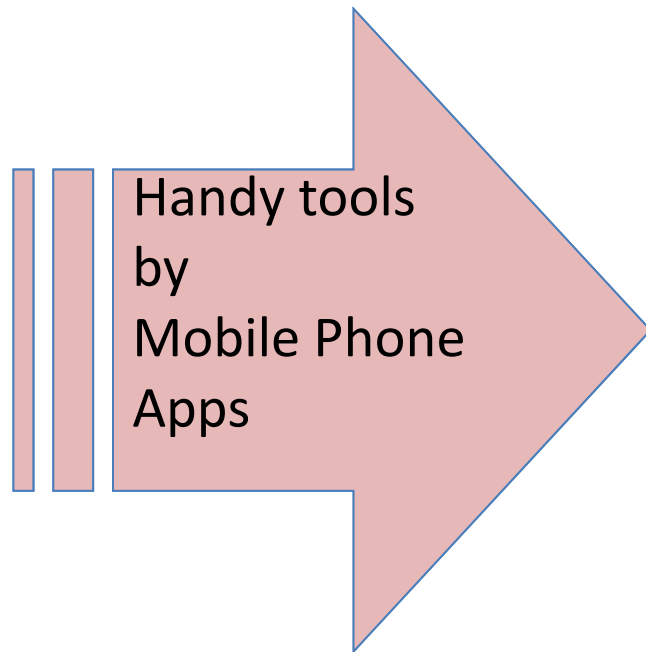
- ~ Continuing Risk Community activities
- ~ Empowering community to capacity building for disaster prevention

b. to comparing study between Japan and Indonesia

vi. Result

Aceh Tsunami Archive for DRR & Global Information



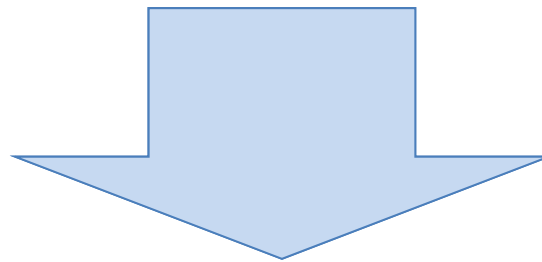


Demo

https://wtnv-lab.github.io/aceh_archive_for_drr/

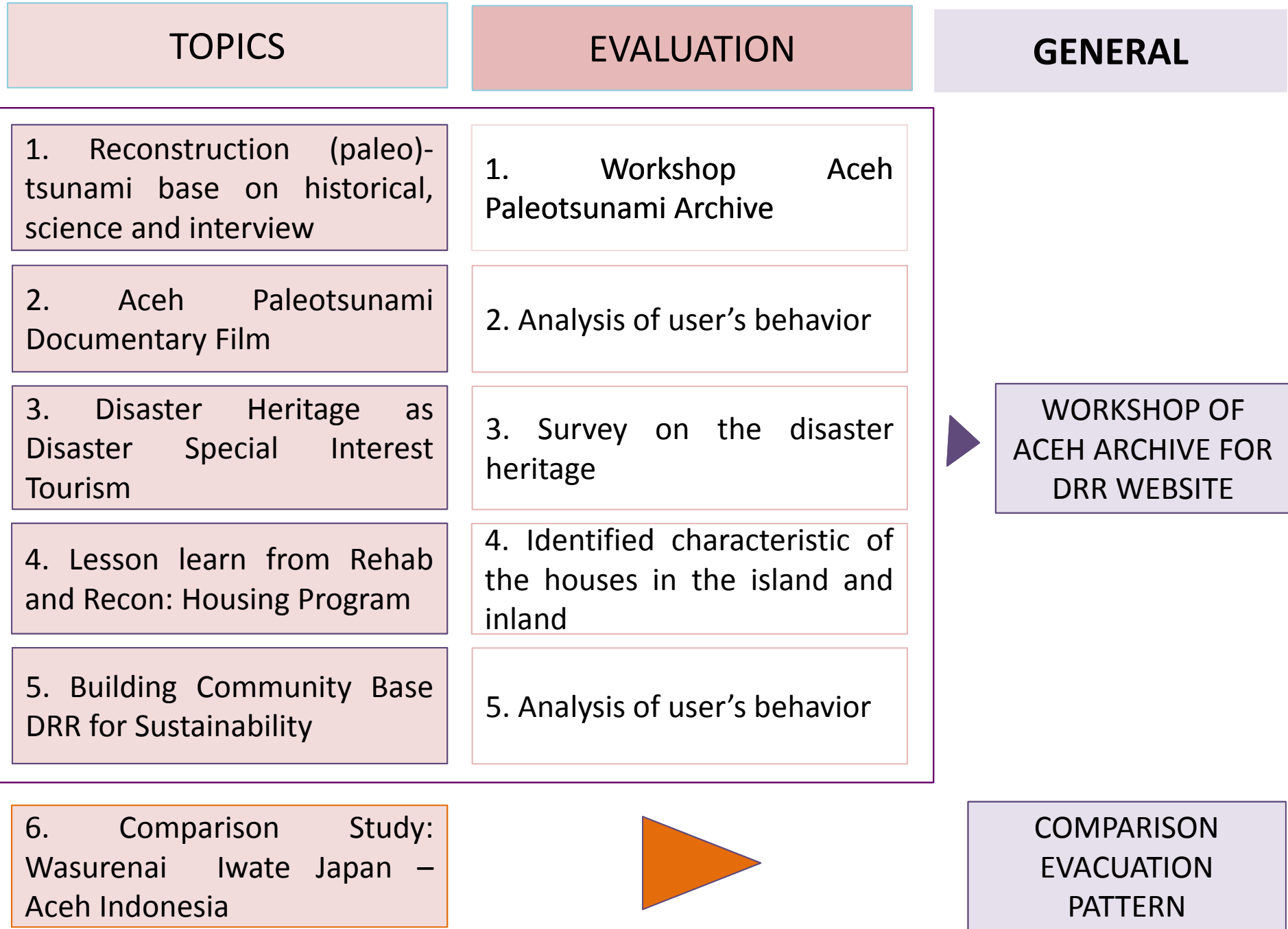


vii. Evaluation



Verification

Function of alternative media to get knowledge, lesson learn and sharing information as contribution for sustainability DRR and global information by a handy tools.



**WORKSHO
P**

Syiah Kuala
University

1 Hour

52-
participants

1st Grade
Various
Faculties

30mins **Manual**

30mins **Digital**

5mins
Introduction

Paper, Proceeding,
browsing

25mins Learning
Historical Disaster

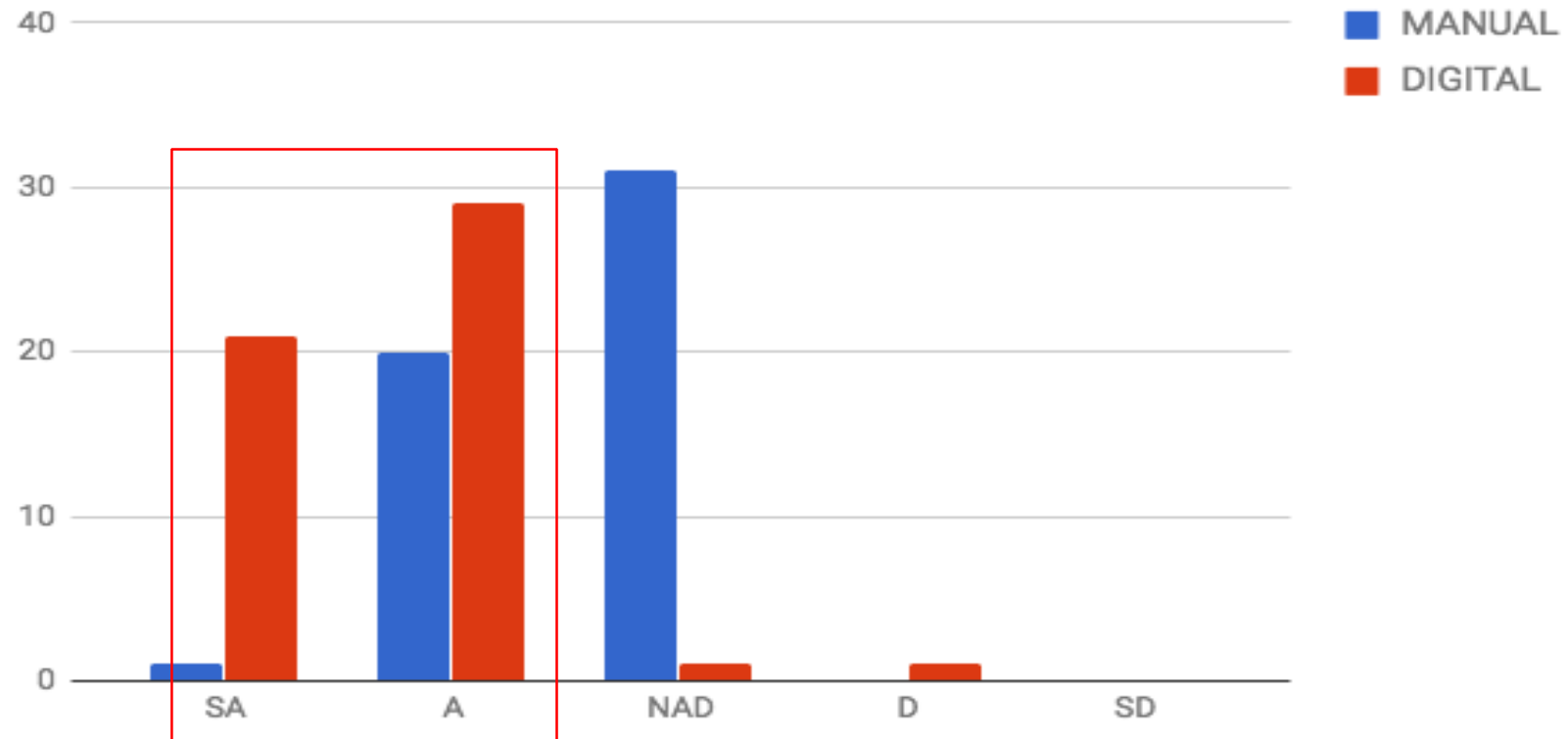
Practice by
Digital devices:
PC, MP etc

5mins
Q & A

Key questions as parameter: To know about how's learning historical disaster, better by manual or digital archive.

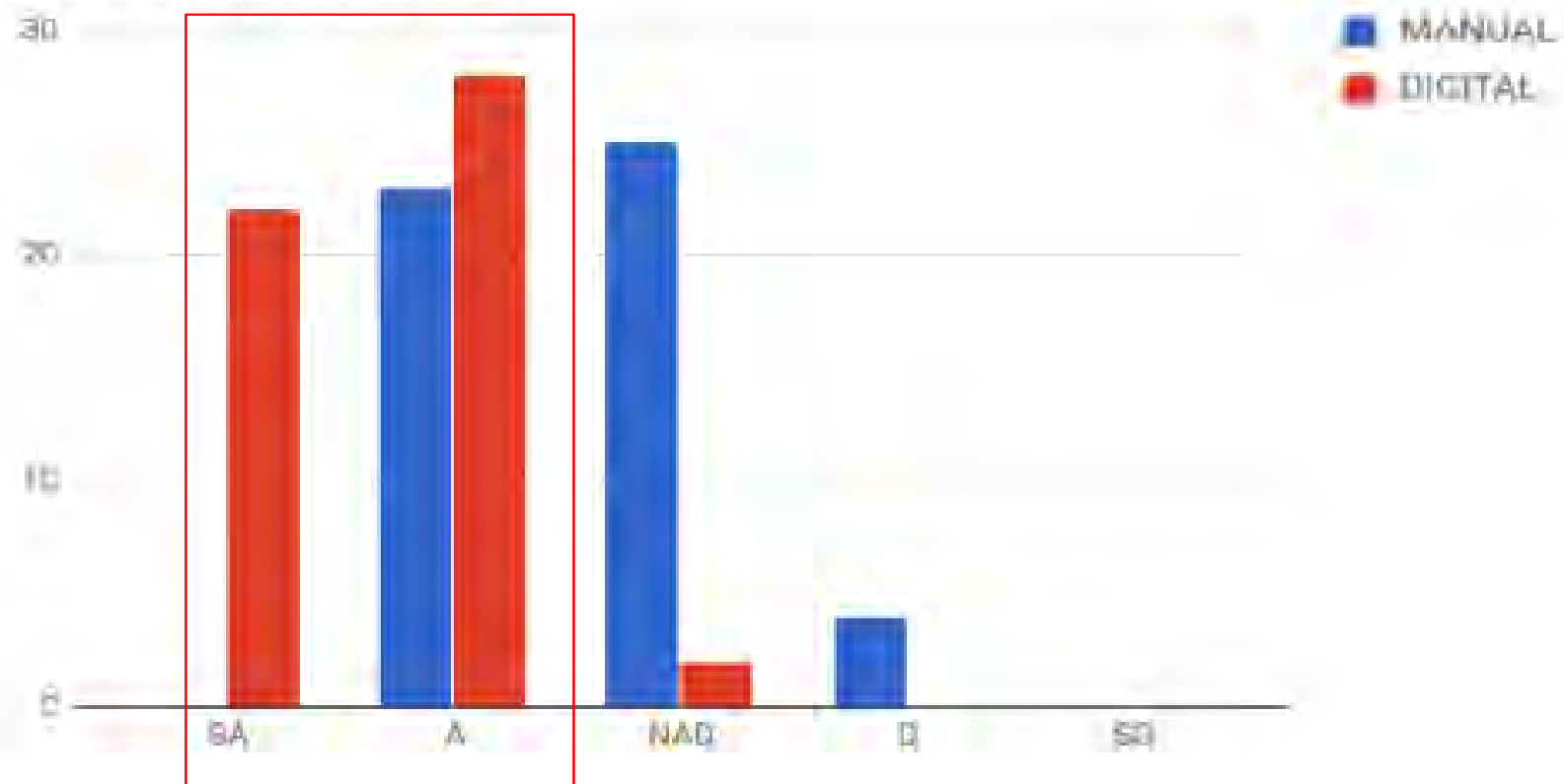
Key questions		Parameter
Q1: Easy to learning	Q6: Get lesson to learn	SA: Strongly agree
Q2: Interesting to learning	Q7: Percentage interest increase	A: Agree.
Q3: Learning efficiency	Q8: Percentage knowledge increase	NAD: Neither Agree or Disagree
Q4: Learning preference	Q9: Testimony learning by the archive	D: Disagree
Q5: Learning Value	Q10: Agree to using archive to learn DRR	SD: Strongly Disagree

1. Easy of Learning



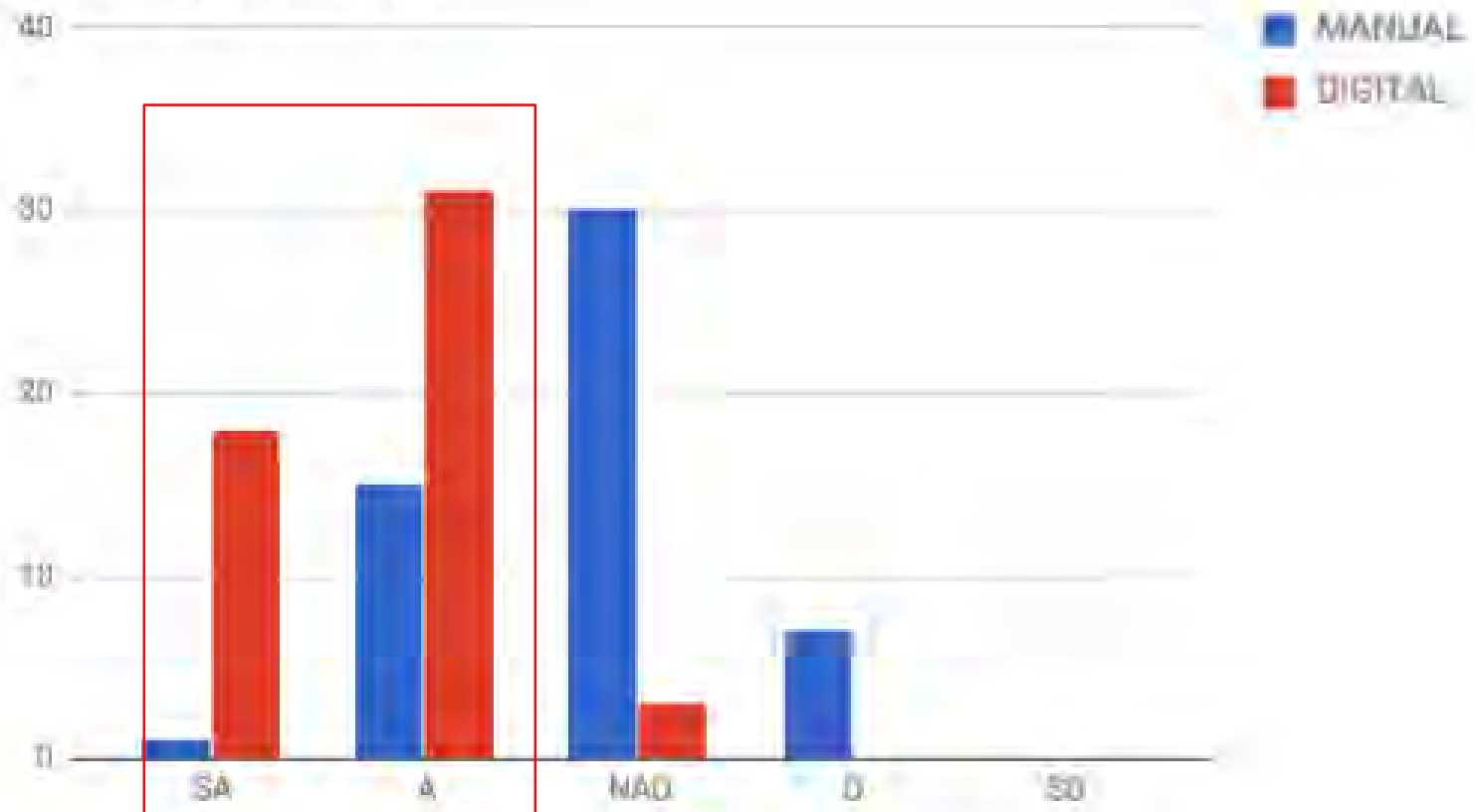
more than 55 of the participants felt that it was easier to learn about tsunami events in the past using the digital archive than using manual research

2. Interesting of Learning



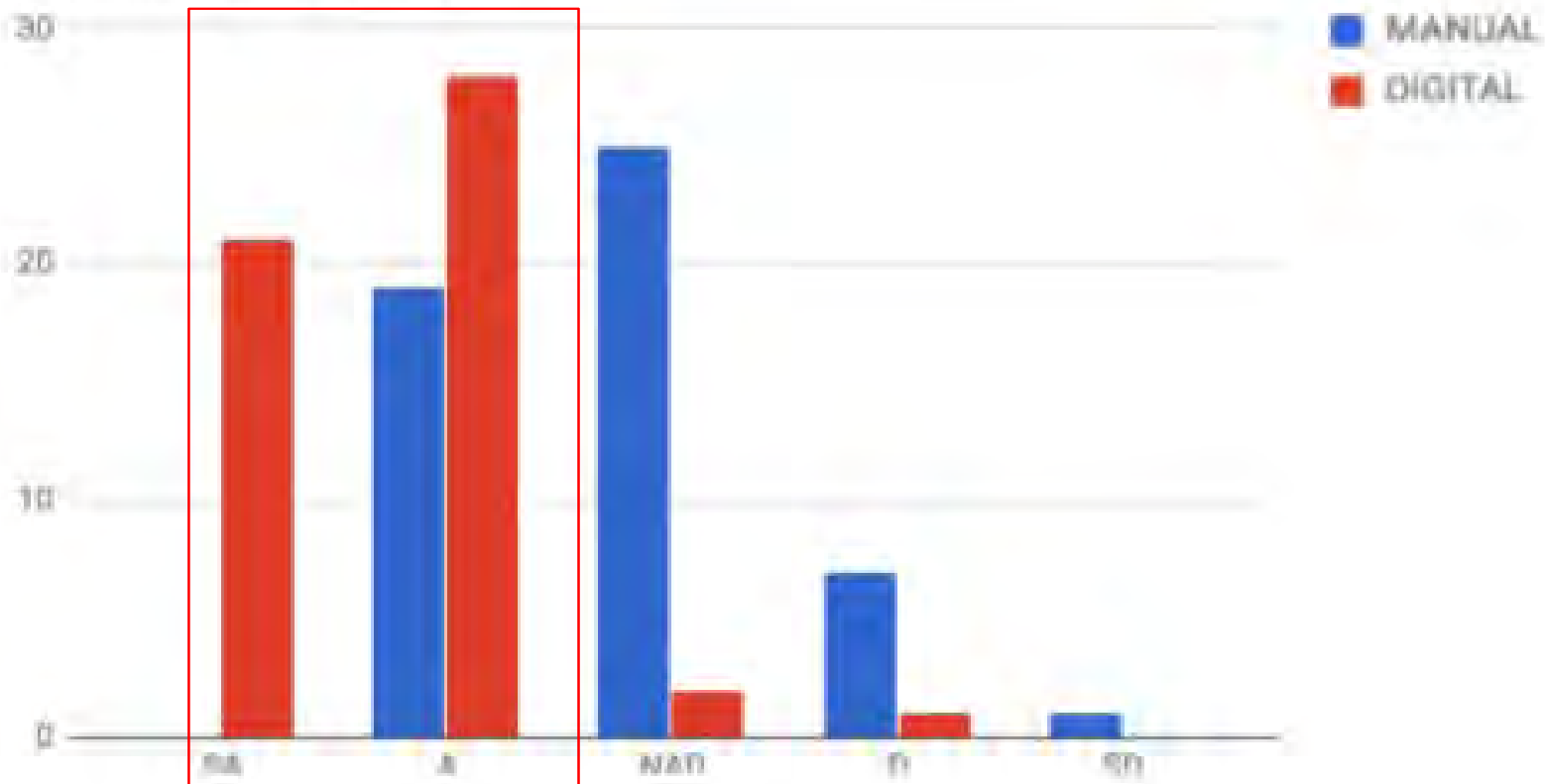
more than 53 of the participants felt that it was more interesting to learn about the history of Aceh tsunamis using the digital archive than using manual research

3. Learning Efficiency



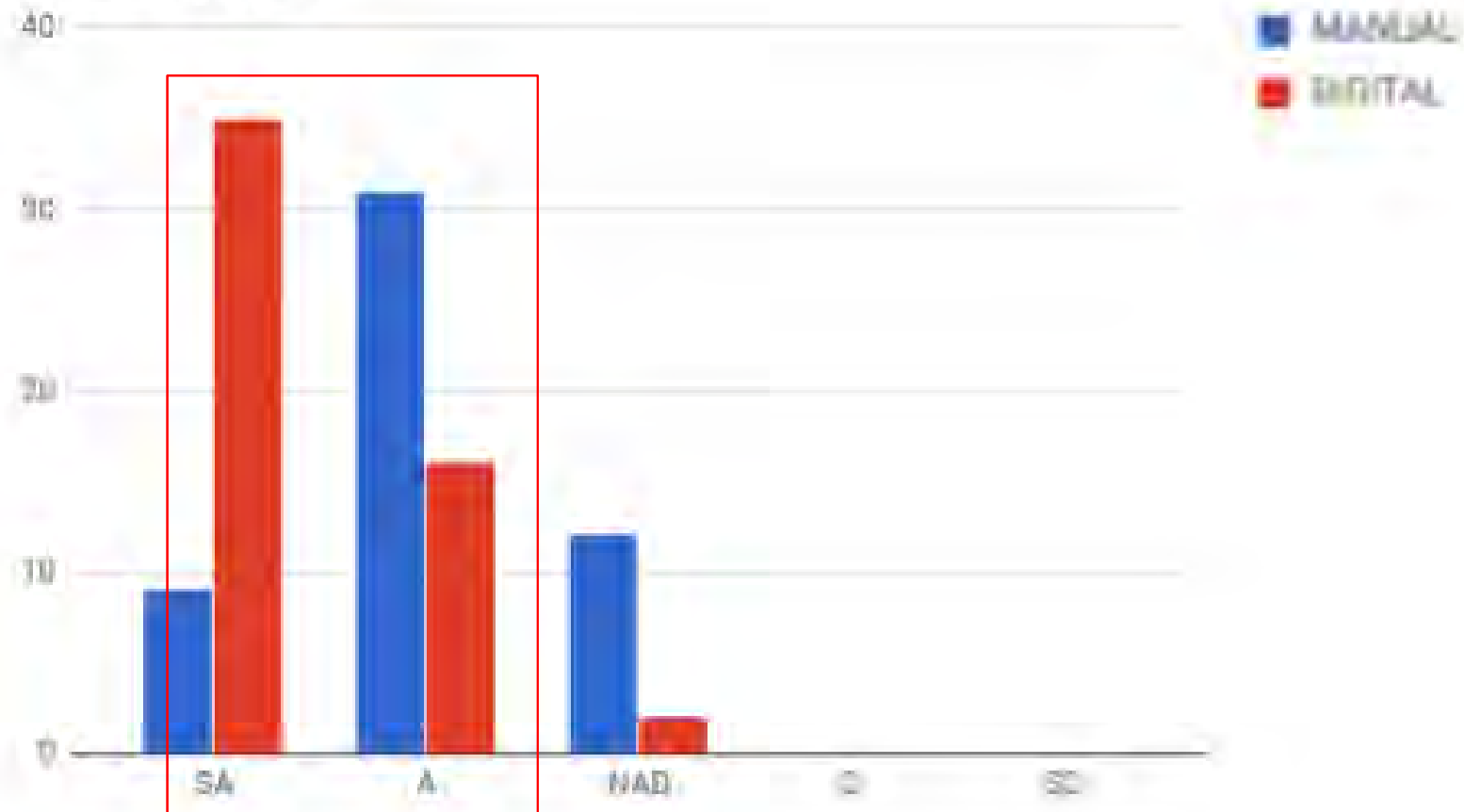
more than 59 of participants felt that it was easier to learn about the history of Aceh tsunamis using the digital archive than using manual research

4. Learning Preferences

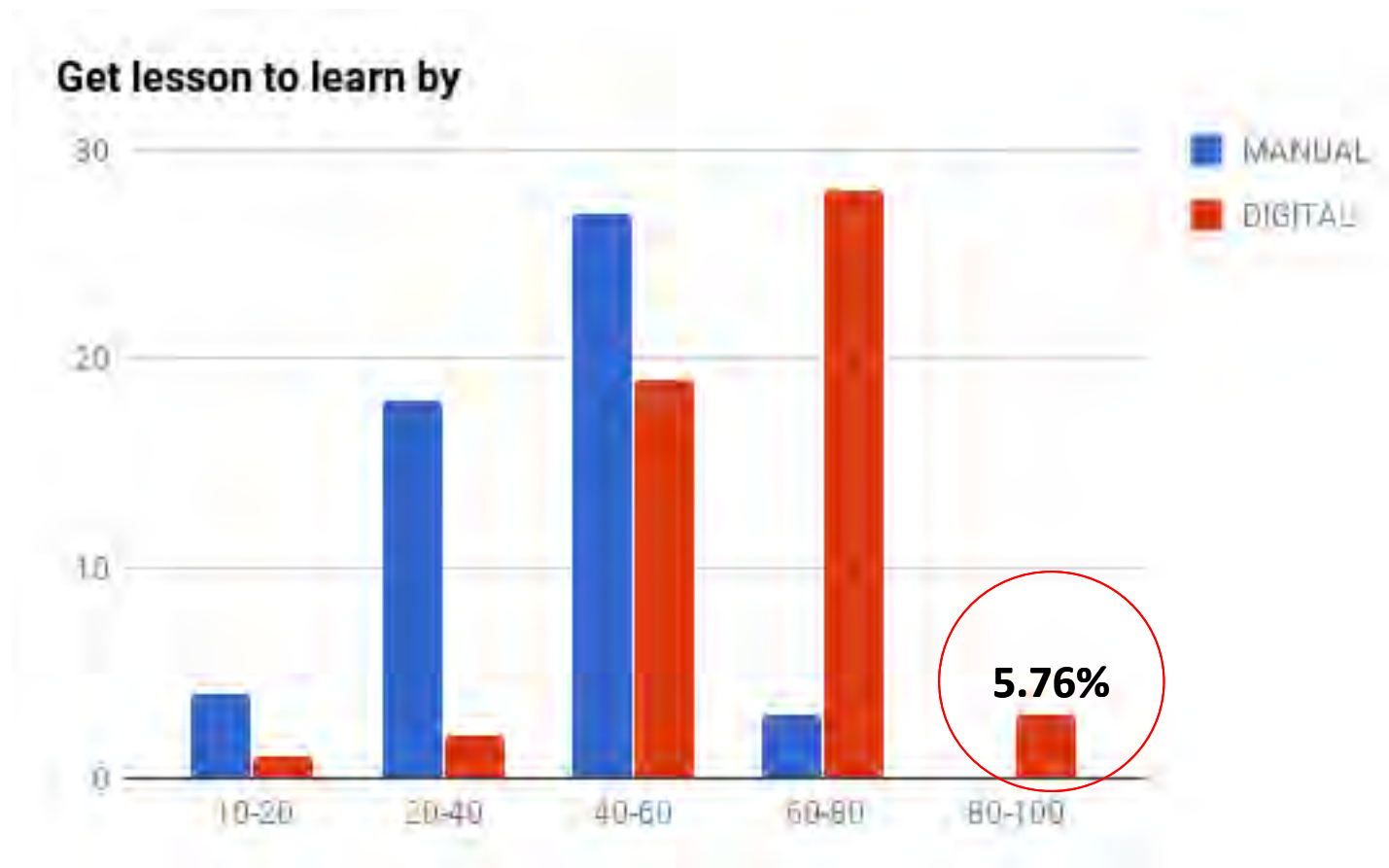


more than 59 of participants felt that it was easier to learn about the history of Aceh tsunamis using the digital archive than using manual research.

5. Learning Value

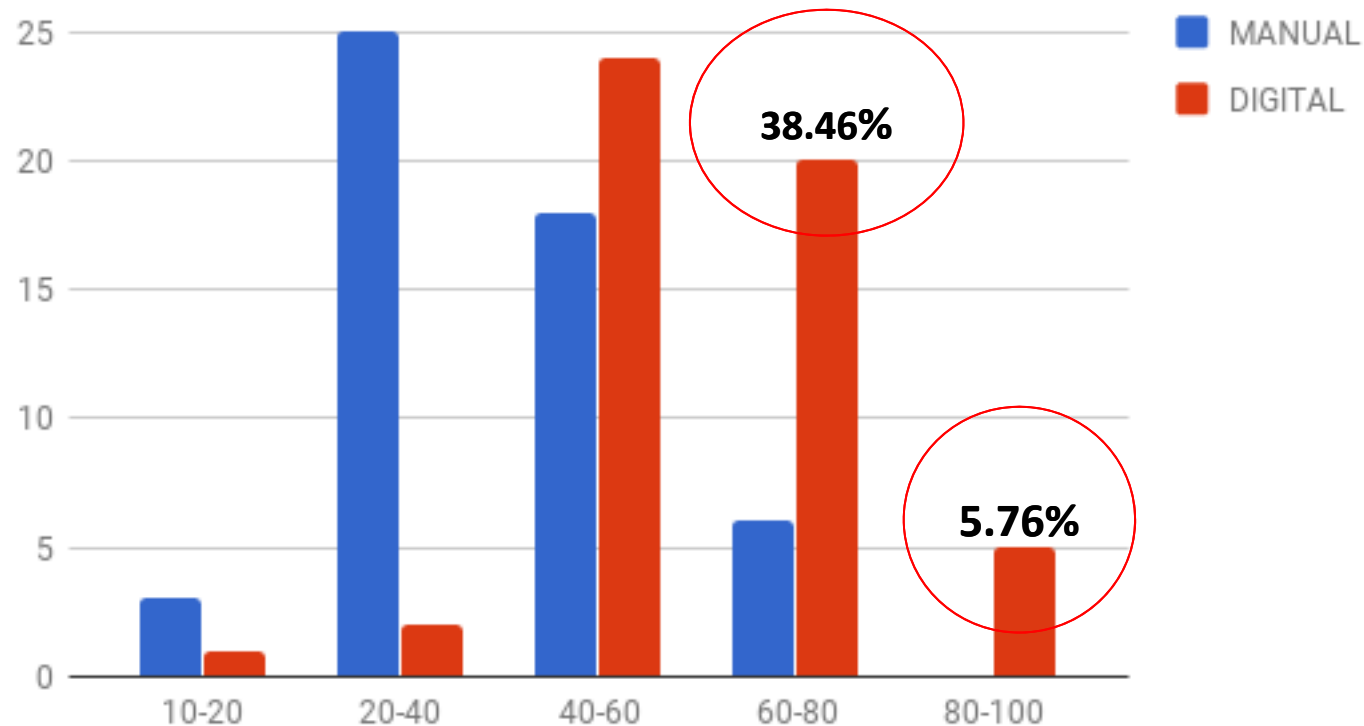


more than that 53 of participants felt that it was more helpful to learn about past tsunamis using the digital archive than doing manual research.

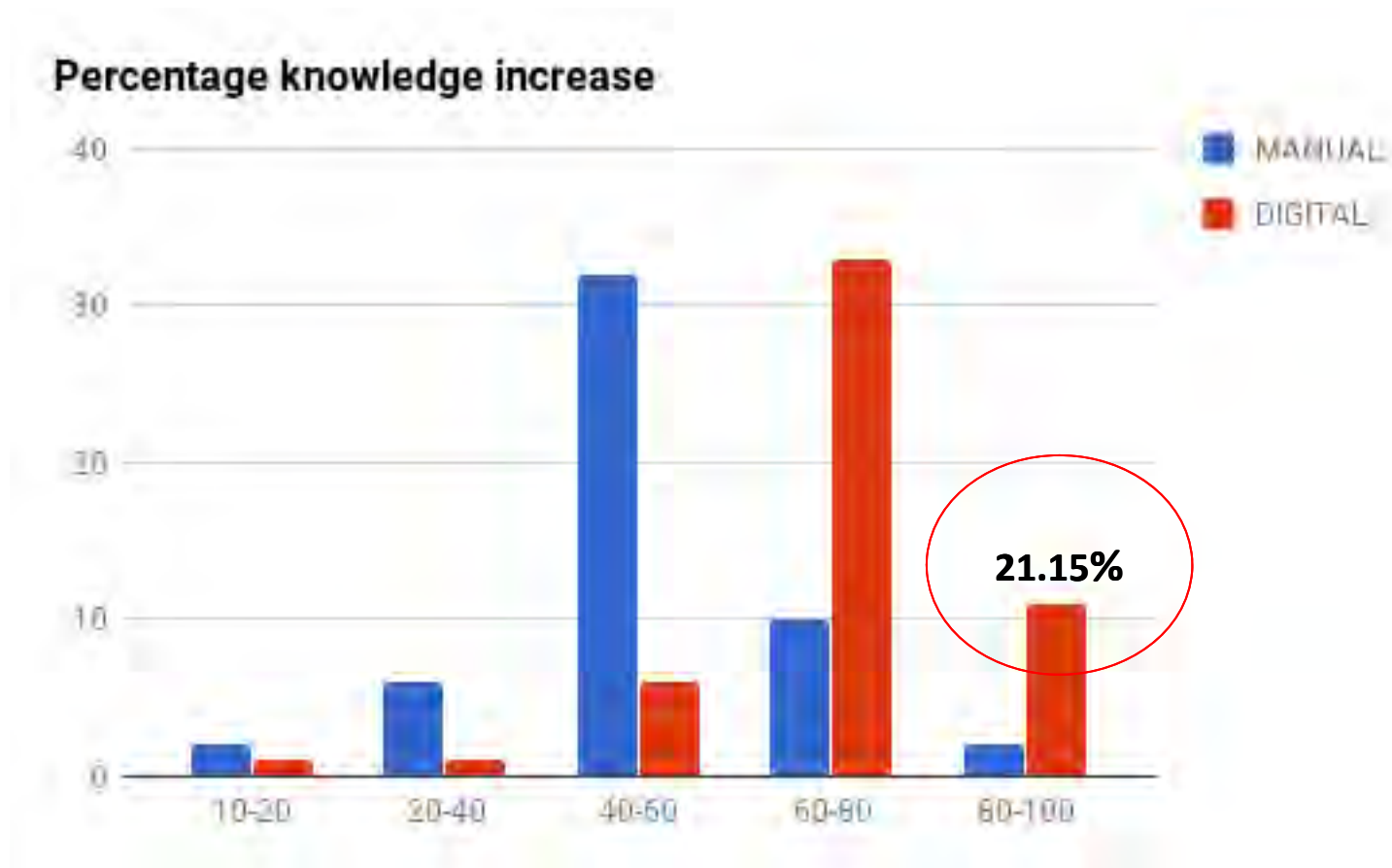


students get 54% lesson to learn by digital archive, even 5.76% get lesson in the range 80–100%

Percentage interest increase



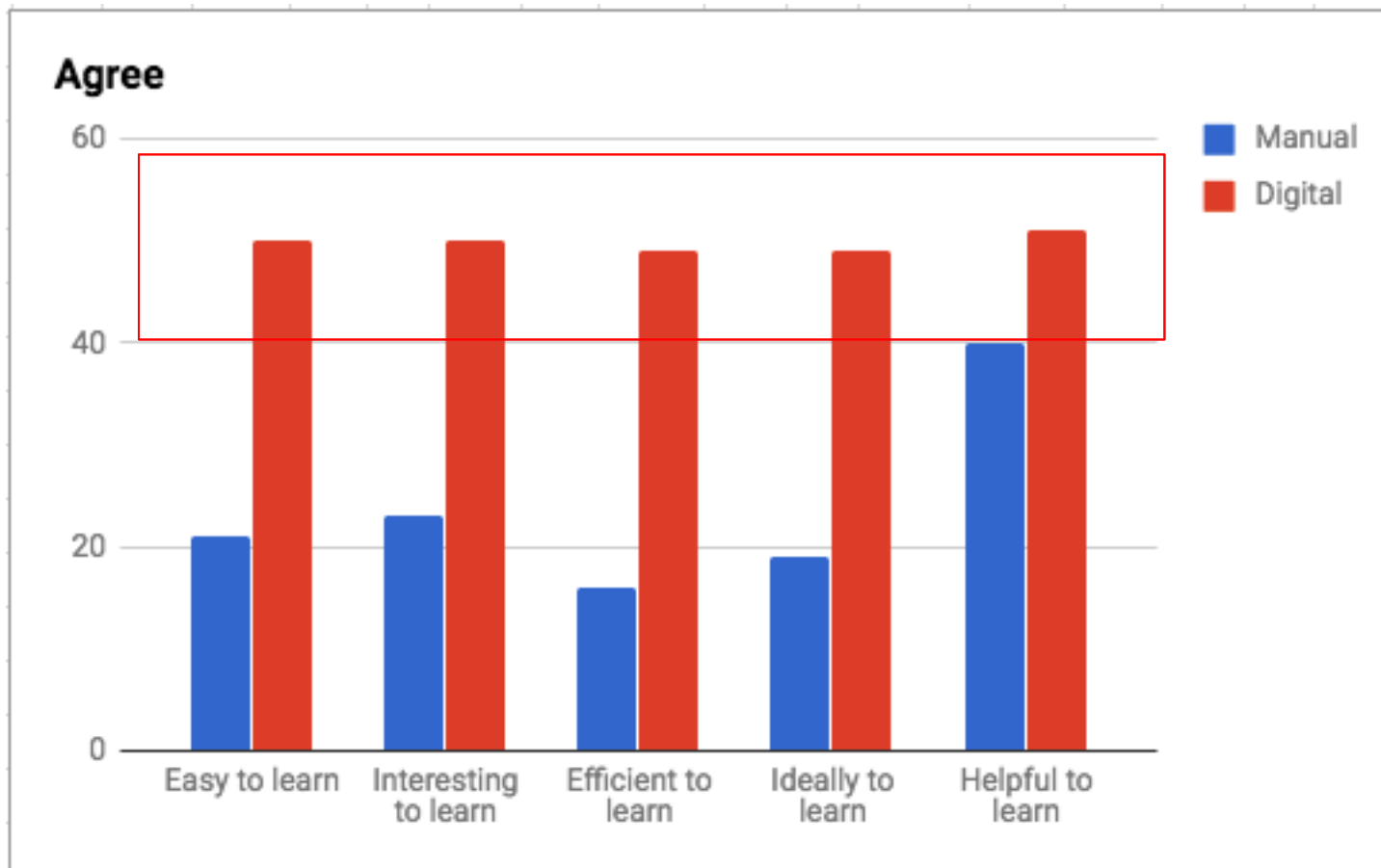
46% of the students were interested in learning with the digital archive, but 38.46% get interest increase to learn related disaster in the range 60–80% and more than 9% in the range 80–100%



student get 63% knowledge increase to learn related disaster by digital archive in the range 60–80%, even 21% get knowledge increase in the range 80–100%



49% of the students gave their impressions by learning from each media. They enjoyed and exited learning about the disaster more with the digital archive than by learning the traditional manual way.



show that student felt that learning with the Aceh Disaster Digital Archive was easier and more interesting, efficient, ideal, helpful than traditional learning, and it also improved their skills and knowledge.

viii. General Conclusion

1. Developing the Aceh Disaster Digital Archive will serve to make **information on past disasters more accessible** to communities
2. Using open-source data, free access, and interactivity make the platform easy to use for the younger generation and handy, its **accessible by mobile phone.**
3. Based on the results of the experiment, we concluded that our method displayed better of knowledge to **fill in the gap information** from the past disaster for a young generation
4. The Aceh Disaster Digital Archive, will remind people all over the world that **local knowledge of past disasters offers valuable lessons for DRR.**

ACEH PALEOTSUNAMI ARCHIVE

Section 1

1.1 Collecting Data

1.1.1 Scientifics Data of Aceh Paleotsunami Records

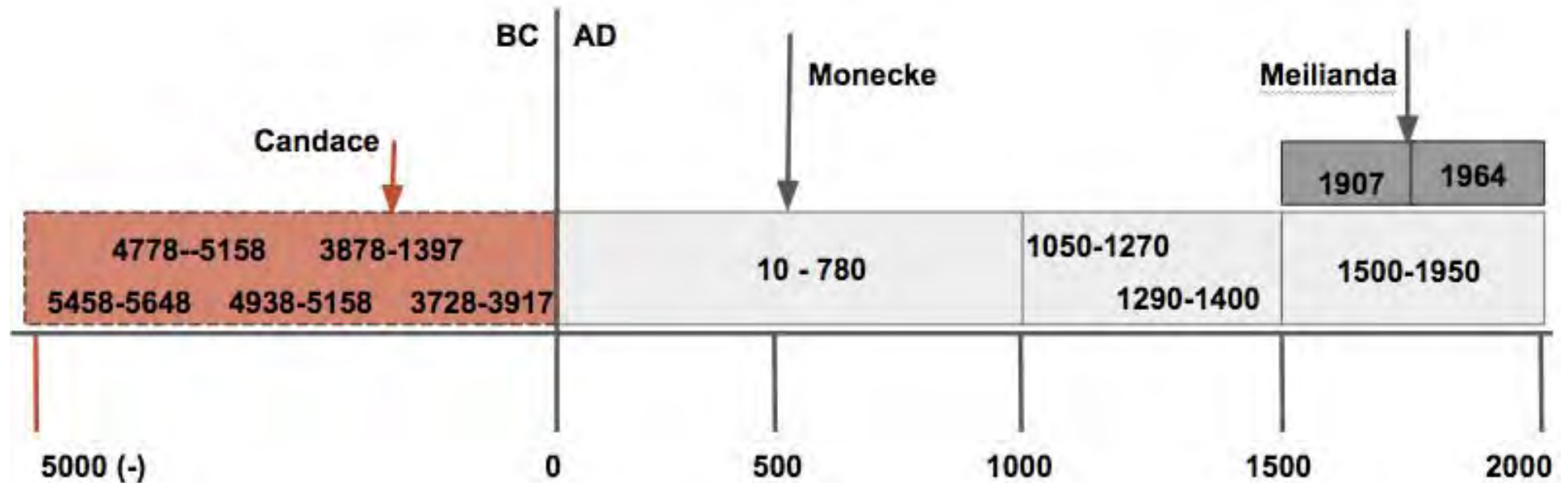
Collecting data by historical approach of ancient tsunami, started from 2011

Candace et al, 2006, 3728-3917,
3878-1397, 4938-5158, 4778-
5158, 5458-5648

Monecke et al, 2008
780–990M, 1000–1170M,
1290–1400M, and 1510–1959M.

Meillianda, 2009
Tsunami events:
1907 validity 4,
1940 validity 4 and
1964 validity 3.
*4:very valid*3: valid

Timeline of Scientifics Aceh Paleotsunami Records



Scientist found tsunami deposit sediment of tsunami event since **5000 years a go**. That's prove paleotsunami record in Aceh

1.1.2 Historical Data of Aceh Paleotsunami Records

List of Manuscripts related earthquake and tsunami in Aceh

Aceh manuscripts records about earthquake and tsunami event **around 17 to 18 century**. Collaborated with expertise to translate the manuscripts.

List of Manuscripts related earthquake and tsunami in Aceh

Sources	Aceh Paleotsunami historical records		
	Documents	Time	Contents
Hermansyah: Aceh National Museum	Earthquake & Eclipse manuscripts 07_00523	Wednesday, 31th January 1906 M (5 Zulhijah 1324 H) <i>Wa-Shahibul Kitab Ibrahim Lambunot Mukim Lam Krak 1324 H (1906 M)</i>	" <i>Rajab</i> : If earthquake moves in <i>dhuha</i> , it's sign that seawater was very hard and very much rainy."
Hermansyah: Ali Hasmy Foundation	Earthquake manuscripts		" <i>Rajab</i> : Earthquake in <i>dhuha</i> , it's a sign that wind, sea water and waves are very hard in that year"
Book of Sultan, Pahlawan, Hakim	Van de Tuuk manuscripts	Tuesday, 12th February 1861 (28 Jumadil akhir 1253 H)	Tectonic earthquake in Singkil 1852 destroyed Dutch infrastructures
Book of Sultan, Pahlawan, Hakim	Dutch Document	Friday, 29th September 1837 (1 Sya'ban 1277 H)	Earthquake 7.3 SR in Sultan Muhammad Syah period (1824-1838)
Hermansyah: Aceh National Museum	Earthquake manuscript 07-01676	Monday, 24th November 1833 M (12 <i>Rajab</i> 1249H), at 10.20 Indonesian Time	" <i>Rajab</i> : Earthquake in <i>dhuha</i> time, it's a sign that sea water will be hard tides"
Hermansyah: Aceh National Museum	Earthquake manuscripts 07_00841	Monday 24 November 1833 M (12 <i>Rajab</i> 1249H), at 10.20 Indonesian Times	" <i>Rajab</i> : Earthquake in <i>dhuha</i> time it's a sign that the sea will be very hard"
Dayah Tanoh Abae, Aceh Besar	Earthquake manuscripts	Thursday, 3th November 1832M (9 <i>Jumadil akhir</i> , 1248 H)	" <i>wa kanak al-zalzalah al-shadidah al-haniyiah faji yaum al-khamis tis'at ayyam min jumada al-akhir sarah</i> 1248 min hijrah al-nabawiyah..." (2" Earthquake has occurred in Thursday, 9 <i>Jumadil Akhir</i>)"
Hermansyah: Surau Lubuk Ipuh Padang	Teks, Colofon	Friday, 10 th February 1797 M (12 Sya'ban, 1211 H)	" <i>Rajab</i> : Earthquake in <i>dhuha</i> time, it's a sign that the sea will be very hard"
Wang Ta Yuan in Mc Kinnon (1988) in Meilanda (2009)	Lambri Archeological Manuscripts	1349 AD (around 600-700 years ago)	"This place is the most important trade center in Nan-wu-li (Aceh), big mountains like waves dash against it."
Akhbar al-Sin wa'l Hind refer Rammi in Mc Kinnon (1988) in Meilanda (2009)	Lambri Archeological Manuscripts	1000 BP (around 9 Century)	"The island is washed by two seas . Harkand & that of Salakli" (Bay of Bengal and the Malacca Strait)
Leiden University	Doc. No. Or. 12.234 Supplement Catalogues by van Ronke		On chapter mention about earthquake treatise.

Earthquake Manuscripts related tsunami event collection of Ali Hasjmy Museum



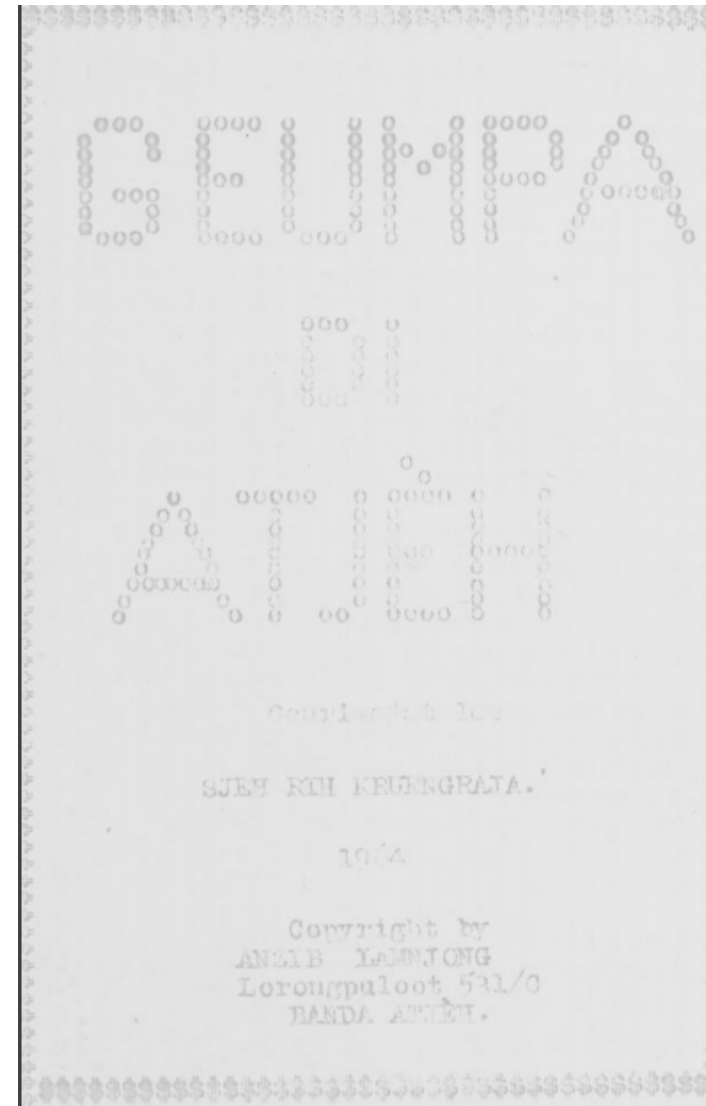
Picture by Hermansyah, 2010

"Rajab*: If earthquake happens in duha** time, it will cause hard wind, **sea waves are loud in it**". This is mentioned in the yellow highlighted sentence in the last paragraph. .

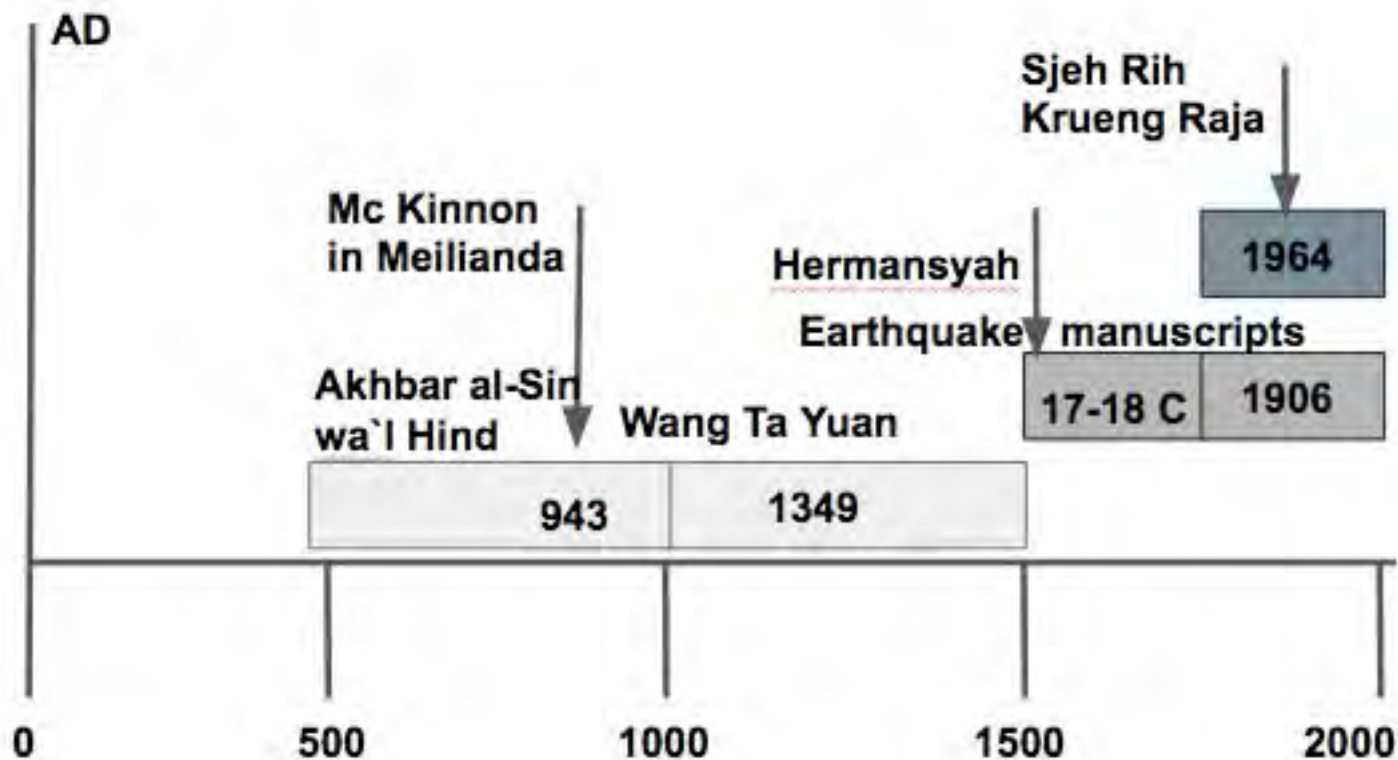
Prose of Earthquake & tsunami in 1964 by Sjeh Rih Krueng Raja

“Ali Head Village trembling body, running and standing to the flat ground, **boat in the sea is shaking, tossed around here and there...**” Sjeh Rih Kruengraja, 1964.

*4 years after Chili earthquake and tsunami,
Tokyo Olympic Game in Japan



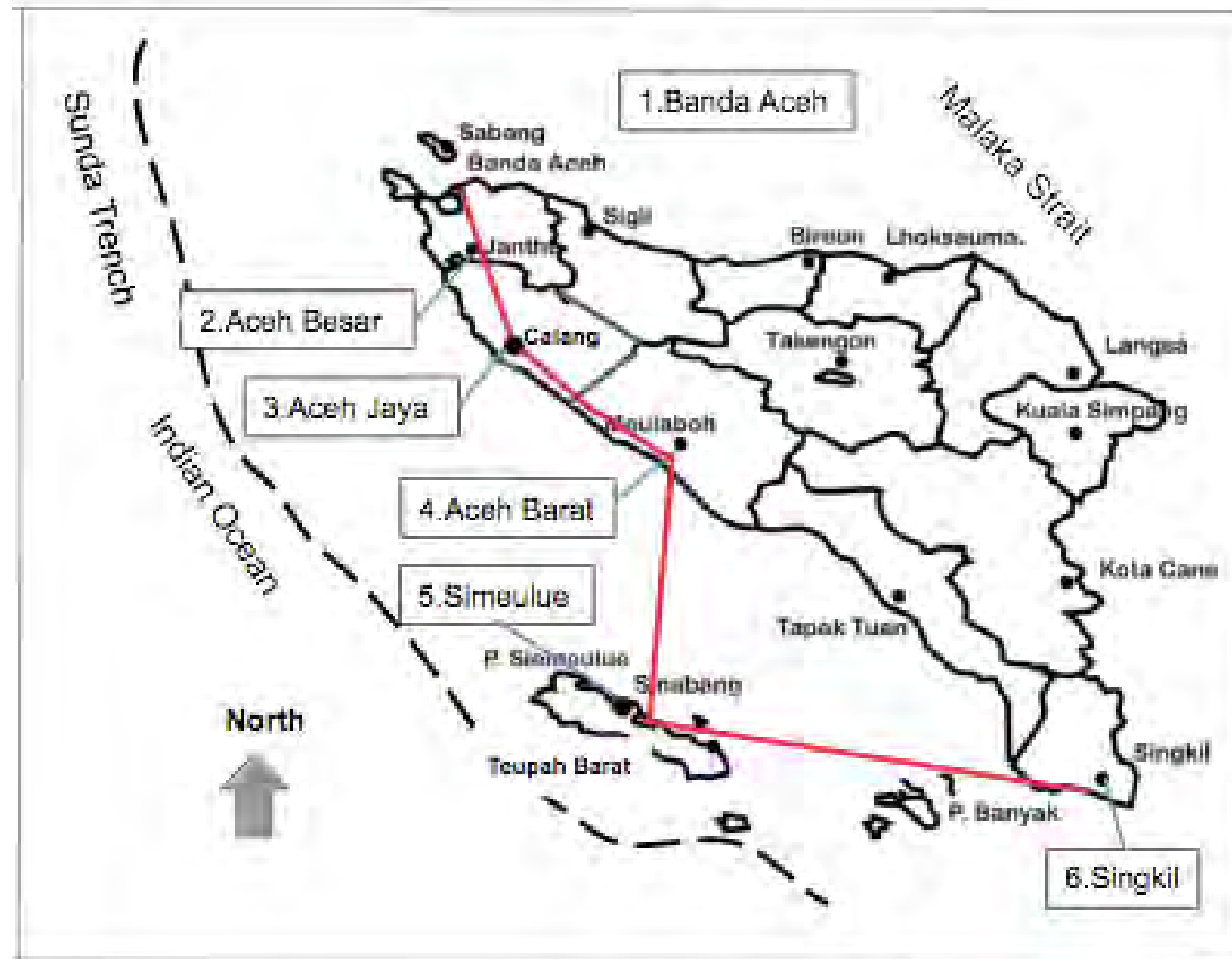
Timeline of Historical Aceh Paleotsunami Records



The oldest Manuscripts by McKinnon mention about tsunami Aceh around **1000 years ago**,

1.1.3 Interviews of Aceh Paleotsunami Records

Collecting data of local knowledge , on March 2012



[6]. Singkil, southern part

Singkil, March 25, 2012, Narated by Safrijal Amni: “The first *gelo* (tsunami) was around the **18th century, which drowned Old Singkil Town**, then around the **19th century**, there was a second *gelo*, which forced **people to move from Kayu Menang to Singkil.**”

[5]. Simuelue Island

(Rachmalia, 2012,). Teupah Barat, Simeulue. Narated by Rukiyah: “In **1907**, an earthquake occurred before Friday prayer. I was a small child and did not know anything. The ground cracked open, and my father took me and we fled to the mountains. After prayer, many people visited the low tide sea, then the *smong* (tsunami) arrived, and the water entered the land and many people died. At that time, we were eating sago and using bark cloth (*bairak*). (Ilyas, 2012),

[3]. Aceh Barat, western part

Aceh Barat, March 23, 2012, Meulaboh-Padang Village. Narated by **Cut Dian Putri**: “According to a story from my **grandmother**, my **grandfather was born at the time of the incident *le Beuna*** (tsunami). On that morning, the water in the sea looked very high. The religious leaders approached the coast and sounded the *Azan*. The sea water broke on the beach and a small amount of water came onto the land. That’s why my grandfather was named ***Teuku Leupek le Beuna***. During the earthquake in the **morning of December 2004**, my **grandmother said, “The sea water will rise soon!”** We were thinking that my grandmother was very old and just senile. When the sea water came, we tried to reach her, as she could not get out of bed. I lost my grandmother and my husband, but my son was saved.”

[4]. Aceh Jaya, Middle part

Aceh Jaya, Krueng Sabe, Bunta Village, March 20, 2012. Narated by **Hamidah**: “When I was a girl, ***le Beuna* (tsunami)** happened (reconstructed by The authors, based on year of her birth, around **1907**). In the morning, the water in the **Krueng Sabe River was spilling over, which was close to the Dragon Cave** (Geni Village, around 7–8 KM from the coastline). I also felt **earthquakes for 7 days and 7 nights** during the DI/TII war (reconstructed by the same authors based on the history of other regions, around **1964**); the earthquakes started in the morning, and consequently ***Gunung Sawah collapsed***.” [Hamidah, 120 years old, Bunta Village, Krueng Sabe, Aceh Jaya].

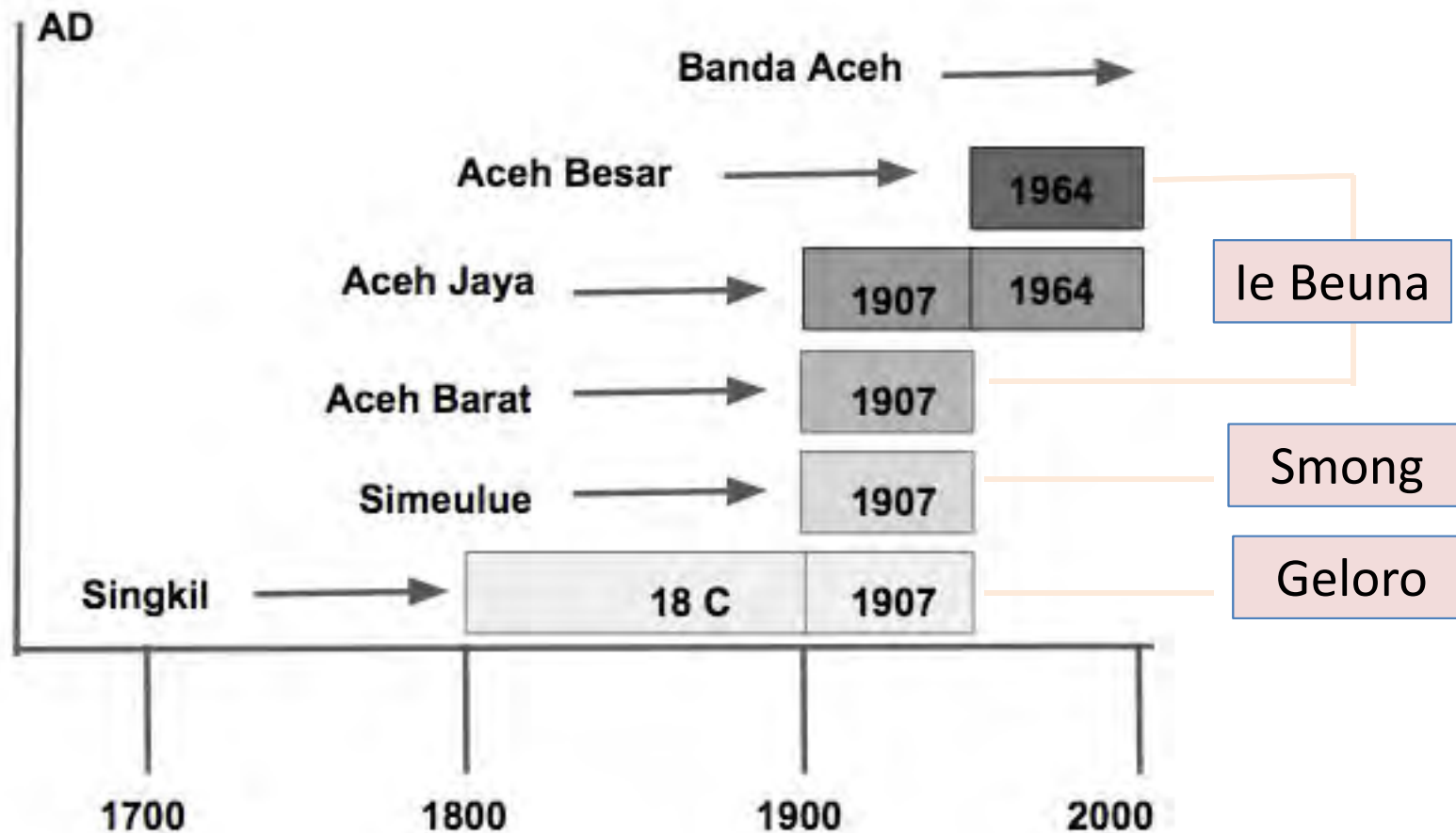
[2]. Aceh Besar, most coastal affected areas

Aceh Besar, Lambaro Nejid Village, March 17, 2012. Narated by Abdul Majid: “**According to a story from my mother**, in the same year as my **birth**, there were *le Beuna* events; **the sea level rose about 2 feet in 1936**. I also experienced **earthquakes in 1945** and morning earthquakes for **7 days and 7 nights in 1964**.” [Abdul Majid, 77 years old, Lambaro Nejid Village, Aceh Besar].

[1]. Banda Aceh, capital city

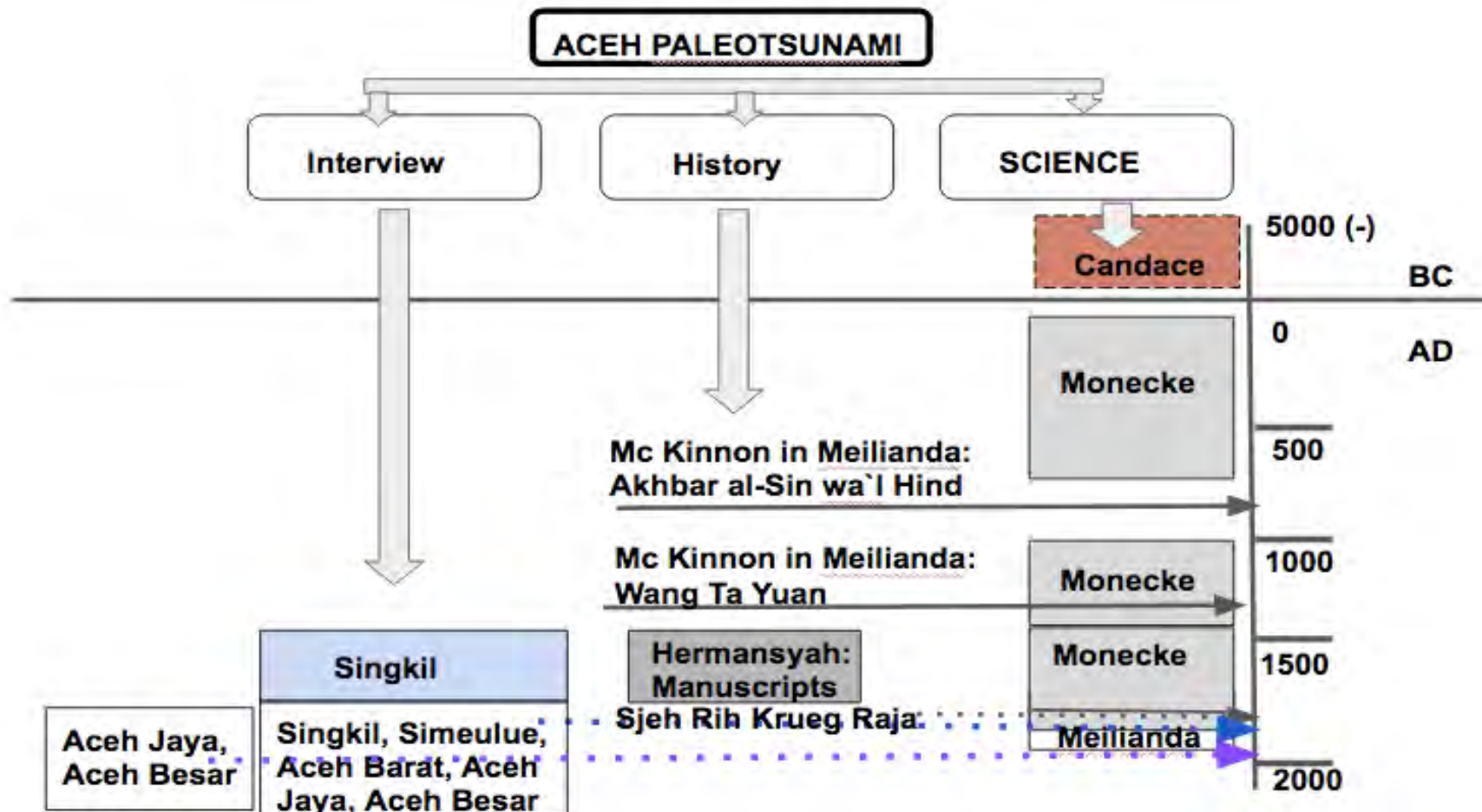
Banda Aceh, Lampulo, March 10, 2012. Narated by Ayi: “**My great-grandfather, my grandfather, and my father were fishermen**, brought up from childhood in the coastal environment, but **I never heard stories** from my parents or grandparents related **to tsunamis before 2004**. So, the tsunami event in 2004 was a new experience for us, especially when it happened. A lot of people died, nearly 80% of them were old people. So, it was impossible to trace back information related to earthquakes and tsunamis from them.”

Timeline of Interviews Aceh Paleotsunami Records



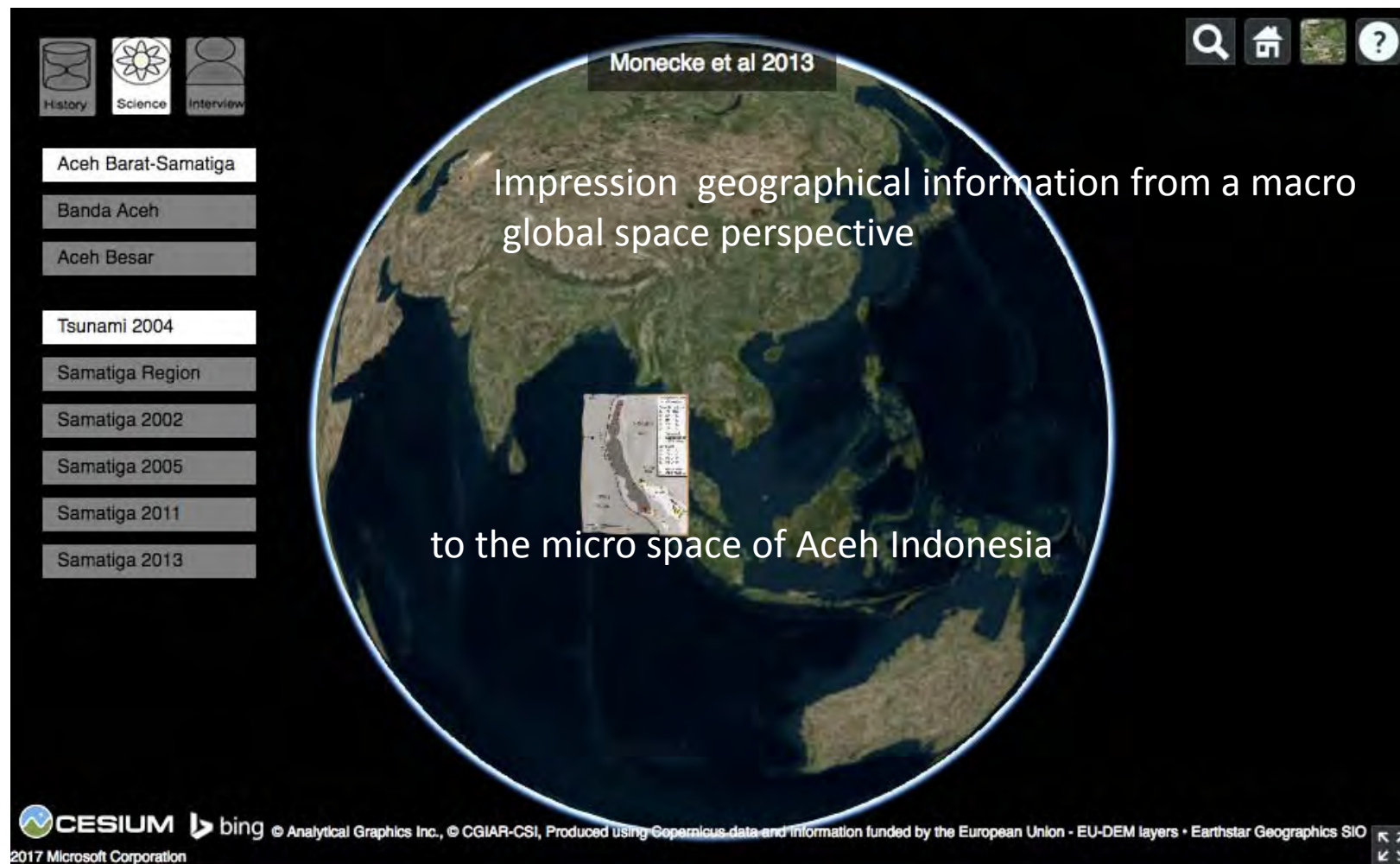
Banda Aceh as the capital of Aceh Province and the Centre of Aceh government resulted in **the largest information gap** in relation to earthquake and tsunami incidents in the past.

1.2 Synchronization of Aceh Paleotsunami Records



There is **synchronization information** related to the past tsunami event in Aceh, **at least from 17 century**

1.3 Aceh Paleotsunami Archive



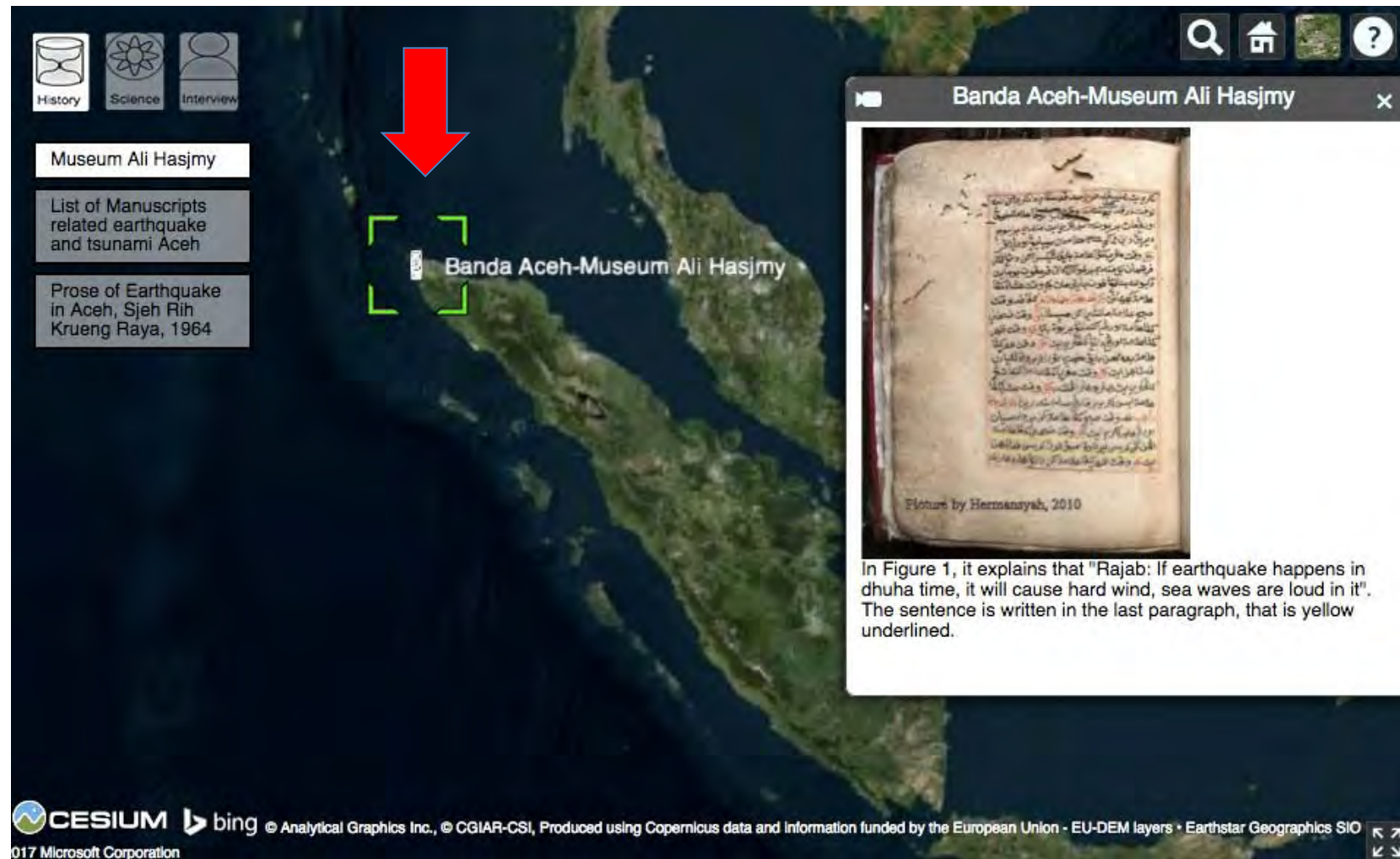
Digitalized materials such as **maps and pictures** using **cesium** as open source data in the github platform were used to **provide more detailed information** of the area shown



the Aceh 2004 tsunami affected to the areas along coastal region, the Andaman Sea and in the Indian Ocean neighborhood.



In this prose, Sjah Rih Krueng Raja describes the earthquake and tsunami that occurred in 1964



Other **local wisdom** are **manuscripts** written in Jawi, an Arabic script for the Malay language, one of which dated **from the 17th century**.



There are **many older people who have had earthquake and tsunami related experiences**, especially along the western coastal areas of Aceh; **however, the information has not been spread from generation to generation.**

1.4 Result section 1

1. The 2004 Aceh tsunami experiences **offer meaningful lessons.**
2. Historical approach is a good method to collecting data of **Aceh Manuscripts and local knowledge**, it must be transferred to others to mitigate future disasters
3. Using **cesium and open-source platform** is an **effective** method to making digital archive to **transfer DRR knowledge** to the **young generation**

GAP Information
Tsunami 2004



1. Reconstruction
(paleo)-tsunami base
on historical, science
and interview

PRE

VISUALIZATION DATA

ACEH PALEOTSUNAMI DOCUMENTARY FILM

Section 2

2.1 Background

To create an alternative medium for educating young generations to learn about historical disasters for DRR

Aceh Paleotsunami Documentary Film collaboration

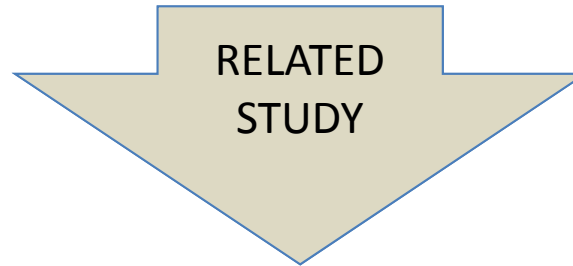


TOKYO METROPOLITAN UNIVERSITY JAPAN – WTNV LABO

WELLESLEY COLLEGE USA – GEOLOGY LAB

YAYASAN KEMASLAHATAN UMMAT – ACEH INDONESIA

2.2 Relative Study



Movie is an effective alternative medium for learning about past disasters. (D Buckingham, 1998)

changing young people's relationships with the media, and with classroom-based research. In this study, I outline the conceptual framework for contemporary media education and address unresolved questions about learning and pedagogy. (Hobbs & Renee 1998)

2.3 Story Line of Film

explain geological theory of paleotsunami by scientist



Shows a historic Jawi language manuscript: describing a past earthquake-related tsunami disaster. This work should also be disseminated to the younger generation.



Followed by community interviews in some districts of Aceh. This added insight to the term *le Beuna* in Aceh Barat and *geloro*, which in the local language languages means “tsunami.” Tsunamis have occurred since the 18th century and drowned the Old Singkil City.

Media

Film

The Aceh Paleotsunami Film



YouTube

https://www.youtube.com/watch?v=yNhVwxQ2kl8&fb_action_ids=1025813297429646&fb_action_types=og.shares&fb_source=other_multiline&action_object_map=%5B846503525385687%5D&action_type_map=%5B%22og.shares%22%5D&action_ref_map=%5B%5D

2.4 Outreaching and Acceptance of the Film

1. YouTube



Global Info



Material of Archive

Analysis of user's behaviour

Top geographies

Watch time

United States (87%)

Japan (7.0%)

Greece (5.0%)



Traffic sources

Watch time

YouTube search (77%)

External (14%)

Direct or unknown (7.04%)



2. Tools of Disaster Education



Permanent Exhibition in Inamura
no Hi no Yakata Tsunami Museum



Inamura-no-Hi no Yakata

稲むらの火の館

濱口梧陵記念館

津波防災教育センター

Hamaguchi Goryo Archives

Tsunami Educational Center

Light a fire of rice sheaves that will last forever in your heart

ホーム > 稲むらの火の館 > Inamura-no-Hi no Yakata > Tsunami Educational Center



Tsunami Educational Center



2.5 Result Section 2

1. We evaluate this situation as a **good starting point** to transfer knowledge.
2. The core of the film is **to encourage young people to re-learn the history of the disaster, respond to disasters, and participate** in disaster reduction activities, learning from the disaster-prone regions of Aceh.
3. **Contributed into sharing and transfer knowledge** between two countries Japan and Indonesia

GAP Information
Tsunami 2004



1. Reconstruction
(paleo)-tsunami base
on historical, science
and interview

PRE

2. Aceh Paleotsunami
Documentary Film



ALTERNATIVE MEDIA DRR

VISUALIZATION DATA

DISASTER HERITAGE :
To rise up economics of the victims
& Develop special interest of
tourism
(Potential of Dark Tourism)

Section 3

3.1 Background & Relative Study

Any major catastrophe will leave some relics and sites, that attract tourist to travel.



The affected area has become a target for the phenomenon of Dark Tourism. Dark tourism (also known as black tourism or grief tourism) has been defined as tourism involving travel to sites historically associated with death and tragedy (John Lennon and Malcolm Foley, 2010).

Today, numerous sites of the death and disaster attract millions from all around the world (Yuill, 2003).

Although it is only in recent years that it has been collectively referred to as dark tourism, travel to places associated with death, disaster and destruction has, occurred as long as people have been able to travel (Sharpley & Stone 2009).

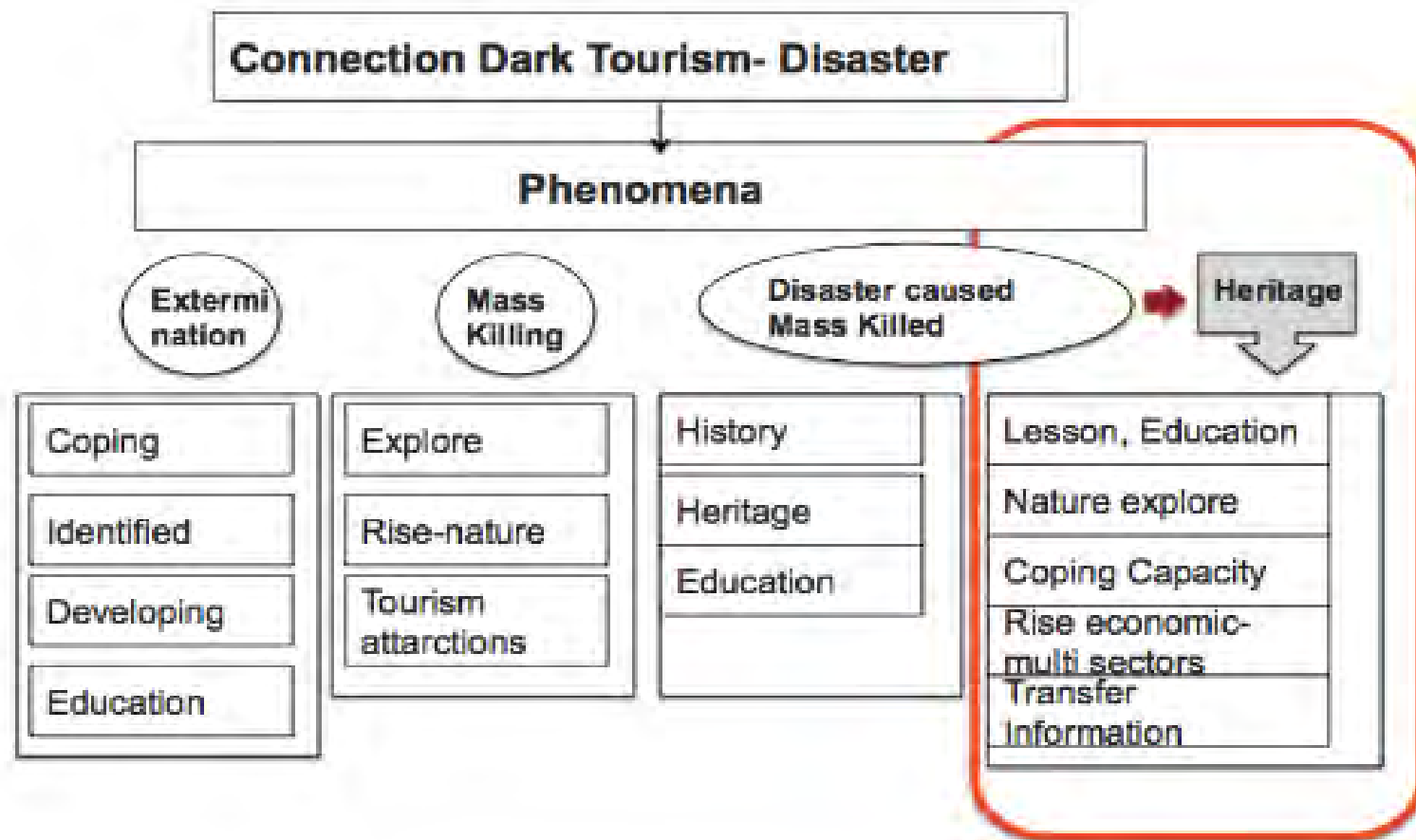
"From the ancient [times], Japan has experienced a lot of natural disasters. Dark tourism is the new way to help young people enjoy journeys" (Akira Ide, 2017).

3.2 Connection Dark Tourism - Disaster

There is no globally accepted framework of dark tourism, and globally accepted definition of dark tourism (Yunus Topsakal and Remziye Ekici, 2014).

Popularity of destination association with war battlefields, prisons, genocide areas, natural disaster etc, are increasing in the recent years, open possibility to add these destinations in special interest tourism destinations (Kurnaz et al, 2013).

Special interest tourism is opposite of mass tourism
(Trauer, 2006).



Man-made and **natural disaster caused mass killed**, leave heritage, lesson learned of education, historical, coping capacity and **attract tourist** to travel.

3.3 Objectives

(1) To display virtual special interest disaster tourism for disaster education and economic base of disaster victims.

(2) This research propose disaster heritage as potential of dark tourism in Aceh.

3.4.1 Collecting Data: Disaster Heritage, Boat on top houses in Lampulo



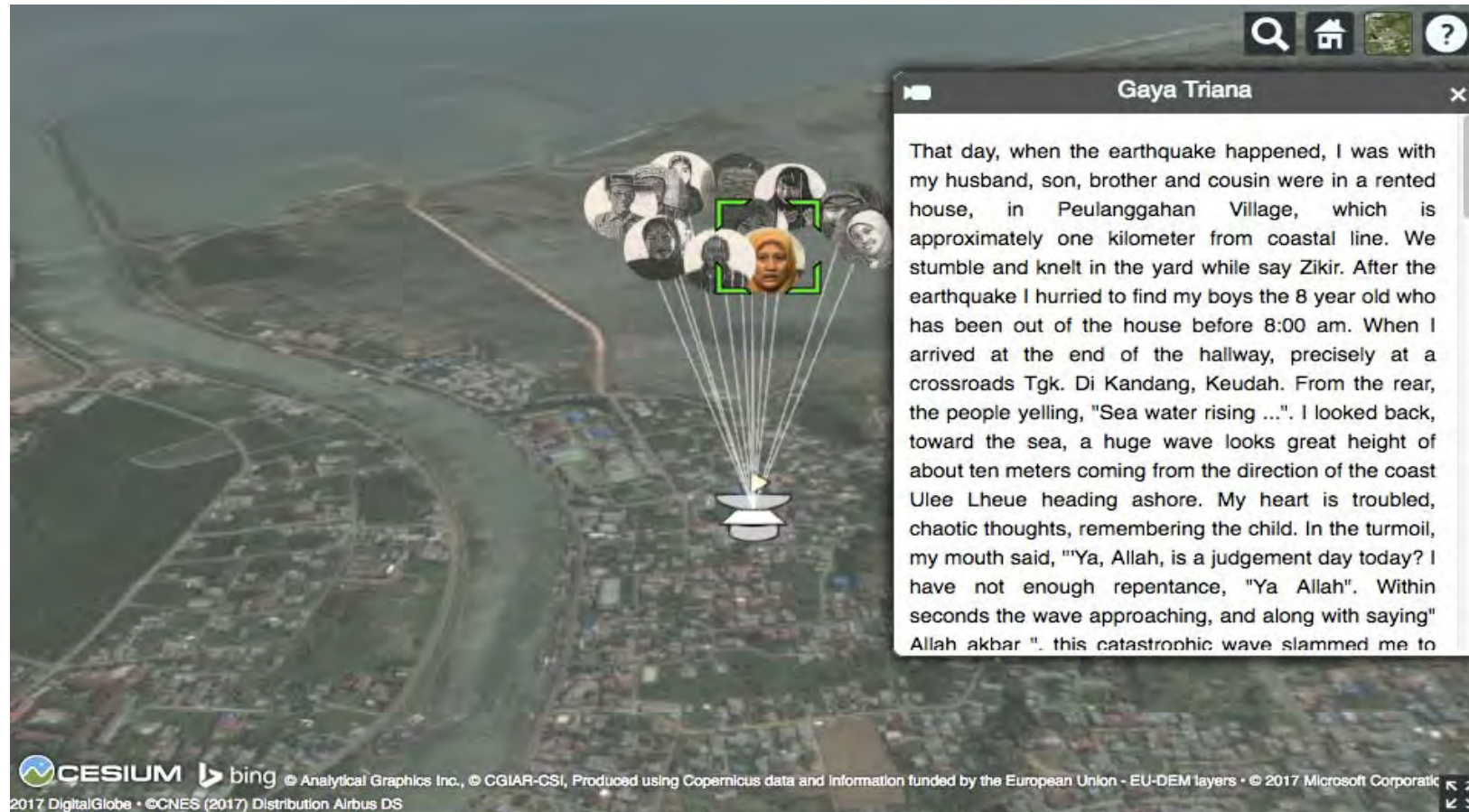
- ~ **59 tsunami survivor** saved in the boat on top Lampulo houses
- ~ National and local Government **support** the sites
- ~ **Local community** has a big role to manage the sites

Testimonies of 10th tsunami's survivor in the boat on top Lampulo houses.

[1]. Abasiah: "On Sunday, December 26, 2004, exactly a year ago, the day that we will never forget in our lifetimes, in the time in which there was a great disaster, never before seen or heard or imagined. Allah (The Majesty and Almighty) was showing some signs of his

[2]. Samsudin: "...Without thinking, we were all climbed up Mrs. Abes house trough stairs. When the water has begun to look at the top of the road. Apparently the sea floor was split, then came out all of the contents of the sea that has been buried for hundreds of years, the sea water was up to the mainland. When we got to the second floor, the water was still rising very fast. Those peoples who were brought by the water were screaming asking for help. The water was black color and mix with a wooden leaf from the seafloor..."

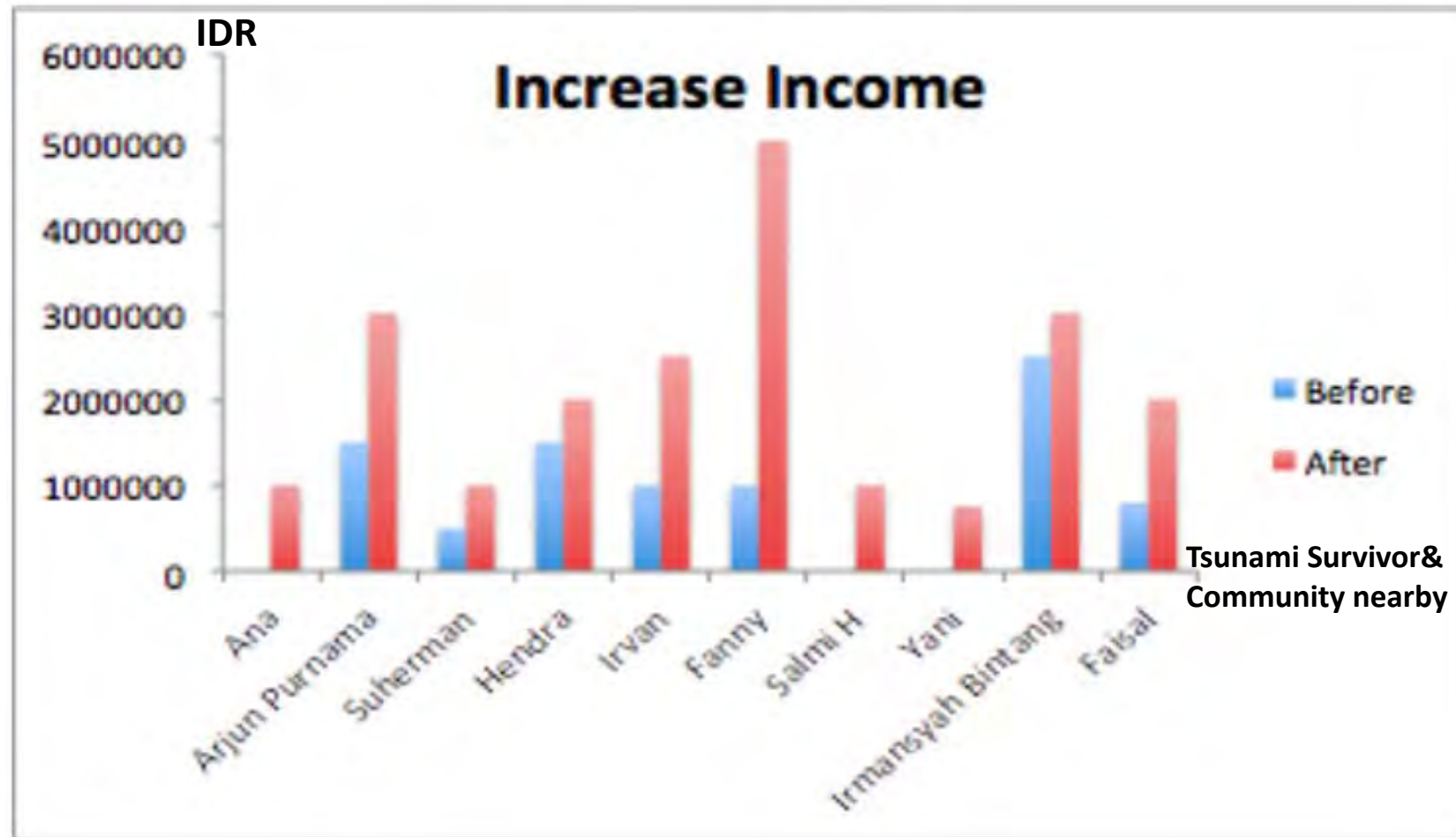
3.4.2 Developing the archive



The heritage of disaster and the testimony of tsunami survivors on the site lets it serve as Dark Tourism attraction.

- Preserving disaster heritage and displaying the testimonials of tsunami survivors by face icon is important
- its serve as a lesson for other disaster areas such as Japan, where many disaster relics have been destroyed
- From the experience of Aceh, we know that the heritage of disaster does not only include sorrow, but education and other benefits.

3.4.3 Survey for Evaluation



Survey on December 2015 in the disaster heritage site, the electrical stranded ship, shown that, mostly tsunami victim and people living nearby the sites.

What is the factor caused they income increasing.
 They confirmed that many tourists came to the site.
 From the data of Aceh Provincial Tourism Agency 2015, we identified tourism visit



Aceh disaster heritage become a site of dark tourism that attracts people from all over the world to see, to learn, to compare, to share etc.

Data of Aceh Provincial Tourism Agency shows significant number of tourist to come in Banda Aceh and neighborhood around the sites.

3.5 Result Section 3

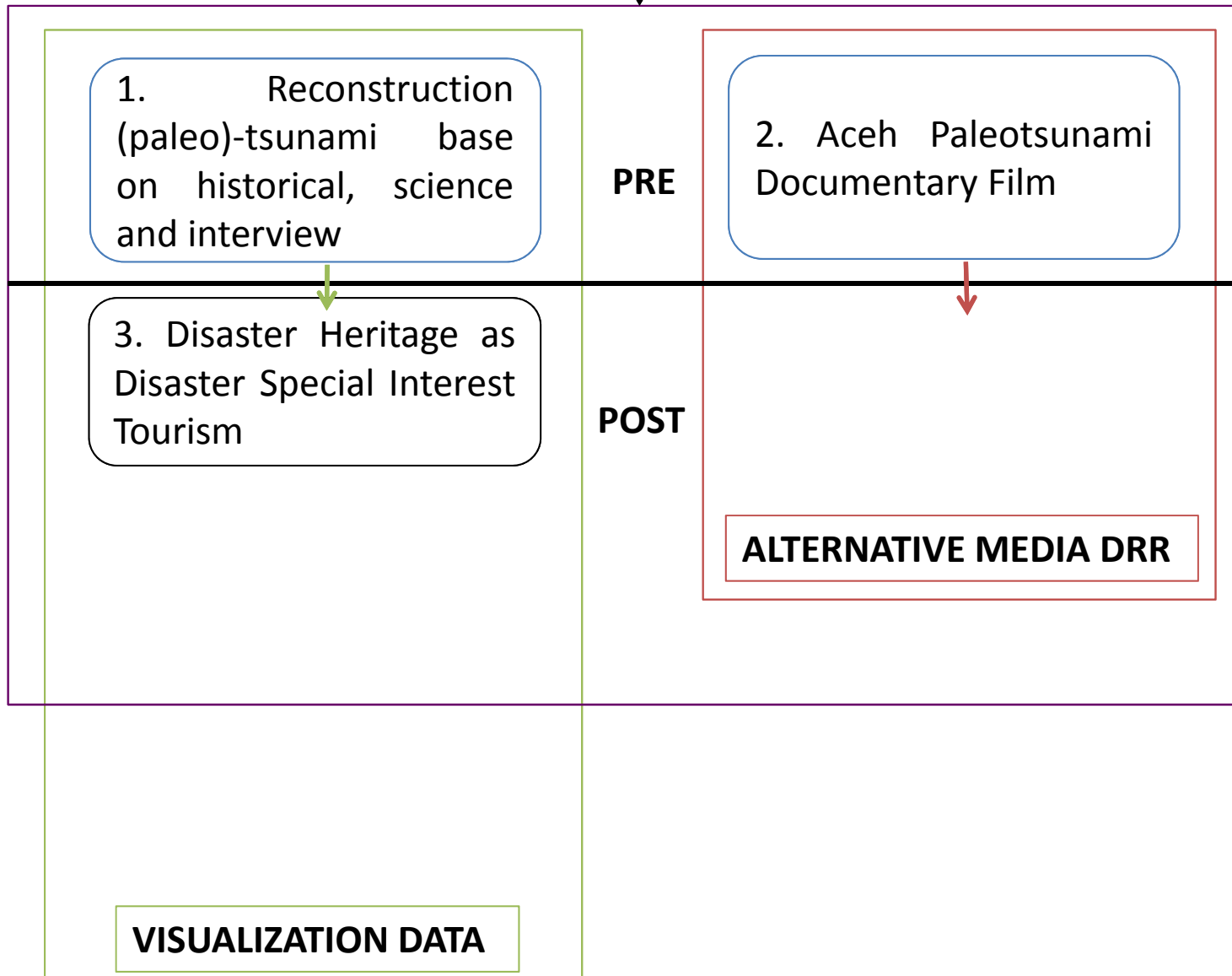
1. **Tsunami survivor's testimonies** visualizing mechanism of disaster heritage **attraction to enhance such special interest tourism**
2. It is not only to teach the history of disasters to young people, but also to attract foreign tourists to visit Aceh's disaster history sites, as well as to **improve the economics of disaster victims and communities** surrounding historical sites
3. Disaster Heritage has potential to be **Dark Tourism** site

3.6 Challenge

In the Process of Film`s Production



GAP Information
Tsunami 2004



LESSON LEARNED FROM REHABILITATION & RECONSTRUCTION OF HOUSING PROGRAM

Section 4

4.1 Background

Post Indian Ocean Tsunami 2004 in Aceh.

Post
Disaster

largest reconstruction projects ever
seen in the developing world

International response nearly 500
participating actors on the ground

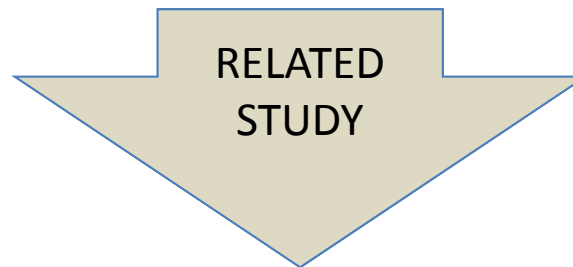
billions of dollars flowed into
reconstruction along with the largest
number of actors ever witnessed

4.2 Objectives

(1) Display the lesson learned housing reconstruction process for DRR in the future.

(2) Data collection of tsunami victims and housing's photos are important to compare the landscape area of the housing location and its effects on damages and significant changes of housing condition

4.3 Relative Study



However, during their rush to be involved in reconstruction, many NGOs operated well outside their expertise due to the fact that action was urgent and essential and did so without the capacity, capabilities and competencies in place to deliver satisfactory projects. (Von Meding J. K., Oyedele L. and Cleland D.J., 2009).

4.4.1 Collecting Data

Sabang: - First Floor - Semi modern

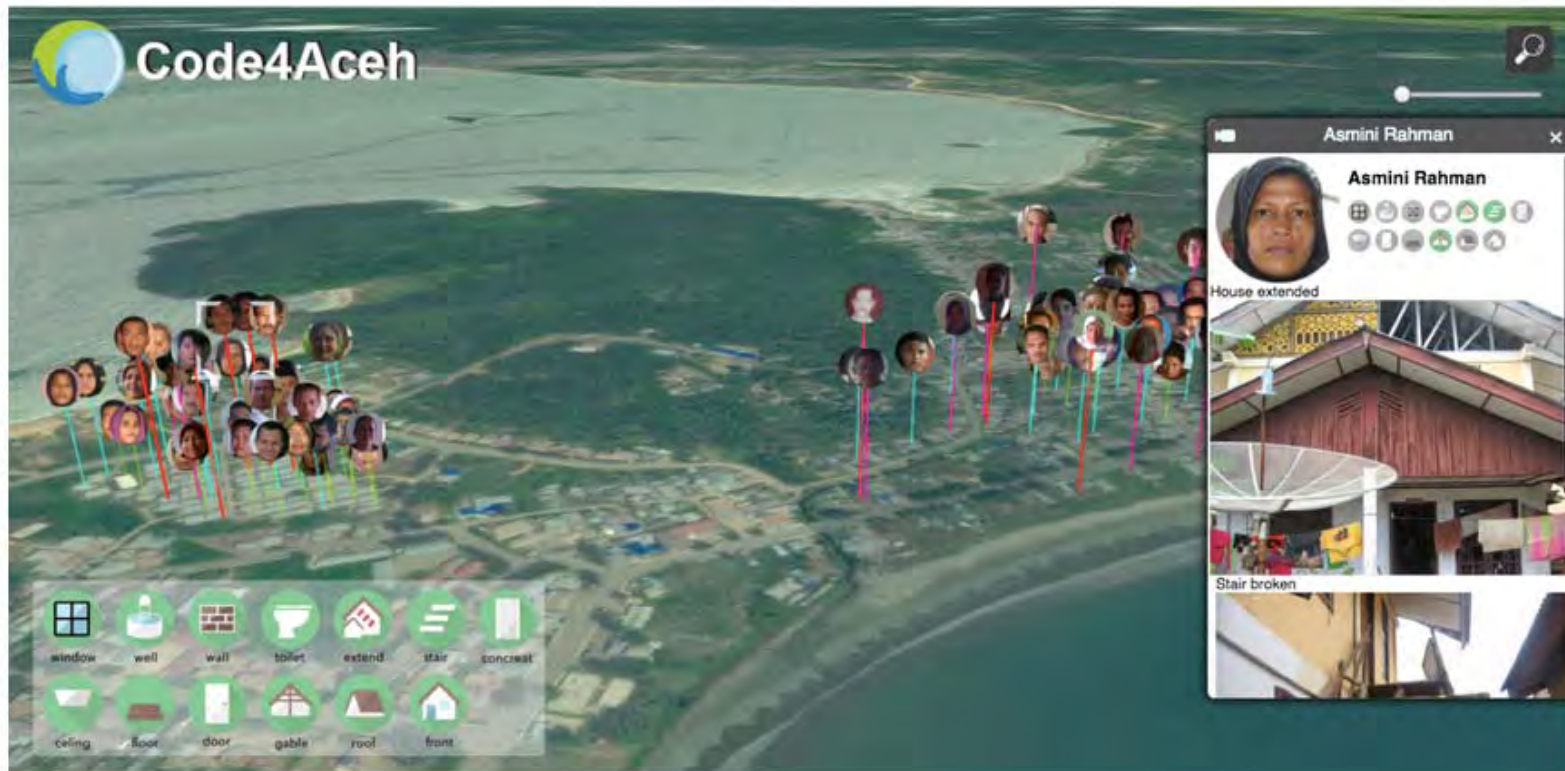


Aceh Jaya: - Second Floor - Semi traditional

German Red Cross (GRC) Housing Program: In depth interview End-line survey to monitor about 'Building Capacity Know-How' and 'Culture of Safety' of housing structures, and therefore it is necessary to learn the situation amongst the communities in the project areas.

4.4.2 Developing the archive

Visualization of Rehabilitation & Reconstruction: German Red Cross Housing Program Aceh



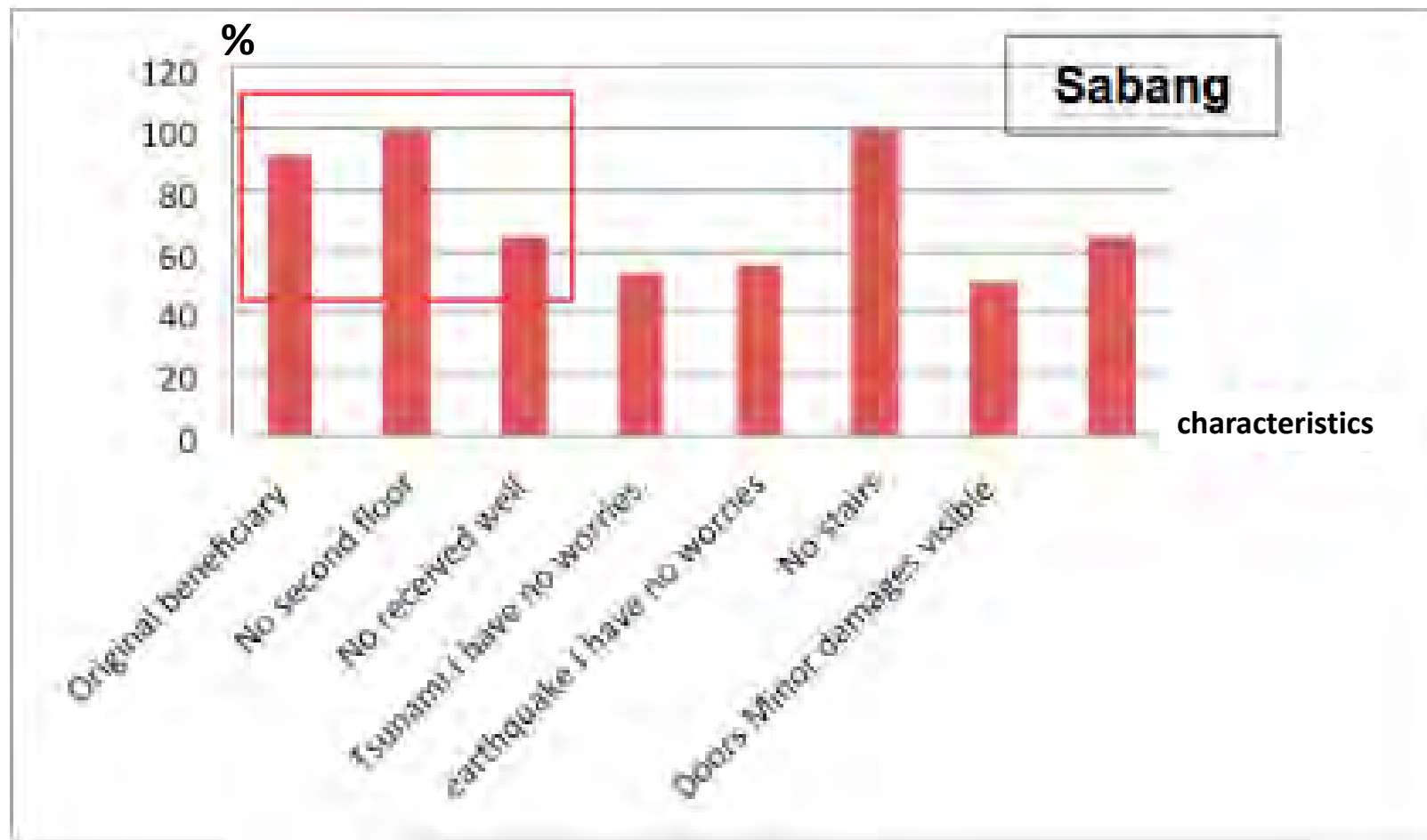
code4aceh

The Visualization provide a better understanding to represent a concrete and overall of housing program post disaster 2004 in Aceh

4.4.3 Survey for Evaluation



Characteristics: *evacuated to the second floor
*received well



Characteristics in: *No Second Floor *No received well,

4.5 Result Section 4

1. Provides a real and attractive display offering access to information such as:

ground-to-top views

their elevation

landscaping in the areas

the number of occupied houses

kinds of materials used

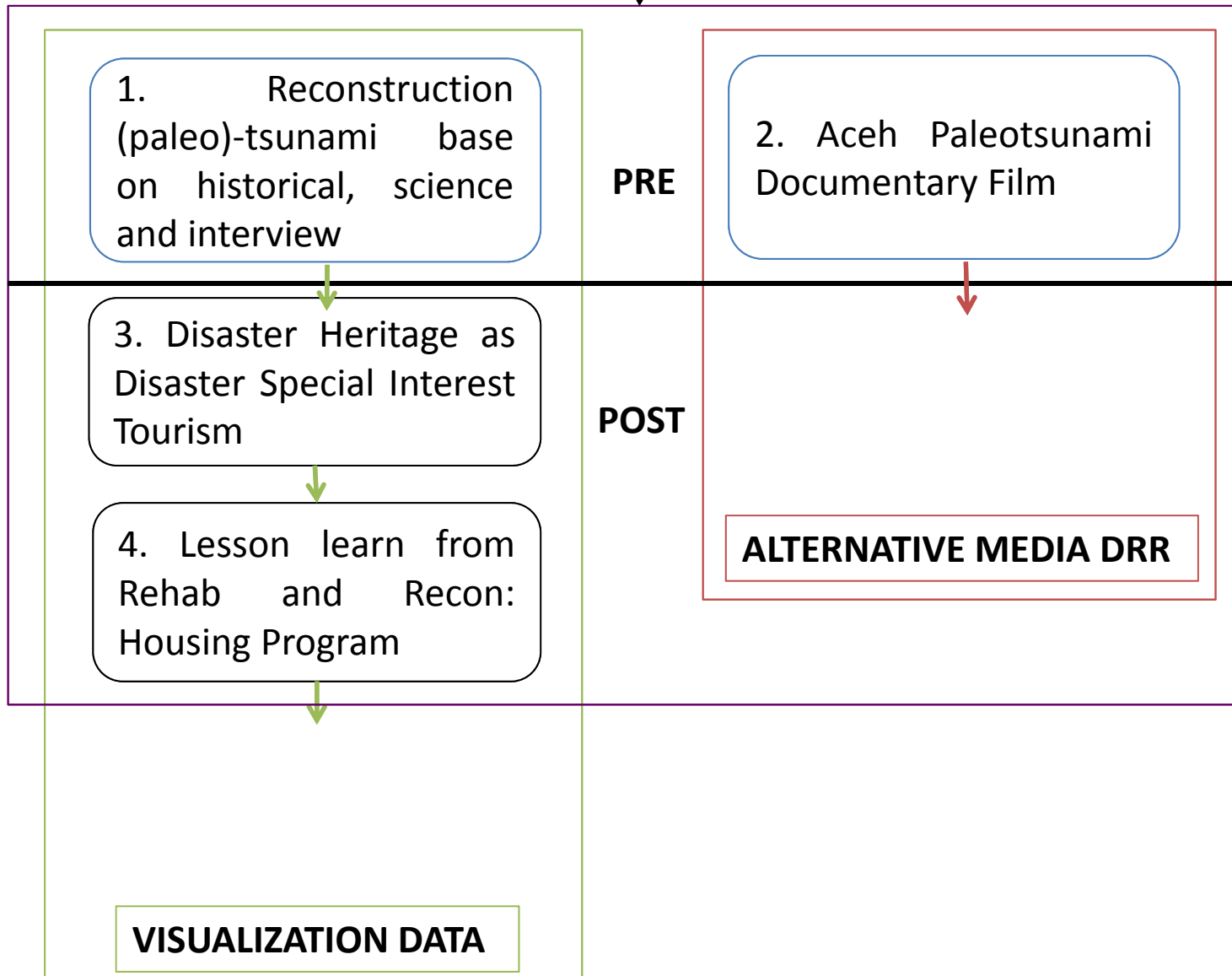
how close the areas are to the ocean

the effect of distance from the ocean on housing

showing the degree of damage to houses or materials

2. Base on the visualization data on the housing reconstruction process proved to be an effective way to document the lessons learned and disaster risk reduction for future use.

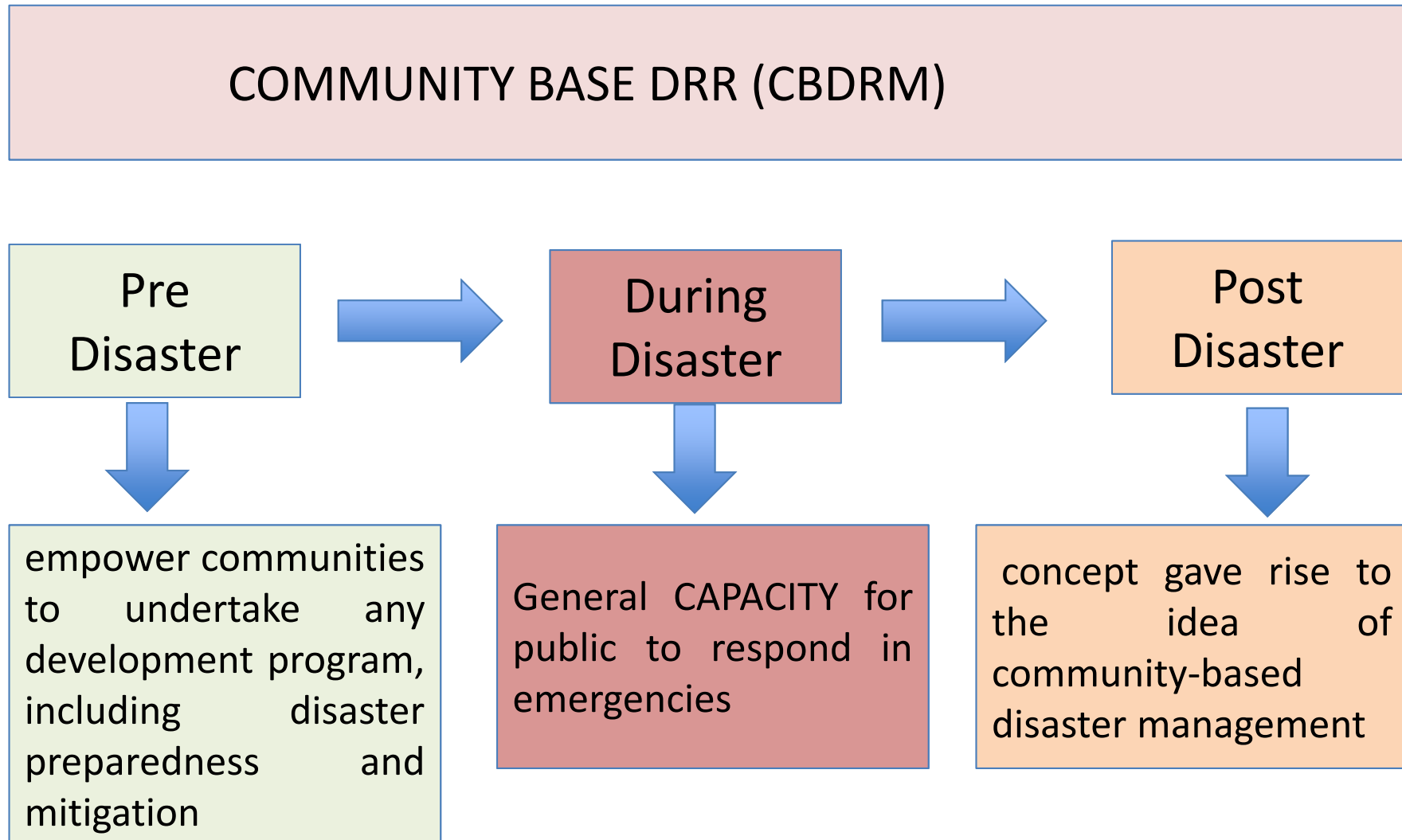
GAP Information
Tsunami 2004



BUILT COMMUNITY BASE DRR FOR SUSTAINABILITY

Section 5

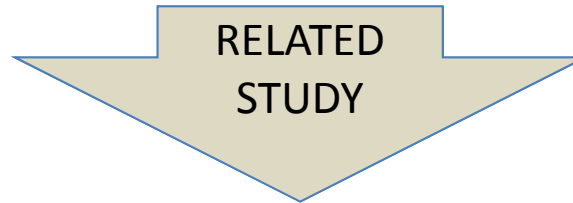
5.1 Background



5.2 Objectives

1. To develop a community-based disaster risk reduction. For **Disaster-responsive communities**, who understand the threats within their territories, make efforts to share disaster information, experiences, and mitigation strategies **by, from, and for the community**.
2. The target is **young people** who can deliver, transfer their skill and power to vulnerable people

5.3 Relative Study



Code for All in the link <https://codeforall.org>, is an international network of organizations who believe that digital technology opens new channels for citizens to more meaningfully engage in the public sphere and make a more positive impact on their communities (Codeforall.org, 2017)

Some studies clarify that collaboration activities needs between community and organizations for disaster prevention is important (Ichiko, T., 2011).

5.4.1 Built Community DRR

Risk Communication Activities



CAPACITY BUILDING: Develop Banda Aceh local wiki

Banda Aceh LocalWiki <https://localwiki.org/bandaaceh/>

localwiki

Banda Aceh

Front Page

Welcome to the Banda Aceh LocalWiki!

A website about Banda Aceh that anyone can edit

I want to make a page about

Welcome to the new LocalWiki region for Banda Aceh!

Click on Explore at the top to see what's here now.

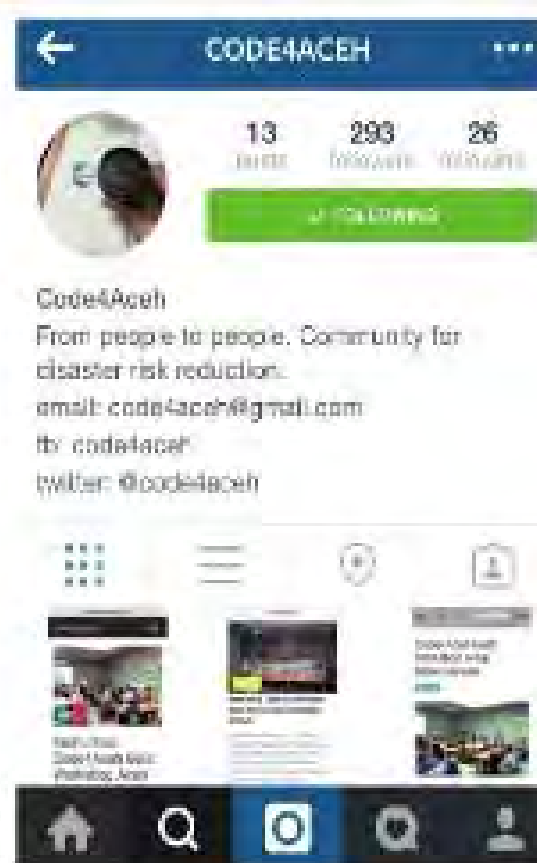
- open source data: Open street map (OSM)
- community participation
- spreading information

COMPETITION: to encourage skills and spread the information



1. Mashup Awards 9: "Using Aceh Rehabilitation open data source, applied in cesium and github." <https://hacklog.jp/works/4216>
2. Urban Data Challenge: "Aceh Rehabilitation open data source, applied in cesium and github." http://aigid.jp/?page_id=1175

5.4.2 Code4Aceh SNS (Social Network Service): Facebook Twitter and Instagram



5.5.1 Evaluation

Using analysis of user's behaviour to evaluate:

- Code4Aceh Sharing information & transfer knowledge
- Connecting multi-stake-holder


EMERGENCY RESPONSE:(1) Kumamoto Earthquake, April 14, 2016

Sharing information& transfer knowledge

Post Details

Code4Aceh
Published by Nuzanah Nur (7) · May 19 · @

Berita terkait Gempa Kumamoto di TribunNews
<http://m.tribunnews.com/.../tanggap-antisipasi-keadaan-darura...>



Tanggap Antisipasi Keadaan Darurat, WNI Bantu Pemda Jepang - Tribunnews.com
WNI di Jepang ternyata aktif dan tanggap dalam mengantisipasi bencana yang terjadi 40 hari lalu di Kumamoto sebelah selatan Jepang.
TRIBUNNEWS.COM

Get More Likes, Comments and Shares
Boost this post for \$3 to reach up to 8,000 people.

1,765 people reached

Boost Post

Reported analysis of user's behaviour

1,765 People Reached

22 Likes, Comments & Shares

18 Likes	3 On Post	15 On Shares
0 Comments	0 On Post	0 On Shares
4 Shares	3 On Post	1 On Shares

63 Post Clicks

0 Photo Views	25 Link Clicks	38 Other Clicks
-------------------------	--------------------------	---------------------------

NEGATIVE FEEDBACK

0 Hide Post	0 Hide All Posts
0 Report as Spam	0 Unlike Page

Community Organization

Q Search for posts on this Page

Very responsive to messages
100% response rate, 15-mins response time

EMERGENCY RESPONSE: Pidie Jaya Earthquake, Dec 7, 2016

Connecting multi-stake-holder



5.5.2 RESULT

Code4Aceh **Facebook Fan Page** spread information faster (more than 1.765 people to the link). The link of Facebook fan page can be found in the link below:

<https://www.facebook.com/code4aceh/>

Code4Aceh also cited publications in online and printed media, on local, national and international level such as:

Lintas Aceh.com

Portal Satu.Com

Asahi Shimbun

Aceh Kita.com

Tribun News Asia

Iwate Nippo

Liputan
Rakyat.com

5.6 Result Section 5

1. Social Network Services (**SNSs**) are an **essential** part of contemporary life.
2. **Digitalizing, visualizing, compiling, and displaying** open-source data and **linking** them to SNSs.
3. So far, the data show that the **Code4Aceh Facebook fan page has had a positive impact and attracted positive attention** from audiences as an alternative medium for learning about disaster.

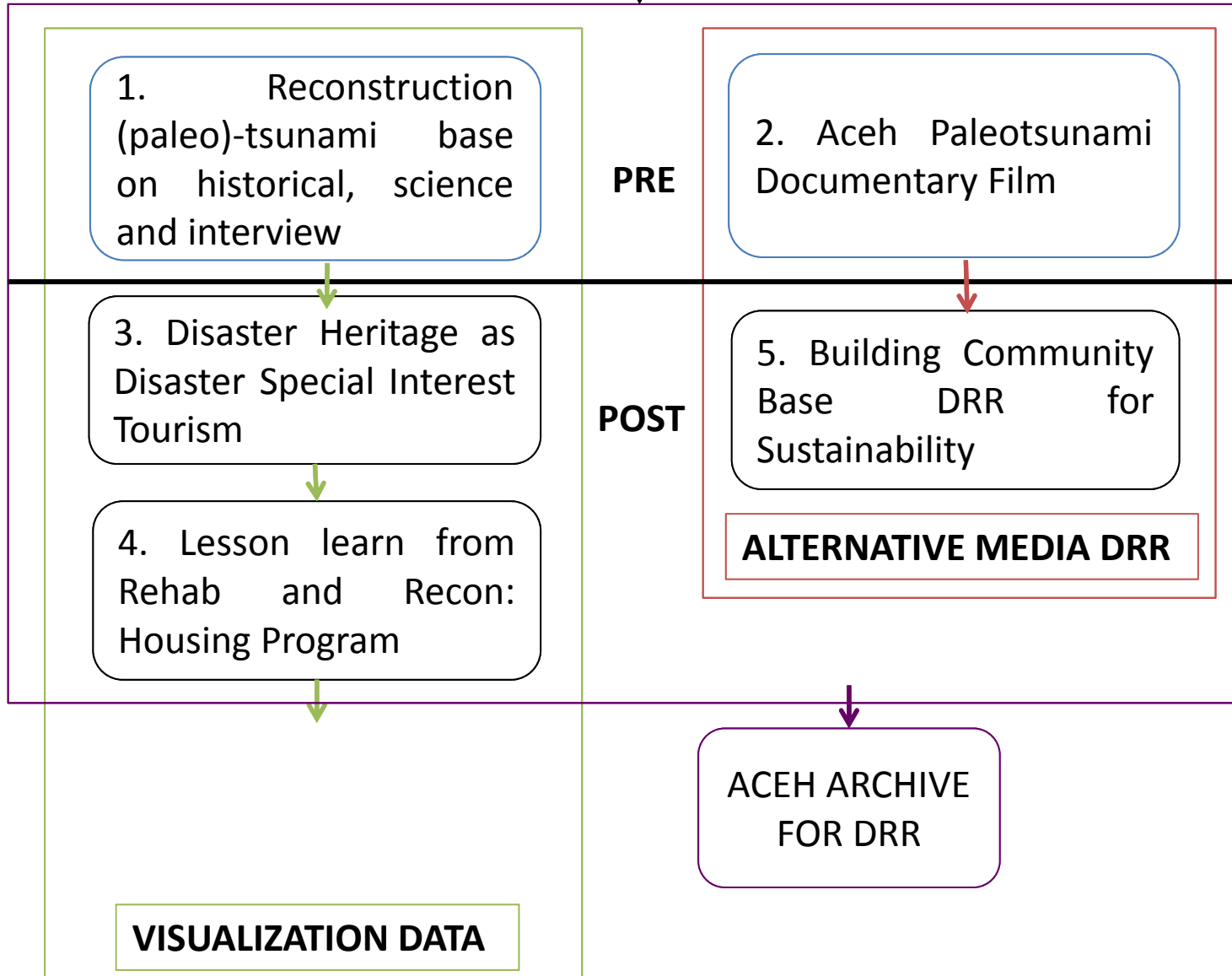
Now our Digital Archive uploaded in **github**,
adoptable to other researcher and **not license yet**



The Future Outcome

“Creative Commons” or “Public Domain” of Aceh
Disaster Archive for sustainability community

GAP Information
Tsunami 2004



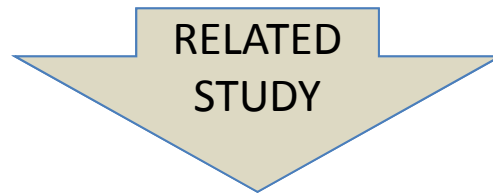
COMPARISON STUDY
“*WASURENAI*” IWATE PREFECTURE
BANDA ACEH INDONESIA

Section 6

6.1 Objectives

1. To get a **mutual understanding** of the disaster experiences and practices between the two countries Japan - Indonesia.
2. To **comparison the pattern of evacuation** during disaster, between Great East Japan Earthquake (GEJE) 2011 experiences and Aceh Earthquake on April 11, 2012

6.2 Relative Study



Creating a digital archive that provides a multipronged, general understanding of an archived event requires a well-designed method (Watanave, H. et al 2011). Data visualization that utilizes an online virtual globe makes it easier for researchers to find new historical information and disseminate knowledge widely on the internet (Watanave, H. et al 2010)

Clarify the awareness, behaviour and related factors of residents who were issued an evacuation advisory alert for the 2004 season's 23rd typhoon in Hyogo Prefecture, (M., Nozawa, N., Katada et al, 2008).

6.3 Background

Post Great East Japan Earthquake 2011

Post
Disaster

Iwate Nippo Newspaper has preserved the names of each and every victim of the disaster

Base on Wasurenai (We Shall Never Forget) project, and the “てんでんこ未来へ” Tendenko-Mirai-E (A Future Where You Look Out For Yourself) series

Collaboration Hidenori Watanave Laboratory and Iwate Nippo

6.4.1 Collecting Data

Iwate Nippo

Collected various positional information from surviving family members, **detailing the location of victims** at 2:46PM on March 11, 2011

Identified the **evacuation behavior patterns** were re-enacted for 1,326 victims, whose whereabouts **when the earthquake struck and tsunami hit became known**

Received responses from 1,549 surviving family members. Between November 6 last year and January 30 this year, and a total of **2,135 victims**

Iwate Nippo

"Five-Year Oath to Protect Lives"

1. Just escape and avoid returning once escaped.
2. Avoid overestimating evacuation sites and head to higher ground.
3. Conduct survival-oriented evacuation training.
4. "Tsunami will not come up to here" does not hold.
5. Create rules to save disaster-vulnerable people.

By creating a visual record of these victims' silenced voices, our team hopes to leave a record that can educate future generations on how to prepare themselves for earthquake disasters.

Translation Wasurenai Indonesian Version

**Asahi
Simbun**



analysis of user's
behaviour

**Iwate
Nippo**



Wasurenai Indonesian Version



Wasurenai Project got award of Inochi no Kiseki, Japan Newspaper Publishers and Editors Association Award on June 2016.

6.4.2 Developing the Archive

Collaboration Iwate Nippo and our laboratory

Combined of three-dimensional aerial photos, maps and interviews data

The aerial **photo layers** used the photos directly **after the disaster** and from **1974 to 1978** use **tile data** from the Geospatial Information Authority of Japan

The visualization 3D map shows the **positions of earthquake victims** as points on a map and then tracks their **evacuation movements** between the earthquake and the approach of the tsunami by showing those points **in motion**

Movies

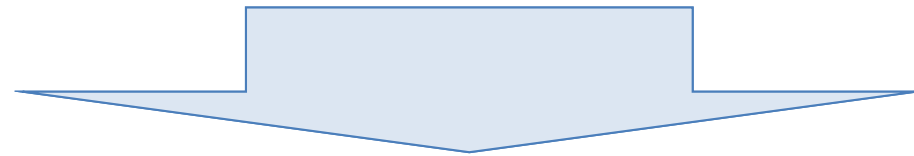
<https://drive.google.com/open?id=0B7uKeVg3VJZRUIJXQWxOREFZUkE>

Collaboration project



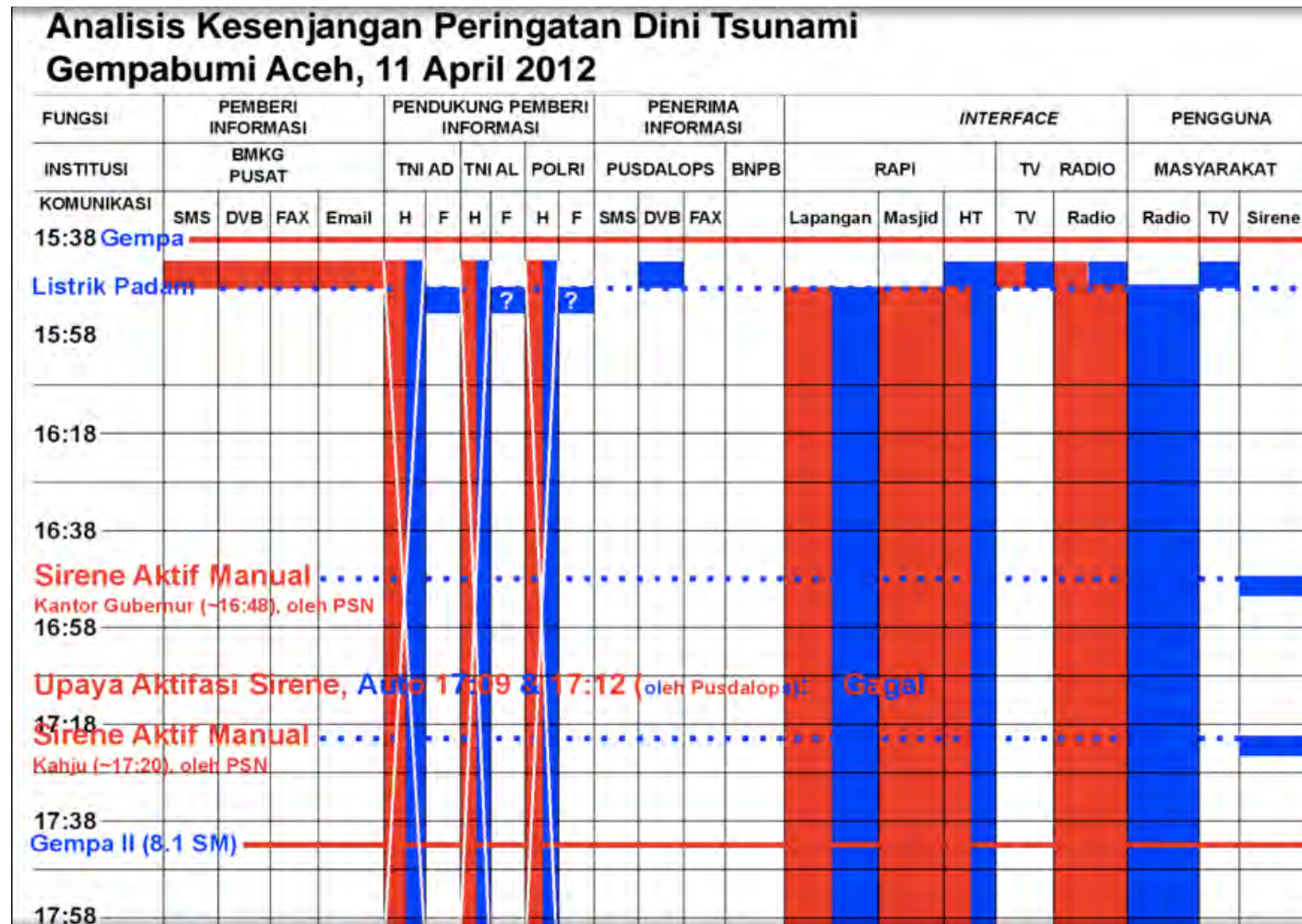
In many **designated evacuation shelters**, including the Rikuzentakata Civic Gymnasium, we can see that people who went to their homes in the tsunami flood zones **lost their lives**

6.5 Comparison Study: *Wasurenai* – Banda Aceh



The Lesson learnt of Great East Japan Earthquake-Tsunami 2011 in Iwate Prefecture-Rikuzen Takata, for Banda Aceh-Indonesia, Post Indian Ocean Tsunami 2004

6.5.1 Aceh Earthquake, April 11, 2012 (8.7SR) Tsunami Early Warning Gap



Source: Rapid Assessment of Indonesian Institute of Sciences (LIPI), 2012

Rapid Assessment of Indonesian Institute of Sciences (LIPI), Aceh Earthquake April 11, 2012

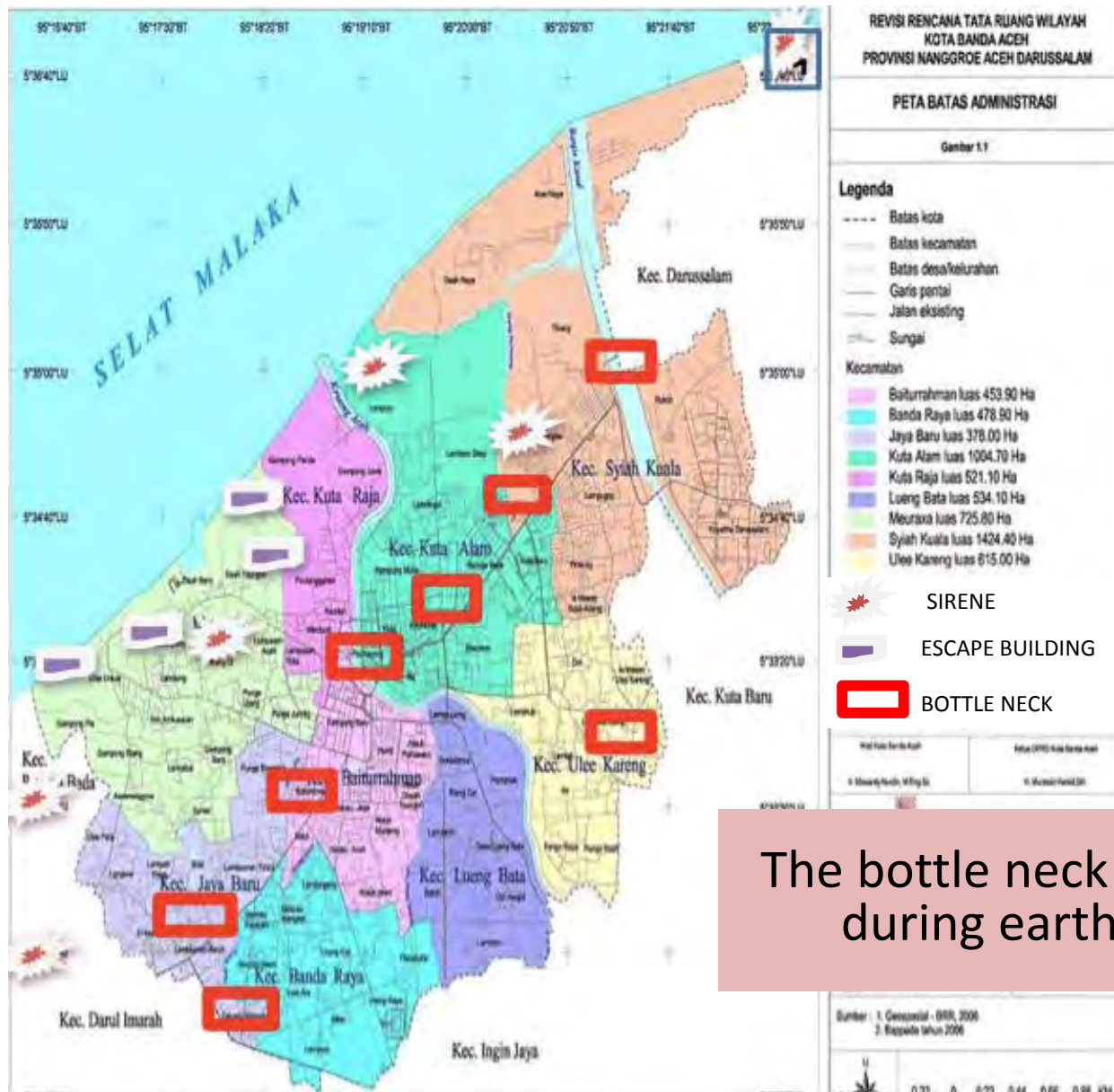
Some of the earthquake-related public perceptions are as follows:

1. Strong earthquakes and long shocks can trigger a tsunami.
2. Tsunamis are marked by the receding of sea water (many people observe seawater after the earthquake occurs, and only evacuate after the water appears receding).
3. The siren is a sign of a tsunami. Most people have never heard tsunami siren PD (Early Warning).
4. **The public does not believe that the strong escape-building site is holding back the tsunami hits.**
5. Escort (escape building) is only for vulnerable groups (parents, children, women) and people who do not have a vehicle.

Rapid Assessment of Indonesian Institute of Sciences (LIPI), Aceh Earthquake April 11, 2012

Most people **directly evacuate** using 2-wheeled **vehicles** and wheels 4. So as to **cause total congestion and blockage of traffic flow (bottle neck)** is actually concentrated in 3 places Ketapang **intersection**, Simpang Ule kareng and Simpang Surabaya, which all headed toward Lambaro (Blang Bintang), as a reference location higher than Banda Aceh.

6.5.2 The Pattern of Evacuation of Aceh Earthquake, April 2012



The bottle neck and traffic jam during earthquake Aceh

6.5.3 Result

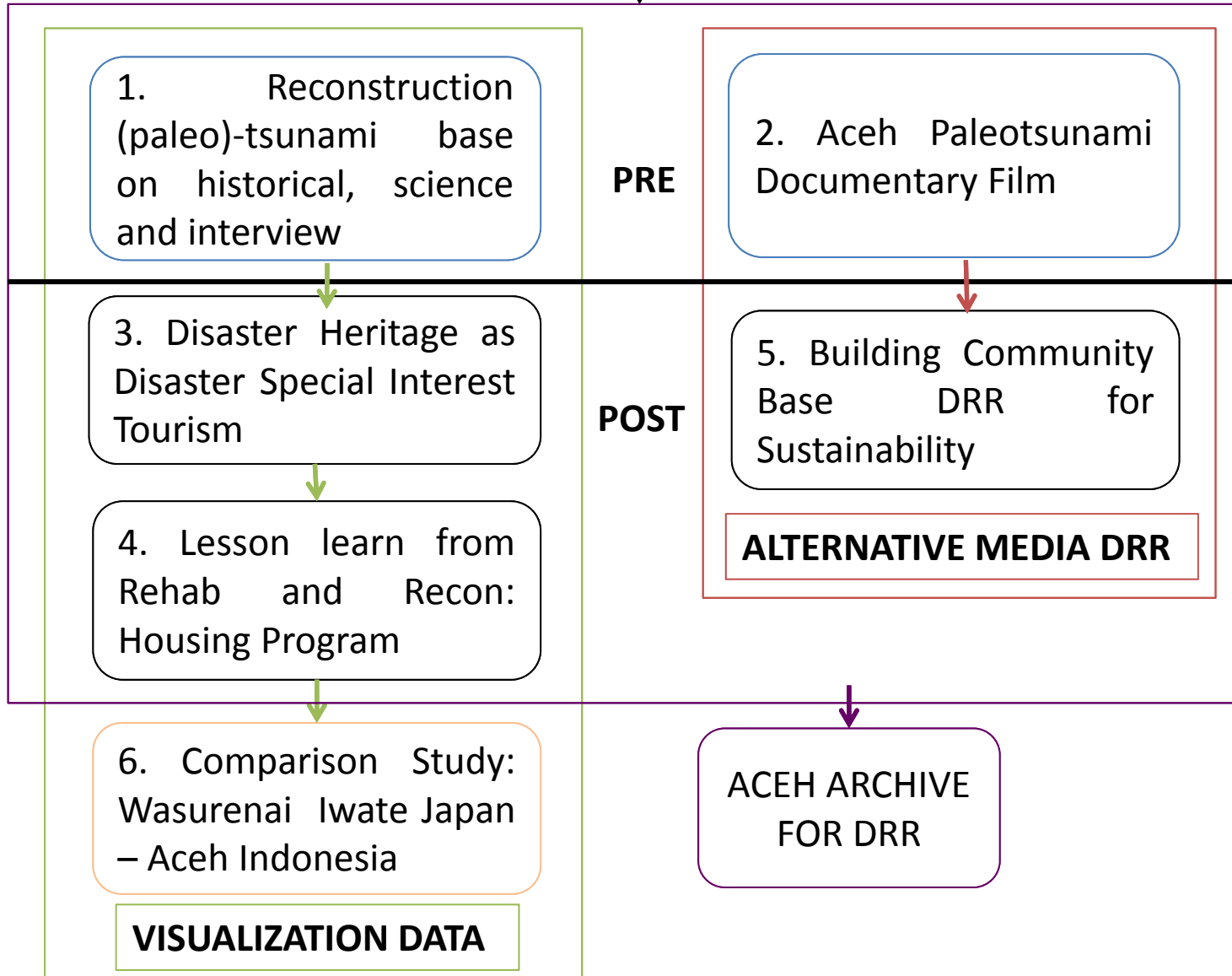
Shown in the Aceh's earthquake in April 11, 2012:

- After the 2004 tsunami disaster, the people of Aceh have a **stronger intuition to save themselves to a higher place** in the event of a major earthquake than evacuate to the escape building.
- The problem is, how **the government** both the center and the region, **prepare evacuation facilities** such as road infrastructure, safe evacuation routes, clear signs and human resources that have capacity of disaster response as an effort to prepare and reduce disaster risk in the future .

6.6 Conclusion of Comparison

No	Cases	Wasurenai GEJE 2011	Banda Aceh, Earthquake 2012
1	Evacuation Shelter	Many, some are close to the ocean	Only 4, all of them close to the ocean
2	Confidence of evacuation shelter is save	Very confidence the evacuation shelter is save	Very not confidence the evacuation shelter is save
3	Perception sign of Tsunami	EWS, smart phone alert	strong earthquake and long shocks, receding sea water
4	Experiences using shelter	Evacuation shelter save in Chile <u>Eartquake</u>	Have no experiences using evac.shelter
5	Vulnerable people perceptions	Didn't evacuate (base on Chile experienced)	Evacuate to the shelter
6	General public perceptions	Evacuate to the shelter	Take vehicles to the <u>up hill</u>
7	The fact during disaster	Many people died in the evacuation shelter	The <u>bottle neck</u> and traffic jam along the road and High Risk

GAP Information
Tsunami 2004



FINAL SUMMARY

Limitation of the Archive

- Scope the data and sampling;
- Reconstruction Paleotsunami: **[1]**. Scientifics data only used data of Collaboration research with Katrin Monecke in Samatiga Region, West Aceh. **[2]**. Historical used Hermansyah translation only some of manuscripts. **[3]**. Sampling of interview only 6 Districts areas in Aceh.
- Film: only one film established as alternative media DRR.
- Dark Tourism: Limitation of sampling interviews tsunami survivor in the boat on the top of houses
- Rehab Recons: Only displayed GRC Housing Program to compare inland and Island housing model.
- Community (CBDRM) only combine digital and DRR community
- The Archive still developing in present time.

Final Conclusion

- We contributed to an **historical-anthropological data collection**, related to the past disasters.
- We proved that our digital archive **method is attractively** digital earth interface to display multimedia data including film and comparison study between Japan and Indonesia.
- We established a DRR-based community as **a better function to transfer information** about disasters more accessible to the younger generation, especially by connecting them to the SNS.
- The pluralistic disaster digital archive will **remind people around the world** that local knowledge from the past disaster offers invaluable lesson for DRR and global information.

