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REPORT ON
The International Workshop on Sustainable Tsunami Disaster Management:
Developing Awareness, Hazard Mapping and Coastal Forest Implementation

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Tsunami and Disaster Mitigation Research Center TDMRC

ICHARM

PWRI

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International Centre for Water Hazard and Risk Management under the auspices of UNESCO (ICHARM)
Public Works Research Institute (PWRI)

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No. 4179

Report on The International Workshop on Sustainable Tsunami Disaster Management:

Developing Awareness, Hazard Mapping and Coastal Forest Implementation

9 – 11 March 2010, Banda Aceh, Indonesia

By

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Dr. Dinar Catur Istiyanto

ICHARM, in cooperation with TDMRC, carried out an international workshop on sustainable tsunami disaster management on March 9 to 11, 2010 at Banda Aceh, Indonesia.

The overall objective is to improve the capacity of local disaster manager in developing countries on sustainable tsunami disaster management through the development of tsunami disaster awareness and preparedness by using THM and coastal forest implementation.

The 30 invited participants were local government officials or community leaders who work closely on disaster management. Among participants, five were invited as country representatives each from India, Indonesia, Malaysia, Sri Lanka and Thailand to introduce the situation in their countries. The rest of participants were representatives from tsunami prone coastal cities in Indonesia and municipalities within Aceh Province.

This is a report to describe the contents, evaluate the results and conclude the lesson for future activities of local capacity development.

Keywords: tsunami, workshop, awareness, sustainable disaster management

Report on
The International Workshop on
Sustainable Tsunami Disaster Management

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Chapter 1
Background

Indian Ocean countries have been developing and enhancing their national as well as regional disaster management system under the support of international communities. Several monumental progresses have been shown such as development of Indian Ocean Tsunami Warning System (IOTWS). However, even a perfect warning would be useless if people performed incorrectly in case of an emergency. Therefore, awareness and preparedness at the community level is essential. In this regard, it is important to give continuous education and remind people to conduct consistent awareness and preparedness measures. Since a massive tsunami occurs infrequently, for example once in 100 years, it is difficult but necessary to come up with ways to sustain public awareness towards tsunami disaster mitigation. Considering the potential role of Tsunami Hazard Map (THM) and coastal forest in tsunami disaster mitigation, assuming their development integrates elements such as, environmental sustainability, coastal disaster countermeasures, and local community livelihood; their implementation will contribute to long-term preparedness and awareness of the community against the low frequency, but high impact disaster of tsunami.

On the above regard and taking the opportunity of the fifth year anniversary of the 2004's Indian Ocean Tsunami disaster, the International Centre for Water Hazards and Risk Management (ICHARM) of the Public Works Research Institute, Japan, in cooperation with the Tsunami and Disaster Mitigation Research Center (TDMRC) of Syiah Kuala University, Indonesia, carried out a workshop on sustainable tsunami disaster management on March 9 to 11, 2010.

The overall objective is to improve the capacity of local disaster manager in developing countries on sustainable tsunami disaster management through the development of tsunami disaster awareness and preparedness by using THM and coastal forest implementation. Participants learned Japan experiences as well as fundamental and practical techniques on planning and design of THM and coastal forest for tsunami mitigation. They also discussed how to raise disaster awareness in developing countries. After returning to their institution or localities, the participants are also expected to share the information and know-how acquired through the workshop with those who are in charge of taking actions. The know-how gained in the workshop is expected to contribute to reduce tsunami disaster damages.

The participants will be capable of conducting planning and design of THM and coastal forest for tsunami mitigation based on natural and socio-economic conditions in their localities. The participants will disseminate the acquired knowledge to the end-users and all the stakeholders in their localities to improve the

quality of planning and design of THM and coastal forest for tsunami mitigation. Implementation of proposed local action plans in cooperation with local government and community will contribute to providing as many field examples of coastal forest for tsunami mitigation as necessary, which will subsequently promote active community participation in tsunami disaster countermeasures.

Chapter 2
Preparation for the Course

2.1 Coordination between ICHARM and TDMRC

In line with its ongoing research on sustainable tsunami disaster mitigation for developing countries and taking the opportunity of the fifth year anniversary of the 2004 Indian Ocean Tsunami disaster, ICHARM initiated this workshop in order to share and disseminate Japan experiences in tsunami disaster mitigation.

Along with the fifth year anniversary of the 2004 Indian Ocean Tsunami disaster, Banda Aceh – the most devastated area by this giant tsunami – was considered to be the most suitable location for the workshop with its various tsunami historical sites and survivors. In this point of view, ICHARM contacted the Tsunami and Disaster Mitigation Research Center (TDMRC) of Syiah Kuala University of Banda Aceh, Indonesia, to co-organize the event. TDMRC is a very important institute in Indonesia, which carries out various researches towards better tsunami disaster mitigation. As one of the focal points, the excellent capacity of TDMRC provides links to other related institutions in Indonesia, such as Ministry of Marine Affairs and Fisheries of Indonesia, UNDP Office Indonesia, Multi Donor Trust Fund, *etc.* After several consultations, ICHARM and TDMRC agreed to conduct the workshop on March 9 to 11, 2010.

2.2 Development of Workshop's Programme and Contents

While sharing and disseminating the Japan experiences in tsunami disaster mitigation measures are very much valuable, the understanding on the development progress of tsunami disaster mitigation measures especially within Indian Ocean tsunami-affected countries, at the same time, is also very important to explore the local challenges and requirements on the related matter. These considerations are reflected in the programme of the workshop, which is shown in Table 2.1.

The workshop was conducted in a two and a half-day programme, with a curriculum that covers the following topics:

- The development of awareness and preparedness
- The roles and limitations of coastal forest for tsunami mitigation
- Planning and design of coastal forest for tsunami mitigation

- Planning, design and utilization of THM
- Discussion and group presentation for the enhancement of guideline for THM as well as planning and design of coastal forest for tsunami mitigation for local cases
- Discussion and group presentation on the role of THM in awareness raising
- THM in coastal disaster management plan
- Field orientation for data collection of planning and design of THM and coastal forest for tsunami disaster mitigation
- Tour to tsunami historical places in Banda Aceh City

Table 2.1 Workshop Programme

[March 9th, 2010]

14:00-15:00 Organizing Committee meeting (ICHARM and TDMRC)
15:00-17:00 Pre-field orientation visit by OC to select field visit locations

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18:00-18:30 Registration of participants
18:30-19:00 Course explanation by ICHARM
19:00-21:00 Welcome Dinner

[March 10th, 2010]

08:15-08:45 Registration of participants
08:45-10:00 Presentation by each country's situation after the Tsunami damages 2004 (emphasis on resident's awareness activities); (15minutes for 5 countries)
10:00-10:15 Coffee Break

(Session 1: Disaster awareness and Tsunami Hazard Map)
10:15-11:00 Lecture#1 on Tsunami disaster management by Dr. Shigenobu Tanaka (ICHARM, Deputy Director, Expert on Local Disaster Management Plan)
11:00-11:45 Lecture#2 on Tsunami hazard map and coastal disaster management by Dr. Subandono Diposaptono (MMAF-GOI, Director of Marine and Coastal Affairs, Expert on Integrated Coastal Zone Management)
11:45-12:15 Lecture#3 on Planning and Design of Tsunami Hazard Map by Dr. Eldina Fatimah (TDMRC, Experts on tsunami hazard mapping)
12:15-13:45 Lunch Break
13:45-14:45 Group Discussion (1) on "Tsunami hazard map's role in awareness raising"
14:45-16:00 Group Presentation, discussion, and comments
16:00-16:15 Coffee Break

(Session 2: Coastal vegetation)
16:15-17:15 Lecture#4 on Planning and Design of Tsunami-mitigative Coastal Forest by Dr. Dinar Istiyanto (ICHARM, Research Specialist)

[March 11th, 2010]

08:00-08:30 Registration of participants
08:30-12:00 Field orientation for data collection and tsunami historic tour
12:00-13:30 Lunch Break
13:30-14:30 Group Discussion (2) on the guideline of coastal forest planning
14:30-15:45 Group Presentation, discussion, and comment
15:45-16:15 Coffee Break; OC meeting to summarize conclusion (further actions, *etc.*)
16:15-17:00 Conclusion and further actions
17:00-17:15 Closing Ceremony

In general, this workshop provides lectures, group discussions and on-sight orientations to practice and verify field data collection and analysis methods. The participants are required to:

(1) Identify their local problems by comparing the need with the potential for coastal forest implementation of tsunami mitigation in their own localities after having knowledge on the role and limitation of coastal forest in tsunami disaster mitigation.

(2) Learn and understand planning/designing techniques of THM and coastal forest for tsunami disaster mitigation.

(3) Learn and understand how to collect and analyze data, both from field survey or literature's data on coastal vegetation.

(4) Discuss awareness development challenge and solution and possible utilization of THM and implementation of coastal forest in tsunami disaster mitigation plan in their own localities.

Lectures in the workshop were mainly given by TDMRC and ICHARM staff members, but a few topics were given by invited lecturers from relevant institutions in Indonesia identified by both organizing insitutions.

2.3 Selection of Locations for the Field Orientation and Tsunami Historic Tour

A pre-investigation was carried out to select locations for the field orientation activity and tsunami historic tour. Four criteria were determined for selection of the locations, *i.e.*

(a) Locations that are related to disaster awareness purposes, such as poles of tsunami inundation depth mark, evacuation buildings, any buildings that have specific mark of tsunami inundation (*e.g.* mosque, *etc.*); these locations are visited to give explanation on the importance of periodic and consistent reminder on people awareness by using these buildings and the significance of the building existence to the local citizens.

(b) Locations that were destroyed by tsunami and their present development plans related to the mitigation of future tsunami events; these visits are important to examine and explain potential risk issues and the appropriate plans for future tsunami mitigation.

(c) Locations with considerable dense coastal vegetation, which consist of more than one type of vegetation species. If possible, having other coastal protection features, such as sand dunes, embankments, *etc*. in order to explain the important variables in the design and planning of coastal vegetation belt, measurement method, maintenance, and their combination with other protective measures.

(d) Locations of ships/ boats drifted and stranded inland, in order to give explanations about the power of tsunami and to show that even if protection structures are available, evacuation to safer places is an indispensable measure.

Considering the above mentioned criteria as well as time availability for the activity, the locations for field orientation and tsunami historic tour had been selected as follows:

1) Alue Naga Village Coast: In this area an example of coast-line protection structure, natural sand dunes and vegetation belt of casuarina and coconut trees is available; participants shall see, learn and discuss the functionality of the mentioned features, important variables of coastal vegetations in terms of tsunami disaster mitigation, and coastal environment development in general.

2) Inland-drifted and stranded boat at Lampulo Village and inland-drifted and stranded electric-power generator vessel at Punge Blang Cut Village at Meuraxa Sub District: In these locations, participants shall see and discuss the impact of huge power and danger of tsunami.

3) One of tsunami poles at Meuraxa Sub District and one of evacuation buildings at Meuraxa Sub District. The major part of the evacuation building to be visited also serves as TDMRC office. By visiting these locations, participants learn the importance of keeping people awareness on the potential tsunami hazard in their area.

Figure 2.1 shows the map of selected locations.

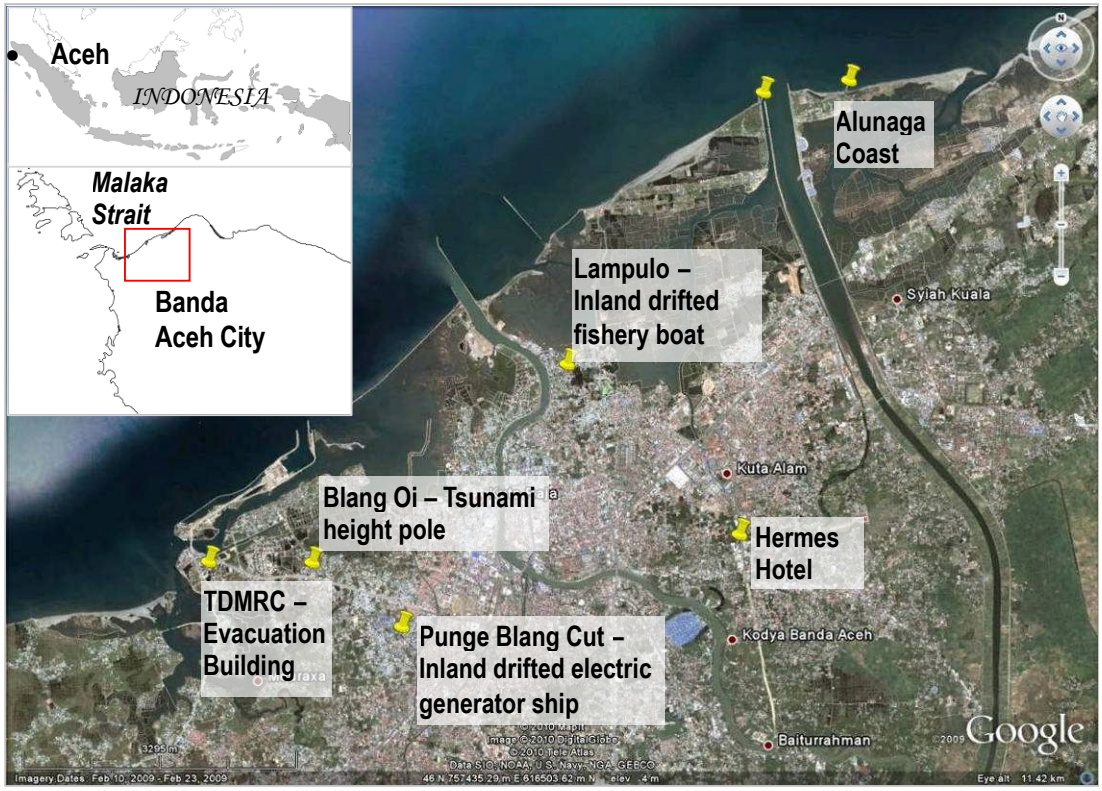


Figure 2.1 Map of visited locations during field orientation and tsunami historic tour

2.4 Selection of participants

In order to reach the objective of the workshop, the nominees were selected among local government officials or community leaders whose work is directly related to disaster management. Those who have never participated in a similar workshop previously were given priority.

Among the 30 invited participants, five participants were invited as country representatives from the Indian Ocean region countries to introduce the situation in their countries, *i.e.* one participant from India, Indonesia, Malaysia, Sri Lanka and Thailand, respectively. Request for nomination was distributed to several eligible institutions in reference to the consultation with ICHARM's network. ICHARM then evaluated the participants nominated by their respective institution.

The rest of participants were selected by TDMRC from relevant institutions by considering representation of several important tsunami-prone coastal cities in Indonesia and municipalities within Aceh Province.
The list of workshop participants including lecturers is shown in Table 2.2.

Table 2.2 List of participants including lecturers

Nr	Name	Affiliation	Note
1	Dr. Ignatius Prabhakar Pushparaj	Project Officer, SEEDS, India	Participant / country representative
2	Jirapoj Chumpooprasit	Civil Engineer , Professional Level, Songkhla Provincial Office of Disaster Prevention and Mitigation, Thailand	Participant / country representative
3	Azmi bin Ibrahim	Senior Engineer, Coastal Section, Department of Irrigation and Drainage, Ministry of Natural Resource and Environment, Malaysia	Participant / country representative
4	A.H.Ravindra Kumara	District Disaster Management Coordinator, District Secretariat, Monaragala, Sri Lanka	Participant / country representative
5	Dr. Subandono Diposaptono	Director, Coastal and Marine Affairs, Ministry of Marine Affair and Fisheries, Indonesia	Participant / lecturer
6	Ir. Nana Mulyana	Office of Marine Affairs and Fisheries, West-Java Province, Indonesia	Participant
7	Kafrizan Zakaria	Office of Marine Affairs and Fisheries, Bengkulu Province, Indonesia	Participant
8	Ir. Riana Faiza	Office of Marine Affairs and Agriculture, Jakarta Province, Indonesia	Participant / country representative
9	Nazdan Meuraxa, S.Pi, MP	Office of Marine Affairs and Fisheries, Lampung Province, Indonesia	Participant
10	Ir. Fegi Nurhabni, MSc.	Engineer, Directorate of Coastal and Marine Affairs, Ministry of Marine Affairs and Fisheries, Indonesia	Participant / country representative
11	Ir. Muslim	Municipality Office of Marine Affairs and Fisheries, Pidie Jaya Regency, Indonesia	Participant
12	Ir. Zaini	Municipality Office of Marine Affairs and Fisheries, Aceh Besar Regency, Indonesia	Participant
13	Laila Wijaya	Municipality Office of Marine Affairs and Fisheries, Banda Aceh City, Indonesia	Participant
14	Ir. Anas Fachruddin	Municipality Office of Marine Affairs and Fisheries, Sabang City, Indonesia	Participant
15	T. Anwar	Municipality Office of Marine Affairs and Fisheries, Simeulue Regency, Indonesia	Participant
16	Husni Yulham, SPi	Municipality Office of Marine Affairs and Fisheries, Aceh Barat Regency, Indonesia	Participant
17	Drs. M. Yusuf D	Municipality Office of Marine Affairs and Fisheries, Aceh Jaya Regency, Indonesia	Participant
18	Samsunan, ST., MT	University of Teuku Umar	Participant
19	Ishak, SPi	Municipality Office of Marine Affairs and Fisheries, Pidie Regency, Indonesia	Participant
20	Nanda Yuniza, ST., MT	Office of Development Planning Board, Aceh Province, Indonesia	Participant

(continued)

Table 2.2 List of Participants including lecturers (continuation)

21	Elly Norita, ST., MT	Municipality Office of Irrigation, Banda Aceh City, Indonesia	Participant
22	Ir. Maimun Rizalihadi, MSc.Eng	Lecturer, Faculty of Engineering, Syiah Kuala University, Banda Aceh, Indonesia	Participant
23	Baiman Fauzy	Yayasan Pelestarian Alam, NGO, Indonesia	Participant
24	Amir Fauzy, ST, Dipl WRM	Lecturer, Faculty of Engineering, Syiah Kuala University, Banda Aceh, Indonesia	Participant
25	Darianto Manik, S.Sos	Team RAD/PMI, Indonesian Red-Cross, Aceh, Indonesia	Participant
26	Akhyar	BWSS I, Indonesia	Participant
27	Dr. Teuku Alvisyahrin	TDMRC, Syiah Kuala University, Banda Aceh, Indonesia	Participant
28	Dr. Syamsidik	TDMRC, Syiah Kuala University, Banda Aceh, Indonesia	Participant
29	Dr. Eldina Fatimah	TDMRC, Syiah Kuala University, Banda Aceh, Indonesia	Participant / lecturer
30	Fahmi Zubir, LC, M.Pd	TDMRC, Syiah Kuala University, Banda Aceh, Indonesia	Participant
31	Didik Sugiyanto, MT.	TDMRC, Syiah Kuala University, Banda Aceh, Indonesia	Participant
32	Dr. Shigenobu Tanaka	Deputy Director, ICHARM, Tsukuba, Japan	Participant / lecturer
33	Dr. Dinar Catur Istiyanto	Research Specialist, ICHARM, Tsukuba, Japan	Participant / lecturer

Chapter 3
Workshop Activities

3.1 Opening Ceremony, Workshop explanation and Welcome party

Figure 3.1 A group photo of participants after the opening ceremony

The opening ceremony, workshop explanation and welcome party were held on the first day of the workshop at the venue, Hermes Palace Hotel. All participants and invited guests from Syiah Kuala University, City Office of Banda Aceh, Aceh Province representative, *etc.* attended this programme.

The welcome party was arranged to include a dinner and Aceh's cultural dance performance by elementary school students. One of the dances choreographed events during the tsunami disaster that hit Banda Aceh in 2004.

Figure 3.2
ICHARM's Deputy Director exchanged souvenirs with the Rector of Syiah Kuala University and the Vice Director of TDMRC in the opening party.

The workshop was officially opened by the Rector of Syiah Kuala University, Prof. Darni M. Daud, M.A. Following the opening ceremony, TDMRC's Vice Director, Dr. M. Ridha, kindly delivered a welcome address and Dr. Shigenobu Tanaka, Deputy Director of ICHARM, explained the background and outline of workshop's activities.

3.2 The Second Day Activities

The second-day's programme was started with presentations by country representatives of India, Indonesia, Malaysia, Sri Lanka, and Thailand about the development of disaster awareness activities in their countries.

A lecture on tsunami disaster management in Japan was delivered by Dr. Tanaka (ICHARM) and followed by a lecture on Planning and Design of THM that was delivered by Dr. Eldina Fatimah (TDMRC). Further, a lecture on THM and coastal disaster management was given by Dr. Subandono Diposaptono (MMAF, Indonesia). Enriched by these three lectures, a group discussion on disaster awareness development as well as the role of THM was conducted by utilizing Project Cycle Management approach to understand the cause and effect of the situations systematically.

The second-day's programme was concluded by a lecture on Planning and Design of Coastal Vegetation Belt for tsunami disaster mitigation by Dr. Dinar Istiyanto (ICHARM).

Figure 3.3 Pictures of several lectures and group discussion in the second day; (upper-left) Lecture by Dr. Tanaka (ICHARM) ; (upper-right) Lecture by Dr. Subandono (MMAF, Director); (lower-left) Lecture by Dr Eldina (TDMRC); (lower-right) A group of workshop's participants discussed about disaster awareness development during group-discussion session.

3.3 The Third Day Activities

A field visit and historic tsunami tour started the programme on the third-day. Participants spent the entire morning to visit coastline protection and vegetation belt of casuarina and coconut trees at Alue Naga Coast, inland-drifted and stranded boat at Lampulo Village, inland drifted and stranded electric-power generator ship at Punge Blang Cut Village, Uleuleu, tsunami pole at Meuraxa Sub District, and one of evacuation buildings at Meuraxa Sub District. This evacuation building also serves as TDMRC office.

In the afternoon session, a general discussion was carried out to solicit ideas, requirements and suggestions on the Draft Guideline of Planning and Design of Coastal Vegetation-belt for Tsunami Mitigation, which is prepared by ICHARM.

The third-day activities were ended by presentation of the workshop summary and conclusions. The Director of TDMRC, Dr. M. Dirhamsyah officially closed the workshop after delivering a closing remark.

Figure 3.4

Field orientation visit and tsunami historic tour; (a) Casuarina belt at Alunaga Village; (b) inland-drifted and stranded boat at Lampulo Village; (c) inland drifted and stranded electric-power generator vessel at Punge Blang Cut Village; (d) tsunami pole at Blang Oi, Meuraxa Sub District

Chapter 4
Questionnaire on Disaster Awareness Development

4.1. Questionnaire Set

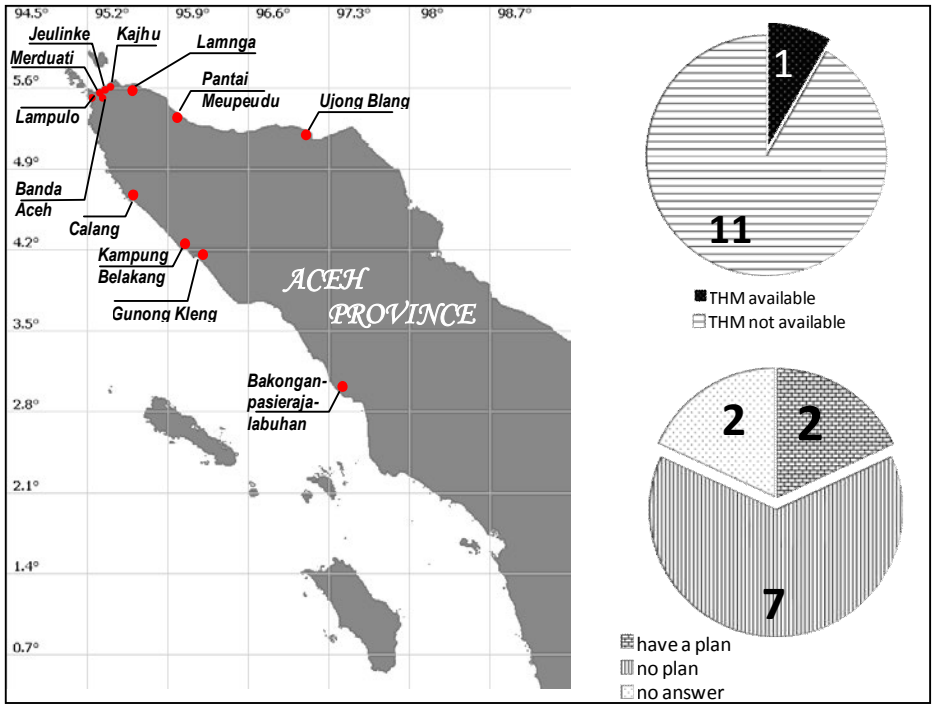
A questionnaire set on tsunami disaster awareness, THM and coastal vegetation implementation was distributed to the workshop's participants to get general picture of recent situation about the above addressed theme in the participant's locality. Prior to the workshop, the participants were requested to prepare data related to the questionnaire items. The set of questions were made very general to get initial related information as shown in Table 4.1.

4.2. Questionnaire Results

In general, although a request had been communicated to the participants prior to the workshop, most of the required data for the questionnaire were not available from the participants. Also, only 18 of 24 set of distributed questionnaire were fully filled out and returned. It should be noted too that 66% of the respondents are from Aceh Province area, 12% from other Indonesian area, and 22% is equally shared from India, Malaysia, Sri Lanka and Thailand. By this composition, conclusion for regional representation is very hard to draw. Nevertheless, initial results on the addressed issues could be provided by using the available data. This result is very valuable and considered important to give direction toward further necessary investigation related to the development of tsunami disaster awareness.

(a) Tsunami Hazard Mapping

Figure 4.1 shows statistics of THM development in 12 coastal villages in Nangroe Aceh Darussalam (Aceh) Province of Indonesia. The map of these 12 locations is shown at the left side of the figure. At the upper right, pie-diagram shows that only one among 12 (8%) coastal villages in Aceh Province of Indonesia have developed THM, and among those have not yet developed THM only 2 villages (16%) have a plan to develop THM in the near future (lower right pie-diagram). This information indicates that inclusion of THM in the local development planning has not been given serious attention in this area. Considering that these villages are highly prone to tsunami, it is important to encourage THM development in these villages with the support of government.



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In Thailand, a good progress of THM development was informed for the case of PhiPhi Island. In this area, THMs have been made for the level of province, city, and district area.

In Sri Lanka, it was reported that the community of Dickwella Village made their own THM and distributed to all households in this village.

(b) Disaster Awareness Development

Fifty percent of respondents mentioned that they are actively collecting information related to possible tsunami events in their localities from trusted institutions. The trusted institutions include department of meteorology, TV News, NGOs, and universities.

It was reported that 50% of villages in Aceh, Indonesia, have been developing various types of coastline protection structure (seawall, breakwater, evacuation building), but further investigation are necessary to identify detail dimension and the main purpose of those structures construction. Meanwhile, 90% of respondents outside Aceh informed that no protection structures have been built in their localities.

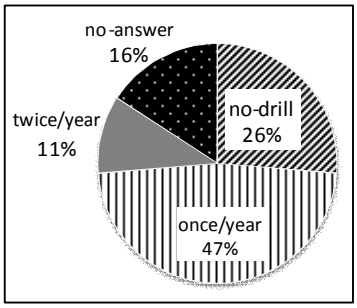

Figure 4.2
Frequency of evacuation drill activities in a year carried out in the respondent's villages

About 90% of respondents expressed their understanding that relocation to a safer area is one of the best options for tsunami disaster mitigation, and many of them noted that convincing village residents is a big challenge.

Regarding the evacuation drills, 60% of the villages carried out at least one drill after Indian Ocean tsunami 2004. Within this, 47% of the villages carry out the drill regularly once per year and 11% do it twice a year. The arrangement and preparation of evacuation drills in 80% of the cases were carried out collaboratively by the community and government. Figure 4.2 shows the related pie-diagram of frequency of evacuation drill activities in a year carried out in the respondent countries.

Only 16% of the villages in Aceh, Indonesia, have developed disaster-fighting groups facilitated by the government.

(c) Development of Coastal Vegetation Belt

Fifty percent of villages in Banda Aceh have planted coastal vegetation for tsunami disaster mitigation. The vegetation types include casuarina, coconut, anacardium, terminalia catappa and mangrove. Dickwella villagers in Sri Lanka also planted coconut and casuarina along their coast with the support of local government.

Table 4.1 Questionnaire-set

QUESTIONAIRE

On tsunami disaster awareness, tsunami hazard mapping and coastal vegetation implementation.

Local information:

1. Country: ……; State/Province: ……; City/Regency: ……..
2. Name of the most tsunami prone coastal village in your locality: …….
3. What is the exact position of the village (latitude ……; longitude……..)
4. How far is the distance (approximately) between the coastline and the nearest houses in this village? …….. meters.
5. Human population data of the village
   (a) Total population: …….. people; male: ……people; female: ……. people
   (b) Number of households: ……
   (c) Age distribution: ≥ 65yrs…. people; between 15 and 65yrs: …. people; ≤ 15yrs: …. people
   (d) Livelihood: fisherman:…. People; farmer: ….people; government officer/teacher: ….people; others (service, shop, garage, etc):… people
   (e) Welfare level: daily income less than USD 1 : …… people

Disaster awareness development

6. Has your coastal village experienced a tsunami attack? (a) Yes (b) No
   If "no", go directly to the question nr. 6. If "yes" then answer :
   (a) In what year? (It can be more than one event) ……
   (b) How many casualties (killed people)? ……
   (c) How many percent of the houses and infrastructures were destroyed? ……
   (d) How far did the inundation reach inland area? …….
   (e) How high was the inundation depth at the coastline? ……
7. Are there any trusted information mentioning that your coastal village has a potential to be attacked by tsunami in the (near) future? (a) Yes (b). No
   What is the name of institution that gave this information? …….
8. Are you really well-informed and do you believe that tsunami will attack your coastal village in the (near) future? (a) Yes (b) No
9. Are you actively collecting any information related to possible tsunami events regarding your locality? (a)Yes (b) No
10. If you believe that tsunami will potentially attack your coastal village, do you agree to relocate to a safer area? (a) Yes (b) No

(continued)

Table 4.1 Questionnaire-set (Continuation)

11. If your answer to question nr 10 is "no", please write down the reason: …….
12. If you are living nearby coastline, do you agree to relocate to safer area? (a) Yes (b) No
13. What kind of activities related to disaster awareness is conducted in your locality?
    (a) Evacuation drill; how many times a year? ……
    (1) by community (2) by government (3) by cooperation between community and government
    (b) Tsunami hazard mapping; (1) by community (2) by government (3) by cooperation between community and government
    (c) Development of disaster fighting group within community who share specific responsibilities related to disaster countermeasure.
    (d) Construction of protection structure; what kind of protection structure? …… ; Length:…….; Width:…….;
    (1) by community (2) by government (3) by cooperation between community and government
    (e) Planting of coastal vegetation to reduce tsunami energy; Length:…….; Width:…….; name of vegetation:…….
    (1) by community (2) by government (3) by cooperation between community and government

Tsunami hazard mapping

14. Does your locality have a tsunami hazard map (THM)? (a) Yes (b) No
15. If your answer to the question nr.14 is "Yes" → which areas are covered by the available THM? (selection may be more than one choice):
    (a) Country-wide (b) State/Province (c) City/Regency (d) District (e) Village
16. If your answer on the question nr.14 is "No", is there any plan of THM development?
    (a) Yes (b) No (c) when will it be completed? …….
17. If your answer to the question nr.14 is "Yes", what kind of information is available on this THM (selection may be more than one choice):
    a) tsunami inundation data (b) evacuation routes (c) emergency evacuation places,
    (d) other information:…….
18. If your answer to the question nr.14 is "Yes", Who are involved in the development of THM:
    (1) by community (2) by government (3) by cooperation between community and government
19. Is tsunami hazard map distributed to all households in your locality? (a) Yes (b) No

Chapter 5
Workshop Conclusion and Further Activities

5.1 Workshop Conclusion

According to the group discussion results, several conclusions can be drawn as follows:

1) Tsunami disaster may cause huge casualties because of lack of awareness and protection.
2) Lack of awareness may be caused by unreliable information and little knowledge and understanding about the risk.
3) THM shall be used to communicate reliable information and develop knowledge and understanding about the risk.
4) Integration of THM into the local development program enables effective and sustainable tsunami disaster mitigation.
5) Perfect protection will be impossible; however any kind of protection to reduce hazard levels of tsunami is necessary. In this regard, the implementation of coastal vegetation shall be considered.

5.2 Further Necessary Activities

At the final session of the workshop, the further necessary investigations or problems to be tackled are described as follows:

1) Enhancement of the Guideline for Planning and Design of Coastal Vegetation Belt for Tsunami Mitigation (Draft version, ICHARM, 2009) to be more simple and implementable. Translation of this guideline into other languages is highly demanded to support planning and design of tsunami mitigative coastal vegetation belt.
2) Participants should sincerely educate local people towards correct understanding and knowledge of the danger of tsunami, important preparedness action (including coastal forest implementation, tsunami hazard mapping, *etc.*)
3) It is requested and expected that:
   - the participants inform the progress of coastal forest development in their localities to ICHARM
   - the participants make a plan on specific activity related to disaster awareness development in their localities and communicate the progress to ICHARM and/or TDMRC.

Closing Remarks:
Cooperation with Local Institute for Local Capacity Development

After the implementation of this workshop, ICHARM learned that:

Sustainable communication and information exchange with the ex-participants of ICHARM's training courses are very important to develop mutual consultation and to get valuable inputs on local water related disaster management issues based on which ICHARM shall do follow-up action to create mutual demanded program.

This workshop was successfully conducted in cooperation with TDMRC. Such cooperation with many local research institutes will abridge the dissemination of ICHARM's research results into regional as well as local communities. This workshop is a part of ICHARM's strategy, namely "Localism", which aims to develop actual cooperation with local research institutes to seek the solution for local issues. In promoting "Localism", local implementation activity is required. This local activity will be effectively conducted when a sustainable cooperation with local research institution is established. In this relation, taking into account the previous collaborative activities and common objectives of that provide a unique opportunity to further develop future cooperation, ICHARM and TDMRC signed a Memorandum of Understanding in June 21, 2010 to conduct collaborative research, co-organizing technical conferences, encouraging exchange visits and collaboration in job-trainings and internships, establishing links between the Parties WebPages and developing electronic communications and jointly preparing technical and scientific reports in areas of mutual interest.

Acknowledgement

We would like to express our deep gratitude to the management and all members of TDMRC for their sincere cooperation in co-organizing this international workshop successfully.

We would like to convey our deepest appreciation towards Dr. Teuku Alvisyahrin of TDMRC for his maximum contribution in preparing this workshop report.

Sincere thanks and appreciation is also conveyed to all participants for their active involvement in the workshop lectures and discussion as well as their cooperation in preparing presentation and responding the questionnaire.

Appendix:

Questionnaire results

QUESTIONAIRE

On Tsunami disaster awareness, tsunami hazard mapping and coastal vegetation implementation.

Local information:

1. Country: MALAYSIA ; State/Province: KEDAH ; City/Regency: LANGKAWI
2. Name of the most tsunami prone coastal village in your locality: KG. KUALA TRIANG
3. What is the exact position of the village (latitude ……; longitude……)
4. How long is the distance (approximately) between coastline and the nearest houses in this village? ……5…….. meters.
5. Human population data of the village
   (a) Total population: ±2.500 people; male: ……people; female: ……. people
   (b) Number of households: 500
   (c) Age distribution: ≥ 65yrs: 500 people; between 15 and 65yrs: 1,250 people; ≤ 15yrs: 750 people
   (d) Livelihood: fisherman: ~~1.000~~ 300 People; farmer: 200 people; government officer/teacher: 1000 people; others (service, shop, garage, etc): 1000 people
   (e) Welfare level: daily income less than USD 1 : 0 people

Disaster awareness development

6. Has your coastal village experienced tsunami attack? (a) Yes (b) No
   If "no", go directly to the question nr. 6. If "yes" then answer :
   (a) In what year? (can be more than one event) 2004
   (b) How many casualties (killed people)? 1
   (c) How many percent of the existing houses and infrastructures were destroyed? 20
   (d) How far is the inundation reach inland area? 100 m
   (e) How height was the inundation depth at the coast line? 2 – 3 metre
7. Are there any trusted informations mentioning that your coastal village has a potential to be attacked by tsunami in the (near) future? (a) Yes (b). No
   What is the name of institution that gave this information? DEPT OF METEOROLOGY
8. Do you really well-informed and believe that tsunami will attack your coastal village in the (near) future?
   (a) Yes (b) No
9. Are you actively collecting any informations related to possible tsunami events regarding your locality?
   (a) Yes (b) No

Questionaire-1

10. If you believe that tsunami will potentially attack your coastal village, do you agree to relocate to safer area? (a) Yes (b) No
11. If your answer to question nr 10 is "no", please write down the reason: ……
12. If you are living nearby coastline, do you agree to relocate to safer area? (a) Yes (b) No
13. What kind of activities related to disaster awareness is conducted in your locality?
    (a) Evacuation drill; how many times a year? Once / year
    (1) by community (2) by government (3) by cooperation between community and government
    (b) Tsunami hazard mapping; (1) by community (2) by government (3) by cooperation between community and government
    (c) Development of disaster fighting group within community who share specific responsibilities related to disaster countermeasure.
    (d) Construction of protection structure; what kind of protection structure? ……; Length:……; Width:……;
    (1) by community (2) by government (3) by cooperation between community and government
    (e) Plantation of coastal vegetation to reduce tsunami energy; Length:……; Width:……; name of vegetation:……
    (1) by community (2) by government (3) by cooperation between community and government

Tsunami hazard mapping

14. Do your locality already have a tsunami hazard map (THM)? (a) Yes (b) No
15. If your answer on the question nr.13 is "Yes" → which areas are covered by the available THM? (selection may be more than one choice):
    (a) Country-wide (b) State/Province (c) City/Regency (d) District (e) Village
16. If your answer on the question nr.13 is "not", is there any plan of THM development?
    (a) Yes (b) No (c) when it will be completed? ……
17. If your answer on the question nr.13 is "Yes", what kind of information are available in this THM (selection may be more than one choice):
    (a) tsunami inundation data (b) evacuation routes (c) emergency evacuation places,
    (d) others, mentioned please: structural / Non structural meatures to reduce the impact
18. If your answer on the question nr.13 is "Yes", Who are involved in the development of THM:
    (1) by community (2) by government (3) by cooperation between community and government
19. Is tsunami hazard map distributed to all household in your locality? (a) Yes (b) No Not yet

Questionaire-2

QUESTIONAIRE

On Tsunami disaster awareness, tsunami hazard mapping and coastal vegetation implementation.

Local information:

1. Country: Indonesia; State/Province: Aceh; City/Regency: Banda Aceh
2. Name of the most tsunami prone coastal village in your locality: Lampulo
3. What is the exact position of the village (latitude ……; longitude……..)
4. How long is the distance (approximately) between coastline and the nearest houses in this village? 2500 meters.
5. Human population data of the village
   (a) Total population: …….. people; male: ……people; female: ……. people
   (b) Number of households: ……
   (c) Age distribution: ≥ 65yrs…. people; between 15 and 65yrs: …. people; ≤ 15yrs: …. people
   (d) Livelihood: fisherman:…. People; farmer: ….people; government officer/teacher: ….people; others (service, shop, garage, etc):… people
   (e) Welfare level: daily income less than USD 1 : 0 people

Disaster awareness development

6. Has your coastal village experienced tsunami attack? (a) Yes (b) No
   If "no", go directly to the question nr. 6. If "yes" then answer :
   (a) In what year? (can be more than one event) 2004
   (b) How many casualties (killed people)? ……
   (c) How many percent of the existing houses and infrastructures were destroyed? 90 %
   (d) How far is the inundation reach inland area? 5000 m
   (e) How height was the inundation depth at the coast line? 5-6 m
7. Are there any trusted informations mentioning that your coastal village has a potential to be attacked by tsunami in the (near) future? (a) Yes (b). No
   What is the name of institution that gave this information? ……
8. Do you really well-informed and believe that tsunami will attack your coastal village in the (near) future?
   (a) Yes (b) No
9. Are you actively collecting any informations related to possible tsunami events regarding your locality?
   (a)Yes (b) No

Questionaire-1

10. If you believe that tsunami will potentially attack your coastal village, do you agree to relocate to safer area? (a) Yes (b) No
11. If your answer to question nr 10 is "no", please write down the reason: ……
12. If you are living nearby coastline, do you agree to relocate to safer area? (a) Yes (b) No
13. What kind of activities related to disaster awareness is conducted in your locality?
   (a) Evacuation drill; how many times a year? once a year.
   (1) by community (2) by government (3) by cooperation between community and government
   (b) Tsunami hazard mapping; (1) by community (2) by government (3) by cooperation between community and government
   (c) Development of disaster fighting group within community who share specific responsibilities related to disaster countermeasure.
   (d) Construction of protection structure; what kind of protection structure? shore protection.
   Length:……; Width:……;
   (1) by community (2) by government (3) by cooperation between community and government
   (e) Plantation of coastal vegetation to reduce tsunami energy; Length:……; Width:……; name of vegetation: Mangrove
   (1) by community (2) by government (3) by cooperation between community and government

Tsunami hazard mapping

14. Do your locality already have a tsunami hazard map (THM)? (a) Yes (b) No
15. If your answer on the question nr.13 is "Yes" → which areas are covered by the available THM? (selection may be more than one choice):
   (a) Country-wide (b) State/Province (c) City/Regency (d) District (e) Village
16. If your answer on the question nr.13 is "not", is there any plan of THM development?
   (a) Yes (b) No (c) when it will be completed? ……
17. If your answer on the question nr.13 is "Yes", what kind of information are available in this THM (selection may be more than one choice):
   a) tsunami inundation data (b) evacuation routes (c) emergency evacuation places,
   (d) others, mentioned please: all of a, b and c.
18. If your answer on the question nr.13 is "Yes", Who are involved in the development of THM:
   (1) by community (2) by government (3) by cooperation between community and government
19. Is tsunami hazard map distributed to all household in your locality? (a) Yes (b) No

Questionaire-2

QUESTIONAIRE

On Tsunami disaster awareness, tsunami hazard mapping and coastal vegetation implementation.

Local information:

1. Country: INDONESIA ; State/Province: ACEH ; City/Regency: MEULABOH
2. Name of the most tsunami prone coastal village in your locality: GUNONG KLENG
3. What is the exact position of the village (latitude ……; longitude……)
4. How long is the distance (approximately) between coastline and the nearest houses in this village? ± 2100 meters.
5. Human population data of the village
   (a) Total population: …….. people; male: ……people; female: ……. people
   (b) Number of households: ……
   (c) Age distribution: ≥ 65yrs…. people; between 15 and 65yrs: …. people; ≤ 15yrs: …. people
   (d) Livelihood: fisherman:…. People; farmer: ….people; government officer/teacher: ….people; others (service, shop, garage, etc):… people
   (e) Welfare level: daily income less than USD 1 : …… people

Disaster awareness development

6. Has your coastal village experienced tsunami attack? (a) Yes (b) No
   If "no", go directly to the question nr. 6. If "yes" then answer :
   (a) In what year? (can be more than one event) 2004
   (b) How many casualties (killed people)? ……
   (c) How many percent of the existing houses and infrastructures were destroyed? 90 %
   (d) How far is the inundation reach inland area? 3 km
   (e) How height was the inundation depth at the coast line? ± 15 m
7. Are there any trusted informations mentioning that your coastal village has a potential to be attacked by tsunami in the (near) future? (a) Yes (b). No
   What is the name of institution that gave this information? Teuku Umar University
8. Do you really well-informed and believe that tsunami will attack your coastal village in the (near) future?
   (a) Yes (b) No
9. Are you actively collecting any informations related to possible tsunami events regarding your locality?
   (a) Yes (b) No

Questionaire-1

10. If you believe that tsunami will potentially attack your coastal village, do you agree to relocate to safer area? (a) Yes (b) No
11. If your answer to question nr 10 is "no", please write down the reason: ……
12. If you are living nearby coastline, do you agree to relocate to safer area? (a) Yes (b) No
13. What kind of activities related to disaster awareness is conducted in your locality?
    (a) Evacuation drill; how many times a year? 1
    (1) by community (2) by government (3) by cooperation between community and government
    (b) Tsunami hazard mapping; (1) by community (2) by government (3) by cooperation between community and government
    (c) Development of disaster fighting group within community who share specific responsibilities related to disaster countermeasure.
    (d) Construction of protection structure; what kind of protection structure? Break Water; Length:……; Width:……;
    (1) by community (2) by government (3) by cooperation between community and government
    (e) Plantation of coastal vegetation to reduce tsunami energy; Length:……; Width:……; name of vegetation: Casuarina PP
    (1) by community (2) by government (3) by cooperation between community and government

Tsunami hazard mapping

14. Do your locality already have a tsunami hazard map (THM)? (a) Yes (b) No
15. If your answer on the question nr.13 is "Yes" → which areas are covered by the available THM? (selection may be more than one choice):
    (a) Country-wide (b) State/Province (c) City/Regency (d) District (e) Village
16. If your answer on the question nr.13 is "not", is there any plan of THM development?
    (a) Yes (b) No (c) when it will be completed? ……
17. If your answer on the question nr.13 is "Yes", what kind of information are available in this THM (selection may be more than one choice):
    a) tsunami inundation data (b) evacuation routes (c) emergency evacuation places,
    (d) others, mentioned please: ……
18. If your answer on the question nr.13 is "Yes", Who are involved in the development of THM:
    (1) by community (2) by government (3) by cooperation between community and government
19. Is tsunami hazard map distributed to all household in your locality? (a) Yes (b) No

Questionaire-2

10. If you believe that tsunami will potentially attack your coastal village, do you agree to relocate to safer area? (a) Yes (b) No
11. If your answer to question nr 10 is "no", please write down the reason: ……
……
……
12. If you are living nearby coastline, do you agree to relocate to safer area? (a) Yes (b) No
13. What kind of activities related to disaster awareness is conducted in your locality?
    (a) Evacuation drill; how many times a year? ……
        (1) by community (2) by government (3) by cooperation between community and government
    (b) Tsunami hazard mapping; (1) by community (2) by government (3) by cooperation between community and government
    (c) Development of disaster fighting group within community who share specific responsibilities related to disaster countermeasure.
    (d) Construction of protection structure; what kind of protection structure? …… ; Length:……; Width:……;
        (1) by community (2) by government (3) by cooperation between community and government
    (e) Plantation of coastal vegetation to reduce tsunami energy; Length:……; Width:……; name of vegetation:……
        (1) by community (2) by government (3) by cooperation between community and government

Tsunami hazard mapping

14. Do your locality already have a tsunami hazard map (THM)? (a) Yes (b) No
15. If your answer on the question nr.13 is "Yes" → which areas are covered by the available THM? (selection may be more than one choice):
    (a) Country-wide (b) State/Province (c) City/Regency (d) District (e) Village
16. If your answer on the question nr.13 is "not", is there any plan of THM development?
    (a) Yes (b) No (c) when it will be completed? ……
17. If your answer on the question nr.13 is "Yes", what kind of information are available in this THM (selection may be more than one choice):
    a) tsunami inundation data (b) evacuation routes (c) emergency evacuation places,
    (d) others, mentioned please: ……
    ……
18. If your answer on the question nr.13 is "Yes", Who are involved in the development of THM:
    (1) by community (2) by government (3) by cooperation between community and government
19. Is tsunami hazard map distributed to all household in your locality? (a) Yes (b) No

Questionaire-2

QUESTIONAIRE

On Tsunami disaster awareness, tsunami hazard mapping and coastal vegetation implementation.

Local information:

1. Country: Indonesia; State/Province: Jakarta; City/Regency: North Jakarta
2. Name of the most tsunami prone coastal village in your locality: North Jakarta Coastal
3. What is the exact position of the village (latitude ……; longitude……)
4. How long is the distance (approximately) between coastline and the nearest houses in this village? ……. meters.
5. Human population data of the village
    (a) Total population: 10 Ribu people; male: ……people; female: ……. people
    (b) Number of households: ……
    (c) Age distribution: ≥ 65yrs…. people; between 15 and 65yrs: …. people; ≤ 15yrs: …. people
    (d) Livelihood: fisherman:…. People; farmer: ….people; government officer/teacher: ….people; others (service, shop, garage, etc):… people
    (e) Welfare level: daily income less than USD 1 : …… people

Disaster awareness development

6. Has your coastal village experienced tsunami attack? (a) Yes (b) No
    If "no", go directly to the question nr. 6. If "yes" then answer :
    (a) In what year? (can be more than one event)……
    (b) How many casualties (killed people)? ……
    (c) How many percent of the existing houses and infrastructures were destroyed? ……
    (d) How far is the inundation reach inland area? ……
    (e) How height was the inundation depth at the coast line? ……
7. Are there any trusted informations mentioning that your coastal village has a potential to be attacked by tsunami in the (near) future? (a) Yes (b). No
    What is the name of institution that gave this information? ……
    ……
8. Do you really well-informed and believe that tsunami will attack your coastal village in the (near) future?
    (a) Yes (b) No
9. Are you actively collecting any informations related to possible tsunami events regarding your locality?
    (a)Yes (b) No

Questionaire-1

QUESTIONAIRE

On Tsunami disaster awareness, tsunami hazard mapping and coastal vegetation implementation.

Local information:

1. Country: Indonesia; State/Province: Aceh; City/Regency: Banda Aceh
2. Name of the most tsunami prone coastal village in your locality: Teulingke
3. What is the exact position of the village (latitude ……; longitude……)
4. How long is the distance (approximately) between coastline and the nearest houses in this village? 1000 meters.
5. Human population data of the village
   (a) Total population: …….. people; male: ……people; female: ……. people
   (b) Number of households: 1500 – 600
   (c) Age distribution: ≥ 65yrs…. people; between 15 and 65yrs: …. people; ≤ 15yrs: …. people
   (d) Livelihood: fisherman:…. People; farmer: ….people; government officer/teacher: ….people; others (service, shop, garage, etc):… people
   (e) Welfare level: daily income less than USD 1 : …… people

Disaster awareness development

6. Has your coastal village experienced tsunami attack? (a) Yes (b) No
   If "no", go directly to the question nr. 6. If "yes" then answer :
   (a) In what year? (can be more than one event) 2004
   (b) How many casualties (killed people)? 200 – 500
   (c) How many percent of the existing houses and infrastructures were destroyed? 90
   (d) How far is the inundation reach inland area? 6 Km
   (e) How height was the inundation depth at the coast line? 10 m
7. Are there any trusted informations mentioning that your coastal village has a potential to be attacked by tsunami in the (near) future? (a) Yes (b). No
   What is the name of institution that gave this information? ……
8. Do you really well-informed and believe that tsunami will attack your coastal village in the (near) future?
   (a) Yes (b) No
9. Are you actively collecting any informations related to possible tsunami events regarding your locality?
   (a) Yes (b) No

Questionaire-1

10. If you believe that tsunami will potentially attack your coastal village, do you agree to relocate to safer area? (a) Yes (b) No
11. If your answer to question nr 10 is "no", please write down the reason: people wan't to move from they village
12. If you are living nearby coastline, do you agree to relocate to safer area? (a) Yes (b) No
13. What kind of activities related to disaster awareness is conducted in your locality?
    (a) Evacuation drill; how many times a year? —
    (1) by community (2) by government (3) by cooperation between community and government
    (b) Tsunami hazard mapping; (1) by community (2) by government (3) by cooperation between community and government
    (c) Development of disaster fighting group within community who share specific responsibilities related to disaster countermeasure.
    (d) Construction of protection structure; what kind of protection structure? ……; Length:……; Width:……;
    (1) by community (2) by government (3) by cooperation between community and government
    (e) Plantation of coastal vegetation to reduce tsunami energy; Length:……; Width:……; name of vegetation:……
    (1) by community (2) by government (3) by cooperation between community and government

Tsunami hazard mapping

14. Do your locality already have a tsunami hazard map (THM)? (a) Yes (b) No
15. If your answer on the question nr.13 is "Yes" → which areas are covered by the available THM? (selection may be more than one choice):
    (a) Country-wide (b) State/Province (c) City/Regency (d) District (e) Village
16. If your answer on the question nr.13 is "not", is there any plan of THM development?
    (a) Yes (b) No (c) when it will be completed? ……
17. If your answer on the question nr.13 is "Yes", what kind of information are available in this THM (selection may be more than one choice):
    (a) tsunami inundation data (b) evacuation routes (c) emergency evacuation places,
    (d) others, mentioned please: ……
18. If your answer on the question nr.13 is "Yes", Who are involved in the development of THM:
    (1) by community (2) by government (3) by cooperation between community and government
19. Is tsunami hazard map distributed to all household in your locality? (a) Yes (b) No

Questionaire-2

QUESTIONAIRE

On Tsunami disaster awareness, tsunami hazard mapping and coastal vegetation implementation.

Local information:

1. Country: INDIA; State/Province: Tamil Nadu; City/Regency: CHENNAI
2. Name of the most tsunami prone coastal village in your locality: LIGHT HOUSE VILLAGE PANCHAYAT
3. What is the exact position of the village (latitude 13 25 43 06 N longitude 13 24 33 06 N)
4. How long is the distance (approximately) between coastline and the nearest houses in this village? 50m to 200m meters.
5. Human population data of the village
   (a) Total population: …….. people; male: ……people; female: ……. people
   (b) Number of households: ……
   (c) Age distribution: ≥ 65yrs…. people; between 15 and 65yrs: …. people; ≤ 15yrs: …. people
   (d) Livelihood: fisherman:…. People; farmer: ….people; government officer/teacher: ….people; others (service, shop, garage, etc):… people
   (e) Welfare level: daily income less than USD 1 : …… people

Disaster awareness development

6. Has your coastal village experienced tsunami attack? (a) Yes ✓ (b) No
   If "no", go directly to the question nr. 6. If "yes" then answer :
   (a) In what year? (can be more than one event) 2004
   (b) How many casualties (killed people)? One
   (c) How many percent of the existing houses and infrastructures were destroyed? ……
   (d) How far is the inundation reach inland area? 500 m
   (e) How height was the inundation depth at the coast line? ……
7. Are there any trusted informations mentioning that your coastal village has a potential to be attacked by tsunami in the (near) future? (a) Yes (b). No ✓
   What is the name of institution that gave this information? ……
8. Do you really well-informed and believe that tsunami will attack your coastal village in the (near) future?
   (a) Yes (b) No
9. Are you actively collecting any informations related to possible tsunami events regarding your locality?
   (a)Yes (b) No ✓

Questionaire-1

10. If you believe that tsunami will potentially attack your coastal village, do you agree to relocate to safer area? (a) Yes (b) No
11. If your answer to question nr 10 is "no", please write down the reason: ……
12. If you are living nearby coastline, do you agree to relocate to safer area? (a) Yes (b) No
13. What kind of activities related to disaster awareness is conducted in your locality?
    (a) Evacuation drill; how many times a year? None
    (1) by community (2) by government (3) by cooperation between community and government
    (b) Tsunami hazard mapping; (1) by community (2) by government (3) by cooperation between community and government
    (c) Development of disaster fighting group within community who share specific responsibilities related to disaster countermeasure.
    (d) Construction of protection structure; what kind of protection structure? None ; Length:……; Width:……;
    (1) by community (2) by government (3) by cooperation between community and government
    (e) Plantation of coastal vegetation to reduce tsunami energy; Length:……; Width:……; name of vegetation: Please calculate
    (1) by community (2) by government (3) by cooperation between community and government NGO

Tsunami hazard mapping

14. Do your locality already have a tsunami hazard map (THM)? (a) Yes (b) No ✓
15. If your answer on the question nr.13 is "Yes" → which areas are covered by the available THM? (selection may be more than one choice):
    (a) Country-wide (b) State/Province (c) City/Regency (d) District (e) Village
16. If your answer on the question nr.13 is "not", is there any plan of THM development?
    (a) Yes (b) No (c) when it will be completed? Not known
17. If your answer on the question nr.13 is "Yes", what kind of information are available in this THM (selection may be more than one choice):
    a) tsunami inundation data (b) evacuation routes (c) emergency evacuation places,
    (d) others, mentioned please: ……
18. If your answer on the question nr.13 is "Yes", Who are involved in the development of THM:
    (1) by community (2) by government (3) by cooperation between community and government
19. Is tsunami hazard map distributed to all household in your locality? (a) Yes (b) No

Questionaire-2

QUESTIONAIRE

On Tsunami disaster awareness, tsunami hazard mapping and coastal vegetation implementation.

Local information:

1. Country: INDONESIA; State/Province: ACEH; City/Regency: BANDA ACEH
2. Name of the most tsunami prone coastal village in your locality: KATHU
3. What is the exact position of the village (latitude ……; longitude……)
4. How long is the distance (approximately) between coastline and the nearest houses in this village? 1000 meters.
5. Human population data of the village
   (a) Total population: …….. people; male: ……people; female: ……. people
   (b) Number of households: ……
   (c) Age distribution: ≥ 65yrs…. people; between 15 and 65yrs: …. people; ≤ 15yrs: …. people
   (d) Livelihood: fisherman:…. People; farmer: …people; government officer/teacher: …people; others (service, shop, garage, etc):… people
   (e) Welfare level: daily income less than USD 1 : …… people

Disaster awareness development

6. Has your coastal village experienced tsunami attack? (a) Yes ✓(b) No
   If "no", go directly to the question nr. 6. If "yes" then answer :
   (a) In what year? (can be more than one event) 2004
   (b) How many casualties (killed people)? ……
   (c) How many percent of the existing houses and infrastructures were destroyed? ……
   (d) How far is the inundation reach inland area? 4-5 meters 5 km
   (e) How height was the inundation depth at the coast line? 4-5 meters
7. Are there any trusted informations mentioning that your coastal village has a potential to be attacked by tsunami in the (near) future? (a) Yes (b). No
   What is the name of institution that gave this information? ……
   ……
8. Do you really well-informed and believe that tsunami will attack your coastal village in the (near) future?
   (a) Yes ✓(b) No
9. Are you actively collecting any informations related to possible tsunami events regarding your locality?
   (a)Yes ✓(b) No

Questionaire-1

10. If you believe that tsunami will potentially attack your coastal village, do you agree to relocate to safer area? ✓(a) Yes (b) No
11. If your answer to question nr 10 is "no", please write down the reason: ……
    ……
    ……
12. If you are living nearby coastline, do you agree to relocate to safer area? ✓(a) Yes (b) No
13. What kind of activities related to disaster awareness is conducted in your locality?
    ✓(a) Evacuation drill; how many times a year? 1
    (1) by community (2) by government ✓(3) by cooperation between community and government
    (b) Tsunami hazard mapping; (1) by community (2) by government (3) by cooperation between community and government
    (c) Development of disaster fighting group within community who share specific responsibilities related to disaster countermeasure.
    (d) Construction of protection structure; what kind of protection structure? …… ; Length:……; Width:……;
    (1) by community (2) by government (3) by cooperation between community and government
    ✓(e) Plantation of coastal vegetation to reduce tsunami energy; Length:……; Width:……; name of vegetation:……
    (1) by community (2) by government (3) by cooperation between community and government

Tsunami hazard mapping

14. Do your locality already have a tsunami hazard map (THM)? (a) Yes ✓(b) No
15. If your answer on the question nr.13 is "Yes" → which areas are covered by the available THM? (selection may be more than one choice):
    (a) Country-wide (b) State/Province (c) City/Regency (d) District (e) Village
16. If your answer on the question nr.13 is "not", is there any plan of THM development? Dont know
    (a) Yes (b) No (c) when it will be completed? ……
17. If your answer on the question nr.13 is "Yes", what kind of information are available in this THM (selection may be more than one choice):
    a) tsunami inundation data (b) evacuation routes (c) emergency evacuation places,
    (d) others, mentioned please: ……
    ……
18. If your answer on the question nr.13 is "Yes", Who are involved in the development of THM:
    (1) by community (2) by government (3) by cooperation between community and government
19. Is tsunami hazard map distributed to all household in your locality? (a) Yes ✓(b) No

Questionaire-2

QUESTIONAIRE

On Tsunami disaster awareness, tsunami hazard mapping and coastal vegetation implementation.

Local information:

1. Country: INDONESIA...; State/Province: LAMPUNG.....; City/Regency: LAMPUNG BARAT
2. Name of the most tsunami prone coastal village in your locality: Desa Pasar Pulau Pisang
3. What is the exact position of the village (latitude .....; longitude.....)
4. How long is the distance (approximately) between coastline and the nearest houses in this village? ....10..... meters.
5. Human population data of the village
   (a) Total population: ...1000..... people; male: 400..people; female: 600... people
   (b) Number of households: ..400..
   (c) Age distribution: ≥ 65yrs.200people; between 15 and 65yrs: 500 people; ≤ 15yrs: 300 people
   (d) Livelihood: fisherman:300 People; farmer: 50people; government officer/teacher: 30.people; others (service, shop, garage, etc):20 people
   (e) Welfare level: daily income less than USD 1 : ..300... people

Disaster awareness development

6. Has your coastal village experienced tsunami attack? (a) Yes (b) No
   If "no", go directly to the question nr. 6. If "yes" then answer :
   (a) In what year? (can be more than one event)...2007., 2009.....
   (b) How many casualties (killed people)? .....0.....
   (c) How many percent of the existing houses and infrastructures were destroyed? .....10 %.....
   (d) How far is the inundation reach inland area? ...50..m.....
   (e) How height was the inundation depth at the coast line? .....1...m.....
7. Are there any trusted informations mentioning that your coastal village has a potential to be attacked by tsunami in the (near) future? (a) Yes (b). No
   What is the name of institution that gave this information? .....
   ...Dinas Kelautan & Perikanan Lampung Barat.....
8. Do you really well-informed and believe that tsunami will attack your coastal village in the (near) future?
   (a) Yes (b) No
9. Are you actively collecting any informations related to possible tsunami events regarding your locality?
   (a) Yes (b) No

Questionaire-1

10. If you believe that tsunami will potentially attack your coastal village, do you agree to relocate to safer area? (a) Yes (b) No
11. If your answer to question nr 10 is "no", please write down the reason: .....
    ...Because the people won't be agree.....
    .....
12. If you are living nearby coastline, do you agree to relocate to safer area? (a) Yes (b) No
13. What kind of activities related to disaster awareness is conducted in your locality?
    (a) Evacuation drill; how many times a year? ....1.....
    (1) by community (2) by government (3) by cooperation between community and government
    (b) Tsunami hazard mapping; (1) by community (2) by government (3) by cooperation between community and government
    (c) Development of disaster fighting group within community who share specific responsibilities related to disaster countermeasure. the government
    (d) Construction of protection structure; what kind of protection structure? ...break water;
    Length:30.m..; Width:...1.m....;
    (1) by community (2) by government (3) by cooperation between community and government
    (e) Plantation of coastal vegetation to reduce tsunami energy; Length:...20.m.; Width:...3.m...; name of vegetation:...Pandanus
    (1) by community (2) by government (3) by cooperation between community and government

Tsunami hazard mapping

14. Do your locality already have a tsunami hazard map (THM)? (a) Yes (b) No
15. If your answer on the question nr.13 is "Yes" → which areas are covered by the available THM? (selection may be more than one choice):
    (a) Country-wide (b) State/Province (c) City/Regency (d) District (e) Village
16. If your answer on the question nr.13 is "not", is there any plan of THM development?
    (a) Yes (b) No (c) when it will be completed? .....
17. If your answer on the question nr.13 is "Yes", what kind of information are available in this THM (selection may be more than one choice):
    (a) tsunami inundation data (b) evacuation routes (c) emergency evacuation places,
    (d) others, mentioned please: .....
    .....
18. If your answer on the question nr.13 is "Yes", Who are involved in the development of THM:
    (1) by community (2) by government (3) by cooperation between community and government
19. Is tsunami hazard map distributed to all household in your locality? (a) Yes (b) No

Questionaire-2

QUESTIONAIRE

On Tsunami disaster awareness, tsunami hazard mapping and coastal vegetation implementation.

Local information:

1. Country: INDONESIA; State/Province: ACEH; City/Regency: B. ACEH
2. Name of the most tsunami prone coastal village in your locality: Merduati
3. What is the exact position of the village (latitude ……; longitude……)
4. How long is the distance (approximately) between coastline and the nearest houses in this village? ……500…. meters.
5. Human population data of the village
   (a) Total population: …….. people; male: ……people; female: ……. people
   (b) Number of households: ……
   (c) Age distribution: ≥ 65yrs…. people; between 15 and 65yrs: …. people; ≤ 15yrs: …. people
   (d) Livelihood: fisherman:…. People; farmer: ….people; government officer/teacher: ….people; others (service, shop, garage, etc):… people
   (e) Welfare level: daily income less than USD 1 : …… people

Disaster awareness development

6. Has your coastal village experienced tsunami attack? (a) Yes (b) ✓ No
   If "no", go directly to the question nr. 6. If "yes" then answer :
   (a) In what year? (can be more than one event)……
   (b) How many casualties (killed people)? ……
   (c) How many percent of the existing houses and infrastructures were destroyed? ……
   (d) How far is the inundation reach inland area? ……
   (e) How height was the inundation depth at the coast line? ……
7. Are there any trusted informations mentioning that your coastal village has a potential to be attacked by tsunami in the (near) future? (a) ✓ Yes (b). No
   What is the name of institution that gave this information? News on TV
8. Do you really well-informed and believe that tsunami will attack your coastal village in the (near) future?
   (a) ✓ Yes (b) No
9. Are you actively collecting any informations related to possible tsunami events regarding your locality?
   (a)Yes (b) ✓ No

Questionaire-1

10. If you believe that tsunami will potentially attack your coastal village, do you agree to relocate to safer area? (a) ✓ Yes (b) No
11. If your answer to question nr 10 is "no", please write down the reason: ……
12. If you are living nearby coastline, do you agree to relocate to safer area? (a) ✓ Yes (b) No
13. What kind of activities related to disaster awareness is conducted in your locality?
    (a) Evacuation drill; how many times a year? 2 x
    (1) by community (2) by government (3) ✓ by cooperation between community and government
    (b) Tsunami hazard mapping; (1) by community (2) by government (3) ✓ by cooperation between community and government
    (c) Development of disaster fighting group within community who share specific responsibilities related to disaster countermeasure.
    (d) Construction of protection structure; what kind of protection structure? Sea W. ; Length:……; Width:……;
    (1) by community (2) ✓ by government (3) by cooperation between community and government
    (e) Plantation of coastal vegetation to reduce tsunami energy; Length:……; Width:……; name of vegetation: Mangrove, Casuarina, Terminalia Catapa
    (1) by community (2) by government (3) ✓ by cooperation between community and government

Tsunami hazard mapping

14. Do your locality already have a tsunami hazard map (THM)? (a) Yes (b) ✓ No
15. If your answer on the question nr.13 is "Yes" → which areas are covered by the available THM? (selection may be more than one choice):
    (a) Country-wide (b) State/Province (c) City/Regency (d) District (e) Village
16. If your answer on the question nr.13 is "not", is there any plan of THM development?
    (a) Yes (b) No (c) when it will be completed? ……
17. If your answer on the question nr.13 is "Yes", what kind of information are available in this THM (selection may be more than one choice):
    a) tsunami inundation data (b) evacuation routes (c) emergency evacuation places,
    (d) others, mentioned please: ……
18. If your answer on the question nr.13 is "Yes", Who are involved in the development of THM:
    (1) by community (2) by government (3) ✓ by cooperation between community and government
19. Is tsunami hazard map distributed to all household in your locality? (a) ✓ Yes (b) No

Questionaire-2

QUESTIONAIRE

On Tsunami disaster awareness, tsunami hazard mapping and coastal vegetation implementation.

Local information:

1. Country: Sri Lanka State/Province: Southern; City/Regency: Dickwella
2. Name of the most tsunami prone coastal village in your locality: Dickwella
3. What is the exact position of the village (latitude ……; longitude……)
4. How long is the distance (approximately) between coastline and the nearest houses in this village? 100 meters.
5. Human population data of the village
   (a) Total population: 1950 people; male: 985 people; female: 965 people
   (b) Number of households: 475
   (c) Age distribution: ≥ 65yrs…. people; between 15 and 65yrs: …. people; ≤ 15yrs: …. people
   (d) Livelihood: fisherman: 300 People; farmer: 50 people; government officer/teacher: 70 people; others (service, shop, garage, etc): 200 50 20 people
   (e) Welfare level: daily income less than USD 1 : 200 people

Disaster awareness development

6. Has your coastal village experienced tsunami attack? (a) Yes ✓ (b) No
   If "no", go directly to the question nr. 6. If "yes" then answer :
   (a) In what year? (can be more than one event) 2004
   (b) How many casualties (killed people)? 50 Casualties 60 were killed
   (c) How many percent of the existing houses and infrastructures were destroyed? 5%
   (d) How far is the inundation reach inland area? 300 meters
   (e) How height was the inundation depth at the coast line? 8 feet
7. Are there any trusted informations mentioning that your coastal village has a potential to be attacked by tsunami in the (near) future? (a) Yes ✓ (b). No
   What is the name of institution that gave this information? Grama Niladari
8. Do you really well-informed and believe that tsunami will attack your coastal village in the (near) future?
   (a) Yes ✓ (b) No
9. Are you actively collecting any informations related to possible tsunami events regarding your locality?
   (a)Yes ✓ (b) No

Questionaire-1

10. If you believe that tsunami will potentially attack your coastal village, do you agree to relocate to safer area? (a) Yes ✓ (b) No
11. If your answer to question nr 10 is "no", please write down the reason: ……
12. If you are living nearby coastline, do you agree to relocate to safer area? (a) Yes ✓ (b) No
13. What kind of activities related to disaster awareness is conducted in your locality?
   (a) Evacuation drill; how many times a year? 02
   (1) by community (2) by government (3) ✓ by cooperation between community and government
   (b) Tsunami hazard mapping; (1) by community (2) by government (3) ✓ by cooperation between community and government
   (c) Development of disaster fighting group within community who share specific responsibilities related to disaster countermeasure.
   (d) Construction of protection structure; what kind of protection structure? …… ; Length:……; Width:……;
   (1) by community (2) by government (3) ✓ by cooperation between community and government
   (e) Plantation of coastal vegetation to reduce tsunami energy; Length: 10'; Width: 1'; name of vegetation: Coconut, or, Casharina.
   (1) by community (2) by government (3) ✓ by cooperation between community and government

Tsunami hazard mapping

14. Do your locality already have a tsunami hazard map (THM)? (a) Yes ✓ (b) No
15. If your answer on the question nr.13 is "Yes" → which areas are covered by the available THM? (selection may be more than one choice):
   (a) Country-wide (b) State/Province (c) City/Regency (d) District (e) Village ✓
16. If your answer on the question nr.13 is "not", is there any plan of THM development?
   (a) Yes (b) No (c) when it will be completed? ……
17. If your answer on the question nr.13 is "Yes", what kind of information are available in this THM (selection may be more than one choice):
   a) tsunami inundation data (b) ✓ evacuation routes (c) ✓ emergency evacuation places,
   (d) others, mentioned please: ……
18. If your answer on the question nr.13 is "Yes", Who are involved in the development of THM:
   (1) by community (2) by government (3) ✓ by cooperation between community and government
19. Is tsunami hazard map distributed to all household in your locality? (a) Yes (b) No ✓

Questionaire-2

QUESTIONAIRE

On Tsunami disaster awareness, tsunami hazard mapping and coastal vegetation implementation.

Local information:

1. Country: Indonesia; State/Province: Aceh; City/Regency: Aceh Jaya
2. Name of the most tsunami prone coastal village in your locality: Sepanjang Pantai / Calang
3. What is the exact position of the village (latitude .....; longitude.....)
4. How long is the distance (approximately) between coastline and the nearest houses in this village? 0,5 Km ..... meters.
5. Human population data of the village
   (a) Total population: ..... people; male: .....people; female: ..... people
   (b) Number of households: .....
   (c) Age distribution: ≥ 65yrs.... people; between 15 and 65yrs: .... people; ≤ 15yrs: .... people
   (d) Livelihood: fisherman:.... People; farmer: ....people; government officer/teacher: ....people; others (service, shop, garage, etc):... people
   (e) Welfare level: daily income less than USD 1 : ..... people

Disaster awareness development

6. Has your coastal village experienced tsunami attack? (a) Yes (b) No
   If "no", go directly to the question nr. 6. If "yes" then answer :
   (a) In what year? (can be more than one event)....2004 / 26-12-2004
   (b) How many casualties (killed people)? .....
   (c) How many percent of the existing houses and infrastructures were destroyed? 100%
   (d) How far is the inundation reach inland area? ...~~15 Meter s/d 30 Meter~~ 10 Km
   (e) How height was the inundation depth at the coast line? ...15-30 Meter
7. Are there any trusted informations mentioning that your coastal village has a potential to be attacked by tsunami in the (near) future? (a) Yes (b). No
   What is the name of institution that gave this information? .....
   .....
8. Do you really well-informed and believe that tsunami will attack your coastal village in the (near) future?
   (a) Yes (b) No
9. Are you actively collecting any informations related to possible tsunami events regarding your locality?
   (a)Yes (b) No

Questionaire-1

10. If you believe that tsunami will potentially attack your coastal village, do you agree to relocate to safer area? (a) Yes (b) No
11. If your answer to question nr 10 is "no", please write down the reason: .....
    .....
    .....
12. If you are living nearby coastline, do you agree to relocate to safer area? (a) Yes (b) No
13. What kind of activities related to disaster awareness is conducted in your locality?
    (a) Evacuation drill; how many times a year? ....Belum / NO Action
    (1) by community (2) by government (3) by cooperation between community and government
    (b) Tsunami hazard mapping; (1) by community (2) by government (3) by cooperation between community and government
    (c) Development of disaster fighting group within community who share specific responsibilities related to disaster countermeasure.
    (d) Construction of protection structure; what kind of protection structure? ...Tiang Tinggi / Rumah PMI
    Length:..3 m...; Width:.....;
    (1) by community (2) by government (3) by cooperation between community and government
    (e) Plantation of coastal vegetation to reduce tsunami energy; Length:.....; Width:.....; name of vegetation:.....
    (1) by community (2) by government (3) by cooperation between community and government

Tsunami hazard mapping

14. Do your locality already have a tsunami hazard map (THM)? (a) Yes (b) No
15. If your answer on the question nr.13 is "Yes" → which areas are covered by the available THM? (selection may be more than one choice):
    (a) Country-wide (b) State/Province (c) City/Regency (d) District (e) Village
16. If your answer on the question nr.13 is "not", is there any plan of THM development?
    (a) Yes (b) No (c) when it will be completed? .....
17. If your answer on the question nr.13 is "Yes", what kind of information are available in this THM (selection may be more than one choice):
    a) tsunami inundation data (b) evacuation routes (c) emergency evacuation places,
    (d) others, mentioned please: .....
    .....
18. If your answer on the question nr.13 is "Yes", Who are involved in the development of THM:
    (1) by community (2) by government (3) by cooperation between community and government
19. Is tsunami hazard map distributed to all household in your locality? (a) Yes (b) No

Questionaire-2

QUESTIONAIRE

On Tsunami disaster awareness, tsunami hazard mapping and coastal vegetation implementation.

Local information:

1. Country: INDONESIA; State/Province: ACEH; City/Regency: ACEH SELATAN
2. Name of the most tsunami prone coastal village in your locality: Bakongan & pasie raja, labuhanh
3. What is the exact position of the village (latitude 2°-4°; longitude 96°-90°)
4. How long is the distance (approximately) between coastline and the nearest houses in this village? ± 500 meters.
5. Human population data of the village
   (a) Total population: ..... people; male: .....people; female: ..... people
   (b) Number of households: .....
   (c) Age distribution: ≥ 65yrs.... people; between 15 and 65yrs: .... people; ≤ 15yrs: .... people
   (d) Livelihood: fisherman:.... People; farmer: ....people; government officer/teacher: ....people; others (service, shop, garage, etc):... people
   (e) Welfare level: daily income less than USD 1 : ..... people

Disaster awareness development

6. Has your coastal village experienced tsunami attack? (a) Yes (b) No
   If "no", go directly to the question nr. 6. If "yes" then answer :
   (a) In what year? (can be more than one event) 2004
   (b) How many casualties (killed people)? –
   (c) How many percent of the existing houses and infrastructures were destroyed? 70 %
   (d) How far is the inundation reach inland area? 3 - 4 km
   (e) How height was the inundation depth at the coast line? 3 - 5 m
7. Are there any trusted informations mentioning that your coastal village has a potential to be attacked by tsunami in the (near) future? (a) Yes (b). No
   What is the name of institution that gave this information? NGO'S
8. Do you really well-informed and believe that tsunami will attack your coastal village in the (near) future?
   (a) Yes (b) No
9. Are you actively collecting any informations related to possible tsunami events regarding your locality?
   (a) Yes (b) No

Questionaire-1

10. If you believe that tsunami will potentially attack your coastal village, do you agree to relocate to safer area? (a) Yes (b) No
11. If your answer to question nr 10 is "no", please write down the reason: .....
12. If you are living nearby coastline, do you agree to relocate to safer area? (a) Yes (b) No
13. What kind of activities related to disaster awareness is conducted in your locality?
    (a) Evacuation drill; how many times a year? Never
    (1) by community (2) by government (3) by cooperation between community and government
    (b) Tsunami hazard mapping; (1) by community (2) by government (3) by cooperation between community and government
    (c) Development of disaster fighting group within community who share specific responsibilities related to disaster countermeasure. / Have
    (d) Construction of protection structure; what kind of protection structure? ..... ; Length:.....; Width:.....;
    (1) by community (2) by government (3) by cooperation between community and government
    (e) Plantation of coastal vegetation to reduce tsunami energy; Length:.....; Width:.....; name of vegetation:.....
    (1) by community (2) by government (3) by cooperation between community and government

Tsunami hazard mapping

14. Do your locality already have a tsunami hazard map (THM)? (a) Yes (b) No
15. If your answer on the question nr.13 is "Yes" → which areas are covered by the available THM? (selection may be more than one choice):
    (a) Country-wide (b) State/Province (c) City/Regency (d) District (e) Village
16. If your answer on the question nr.13 is "not", is there any plan of THM development?
    (a) Yes (b) No (c) when it will be completed? .....
17. If your answer on the question nr.13 is "Yes", what kind of information are available in this THM (selection may be more than one choice):
    a) tsunami inundation data (b) evacuation routes (c) emergency evacuation places,
    (d) others, mentioned please: .....
18. If your answer on the question nr.13 is "Yes", Who are involved in the development of THM:
    (1) by community (2) by government (3) by cooperation between community and government
19. Is tsunami hazard map distributed to all household in your locality? (a) Yes (b) No

Questionaire-2

QUESTIONAIRE

On Tsunami disaster awareness, tsunami hazard mapping and coastal vegetation implementation.

Local information:

1. Country: INDONESIA; State/Province: ACEH; City/Regency: PIDIE JAYA.
2. Name of the most tsunami prone coastal village in your locality: PANTAI MEUREUDU.
3. What is the exact position of the village (latitude ……; longitude……)
4. How long is the distance (approximately) between coastline and the nearest houses in this village? 250 meters.
5. Human population data of the village
   (a) Total population: …….. people; male: ……people; female: ……. people
   (b) Number of households: ……
   (c) Age distribution: ≥ 65yrs…. people; between 15 and 65yrs: …. people; ≤ 15yrs: …. people
   (d) Livelihood: fisherman:…. People; farmer: ….people; government officer/teacher: ….people; others (service, shop, garage, etc):… people
   (e) Welfare level: daily income less than USD 1 : …… people

Disaster awareness development

6. Has your coastal village experienced tsunami attack? (a) Yes (b) No
   If "no", go directly to the question nr. 6. If "yes" then answer :
   (a) In what year? (can be more than one event) Tahun 2004
   (b) How many casualties (killed people)? 8 orang.
   (c) How many percent of the existing houses and infrastructures were destroyed? 20 %
   (d) How far is the inundation reach inland area? ~~3 km~~ ~~meter~~ 3 Km.
   (e) How height was the inundation depth at the coast line? 3 meter.
7. Are there any trusted informations mentioning that your coastal village has a potential to be attacked by tsunami in the (near) future? (a) Yes (b) No
   What is the name of institution that gave this information? ……
   ……
8. Do you really well-informed and believe that tsunami will attack your coastal village in the (near) future?
   (a) Yes (b) No
9. Are you actively collecting any informations related to possible tsunami events regarding your locality?
   (a) Yes (b) No

Questionaire-1

10. If you believe that tsunami will potentially attack your coastal village, do you agree to relocate to safer area? (a) Yes (b) No
11. If your answer to question nr 10 is "no", please write down the reason: ……
    ……
    ……
12. If you are living nearby coastline, do you agree to relocate to safer area? (a) Yes (b) No
13. What kind of activities related to disaster awareness is conducted in your locality?
    (a) Evacuation drill; how many times a year? BELUM PERNAH.
    (1) by community (2) by government (3) by cooperation between community and government
    (b) Tsunami hazard mapping; (1) by community (2) by government (3) by cooperation between community and government
    (c) Development of disaster fighting group within community who share specific responsibilities related to disaster countermeasure.
    (d) Construction of protection structure; what kind of protection structure? ……; Length:……; Width:……;
    (1) by community (2) by government (3) by cooperation between community and government
    (e) Plantation of coastal vegetation to reduce tsunami energy; Length:……; Width:……; name of vegetation:……
    (1) by community (2) by government (3) by cooperation between community and government

Tsunami hazard mapping

14. Do your locality already have a tsunami hazard map (THM)? (a) Yes (b) No
15. If your answer on the question nr.13 is "Yes" → which areas are covered by the available THM? (selection may be more than one choice):
    (a) Country-wide (b) State/Province (c) City/Regency (d) District (e) Village
16. If your answer on the question nr.13 is "not", is there any plan of THM development?
    (a) Yes (b) No (c) when it will be completed? ……
17. If your answer on the question nr.13 is "Yes", what kind of information are available in this THM (selection may be more than one choice):
    (a) tsunami inundation data (b) evacuation routes (c) emergency evacuation places,
    (d) others, mentioned please: ……
    ……
18. If your answer on the question nr.13 is "Yes", Who are involved in the development of THM:
    (1) by community (2) by government (3) by cooperation between community and government
19. Is tsunami hazard map distributed to all household in your locality? (a) Yes (b) No

Questionaire-2

QUESTIONAIRE

On Tsunami disaster awareness, tsunami hazard mapping and coastal vegetation implementation.

Local information:

1. Country: Indonesia.....; State/Province: ....Aceh.....; City/Regency: ....Banda Aceh.....
2. Name of the most tsunami prone coastal village in your locality: .....Banda Aceh.....
3. What is the exact position of the village (latitude .....; longitude.....)
4. How long is the distance (approximately) between coastline and the nearest houses in this village? ..... meters.
5. Human population data of the village
   (a) Total population: ..... people; male: .....people; female: ..... people
   (b) Number of households: .....
   (c) Age distribution: ≥ 65yrs.... people; between 15 and 65yrs: .... people; ≤ 15yrs: .... people
   (d) Livelihood: fisherman:.... People; farmer: ....people; government officer/teacher: ....people; others (service, shop, garage, etc):... people
   (e) Welfare level: daily income less than USD 1 : ..... people

Disaster awareness development

6. Has your coastal village experienced tsunami attack? (a) Yes (b) No
   If "no", go directly to the question nr. 6. If "yes" then answer :
   (a) In what year? (can be more than one event).....2004.....
   (b) How many casualties (killed people)? .....> 30 people.....
   (c) How many percent of the existing houses and infrastructures were destroyed? .....
   (d) How far is the inundation reach inland area? .....4 km.....
   (e) How height was the inundation depth at the coast line? .....> 4 m.....
7. Are there any trusted informations mentioning that your coastal village has a potential to be attacked by tsunami in the (near) future? (a) Yes (b) No
   What is the name of institution that gave this information? .....
   .....
8. Do you really well-informed and believe that tsunami will attack your coastal village in the (near) future?
   (a) Yes (b) No
9. Are you actively collecting any informations related to possible tsunami events regarding your locality?
   (a)Yes (b) No

Questionaire-1

10. If you believe that tsunami will potentially attack your coastal village, do you agree to relocate to safer area? (a) Yes (b) No
11. If your answer to question nr 10 is "no", please write down the reason: .....
    .....
    .....
12. If you are living nearby coastline, do you agree to relocate to safer area? (a) Yes (b) No
13. What kind of activities related to disaster awareness is conducted in your locality?
    (a) Evacuation drill; how many times a year? ....once time since the tsunami disaster in 2004.
    (1) by community (2) by government (3) by cooperation between community and government
    (b) Tsunami hazard mapping; (1) by community (2) by government (3) by cooperation between community and government
    (c) Development of disaster fighting group within community who share specific responsibilities related to disaster countermeasure.
    (d) Construction of protection structure; what kind of protection structure? ..... ;
    Length:.....; Width:.....;
    (1) by community (2) by government (3) by cooperation between community and government
    (e) Plantation of coastal vegetation to reduce tsunami energy; Length:.....; Width:.....; name of vegetation:.....mangrove
    (1) by community (2) by government (3) by cooperation between community and government

Tsunami hazard mapping

14. Do you locality already have a tsunami hazard map (THM)? (a) Yes (b) No
15. If your answer on the question nr.13 is "Yes" → which areas are covered by the available THM? (selection may be more than one choice):
    (a) Country-wide (b) State/Province (c) City/Regency (d) District (e) Village
16. If your answer on the question nr.13 is "not", is there any plan of THM development?
    (a) Yes (b) No (c) when it will be completed? .....
17. If your answer on the question nr.13 is "Yes", what kind of information are available in this THM (selection may be more than one choice):
    (a) tsunami inundation data (b) evacuation routes (c) emergency evacuation places,
    (d) others, mentioned please: .....
    .....
18. If your answer on the question nr.13 is "Yes", Who are involved in the development of THM:
    (1) by community (2) by government (3) by cooperation between community and government
19. Is tsunami hazard map distributed to all household in your locality? (a) Yes (b) No

Questionaire-2

QUESTIONAIRE

On Tsunami disaster awareness, tsunami hazard mapping and coastal vegetation implementation.

Local information:

1. Country: Indonesia; State/Province: Bengkulu; City/Regency: – Bengkulu
2. Name of the most tsunami prone coastal village in your locality: Marus coastal (about 100 km from Bengkulu City)
3. What is the exact position of the village (latitude ……; longitude……)
4. How long is the distance (approximately) between coastline and the nearest houses in this village? 75 meters.
5. Human population data of the village
   (a) Total population: …….. people; male: ……people; female: ……. people
   (b) Number of households: about 100.
   (c) Age distribution: ≥ 65yrs…. people; between 15 and 65yrs: …. people; ≤ 15yrs: …. people
   (d) Livelihood: fisherman:…. People; farmer: ….people; government officer/teacher: ….people; others (service, shop, garage, etc):… people
   (e) Welfare level: daily income less than USD 1 : …… people

Disaster awareness development

6. Has your coastal village experienced tsunami attack? (a) Yes (b) No
   If "no", go directly to the question nr. 6. If "yes" then answer :
   (a) In what year? (can be more than one event) 2004
   (b) How many casualties (killed people)? 0 (no body)
   (c) How many percent of the existing houses and infrastructures were destroyed? about around 25 %
   (d) How far is the inundation reach inland area? ± 200 m
   (e) How height was the inundation depth at the coast line? ± 100 cm
7. Are there any trusted informations mentioning that your coastal village has a potential to be attacked by tsunami in the (near) future? (a) Yes (b). No
   What is the name of institution that gave this information? Badan Penanggulangan Bencana
8. Do you really well-informed and believe that tsunami will attack your coastal village in the (near) future?
   (a) Yes (b) No
9. Are you actively collecting any informations related to possible tsunami events regarding your locality?
   (a)Yes (b) No

Questionaire-1

10. If you believe that tsunami will potentially attack your coastal village, do you agree to relocate to safer area? (a) Yes (b) No
11. If your answer to question nr 10 is "no", please write down the reason: ……
12. If you are living nearby coastline, do you agree to relocate to safer area? (a) Yes (b) No
13. What kind of activities related to disaster awareness is conducted in your locality?
   (a) Evacuation drill; how many times a year? ……?
   (1) by community (2) by government (3) by cooperation between community and government
   (b) Tsunami hazard mapping; (1) by community (2) by government (3) by cooperation between community and government
   (c) Development of disaster fighting group within community who share specific responsibilities related to disaster countermeasure.
   (d) Construction of protection structure; what kind of protection structure? ……; Length:……; Width:……;
   (1) by community (2) by government (3) by cooperation between community and government
   (e) Plantation of coastal vegetation to reduce tsunami energy; Length:……; Width:……; name of vegetation:……
   (1) by community (2) by government (3) by cooperation between community and government

Tsunami hazard mapping

14. Do your locality already have a tsunami hazard map (THM)? (a) Yes (b) No
15. If your answer on the question nr.13 is "Yes" → which areas are covered by the available THM? (selection may be more than one choice):
   (a) Country-wide (b) State/Province (c) City/Regency (d) District (e) Village
16. If your answer on the question nr.13 is "not", is there any plan of THM development?
   (a) Yes (b) No (c) when it will be completed? ……
17. If your answer on the question nr.13 is "Yes", what kind of information are available in this THM (selection may be more than one choice):
   a) tsunami inundation data (b) evacuation routes (c) emergency evacuation places,
   (d) others, mentioned please: ……
18. If your answer on the question nr.13 is "Yes", Who are involved in the development of THM:
   (1) by community (2) by government (3) by cooperation between community and government
19. Is tsunami hazard map distributed to all household in your locality? (a) Yes (b) No

Questionaire-2

QUESTIONAIRE

On Tsunami disaster awareness, tsunami hazard mapping and coastal vegetation implementation.

Local information:

1. Country: THAILAND; State/Province: KRABI; City/Regency: PHI PHI ISLAND
2. Name of the most tsunami prone coastal village in your locality: PHI PHI ISLAND
3. What is the exact position of the village (latitude ……; longitude……)
4. How long is the distance (approximately) between coastline and the nearest houses in this village? 2 meters.
5. Human population data of the village
   (a) Total population: 10,000 people; male: 6000 people; female: 4000 people
   (b) Number of households: 1200
   (c) Age distribution: ≥ 65yrs…. people; between 15 and 65yrs: …. people; ≤ 15yrs: …. people
   (d) Livelihood: fisherman: 100 People; farmer: NO people; government officer/teacher: 2000 people; others (service, shop, garage, etc): 6000 people
   (e) Welfare level: daily income less than USD 1 : …… people

Disaster awareness development

6. Has your coastal village experienced tsunami attack? (a) Yes (b) No
   If "no", go directly to the question nr. 6. If "yes" then answer :
   (a) In what year? (can be more than one event) 2004
   (b) How many casualties (killed people)? 698
   (c) How many percent of the existing houses and infrastructures were destroyed? 80
   (d) How far is the inundation reach inland area? 200
   (e) How height was the inundation depth at the coast line? 6 – 8
7. Are there any trusted informations mentioning that your coastal village has a potential to be attacked by tsunami in the (near) future? (a) Yes (b). No
   What is the name of institution that gave this information? DEPT OF METEOROLOGY
8. Do you really well-informed and believe that tsunami will attack your coastal village in the (near) future?
   (a) Yes (b) No
9. Are you actively collecting any informations related to possible tsunami events regarding your locality?
   (a) Yes (b) No

Questionaire-1

10. If you believe that tsunami will potentially attack your coastal village, do you agree to relocate to safer area? (a) Yes (b) No
11. If your answer to question nr 10 is "no", please write down the reason: ……
12. If you are living nearby coastline, do you agree to relocate to safer area? (a) Yes (b) No
13. What kind of activities related to disaster awareness is conducted in your locality?
    (a) Evacuation drill; how many times a year? 1
    (1) by community (2) by government (3) by cooperation between community and government
    (b) Tsunami hazard mapping; (1) by community (2) by government (3) by cooperation between community and government
    (c) Development of disaster fighting group within community who share specific responsibilities related to disaster countermeasure.
    (d) Construction of protection structure; what kind of protection structure? …… ; Length:……; Width:……;
    (1) by community (2) by government (3) by cooperation between community and government
    (e) Plantation of coastal vegetation to reduce tsunami energy; Length:……; Width:……; name of vegetation:……
    (1) by community (2) by government (3) by cooperation between community and government

Tsunami hazard mapping

14. Do your locality already have a tsunami hazard map (THM)? (a) Yes (b) No
15. If your answer on the question nr.13 is "Yes" → which areas are covered by the available THM? (selection may be more than one choice):
    (a) Country-wide (b) State/Province (c) City/Regency (d) District (e) Village
16. If your answer on the question nr.13 is "not", is there any plan of THM development?
    (a) Yes (b) No (c) when it will be completed? ……
17. If your answer on the question nr.13 is "Yes", what kind of information are available in this THM (selection may be more than one choice):
    (a) tsunami inundation data (b) evacuation routes (c) emergency evacuation places,
    (d) others, mentioned please: ……
18. If your answer on the question nr.13 is "Yes", Who are involved in the development of THM:
    (1) by community (2) by government (3) by cooperation between community and government
19. Is tsunami hazard map distributed to all household in your locality? (a) Yes (b) No

Questionaire-2

QUESTIONAIRE

On Tsunami disaster awareness, tsunami hazard mapping and coastal vegetation implementation.

Local information:

1. Country: Indonesia; State/Province: Aceh; City/Regency: Meulaboh / Aceh Barat
2. Name of the most tsunami prone coastal village in your locality: Kampung Betakang
3. What is the exact position of the village (latitude ……; longitude……)
4. How long is the distance (approximately) between coastline and the nearest houses in this village? ……0…… meters.
5. Human population data of the village
   (a) Total population: …….. people; male: ……people; female: ……. people
   (b) Number of households: ……
   (c) Age distribution: ≥ 65yrs…. people; between 15 and 65yrs: …. people; ≤ 15yrs: …. people
   (d) Livelihood: fisherman:…. People; farmer: ….people; government officer/teacher: ….people; others (service, shop, garage, etc):… people
   (e) Welfare level: daily income less than USD 1 : …… people

Disaster awareness development

6. Has your coastal village experienced tsunami attack? (a) Yes (b) No
   If "no", go directly to the question nr. 6. If "yes" then answer :
   (a) In what year? (can be more than one event) 2004
   (b) How many casualties (killed people)? I don't know yet
   (c) How many percent of the existing houses and infrastructures were destroyed? 0 %
   (d) How far is the inundation reach inland area? 4 km
   (e) How height was the inundation depth at the coast line? 10-15 m
7. Are there any trusted informations mentioning that your coastal village has a potential to be attacked by tsunami in the (near) future? (a) Yes (b). No
   What is the name of institution that gave this information? ……
   ……
8. Do you really well-informed and believe that tsunami will attack your coastal village in the (near) future?
   (a) Yes (b) No
9. Are you actively collecting any informations related to possible tsunami events regarding your locality?
   (a)Yes (b) No

Questionaire-1

10. If you believe that tsunami will potentially attack your coastal village, do you agree to relocate to safer area? (a) Yes (b) No
11. If your answer to question nr 10 is "no", please write down the reason: ……
    ……
    ……
12. If you are living nearby coastline, do you agree to relocate to safer area? (a) Yes (b) No
13. What kind of activities related to disaster awareness is conducted in your locality?
    (a) Evacuation drill; how many times a year? ……
    (1) by community (2) by government (3) by cooperation between community and government
    (b) Tsunami hazard mapping; (1) by community (2) by government (3) by cooperation between community and government
    (c) Development of disaster fighting group within community who share specific responsibilities related to disaster countermeasure.
    (d) Construction of protection structure; what kind of protection structure? Breakwater ; Length:……; Width:……;
    (1) by community (2) by government (3) by cooperation between community and government
    (e) Plantation of coastal vegetation to reduce tsunami energy; Length:……; Width:……; name of vegetation: Coconut trees, Anacardium sp.
    (1) by community (2) by government (3) by cooperation between community and government

Tsunami hazard mapping

14. Do your locality already have a tsunami hazard map (THM)? (a) Yes (b) No
15. If your answer on the question nr.13 is "Yes" → which areas are covered by the available THM? (selection may be more than one choice):
    (a) Country-wide (b) State/Province (c) City/Regency (d) District (e) Village
16. If your answer on the question nr.13 is "not", is there any plan of THM development?
    (a) Yes (b) No (c) when it will be completed? ……
17. If your answer on the question nr.13 is "Yes", what kind of information are available in this THM (selection may be more than one choice):
    a) tsunami inundation data (b) evacuation routes (c) emergency evacuation places,
    (d) others, mentioned please: ……
    ……
18. If your answer on the question nr.13 is "Yes", Who are involved in the development of THM:
    (1) by community (2) by government (3) by cooperation between community and government
19. Is tsunami hazard map distributed to all household in your locality? (a) Yes (b) No

Questionaire-2

QUESTIONAIRE

On Tsunami disaster awareness, tsunami hazard mapping and coastal vegetation implementation.

Local information:

1. Country: Indonesia…; State/Province: Aceh……; City/Regency: Aceh Besar
2. Name of the most tsunami prone coastal village in your locality: Lam Nga……
3. What is the exact position of the village (latitude ……; longitude……..)
4. How long is the distance (approximately) between coastline and the nearest houses in this village? 100…….. meters.
5. Human population data of the village
   (a) Total population: 900…….. people; male: ……people; female: ……. people
   (b) Number of households: ……
   (c) Age distribution: ≥ 65yrs…. people; between 15 and 65yrs: …. people; ≤ 15yrs: …. people
   (d) Livelihood: fisherman:…. People; farmer: ….people; government officer/teacher: ….people; others (service, shop, garage, etc):… people
   (e) Welfare level: daily income less than USD 1 : …… people

Disaster awareness development

6. Has your coastal village experienced tsunami attack? (a) Yes (b) No
   If "no", go directly to the question nr. 6. If "yes" then answer :
   (a) In what year? (can be more than one event)……
   (b) How many casualties (killed people)? ……
   (c) How many percent of the existing houses and infrastructures were destroyed? ……
   (d) How far is the inundation reach inland area? ……
   (e) How height was the inundation depth at the coast line? ……
7. Are there any trusted informations mentioning that your coastal village has a potential to be attacked by tsunami in the (near) future? (a) Yes (b). No
   What is the name of institution that gave this information? ……
   ……
8. Do you really well-informed and believe that tsunami will attack your coastal village in the (near) future?
   (a) Yes (b) No
9. Are you actively collecting any informations related to possible tsunami events regarding your locality?
   (a)Yes (b) No

Questionaire-1

10. If you believe that tsunami will potentially attack your coastal village, do you agree to relocate to safer area? (a) Yes (b) No
11. If your answer to question nr 10 is "no", please write down the reason: ……
    ……
    ……
12. If you are living nearby coastline, do you agree to relocate to safer area? (a) Yes (b) No
13. What kind of activities related to disaster awareness is conducted in your locality?
    (a) Evacuation drill; how many times a year? ……
    (1) by community (2) by government (3) by cooperation between community and government
    (b) Tsunami hazard mapping; (1) by community (2) by government (3) by cooperation between community and government
    (c) Development of disaster fighting group within community who share specific responsibilities related to disaster countermeasure.
    (d) Construction of protection structure; what kind of protection structure? …… ;
    Length:……; Width:……;
    (1) by community (2) by government (3) by cooperation between community and government
    (e) Plantation of coastal vegetation to reduce tsunami energy; Length:……; Width:……; name of vegetation:……
    (1) by community (2) by government (3) by cooperation between community and government

Tsunami hazard mapping

14. Do your locality already have a tsunami hazard map (THM)? (a) Yes (b) No
15. If your answer on the question nr.13 is "Yes" → which areas are covered by the available THM? (selection may be more than one choice):
    (a) Country-wide (b) State/Province (c) City/Regency (d) District (e) Village
16. If your answer on the question nr.13 is "not", is there any plan of THM development?
    (a) Yes (b) No (c) when it will be completed? ……
17. If your answer on the question nr.13 is "Yes", what kind of information are available in this THM (selection may be more than one choice):
    a) tsunami inundation data (b) evacuation routes (c) emergency evacuation places,
    (d) others, mentioned please: ……
    ……
18. If your answer on the question nr.13 is "Yes", Who are involved in the development of THM:
    (1) by community (2) by government (3) by cooperation between community and government
19. Is tsunami hazard map distributed to all household in your locality? (a) Yes (b) No

Questionaire-2

QUESTIONAIRE

On Tsunami disaster awareness, tsunami hazard mapping and coastal vegetation implementation.

Local information:

1. Country: Indonesia; State/Province: Aceh; City/Regency: Thakkuman
2. Name of the most tsunami prone coastal village in your locality: Ujung Blang
3. What is the exact position of the village (latitude .....; longitude.....)
4. How long is the distance (approximately) between coastline and the nearest houses in this village? ....10..... meters.
5. Human population data of the village
   (a) Total population: ..... people; male: .....people; female: ..... people
   (b) Number of households: .....
   (c) Age distribution: ≥ 65yrs.... people; between 15 and 65yrs: .... people; ≤ 15yrs: .... people
   (d) Livelihood: fisherman:.... People; farmer: ....people; government officer/teacher: ....people; others (service, shop, garage, etc):... people
   (e) Welfare level: daily income less than USD 1 : ..... people

Disaster awareness development

6. Has your coastal village experienced tsunami attack? (a) Yes (b) No
   If "no", go directly to the question nr. 6. If "yes" then answer :
   (a) In what year? (can be more than one event).....
   (b) How many casualties (killed people)? .....
   (c) How many percent of the existing houses and infrastructures were destroyed? .....
   (d) How far is the inundation reach inland area? .....
   (e) How height was the inundation depth at the coast line? .....
7. Are there any trusted informations mentioning that your coastal village has a potential to be attacked by tsunami in the (near) future? (a) Yes (b). No
   What is the name of institution that gave this information? .....
   .....
8. Do you really well-informed and believe that tsunami will attack your coastal village in the (near) future?
   (a) Yes (b) No
9. Are you actively collecting any informations related to possible tsunami events regarding your locality?
   (a)Yes (b) No

Questionaire-1

10. If you believe that tsunami will potentially attack your coastal village, do you agree to relocate to safer area? (a) Yes (b) No
11. If your answer to question nr 10 is "no", please write down the reason: .....
    .....
    .....
12. If you are living nearby coastline, do you agree to relocate to safer area? (a) Yes (b) No
13. What kind of activities related to disaster awareness is conducted in your locality?
    (a) Evacuation drill; how many times a year? .....
    (1) by community (2) by government (3) by cooperation between community and government
    (b) Tsunami hazard mapping; (1) by community (2) by government (3) by cooperation between community and government
    (c) Development of disaster fighting group within community who share specific responsibilities related to disaster countermeasure.
    (d) Construction of protection structure; what kind of protection structure? .....;
    Length:.....; Width:.....;
    (1) by community (2) by government (3) by cooperation between community and government
    (e) Plantation of coastal vegetation to reduce tsunami energy; Length:.....; Width:.....; name of vegetation:.....
    (1) by community (2) by government (3) by cooperation between community and government

Tsunami hazard mapping

14. Do your locality already have a tsunami hazard map (THM)? (a) Yes (b) No
15. If your answer on the question nr.13 is "Yes" → which areas are covered by the available THM? (selection may be more than one choice):
    (a) Country-wide (b) State/Province (c) City/Regency (d) District (e) Village
16. If your answer on the question nr.13 is "not", is there any plan of THM development?
    (a) Yes (b) No (c) when it will be completed? .....
17. If your answer on the question nr.13 is "Yes", what kind of information are available in this THM (selection may be more than one choice):
    a) tsunami inundation data (b) evacuation routes (c) emergency evacuation places,
    (d) others, mentioned please: .....
    .....
18. If your answer on the question nr.13 is "Yes", Who are involved in the development of THM:
    (1) by community (2) by government (3) by cooperation between community and government
19. Is tsunami hazard map distributed to all household in your locality? (a) Yes (b) No

Questionaire-2