

**THE GOVERNMENTAL AND NON-GOVERNMENTAL
APPROACHES TO MAINTAIN MEDIUM AND LONG-TERM
DISASTER RESILIENCE
AFTER A MEGA-DISASTER**

Case study: Aceh Province, Indonesia after 2004 the Indian Ocean Tsunami

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Abstract

After the Indian Ocean Tsunami in 2004, the Government of Aceh started to promote disaster risk reduction and to build disaster resilience in order to address the current challenges in disaster risk mitigation in Aceh Province, Indonesia. One of the remarkable changes in the disaster management setting following the Indian Ocean Tsunami 2004 was the establishment of disaster risk management institutions and laws at the national, sub-national and local levels in Indonesia. The rationale of this study emanates from the emerging problems faced by the local government in maintaining disaster resilience after the rehabilitation and reconstruction phase ended in 2010 in Aceh following the mega-disaster. This study will focus on the concept of resilience within Aceh's disaster management agenda and how the government of Aceh developed organizational and political capacities to become „a resilient province “.

After the interventions and engagement of various international and national organizations in the rehabilitation and reconstruction phases in Aceh, it remains unclear whether and how local and provincial institutions are able to maintain and strengthen disaster resilience in the medium- and long-term, and whether resilience issues are implemented and integrated also six and ten years after the Tsunami event in medium and long-term development plans. This thesis will enhance the knowledge about post-disaster resilience building by focusing on medium and long-term resilience building processes, analysis of key tools and strategies to maintain resilience and challenges in multi-actor collaboration.

The PhD thesis focuses on different strategies to build resilience after the crisis of the Indian Ocean tsunami, particularly comparing strategies and tools conducted by governmental and non-governmental actors and to develop an evaluation framework for the process of building disaster resilience. This research aims to provide in-depth knowledge and systematize the knowledge about how the disaster resilience concept is translated into different policies and long-term development plans and examines which legal tools or measures have been used to promote disaster resilience. In this regard, the PhD research also aims to assess how different stakeholders and local actors are involved in disaster resilience, particularly in the learning and implementation of specific DRR measures to build disaster resilience.

The dissertation is based on a mixed-methods approach in three case study areas in Aceh Province (Banda Aceh, Sabang, and Aceh Jaya). The content analysis of the existing policy document aims to identify the use of the “disaster resilience” concept by actors. In addition, the semi-structured expert interviews were conducted with members of local government

agencies and non-governmental organizations involved in disaster risk reduction and tsunami resilience building efforts in order to explore how they judge the opportunities and limitations to promote resilience after disasters through the different strategies and measures. The aim of these interviews was to elicit information about the key informant's perspectives and reflections on the process of building disaster resilience in the province of Aceh. Next to the document analysis and expert interviews, a household survey was conducted to explore how households have increased their resilience and how they evaluate different strategies and the implementation process of other formal and informal actors.

The interviews revealed that integration of the resilience concept is still weak, meaning that the local government struggles to integrate the tsunami resilience concept in the current development agenda and respective plans. Challenges in communication and coordination between agencies and with local actors were identified. In addition, the lack of trust among the local actors and a lack of leadership by the local government in governing and promoting disaster resilience are seen as major obstacles in the implementation of resilience building after the mega-disaster. Interestingly, the study shows that cultural and religious aspects are not seen as major obstacles, but rather as an opportunity to also encourage informal actors to promote resilience, even though the level of coordination between these organizations and formal governmental institutions seem to still be weak.

The household survey underscored that many people are aware of various strategies and approaches that aim to build disaster resilience, such as the implementation of evacuation plans, vertical evacuation shelters, and an early warning system. The evidence suggests that the community has sufficient knowledge and experience to respond to disaster events, however, many of the strategies discussed had not sufficiently considering the specific community needs that the people interviewed mentioned. As such, the effectiveness of these strategies is insufficient.

In addition, it is important to define more specific goals and a common understanding of disaster resilience that connects the concept to the spatial specific conditions in the region and that allow to measure progress towards disaster resilience. Finally, the sustainability of approaches, tools, and institutions is an issue that needs to receive more attention, if building disaster resilience is more than just a short-term exercise after a disaster.

Keywords: maintaining disaster resilience, learning, self-organization, collaboration, local level, post-disaster

Zusammenfassung

Nach dem Tsunami im Indischen Ozean im Jahr 2004 begann die Regierung von Aceh, die Katastrophenvorsorge und die Resilienz gegenüber Katastrophen zu fördern, um den aktuellen Herausforderungen im Katastrophenschutz und Risikomanagement in der Provinz Aceh, Indonesien, zu begegnen. Eine der bemerkenswerten Veränderungen nach dem Tsunami 2004 war die Schaffung von spezifischen Institutionen und Gesetzen für Katastrophenschutz und Risikomanagement auf nationaler, subnationaler und lokaler Ebene in Indonesien. Diese Doktorarbeit gründet sich auf den sich abzeichnenden Problemen der lokalen Regierung bei der Aufrechterhaltung der Resilienz gegenüber Naturkatastrophen nach Abschluss der Rehabilitations- und Wiederaufbauphase in Aceh im Jahr 2010. Diese Studie wird sich auf das Konzept der Resilienz zur Analyse des Katastrophenschutzplans von Aceh konzentrieren und untersuchen, wie die Regierung von Aceh organisatorische und politische Kapazitäten entwickelt hat, um zu einer "resilienten Provinz" zu werden.

Nach den Interventionen und dem Engagement verschiedener internationaler und nationaler Organisationen in der Rehabilitations- und Wiederaufbauphase in Aceh bleibt unklar, ob und auf welche Weise Institutionen auf lokaler und auf Provinzebene in der Lage sind, die Resilienz gegenüber Naturkatastrophen mittel- und langfristig aufrechtzuerhalten und zu stärken. Ebenso bleibt offen, ob Fragen bezüglich Resilienz auch sechs und zehn Jahre nach dem Tsunamieignis in mittel- und langfristigen Entwicklungsplänen umgesetzt und integriert werden. Diese Doktorarbeit wird das Wissen über ‚post-disaster resilience building‘ erweitern, indem sie sich sowohl mittel- und langfristigen Prozessen, als auch der Analyse von zentralen Methoden und Strategien zur Aufrechterhaltung von Resilienz widmet und sich den Herausforderungen einer Zusammenarbeit mit mehreren Akteuren stellt.

Diese Dissertation konzentriert sich auf die Analyse verschiedener Strategien zur Stärkung der Resilienz nach der Tsunami Katastrophe im Indischen Ozean. Insbesondere werden Strategien und Instrumente staatlicher und nichtstaatlicher Akteure miteinander verglichen. In diesem Sinne wird ein Evaluationskonzept zur Untersuchung von Strategien zum Aufbau von Resilienz entwickelt. Ziel dieser Forschung ist es, zu verstehen, wie das Konzept der Resilienz in verschiedene Politikmaßnahmen und langfristige Entwicklungspläne einfließt und umgesetzt wird. Es wird hierbei untersucht, welche rechtlichen Instrumente oder Maßnahmen zur Stärkung der Resilienz gegenüber Naturkatastrophen eingesetzt wurden. Diese Doktorarbeit zielt auch darauf ab, zu bewerten, wie verschiedene Interessengruppen und lokale

Akteure an der Stärkung von resilienten Strukturen und Prozessen beteiligt sind. Von besonderem Interesse sind die damit in Verbindung stehende Lernprozesse und die Umsetzung spezifischer Maßnahmen zum Aufbau von Resilienz.

Diese Forschung basiert auf einem Mixed-Methods Ansatz mit Fallstudien in drei Untersuchungsgebieten in der Provinz Aceh (Banda Aceh, Sabang und Aceh Jaya). Methodisch stützt sich diese Arbeit auf eine Inhaltsanalyse bestehender Strategiepapiere der Regierung. Dies zielt darauf ab, zu ermitteln, ob und in welcher Form das Konzept der Resilienz von zentralen Akteuren verwendet wird. Darüber hinaus wurden semi-strukturierte Experteninterviews durchgeführt mit Vertretern lokaler Regierungsbehörden und Nichtregierungsorganisationen, die an der Katastrophenvorsorge und dem Aufbau von Tsunami-Resilienz beteiligt sind. Ziel ist es, zu untersuchen, wie diese Akteure die Chancen und Grenzen von Maßnahmen und Strategien im Kontext von ‚post-disaster resilience building‘ bewerten. Insbesondere dienten die Interviews dazu, Informationen zu gewinnen über individuelle Meinungen und Bewertungen von Schlüsselinformanten zum Prozess des Aufbaus der Resilienz gegenüber Naturkatastrophen in der Provinz Aceh. Neben der Dokumentenanalyse und den Experteninterviews wurde eine quantitative Haushaltsbefragung durchgeführt, um zu untersuchen, wie Haushalte ihre Resilienz gegenüber Tsunamis erhöht haben und wie sie die verschiedenen Strategien und den Umsetzungsprozess anderer formeller und informeller Akteure bewerten.

Die Interviews zeigen, dass das Konzept der Resilienz bisher nur in geringem Maße von der Regierung in die aktuelle Entwicklungsagenda und die entsprechenden Pläne integriert werden konnte. Insbesondere Herausforderungen in der Kommunikation und Kooperation zwischen den Behörden und den lokalen Akteuren wurden hierbei deutlich. Als Haupthindernis für den Aufbau von Resilienz nach dem Tsunami im Jahr 2004 wurde das mangelnde Vertrauen der lokalen Akteure in die lokale Regierung und deren Führungsschwäche bei der Steuerung und Förderung der Resilienz gegenüber Naturkatastrophen identifiziert. Die Studie verdeutlicht, dass kulturelle und religiöse Aspekte nicht als große Hindernisse angesehen werden, sondern als Chance, auch informelle Akteure zu ermutigen, Resilienz zu fördern, obwohl die Koordination zwischen diesen Organisationen und formalen staatlichen Institutionen noch schwach zu sein scheint.

Die Auswertung der Haushaltsumfrage unterstreicht, dass viele Menschen Strategien und Ansätze kennen, die darauf abzielen, Resilienz gegenüber Naturkatastrophen aufzubauen, wie

zum Beispiel Evakuierungspläne, die Lage von Evakuierungsunterkünften und das Frühwarnsystem. Die Ergebnisse deuten darauf hin, dass die Haushalte über genügend Wissen und Erfahrung verfügen, um auf Katastrophenereignisse zu reagieren. Jedoch haben viele der diskutierten Strategien die spezifischen Bedürfnisse der Bürger nicht ausreichend berücksichtigt. Die Wirksamkeit dieser Strategien ist daher als unzureichend zu bewerten.

Insgesamt hat die Studie verdeutlicht, dass spezifischere Ziele und ein gemeinsames Verständnis von Resilienz gegenüber Naturkatastrophen definiert werden müssen. Es ist ein Resilienzkonzept erforderlich, das mit den spezifischen Bedingungen in der Region verbunden werden kann und das es ermöglicht, die Fortschritte im Sinne der Resilienz gegenüber Tsunamis zu messen. Weiterhin ist die Nachhaltigkeit von Konzepten, Instrumenten und Institutionen ein Thema, dem mehr Aufmerksamkeit geschenkt werden muss, wenn der Aufbau von Resilienz gegenüber Naturkatastrophen mehr sein soll als nur eine kurzfristige Aufgabe nach einer Katastrophe.

Key Words: Resilienz gegenüber Naturkatastrophen, Lernen, Selbstorganisation, Zusammenarbeit, lokale Ebene, Post-Disaster

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List of Abbreviations

ARF	Aceh Recovery Framework
BAPPEDA	Badan Perencanaan Pembangunan Daerah Regional Development Planning Agency
BAPPENAS	Badan Perencanaan Pembangunan Nasional State ministry of national development planning
BMKG	Badan Meteorologi, Klimatologi, dan Geofisika Meteorological, Climatological, and Geophysical Agency
BNPB	Badan Nasional Penanggulangan Bencana National disaster management agency
BPBA	Badan Penanggulangan Bencana Aceh Aceh disaster management Agency
BPBD	Badan Penanggulangan Bencana Daerah Local Disaster management Agency
BPS	Badan Pusat Statistik Central Statistics Office
BRR	Badan Rehabilitasi dan Rekonstruksi (Aceh-Nias) Aceh-Nias Rehabilitation and Reconstruction Agency
CBO	Community-based Organization
CSO	Civil Society Organization
DPR	Dewan Perwakilan Rakyat Aceh Aceh Provincial Legislative Assembly
DPRK	Dewan Perwakilan Rakyat Kabupaten Local people´s representative council at the municipality or regency level
DRR	Disaster Risk Reduction
DRR-A	Disaster Risk Reduction-Aceh
Forum PRB	Forum Pengurangan Risiko Bencana Disaster Risk Reduction Forum
GAM	Gerakan Aceh Merdeka Free Aceh Movement
GIS	Geographic Information System
GTZ	Gesellschaft Für Technische Zusammenarbeit German Assistance Agency
HAM	Hak Azasi Manusia Human Right
HIV/AIDS	Human Immune Deficiency Virus, Acquired Immune Deficiency Syndrome
JRF	Java Recovery Fund
IOC	The Intergovernmental Oceanographic Commission
IOM	International Organization for Migration
JICA	Japan International Cooperation Agency
LGBT	The Lesbian, Gay, Bisexual, and Transgender
LIPI	Lembaga Ilmu Pengetahuan Indonesia The Indonesians Institute of Sciences
LoGA	Law on Governing Aceh
MDF	Multi Donor Fund
MOU	Memorandum of Understanding

Musrenbang	Musyawaran Perencanaan Pembangunan a local stakeholder consultation forum for development planning
Mw	Moment Magnitude of Earthquake
NGO	Non-governmental organization
NOAA	National Oceanic and Atmospheric Administration
PKBI	Persatuan Keluarga Bencana Indonesia (NGO)
PMI	Palang Merah Indonesia Indonesian Red Cross
POLRI	Kepolisian Negara Republik Indonesia Indonesian National Police
Qanun	(Aceh, Arabic) Canon. Regulations issued by the provincial and district governments of Aceh Province
RPJM	Rencana Pembangunan Jangka Menengah Medium-term development plan
RPJMN	Rencana Pembangunan Jangka Menengah Nasional National medium-term development Plan
RPJP	Rencana Pembangunan Jangka Panjang Long-term development Plan
RTRW	Rencana Tata Ruang dan Wilayah Spatial and Urban Plan
Sibat	Siaga bencana berbasis masyarakat Community volunteer for disaster response
SKPD	Satuan Kerja Perangkat Dinas Provincial Government Departments
SD	Sekolah Dasar Primary school
SMA	Sekolah Menengah Atas High school
SMP	Sekolah Menengah Pertama Junior high school
SOP	Standard Operating Procedure
SPSS	Statistical Package for the Social Scientist
Tagana	Taruna siaga Bencana Volunteer for disaster response
TDRMC	Tsunami and Disaster Mitigation Research Centre
TEWS	Tsunami Early Warning System
TNI	Tentara Nasional Indonesia: Indonesian Armed Forces
TRC	Tim Reaksi Cepat Fast Response Team
Ulama	(Indonesia, Arabic) Religious leader
UNDP	United Nations Development Programme
UNISDR	United Nations office for Disaster Risk Reduction
Walhi	Wahana Lingkungan Hidup (NGO)

1 Introduction

After the rehabilitation and reconstruction following the Indian Ocean Tsunami in 2004, officially ended in 2010, Aceh local government, NGOs, and communities take over the responsibility to build disaster resilience from the Aceh-Nias Rehabilitation and Reconstruction Agency (BRR). However, as the Aceh government takes over these responsibilities, it faces considerable challenges due to its limited capacity and the unclear commitment of the local government to continue to priorities the resilience building process in the current development agenda. However, nearly fifteen years after the Indian Ocean Tsunami in 2004, the process of building tsunami resilience has not been sufficiently assessed to determine whether resilience building has been maintained in Aceh Province.

On December 26th 2004, an earthquake of an estimated magnitude $M_w = 9.1$ to 9.3 occurred and was followed by the Tsunami waves that destroyed more than 139.000 houses and displaced 635.384 number of people solely in Aceh Province (IOC-UNESCO 2009; BRR 2009; NOAA 2006). 127.707 fatalities were recorded and 93.285 people missing (BRR 2009). In addition, an estimated 750,000 people lost their livelihoods (MDF-JRF Secretariat 2012). But, even before the tsunami, the region had been exposed to more than thirty years (1976-2005) of political conflict between the Government of Indonesia and GAM (Free Aceh Movement) (Featherstone 2014). This conflict is believed to have led to approximately between 10.000 to 30.000 people being killed and 400.000 displaced, particularly during military operations in 1989-2004 (Aspinall 2008; Amnesty International 2015).

The process of resilience building that officially started after the tsunami disaster, involved different key players from both governmental and non-governmental agencies. There were a handful of international and national recovery activities. The Multi Donor Fund (MDF) collected \$655 million in contributions from 15 donors (MDF-JRF Secretariat 2012). 140.304 permanent houses were built, 67,979 hectares of agricultural land reclaimed, and 3,696 kilometres of road constructed (BRR 2009; Oxfam 2014). Of particular note, the conflict resolution and peace process were embedded in the post-tsunami recovery process (The Government of Indonesia; Free Aceh Movement 8/15/2005).

Following the tsunami disaster, building disaster resilience has become a key strategy for people and organizations in Aceh to prepare for crises situations and learn lessons from the Indian Ocean Tsunami event of 2004 (BNPB 2014b).The concept of building resilience was

promoted by the government and should be supported by communities. The resilience concept is used and interpreted differently by different stakeholders (Pemerintah Aceh 2009; BPBA 2012). The complexity and abstract level of the resilience concept become a problem for the local actors because of the limited communication among local actors, in terms of knowledge sharing and management. This research sheds light on the discussion and examines more precisely, how resilience has been integrated into development strategies and the legal (planning) documents. This is followed by an analysis to answer the question of what kind of actor networks have communicated and dealt with resilience at the local level. In this regard, this dissertation explores how different collaborations have emerged and developed and to what extent these collaborations are still working, or not, as the case may be.

Next to the question of which strategies were used to build resilience, the PhD thesis explores how state and non-state actors sustained a process that allowed the promotion of resilience building at the level of organizations and individual households. In this regard, the activities of different actors were examined from 2005 to 2010 (see figure 1). However, the level of engagement of local actors is often not sufficiently clear after the emergency and rehabilitation ended, so it is important to have more information on known how different local actors such as government agencies, civil societies, religious leaders, academic and educational communities worked together after the Indian Ocean Tsunami and in these days in order to sustain activities in maintaining long-term disaster resilience. In this regard, information related to the current collaborative process and problems in building disaster resilience are required.

DISASTER RESILIENCE TIMELINE IN ACEH PROVINCE

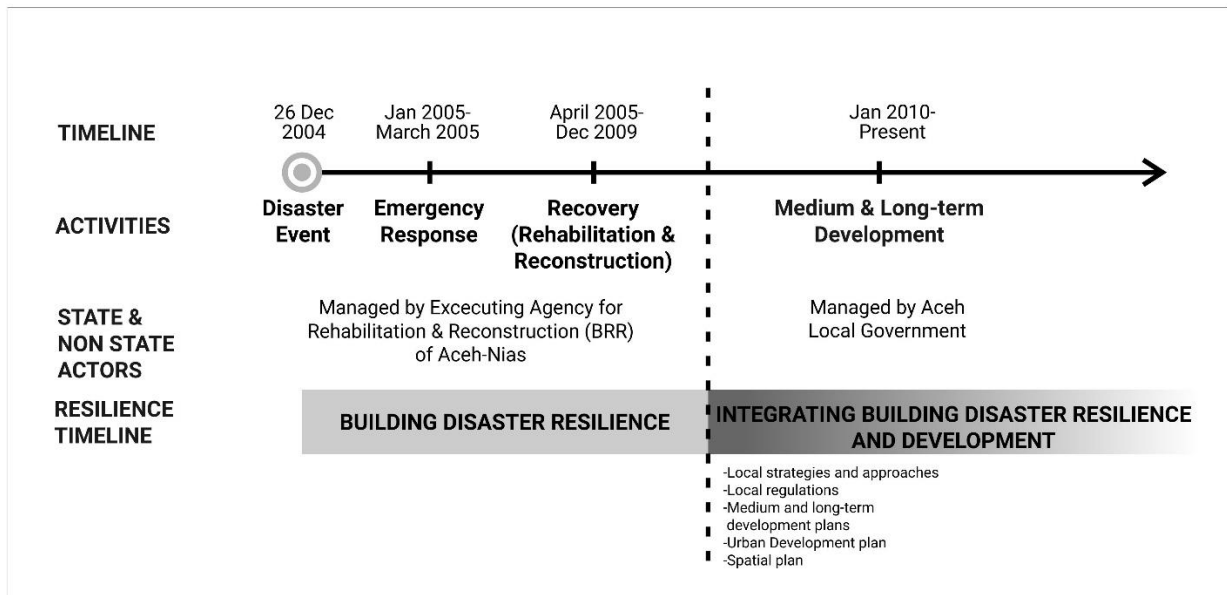


Figure 1 Disaster resilience timeline in Aceh Province

Source: own

1.1 Problem definition

The main aim of this thesis is to analyze which legal tools or measures have been used to implement disaster resilience strategies following the tsunami disaster. In this regard, it is important for the community to be aware of the strategies, measures, and tools that used by the local authorities (Oktari et al. 2014; Tim Kaji Cepat 2012). To complement the local actor perspectives, this dissertation will provide an evaluation of the effectiveness of the legal tools used to implement disaster risk reduction strategies at the local and community levels, building in perspectives from the communities themselves. This evaluation will reveal to what extent local people or communities are aware of the measure and how they judge the effectiveness of the implementation process compared to the various strategies advertised by the local government.

Although the institutional arrangement of disaster risk reduction at the levels of the province, regencies and municipalities has been established, the function and performance of this disaster management agency is not sufficiently clear, and the roles and capacities of the provincial and local institutions and actors are also not well examined and documented. For example, the commitment of these local institutions to integrate disaster resilience in the medium and long-

term development plans (UNDP Indonesia 2012; Australian National University 2012). In addition to a better definition and understanding of the different roles of institutions it is also essential to examine the capacities and resources of different organizations, particularly against the discourse that networks of state, private or civil society institutions in disaster risk management in Aceh need to be strengthened in order to create synergies for resilience building after the 2004 Indian Ocean Tsunami (Illy 2012).

The next problem is the complexity and abstract level of the disaster resilience concept; however, this research will shed light on this discussion and examine more precisely, how disaster resilience has been integrated into legal tools as well as document strategies (BAPPENAS 2014). Therefore, the following dissertation provides an in-depth exploration into how the concept of disaster resilience has been defined, used and applied by provincial and local governmental institutions. Hence, the dissertation aims to explore how disaster resilience is translated and put into practice at the provincial and local level by state and non-state actors in different fields, such as disaster risk management and spatial/urban planning.

According to a study of the village government, conducted three years after the Indian Tsunami in 2004 (Thornburn 2008), the government, civil societies, and local actors should prepare „a long term time frame“ for engagement. That means that not only the comprehensiveness of resilience building strategies but also their sustainability and stability in terms of medium and long-term impacts is important. At the same time, the level of engagement of local actors is often not sufficiently clear and some have concluded that various local actors have little engagement during and after the rehabilitation and reconstruction in Aceh Province (Craig 2007). This engagement is needed to improve the governance at the local level, specifically to solve the problems of multi-stakeholder forum and improve the capability and skills of local actors. Moreover, the lack of engagement among the actors hampers the process of improving the local capacities and finding long-term solutions in maintaining disaster resilience, since stakeholders and networks are key to building resilience and promoting disaster risk reduction at the local level.

In the context, Djalante and Thomalla (2012) also underscore that one challenge for promoting resilience after the Tsunami disaster is the limited capacities that local governments have and the limited support they have received from the national government in terms of technical and financial support, particularly in inviting multiple stakeholders to participate and coordinate in building resilience at the local level. While these important findings are presented in literature,

most of the information presented is still incomplete and fragmented, particularly on the question of how these local actors can work together and support the development of comprehensive strategies to maintain disaster resilience overtime. The next question is to identify the factors that are missing from the development of local collaboration in terms of technical, funding and other resources to build capacities to work together in promoting disaster resilience.

The Government of Aceh has developed important efforts to promote disaster risk reduction and built disaster resilience, such as local disaster management regulations and establishing a local disaster management agency (BPBD). However, the effective risk reduction and building of disaster resilience needs a clear definition of the role of various government institutions and other organizations that are involved in different sectors and which are important for building disaster resilience in the short-, medium and long-term. Since the roles of provincial government, regencies and municipalities plus village government level are critical, the performance of these organizations will be examined in relation to the implementation of their strategies through concrete measures and planning processes. This thesis will provide in-depth analysis of the local actor perspectives on the process of building resilience, particularly their contribution and reflection in this process.

The other significant problem in building resilience is the vulnerability of women in disaster situations. According to Doocy et al. (2007), two-thirds of the tsunami victims in Aceh Province were women . Women were more vulnerable after losing their husbands either as a result of the political conflict or the 2004 Tsunami, particularly women have to work and support their families financially and emotionally and at the same time, looking after children (Gender Working Group 2007). As such, the resilience building process needs to consider different gender roles and invite more women to participate actively in this process. This thesis analyzes the challenges in involving women in the process of building disaster resilience at the community level.

The literature suggests that the long-lasting political conflict in Aceh caused trust issues among the governmental authorities, local NGOs, and, community. This destabilization factor hampers the collaborative process, particularly in terms of building trust among the local actors to work together (Fara 2012). Consequently, the dissertation also aims to provide new insights on how the engagement of and cooperation between different local actors has evolved to build

their trust and willingness to collaborate in maintaining long-term disaster resilience after the conflict and Indian Ocean Tsunami 2004.

In Aceh's case, there is no in-depth and systematic knowledge about how learning evolved in the medium and long term after the tsunami. The ability to learn and improve following a disaster event is an important element in managing future disaster risk and a fundamental aspect of disaster risk management. This learning process needs the cooperation of multiple stakeholders (Lebel et al. 2006; Tschakert, Dietrich 2010). Based on the interpretation of resilience theory (Berkes, Turner 2006; Folke 2016), learning and collaboration can enhance resilience after disaster. Therefore, various actors and different types of knowledge should be integrated, particularly to bring together the local government, NGOs and community knowledge. Besides the need to better understand how the knowledge generation and coordination between the various local actors is organized and takes place to promote resilience building, it is also essential to examine how different stakeholders are involved, particularly in the learning and knowledge development processes.

1.2 Research objectives and questions

The main objective of this research is to provide in-depth insights that explain and take a step towards systematizing learning about how the concept of disaster resilience has been translated into different policies and long-term development plans in Aceh Province. In this regard, the PhD research assesses how different stakeholders and local actors are involved in disaster resilience, particularly in learning and the implementation of specific DRR measures to build disaster resilience. In addition, this dissertation's objective is to explore the level of cooperation and the commitment of the institutions and local actors to implement the selected disaster risk reduction strategies and approaches.

Based on the core objective outlined above, the PhD research develops a framework for resilience focused collaboration that demonstrates approaches to enhance the collaboration between different state and non-state organizations to build resilience in terms of linking important components and activities of various local actors in order to sustain the promotion of disaster resilience in the medium- and long-term following the tsunami in 2004 in Aceh.

1.2.1 Main research questions

Against the background of the problem definition and in the context of the core goals of the dissertation outlined above, the key research question of the dissertation is:

“how disaster resilience strategies and activities are defined and how different local state and non-state actors cooperate to achieve disaster resilience in medium and a long-term”

1.2.2 Research sub-questions

In the light of the core question, sub-questions of the PhD work are as follows:

1. How do different local actors define and conceptualize disaster resilience for the province of Aceh? What are key characteristics of building disaster resilience at the provincial and local level?
2. What strategies and approaches are employed and preferred by governmental institutions and community groups to build disaster resilience after the Indian Ocean Tsunami in 2004 in Aceh Province? Which differences exist between approaches employed?
3. How do local actors collaborate with each other in the development and maintenance of building resilience to disasters?
4. What are factors that hamper the development and / or the sustainability of multi-actor and comprehensive strategies to promote disaster resilience at the local and provincial levels?

1.3 Research approach

The PhD research is based on three case study areas in Banda Aceh, Sabang, and Aceh Jaya, two municipalities and a regency in Aceh Province in order to examine the governmental strategies, institutions, and tools in building disaster resilience. These municipalities and regency have different geographical conditions (urban, small island, rural areas), size of the areas, and the impacts from the Indian Ocean Tsunami 2004. While Banda Aceh and Aceh Jaya were highly devastated in the Tsunami disaster with 61.065 death and major destruction 21.757 houses destroyed, the loss and damaged in Sabang was less severe (Doocy et al. 2007; Frankenberg et al. 2011). Interestingly, the structures and institutions for disaster management and capacities for DRR are in theory the same in three case study areas. However, the PhD revealed some important difference.

This study builds on the combination of qualitative and quantitative methods in answering the research questions. By employing a mixed-methods approach, the research integrates both

qualitative and quantitative data, performing triangulation to test for validity and complementary empirical findings. In this study, mixed-methods research is appropriate to examine various governmental organizations, NGOS, and community strategies in building disaster resilience. Both qualitative and quantitative data collection and analysis were essential to capture the local meanings and targets of disaster resilience. For example, conducting semi-structured interviews with the respected governmental officials and then confirming the findings from these interviews with the household surveys among targeted community members.

In this regard, primary data collection included observations, semi-structured interviews and household surveys. Qualitative data was analyzed by transcribing interviews and initiating coding schemes by looking at the research questions. Quantitative data from the household surveys was analyzed through descriptive statistics. Secondary data was gathered from governmental statistics, documents and reports as well as recent studies or projects related to Tsunami risk reduction in Aceh. In addition, media material was examined. Figure 2 provides an overview about the research workflow and the respective research tasks.

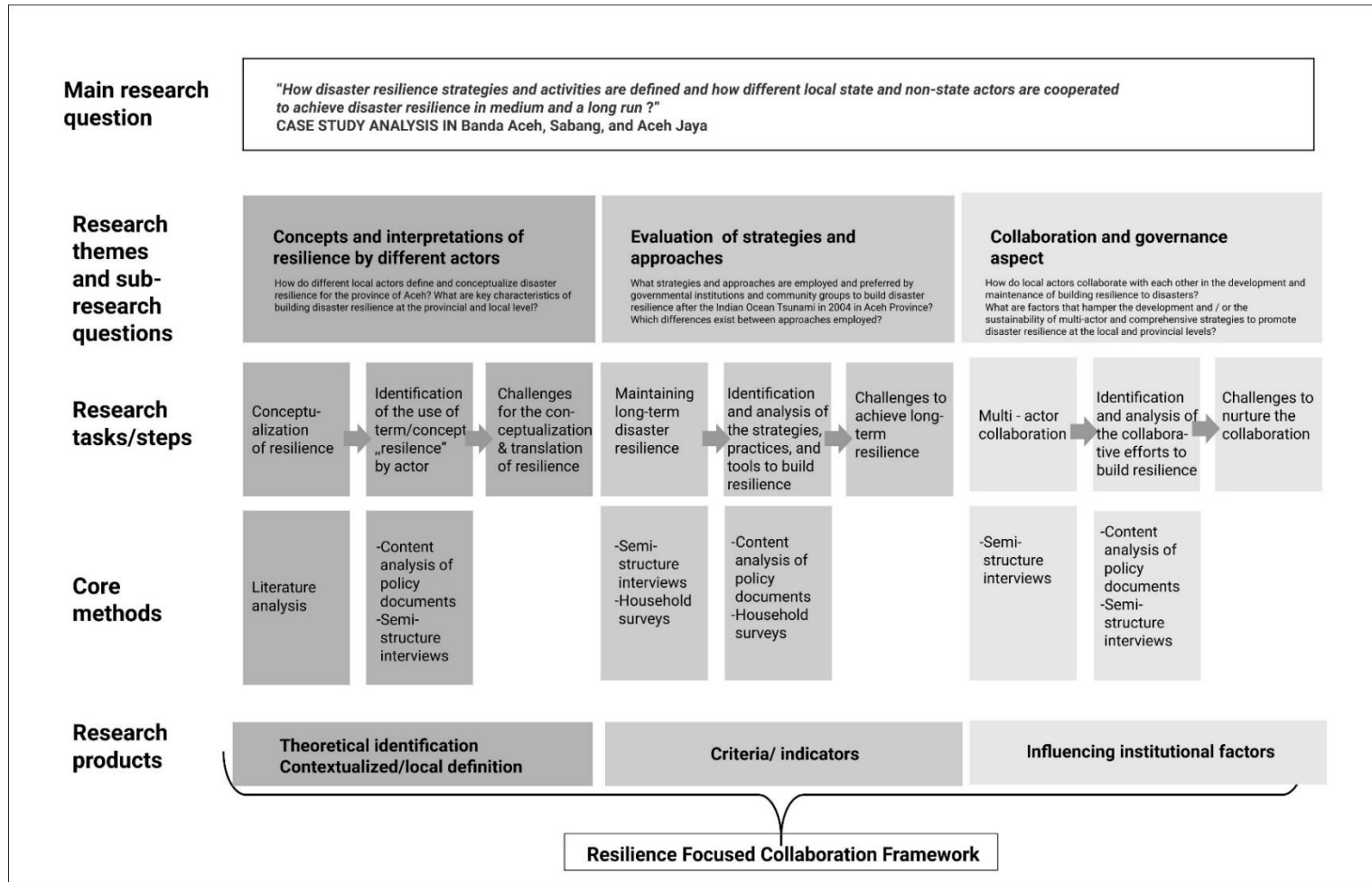


Figure 2 Reserch workflow and tasks
Source: own

1.4 Rationale and significance

Even though the experiences and lessons learned during the phase of emergency management, rehabilitation and reconstruction are important and provide a foundation for governmental and non-governmental organizations to further build disaster resilience, there is very little data and evidence to show whether and how resilience building took place in the last 4 years – hence nearly 15 years after the Tsunami disaster. Improving the knowledge base on how resilience building has emerged after the rehabilitation and reconstruction phase is important in order to understand whether and how resilience building after disasters can be maintained also in the medium- and long run. In addition, it is key to identify a framework and measures that can help to sustain approaches in resilience building after disasters, since only with continued awareness activities and a high level of preparedness can future disaster risk in the region can be reduced.

This PhD research uses resilience theory which highlights environmental factors and focuses particularly on issues of governance and capacity to manage resilience (Lebel et al. 2006; Folke 2016) to examine how governmental and non-governmental organizations in Aceh developed and implemented approaches to build disaster resilience after a mega disaster in 2004. In this regard, a broader framework and context for defining and analysing disaster resilience is applied that combines the theoretical and conceptual work of the social-ecological resilience research community (Holling 1973; Carpenter et al. 2012), the natural hazard, and disaster risk research community (Lebel et al. 2006; DFID 2011; Cutter et al. 2008; emBRACE 2012; Birkmann et al. 2015).

The goal of applying resilience theories in this thesis is to reveal how resilience is used and interpreted differently by different stakeholders (see subchapters 5.1 and 5.2). For example, how concepts of disaster resilience after the Tsunami have been defined, used and applied by governmental institutions and NGOs. The conceptualization and interpretation of disaster resilience underpin the ability to learn and improve after crises, particularly to build knowledge, choose better measures, communicate and reflect on the implementation process (Folke 2016; Tschakert, Dietrich 2010). The following empirical analysis focuses on how resilience is defined or conceptualized by actors and how this influences their ability to maintain resilience over time by providing a critical examination of the existing approaches and strategies from the local actors (see subchapter 5.3).

One of the key challenges in applying the resilience concept [or using the resilience concept as a frame] is that it is fairly nebulous. This makes it difficult to define and operationalize the

concept for specific purposes and means that the standard resilience concept needs to be considered with other theories that enable resilience to be refined for a specific domain. (see e.g. Brand, Jax 2007; Cutter 2016). These theories allow more a comprehensive analytical framework to be established to support the study and systematization of the recovery process, lessons learned, and challenges in building disaster resilience. As such, this thesis draws on, governance and collaboration theories to provide conceptual clarity and practical relevance of resilience theory in the context of collaborative resilience building at the local level, following a disaster.

Governance approaches are used to inform the empirical analysis, particularly to identify legal tools or measures that were used to implement the disaster resilience building strategies after the tsunami. Governing disaster resilience includes inviting various non-governmental actors and civil society organizations in managing disaster resilience and increasing governmental capacity to collaborate with different actors (Bevir 2006). In this respect, governance theory will contribute information on what the local stakeholder roles and functions are in maintaining resilience after a disaster (see chapter 6). In this study, the governance approach is applied to the question of how the resilience concept has burst onto the Aceh government's political agenda, particularly how the governance structures contribute to supporting cooperation in building disaster resilience (see subchapters 6.1 and 6.2).

The linkage between disaster risk reduction, development policies and planning processes is important to understand whether and how resilience building can also be mainstreamed into the medium- and long-term development programmes of these municipalities. The additional values that governance theory contributes is the promotion and understanding of different strategies and mechanisms in building resilience, particularly how to enhance better coordination and cooperation from non-governmental actors in managing disaster risk (see sub chapter 6.3). In this regard, as proposed by Birkmann et al. (2016b), joined up governance can strengthen resilience, particularly for improving the coordination between different agencies to solve local problems related disaster risks.

Collaboration theories (National Research Council 2011; Champagne et al. 2014; Kapucu 2006; Noran 2014a) provide basis for the analysis on how the engagement of and cooperation between different local actors have evolved directly after the Indian Ocean Tsunami in the emergency and rehabilitation phase (see chapter 7). Effective collaboration to maintain disaster resilience is best developed by inviting various local actors and community members, with their diverse knowledge, capacities, and experiences (National Research Council 2011). This

theory can be useful in evaluating the network actors that have communicated and dealt with resilience at the local level. This analysis will develop an understanding of existing problems that face the Aceh multi-stakeholder forum (see subchapter 7.1). More fundamentally, it is also essential to assess the level of cooperation and the commitment of the local actors to implement the resilience building strategies (see subchapters 7.2 and 7.3).

Moreover, the case studies provide an important laboratory to test how municipalities and cities in Indonesia after the mega-disaster have attempted to sustain efforts to build resilience and how different actors cooperate with each other— particularly governmental and non-governmental institutions. The findings and the newly developed framework to improve the sustainability and range of resilience building strategies at the local level also in the medium- and long-term after disasters is also important for other cities that might have experienced disasters in the past but also cities that might experience disasters in the future and want to learn from Indonesia's experience to ensure that resilience building is not limited to the rehabilitation and reconstruction phase. In addition, the sharing of experiences and lessons from the research in the PhD work can also support the Aceh Government to identify good practices that will help to promote disaster risk reduction in a comprehensive manner with a long-term perspective. Also, the shortcomings and problems identified in the research can help to overcome existing problems or at least can help to articulate them.

1.5 Organization of the dissertation

This dissertation work is structured into nine chapters. While chapter 1 encompasses an introduction and frames this study within the context of Aceh Province after the Indian Ocean Tsunami in 2004. Chapter 2 lays out the theoretical foundation of the research, particularly on the key concepts of building disaster resilience in post-disaster contexts such as learning and self-organization and focusing on resilience, governance and collaboration theories and concepts. This is followed by defining key concepts of an analytical framework devised by the author for this research. In chapter 3, the methodologies used are presented. These show how the data collection and analysis was conducted to examine different strategies of governmental and non-governmental actors to build resilience. The fourth chapter describes the context of the study areas related to the regulations, framework, and institutional architecture of building resilience in Aceh Province. Chapter 5, 6 and 7 report the detailed findings of the research. These empirical chapters focus on the three key themes: disaster resilience concepts and interpretations, governance, and collaboration in managing and strengthening disaster

resilience building. Chapter 8 focuses on dealing with the discussion and interpretation of the research results. The final chapter draws upon the entire thesis, tying up the various theoretical and empirical strands, to formulate core conclusions, to provide recommendations and to identify future research needs.

2 Theory

This theory chapter introduces a relevant discussion on the theoretical and conceptual assumptions related to the main research questions on how disaster resilience strategies and activities are defined and how different local state and non-state actors are cooperated to achieve disaster resilience in medium and a long-term. In addition, this research aims to develop an evaluation framework of building disaster resilience in Aceh Province following the Indian Ocean Tsunami 2004. These theory and framework will apply to guide the empirical analysis in chapter 5, 6, and 7 and to discuss and interpret the findings in chapter 8.

The research links the theoretical approaches and concepts of disaster resilience (Folke 2016; Cutter 2016), governance (Tierney 2012; Lebel et al. 2006), and collaboration (National Research Council 2011; Noran 2014b) to better understand how strengthening and maintaining disaster resilience after mega-disasters can be achieved and explored. That means the research is underpinned by theoretical concepts which center on the interface of three main subjects: (1) resilience, (2) governance, and (3) collaboration. These three key concepts are central to understanding how disaster resilience is built and maintained after the rehabilitation and reconstruction phase of the Indian Ocean Tsunami 2004 ended.

This theory chapter considers some main literature to analyze how the concept of disaster resilience has been defined and put in practice by the local actors (Lebel et al. 2006; Folke 2016; Cutter 2016). Resilience approaches may explain the meaning of disaster resilience concept and identify the main goals in resilience building activities by the local actors. At the same time, this approach provides practical perspective on the interpretation of this concept by different actors. The next step in the application of resilience theory is to identify the main factors that contribute in building disaster resilience after the crises and how these factors support the sustainability of maintaining resilience over time. In this context, resilience approaches allow to better understand of the concrete features and directs connection of resilience factors that important to evaluate the progress and level of disaster resilience building at the local level. For examples, closely observing learning and self-organization that recognizes as important features in building disaster resilience.

The governance approaches will apply to examine the participatory process and capacity of local actors in maintaining disaster resilience (Stoker 1998; Tierney 2012). The governance approach will advance deeper understanding of various governance challenges related to structural arrangements, planning, and decision making in developing comprehensive

strategies in building disaster resilience. Specifically, the governance approach will help to examine the implementation of strategies and practices in building disaster resilience.

The collaboration approach will use to understand how the various local actors involved and organized to promote resilience building, particularly how they communicated and dealt with resilience at the local level (National Research Council 2011; Mayer, Kenter 2015). Consequently, these approaches are applied to anticipate the empirical findings in this dissertation. Theoretical and empirical works on collaboration may explain collaborative advantage in building resilience, particularly how to advance collaborative approach in sustaining disaster resilience building. Collaboration between non-governmental and governmental institutions might be key to ensure a high level of disaster resilience in communities and at the local level – here perhaps collaboration theory provides an interesting perspective.

In practice, the combination of these theoretical concepts and approaches can provide new insights for the conceptualization and translation of disaster resilience, as an overarching approach to analyses the local disaster governance. These key theoretical principals will help to understand the interactions and cooperation of the actors at the local level. For example, to understand the existing mismatches that hampered the cooperation and hindered the development and implementation of a comprehensive strategy to build disaster resilience. In addition, this discussion of different concepts and their linkages is an important foundation for the development of the “resilience focused collaboration” framework that will develop in this reseach.

This chapter is divided into four sections. The first section elaborates on the concept and definition of disaster resilience from different perspectives, particularly the key characteristics of disaster resilience that needed to maintain medium and long-term disaster resilience at the local level. The second section facilitate the discussion about the key characteristics of governance in managing disaster resilience at the local level. Specifically, governance theory can inform on what the local stakeholder’s roles and function in maintaining resilience after disaster. In addition, concepts of good governance also provide important normative information and concepts that are prerequisite for sustaining high levels of disaster resilience.

The third section provides foundation for the analysis on how the engagement and the cooperation between different local actors evolved to build resilience, by identifying the key characteristics of collaboration. The fourth section deals with the development the analytical

framework of resilience focused collaboration. This final section will synthesis the discussion of the resilience, governance, and collaboration theories to develop an evaluation framework for the process of building disaster resilience.

2.1 Key characteristics of disaster resilience

The following section underlines the key characteristics and applications of resilience approach in post-disaster resilience building at the local level. Despite the discourse surrounding the resilience concept at the theoretical level, in practice, the recent policy trend has incorporated the resilience concept to manage environment and enhance human security, particularly in terms of building disaster resilience (Bara, Broennimann 2011; UN/ISDR 2005; DFID 2011). This resilience concept has been developed and integrated in risk management and development policy from the global community to the local level government. For example, the current development of the resilience concept has revolved through disaster risk reduction frameworks and strategies to reduce disaster risk from natural hazards at the global and local levels. However, in practice, the efforts to operationalize this concept into policies and institutions of disaster reduction are remained problematic because of the vague meanings of disaster resilience (Klein et al. 2003).

The literature of resilience has progressed significantly and has brought a strong interest to climate change to enrich resilience theory. The IPCC (2012) defined resilience as “the ability of a system and its component parts to anticipate, absorb, accommodate, or recover from the effects of a hazardous event in a timely and efficient manner, including through ensuring the preservation, restoration, or improvement of its essential basic structures and functions”. This definition places resilience in the context of extreme events and climate change and therewith underscores that the concept of resilience is used today not only in the social-ecological resilience research community, but also in various discussion and science-policy documents, particularly in natural hazards and climate change.

Resilience concept is used in many areas of disaster studies, particularly in disaster management and disaster risk reduction. The concept of resilience helps to understand that crises can provide an important stimulus for changing behavior and conducting risk reduction and preparedness measures (Ejeta et al. 2015). Disaster resilience is defined as “the capacity of system, community or society potentially exposed to hazards to adapt by resisting or changing in order to reach and maintain an acceptable level of functioning and structure. This is determined by the degree to which the social system is capable of organizing itself to increase

its capacity for learning from the past disasters for better future protection and to improve risk reduction measures” (UN/ISDR 2004). Resilience approach is used as a much more specific term for the capability to prepare, response and recover from disaster hazards (Bhamra et al. 2011).

According to Folke (2016), “resilience thinking is about how periods of gradual communities, societies, cultures to adapt or even transforms into new development pathways in the face of dynamic changes”. In the context of building resilience after disaster, this definition is conceptualized as a process to embrace changes and improve after disaster, particularly with a more sustainable development agenda. It means to get better future protection and to improve risk reduction measures in development, there is a need for efforts to promote resilience in a system, community, or society. In addition, the two fundamental questions tackled in building disaster resilience are concerned either with resilience as a process or an outcome of the recovery and learning process after disaster (Manyena 2014). This dualism may be hard to distinct in practice, but it depends on how disaster resilience conceptualized and defined.

From the discussion of resilience definitions and concepts above, it is evident that resilience today has emerged into different concepts. However, a common basis is that resilience deals with capacities and processes on how a system – e.g. a society or social-ecological system – can deal with and sustain its basic functions even in situations where it is exposed to major shocks and perturbations or disruptions (Gall 2013). Even though the resilience concept and various theoretical approaches remain often abstract, the concept has provided important new insights into disaster risk thinking. It underscored that crises and shocks might be a part of the “normal development” and therefore building resilience to these shocks and stressors is a key.

Maintaining resilience requires certain key factors to achieve the disaster resilience. In this research, it will be argued that the explicit capacities and attributes must be developed and nurtured after a disaster to build disaster resilience. In a broad sense, disaster resilience concept is concerned with (1) capacity to learn and improve after crises, (2) capacity to self-organize, (3) capacity to recover, (4) ability to bounce back, (5) ability to absorbs shocks, (6) ability to maintain major functions and its structures in crises and, (7) ability to adapt. The key components and characteristics of resilience in the broader sense of disaster studies is presented in table 1.

Table 1 Key components and characteristics of disaster resilience

Disaster resilience concepts	Key components	Characteristics
Capacity to learn and improve after crises	<ul style="list-style-type: none"> • Be aware of a problem • Build knowledge • Diversify their ideas • Reflect • Communicate • Develop a shared vision • Act (Tschakert, Dietrich 2010)	<ul style="list-style-type: none"> • Building memory of past disaster events • Abandoning the notion of stability • Expected the unexpected • Bringing different kinds of knowledge (Berkes 2007)
Capacity to self-organize after crises	<ul style="list-style-type: none"> • Number of actors that involve • Frequency of interactions among the actors • Goal of the action • Communication • Choice • Mutual adjustment (Comfort 1994; Berkes 2007)	<ul style="list-style-type: none"> • Maintaining the local capacity for social and political organization in the face of disasters. • Cross-scale thinking and partnerships • Strengthening institutional memory learning-by-doing (Berkes 2007)
Capacity to recover from crises	<ul style="list-style-type: none"> • Trust • Social norms • Participation • Networks • Multidisciplinary • Formal collaboration (Aldrich 2015; Nakagawa, Shaw 2004)	<ul style="list-style-type: none"> • More ties to their old communities • The overcoming of barriers to collective action • The provision of mutual aid and informal insurance • Strong networks and communities (Aldrich 2015)
Ability to bounce back	<ul style="list-style-type: none"> • Having a preparedness plan for disaster • Having a quick recovery after disaster • Build back better after disaster (Aldunce et al. 2014)	<ul style="list-style-type: none"> • Discontinuous change • Proactive • Open the opportunity to do better and differently • Radically innovate (Aldunce et al. 2014)
Ability to absorb shocks	<ul style="list-style-type: none"> • Self-organizations after disaster • Learning from disaster 	<ul style="list-style-type: none"> • Absorbs disturbance and change • Re-organize

	<ul style="list-style-type: none"> • Adaptation from future disaster risks • Renewal and continuous development after disaster (Aldunce et al. 2014) 	<ul style="list-style-type: none"> • Retain essentially the same function, structure, identity, and feedbacks (Walker et al. 2004)
Ability to maintain major functions and its structures in crises	<ul style="list-style-type: none"> • Disaster response • Disaster preparedness • Disaster mitigation • Recovery (Birkmann, Teichman 2010; Chang, Shinozuka 2004) 	<ul style="list-style-type: none"> • Strongly connected • Behave in nonlinear way • Unpredictable (Walker, Salt 2012)
Ability to adapt after crises	<ul style="list-style-type: none"> • Evaluating and negotiating tradeoffs • Communication among diverse groups • Social learning (Armitage et al. 2011) 	<ul style="list-style-type: none"> • Open and adaptable system • Flexibility • Readiness to adapt • Major change (Handmer, Dovers 1996)

Source: own

According to Folke et al. (2002) the capacity to learn and improve after crises, capacity to self-organize, and capacity to recover are the critical factors to build resilience after disaster. The following sections will discuss further these three critical capacities that require to deal with the process of maintaining medium and long-term resilience.

2.1.1 Capacity to learn and improve after crises

The resilience approach in this dissertation emphasizes changes and particularly the process of learning and improving after a disaster event (Folke 2016). In disaster research, learning is defined as “a key component for living with uncertainty and extreme events, and is nurtured by building the right kind of social/institutional space for learning and experimentation that allows for competing worldviews, knowledge systems and values, and facilitates innovative and creative adaptation.” (IPCC 2012). The concern about learning from past disasters is related to the ability to identify the lessons from the disaster experience. These identified lessons are critical for the formulation of recommendations and strategies to deal with future disaster risk. Based on these lessons, disaster resilience can be maintained better (Cutter et al. 2008). Overall, these studies outline that learning is part of the knowledge management that should enhance after disaster (Koslowski, Longstaff 2015).

Ideally, learning should begin immediately after disaster and involve not only the authorities but also the communities themselves. Due to other urgent agendas such as recovery activities,

learning mostly begins after the situation has returned to a normal condition. It means that learning rarely appear immediately after disaster. Toft, Reynolds (2005) argue that post-disaster learning is more than having good recovery process, but it is a process to take proper actions to improve the condition. This type of learning is known as active learning that needed to practice by the authorities to improve the recovery process.

Learning after disaster can be classified by their specific aims. For example, Gunderson (2010) introduces “episodic learning” and “transformational learning”. Episodic learning can be done by renewing the existing policies, plans, and strategies. Transformational learning offers innovation to solve problems that affect cross-scale systems with detailed variables. However, both types of learning may occur after disaster, which makes it difficult to distinguish and differentiate among these learning activities.

In the context of building resilience, learning is one of the key characteristics that aim to shape capacities and outcomes from the process of building disaster resilience (Bahadur et al. 2010; Matyas, Pelling 2015). It means that learning is needed to develop the local actor’s capacities to build resilience, particularly for policy implementation (Miller 2010). At the same time, it is important to combine various local actor’s knowledge and experiences in learning to build resilience (Folke et al. 2002). The evidence suggests that there are various types of learning capacities that can take place to build disaster resilience. For example, the capacity to collect knowledge and share information from scientific and indigenous sources, research and review, and social learning are important to develop in building resilience (Oxley 2013).

As shown in table 1, the capacity to learn and improve after disaster comprise (1) capacity to be aware of a problem, (2) capacity to build knowledge, (3) capacity to diversify their ideas, (4) capacity to reflect, (5) capacity to communicate, (6) capacity to develop a shared vision and (7) capacity to act (Tschakert, Dietrich 2010). These capacities can be achieved by (1) building memory of past disaster events, (2) abandoning the nation of stability, (3) expected the unexpected, and (4) bringing different kinds of knowledge (Berkes 2007). To develop these capacities, it needs a continuous learning process. It is almost certain that the willingness and commitment to continue to learn is needed to promote resilience after the disaster.

2.1.2 Capacity to self-organize after crises

Capability to self-organize is one of the core characteristics of resilience that give a system capacity to recover after crises (Berkes et al. 2002; Heylighen 2001). Most understandings of self-organization share a common interest in the capacity of an open system to reorganize at

critical points of instability, crises, or perturbations to achieve a larger goal and new order (Berkes et al. 2002; Comfort 1994; Fuchs 2003). As shown in table 1, the key characteristics of self-organization are including (1) maintaining the local capacity for social and political organization in the face of disasters (2) cross-scale thinking and partnerships, and (3) strengthening institutional memory learning-by-doing (Berkes 2007). As such, these characteristics will determine the capacity of local actors to self-organize in building disaster resilience after disaster.

In the context of maintaining resilience after disaster, Lebel et al. (2006) emphasize that resilience can be achieved by increasing the capacities to self-organize, learn, and adapt after a crises. These components are needed for a system to be able to recover and improve after disaster (Koslowski, Longstaff 2015). Birkmann et al. (2013) argue that the ability to learn and self-organize after disaster is part of the adaptation process when the resilience is lacking or missing in a system. It means that self-organization allows the system to adapt after disaster. Self-organization refers to a natural tendency to organize formally or informally without command from the government or other important stakeholders to deal with change after disaster (Pelling 2011).

In practice, the capacity to self-organize is one of the important components to build back better, particularly through community involvement in development plans (Kennedy et al. 2008). This ability is often seen as important factor in coping with community participation problems. The activation of community capacity to manage resilience may be triggered by the improvement of self-organization of the community (Berkes, Ross 2013). Self-organization is a long-term activity that depends on the community's capacities to participate in various activities related to building disaster resilience. This seems to imply that it is challenging to prove the existence of resilience without understanding the community self-organization mechanisms.

According to Folke et al. (2002), it is important to create opportunities to self-organize by focus on governance, scale, and external drivers that can enhance self-organization. As shown in table 1, the self-organization to build resilience after disaster are determined by (1) number of actors that involve, (2) frequency of interactions among the actors, (3) goal of the action, (3) communication, (4) choice, and (5) mutual adjustment (Comfort 1994; Berkes 2007). In addition, Ostrom (2009) argues that self-organization may take place, when the leadership, trust, and respects occurs in the interactions among the local actors. These components can stimulate self-organization, particularly to resolve the challenges in maintaining long-term

disaster resilience (Carpenter et al. 2001). Together these studies provide insights into the importance of self-organization after disaster.

2.1.3 Capacity to recover after crises

Actions toward building resilience will require understanding of the capacity to recover after crises. In building disaster resilience context, recovery is defined as “the differential process of restoring, rebuilding, and reshaping the physical, social, economic, and natural environment through pre-event planning and post-event actions” (Smith, Wenger D 2009). The recovery process includes not only the rehabilitation of the infrastructure, livelihoods, and environment, but also the implementation of disaster risk reduction measures during the reconstruction process (UN/ISDR 2009).

Capacity to recover after disaster is seen as the local actor’s ability to capitalized the “windows of opportunities” to promote change in society and effective disaster management after disaster (Birkmann et al. 2010). Table 1 provides the components of disaster resilience that will enhance the capacity to recover after crises, include trust, social norms, participation, networks, multidisciplinary, formal collaboration (Aldrich 2015; Nakagawa, Shaw 2004). Most of these components related to the governance of building disaster resilience that consider the engagement and contribution of local actors and community in the recovery process.

The long-term recovery plans and tools are the main components to manage infrastructures and resolve the wicked problems (Brandon 2011). The long-term recovery requires community involvement in the decision making process (Mileti 1999). In the recovery process, another option and opportunity to build disaster resilience is to incorporate social capital with the long-term development plan (Fukuyama 2001). It is almost certain that community recovery requires (1) more ties to their old communities, (2) the overcoming of barriers to collective action, (3) the provision of mutual aid and informal insurance, and (4) strong networks and communities (see table 1) (Aldrich 2015). These characteristics are part of strong social capital as key components of community to recover and build disaster resilience (Dynes 2005).

Masterson et al. (2014) underscore that social capital provides resources for victim that needs to recover after disaster. By drawing on this concept of social capital, it appears that participation in the emergency response can provide significant benefits for the disaster victims through strengthening/establishing their social relationships. In addition, Norris et al. (2008) indicate that social support, networks, and bounding will improve the capacity to recover after a disaster. On the other hand, Aldrich (2008) draws our attention to the disruption of social

capital because of the disaster victims relocated and often lost contact with each other after the disaster. This can have significant impacts on community relations after disaster. Aldrich (2008) suggests that recovery efforts should, therefore, include the reconstruction of social networks for the community that experiences a disaster. This can be achieved through disaster commemoration, traditional ceremonies, and anniversaries (Dynes 2005).

Aldrich, Meyer (2014) argue that social capital positively affects and contributes to building resilience after a disaster. The communities that has strong social capital tend to be “efficient” in emergency response and post disaster recovery (Shaw et al. 2004). According to Dynes (2005) some communities had greater confidence and trust in their own capacities and resources after recovering from disaster. Cutter (2016) points out that social capital relates to the participation and engagement of community members in civic society and religious organizations. It means that the capacity to recover depend on the contribution of the community to take part in the recovery process

2.2 Key characteristics of governance

The following section underlines the application of governance theory related to building disaster resilience at the local level. In the context of building resilience, most of governance studies have focused on governance as a useful tool to analyze the institutions and increase the effectiveness of various strategies in building resilience (Schuppert 2015; Mehta 2006). Governance refers to “theories and issues of social coordination and the nature of all patterns of rule” (Bevir 2011). This definition focuses not only on theories and practices of governance but also on the dilemmas that encourage further theoretical reflection and practical activity. This means that governance allow the actors to extend access to resources and make collective decisions.

Resilience is an approach that used widely in the governance of disaster, particularly in laws, regulations, and frameworks related disaster risk management. Disaster governance defines as “the interrelated sets of norms, organizational and institutional actors, and practices (spanning pre-disaster, trans-disaster, and post-disaster periods) that are designed to reduce the impacts and losses associated with disasters arising from natural and technological agents and from intentional acts of terrorism“ (Tierney 2012). With the focus on governing disaster, the major role of disaster governance is to “identify the mode operandi (strategies and mechanism used) that are more likely to allow a system (such as a community or a technical system) to achieve

resilience” (Koslowski, Longstaff 2015). This definition is consistent with the definition and function of governance that is widely accepted in different practices.

There has been discussion around contribution of the application of resilience concept in governance. Duit et al. (2010) question whether resilience is a useful concept for governance when the contribution of this concept in governance is not clear. Previously, a number of studies have attempted to explain the relationship between governance and resilience in the context of the social ecological system (Larsen et al. 2011; Lebel et al. 2006; Garmestani, Benson 2013). This attempt is important to gain more understanding about building disaster resilience from both theories. As Tierney (2012) claims, governance is a relatively new concept in disaster research. For this reason, the interpretation and development of the combination from resilience and governance studies are encouraged.

In the context of building disaster resilience, most strategies and approaches focus on the implementation of good governance. It argued that good governance improves the effectiveness of disaster governance, particularly in the implementation of disaster risk reduction measures (Tierney 2012). To ascertain whether governance is ‘good’, actors look at the *mechanisms* to promote it, the *processes* used, and the *outcomes* achieved (UNDP 2014). Good governance highlights the need to build the trust and accountability of decision makers, including the government as well as other stakeholders (Mehta 2006). In support, Aven, Renn (2010) lists six principles of good governance of actor engagement in governing disaster resilience, include (1) openness of the institutions to the general public, (2) participation of stakeholders, (3) accountability of actors, (4) effectiveness of policies, (5) coherent and understandable policies, and (6) proportionality and subsidiarity of the governance process. The implementation of good governance in building disaster resilience aims to achieve management effectiveness, particularly in planning, outputs, and outcomes (Lockwood 2010).

The link between governance and disaster resilience is focused on defining the functions, roles, and responsibilities of the actors and understanding the changes and impacts that these actors contribute in the process (Lal et al. 2012). The central idea of governing disaster resilience is to identify the changes and shifts from the role of government to governance in maintaining disaster resilience. To achieve this target, there needs to be successful of implementation of various approaches and strategies in resilience process (Poterie, Baudoin 2015).

It will be argued that it is important to recognize the components of resilience in governance. These components are useful to evaluate and improve the performance of the authorities and

stakeholders who are involved in the governance process for the long term. According to Twigg (2007), the concrete features of resilience in governance consist of (1) policy, planning, priorities and political commitment, (2) legal and regulatory systems, (3) integration with development policies and planning, (4) integration with emergency response and recovery, (5) institutional mechanisms, capacities and structures; allocation of responsibilities, (6) partnerships, and (7) accountability and community participation. Perhaps, the most serious challenge is to find all these components in practice because they do not appear naturally but must be developed by the authorities.

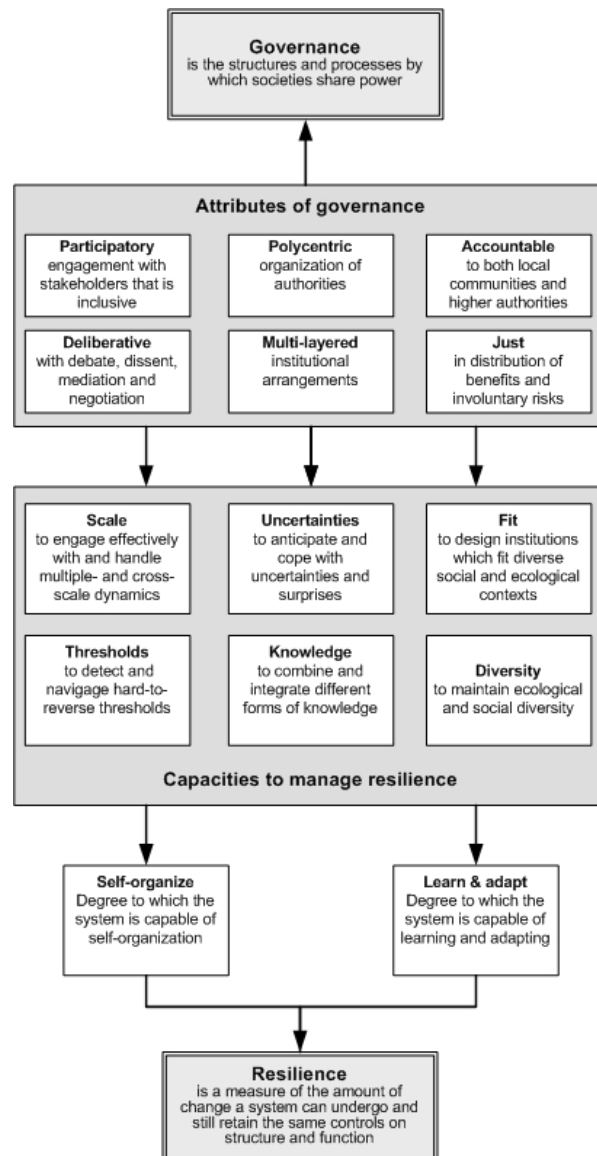


Figure 3 Capacity to manage resilience framework (Lebel et al. 2006)

Lebel et al. (2006) were among the first to propose a framework that brings the idea of linking governance and resilience theories related to managing resilience in the social ecological systems (Figure 2). Lebel’s framework is useful for assessing the relationship between

governance and the capacities of actors, institutions and their relationships by linking good governance as a foundation to build resilience. In this context, managing resilience means the promotion of good governance as a key component in developing capacities of actors and agencies (Lebel et al. 2006). However, in the context of maintaining disaster resilience, this framework would have been more useful if explicit resilience factors were recognized and used as the attributes of governance.

The relevant strategies and mechanisms are beneficial for maintaining disaster resilience. Several attempts have been made to link disaster resilience with comprehensive disaster management strategies and activities before and after the disaster events. This can be achieved through the development of strong disaster prevention, preparedness, and mitigation measures as the main strategies to reduce and prepare future disaster risk. In general, these strategies comprise of a political and legal commitment, long term planning and infrastructure enhancement. (Kohler et al. 2004). These strategies rely upon social, political, economic, cultural, and environmental factors of the country (Lal et al. 2012). The programs and activities include development of organizational structures, warning and communication systems, evacuation of residents, promotion of public awareness, safety drills, and emergency response system (UNESCO 2008).

After the emergency response and recovery phase has ended, sustainable funding is one of the main challenges for maintaining medium and long-term disaster resilience. In fact, the sources of funding support are multifarious, including from individuals, businesses, foundations, governments, religious organizations, community organizations, fee generation and partnerships (Coppola, Maloney 2009). However, it may be that the mechanisms to apply for funding from donor organizations are complex and difficult to negotiate. Building disaster resilience requires improvements to the networking and collaboration between governmental and non-governmental organizations in order to provide sufficient funding, political support and other disaster resilience resources (Berke, Campanella 2006).

As highlighted above, institutional capacity is a critical component in maintaining disaster resilience. In this research, it is argued that institutional capacity is linked to disaster management structures and infrastructure. Disaster management structures include emergency response, preparation, mitigation, recovery measures, plannings, tools and strategies to reduce future disaster risk (Cutter 2016; Coppola, Maloney 2009; Rubinoff, Courtney 2007). At the same time, institutions such as the laws, attitudes, cultures, actors and human environment are

also important as they provide opportunities to enhance the capacity of a society to deal with the complexity and uncertainty associated with natural hazards (Manyena 2006).

On the other hand, the quality of disaster management institutions in maintaining resilience relies in the capacity of institutions to convert disruption and crisis into resilience (Masys 2015). However, Christoplos (2003) finds that it is difficult to maintain the quality of disaster management institutions when the situation has returned to a normal state after disaster. Strong political commitment is needed to maintain their capacity and quality over a long period of time (Lucini 2014). One reason for that is because the effectiveness of disaster management policies and strategies may depreciate over time (Birkmann 2007).

2.2.1 Participation and capacity of local actors

Research on participation in disaster resilience governance focuses on how stakeholders and community are involved in building disaster resilience (UNISDR 2015; IPCC 2012). It has often been assumed that the participation of stakeholders and community is crucial in disaster resilience governance at the local level. Recent evidence suggests that stakeholders are the main factor in determining the success of resilience building (Larsen et al. 2012). The contribution of stakeholders can improve the quality and effectiveness of decision-making processes. Later, decisions are more likely to be accepted by the stakeholders (IRGC 2005).

Stakeholders refer to “any individual, social group, or actor who possesses a stake (e.g., interest, legal obligation, moral right) in the decisions or outcomes of an organization (typically firms, corporations, or governments) and affected or being affecting the achievement of an organization’s objectives.” (Manuel-Navarrete, Modvar 2006). This includes people and groups who are typically disadvantaged and unsatisfied with the programs or decisions (Weiss 1998).

The literature on stakeholder participation explores the process of inviting relevant actors and community to participate in disaster governance. Recent evidences show that stakeholders have different roles and responsibilities in governing disaster resilience (Lal et al. 2012). Several attempts have been made to identify the stakeholders before accommodating them into the appropriate functions. The attempt begins with defining stakeholders in the governance arrangements by conducting a reliable stakeholdres analysis. Stakeholders analysis refers to “an approach, a tool or set of tools for generating knowledge about actors – individuals and organizations – so as to understand their behaviour, intentions, interrelations and interests; and for assessing the influence and resources they bring to bear on decision-making or

implementation processes is used to identify and reveal the interest, roles, responsibilities, and relationships of the local actors” (Varvasovszky, Brugha 2000).

In this analysis, the stakeholders are categorized based on their power and interests, including players, subjects, context setters, and crowds ((Bryson 2004; Bryson et al. 2011). This exercise is helpful to increase the effectiveness of governance because in some cases stakeholders tend to be unconscious and not clear about their status and roles in governance (Jentoft 2007). Based on this analysis, stakeholder participation can be enhanced by empowering and increasing stakeholder interests with various methods. One of the methods that can be used to increase the interest in participating is by offering transformation in policies, reallocation budget, and redefining the responsibilities of the stakeholders (Kahan et al. 2009).

At the same time, stakeholders engagement are needed to develop. According to Burnside-Lawry et al. (2013), stakeholder engagement is „the overall practice of involving publics in policy-setting decisions of organizations or institutions”. These practices aim to improve the effectiveness of policy formulation and implementation (Helbig et al. 2015). In the context of governing disaster resilience, the stakeholder engagement can benefit in the improvement and evaluation of policy making, specifically when the government is able to convene the stakeholders in these practices. The other method to empower this engagement is by involving more local actors in order to produce “locally appropriate policies” (Duxbury, Dickinson 2007).

It has been argued that governance arrangements and participation mostly depend on government initiatives at the local level. The local level refers to “a range of places, social groupings, experience, management, institutions, conditions, and sets of knowledge that exist at a sub-national scale” (Cutter, S. et al. 2012). The concept of governance at the local level refers to “how policies and decisions are being made at the local level” and the network between the governmental and non-governmental actors (Schaap 2006). In his paper (Kauzya 2002) identifies local governance as governmental and non-governmental actors that have power and roles at the local level. In this sense, local governance serves as a decision making and implementing agency on behalf of the local population to fulfill their needs and aspirations (Kauzya 2002).

Together, these studies outline that the state and non-state actors, including government agencies, NGOs, and civil society organizations (CSO) have significant contribution to maintain medium and long-term disaster resilience at the local level. These local actors contributions depend on their interests, expertises, and experiences (Thornburn 2008; Kahan

et al. 2009). Table 2 shows the common roles and responsibilities of different stakeholders in maintaining disaster resilience.

Table 2 Stakeholders contribution in maintaining disaster resilience at the local level

Stakeholders	Contribution in maintaining disaster resilience
Local Government	to take the lead, convince other actors, regulate, monitor and evaluate
Sectors (education, health, transport, environment, etc.)	to integrate risk reduction as part of plans and responsibilities
Academia, research center, scholar	to provide research and data analysis, support the government with scientific-based policy making
Citizens, community groups (indigenous communities, women, children, person with disabilities, older persons, migrants)	to participate, be actively informed, and take individual responsibility
Private sectors/business community	to share resources, disseminate knowledge, practices and non- sensitive data
Professional groups	to provide technical expertise, raise awareness, collect data and inform the media
Civil society (NGOs, CSO, CBO, Voluntary)	to participate, organize communities, coordinate, help oversee, monitor, and evaluate
National government and Parliamentary	to guide, build, and develop policy, allocate financial and administrative resources, and provide political authority to guide and support the stakeholders
International Organizations (Bilateral and Multilateral Agencies)	to provide cooperation and consultation
Media	to raise public awareness and disseminate accurate disaster information

Source : (UNISDR 2015; UN/ISDR 2005)

In the case of actor’s participation, inclusiveness is an important strategy to promote good governance principles. Inclusiveness defines as the competency to involve actors and bring their perspective into consideration (Jentoft 2007). In practice, inclusiveness is more than direct participation of the stakeholders, but acknowledgement of their diverse “interests and viewpoints” that exist in the sphere of disaster resilience governance (Head 2007). However, the effectiveness of governing the stakeholders is not merely dependent on the principles of

inclusiveness but also rely on the process to achieve common goals (Manuel-Navarrete, Modvar 2006).

Preliminary work on the evaluation of tsunami preparedness after the Indian Ocean tsunami 2004 was undertaken by Said et al. (2011) and reveal that community involvement and participation of stakeholders are critical factors for developing good strategies, specifically in preparedness and response activities. In the context of early warning systems, Thomalla, Larsen (2010) argue that the engagement of governmental and non-governmental actors is crucial in implementing warning and evacuation policies. As indicated, the affected community need to be inform and effectively communicate about the strategies (Collins, Kapucu 2008).

On the other hand, the community perceives participation as one of the empowerment forms that aim to increase their capacity to decide and show their interests and expectation in development agenda (White 1996). As Hattie, Timperley (2007) address, feedback provided by the community is an important information for the local government to improve their performance in building disaster resilience.

2.2.2 Local government

The local government has significant roles in maintaining medium and long-term disaster resilience. Most of the local government roles are mandated in various global disaster risk reduction frameworks, for example, UN/ISDR (2012) highlights that the local government's roles are to develop and manage local collaboration in building disaster resilience. Specifically, the main tasks of local government are to provide reliable emergency response systems and to design effective disaster mitigation and preparedness measures. In addition, the local government should implement the preparedness and mitigation measures and seek support from the higher levels of government (Col 2007). At the same time, the synchronization of these local programs with the national government's policy will attain strong political commitment (Kahan et al. 2009; Christoplos 2003).

The reasons to improve the capacity of local government in building resilience because (1) disasters are experienced at the local level, (2) directly affect the community and individual quality of life, (3) local policy issues must be urgently solved, (4) the community relies upon the local authority, and (5) local policy is more effective than the higher level government policy (Cutter, S. et al. 2012; Nabatchi, Amsler 2014; Heitz et al. 2009). On the other hand, the challenges that local governments face in this process are (1) lack of interest and capacities, (2) to understand local risks and vulnerabilities, (3) to maintain and upgrade critical

infrastructure, (4) to manage long-term processes, and (5) to learn from disasters (UN/ISDR 2010). In general, the local government tends to be inconsistent and poor in disaster management planning and implementation (Wolensky, Wolensky 1990).

As such, there is an urgent need to improve the performance of the local government in building disaster resilience. The improvement can be done by (1) acknowledgment of roles, responsibilities, and tasks, (2) sufficient budget, (3) coordination and collaboration with stakeholders, (4) integration with development plans and, (5) building local capacity (FAO 2004). The local government needs to invite the non-state actors, particularly the NGOs and community-based organizations (CBO) to participate in building disaster resilience. However, in practice, local government has a low interest to collaborate due to their insufficient experience and lack of capacity to engage (Gazley 2010).

One of the attempts to answer this problem is by providing the regulatory affairs and appropriate funding to encourage local government to develop a collaboration arrangement with civil society and the relevant stakeholders at the local level (UNISDR 2015). Governing disaster resilience at the local level means to collaborate with the local actors and agencies and to incorporate their indigenous knowledge and abilities to adapt, as well as building their capacity to manage disaster risks (Olwig 2012). This local engagement may generate innovation and enhance good governance in managing disaster resilience (Werg et al. 2013).

2.2.3 NGOs

NGOs play an important role in the maintenance of resilience after a disaster event. In the context of this research, NGOs not only provide significant assistance and reliefs in the emergency response, but they also changed and shaped the social structure during and following the recovery phase of the Indian Ocean Tsunami 2004 (Thorburn 2007). Disasters open the opportunity for NGOs to coordinate not only with the local government but also with the military and civil protection (Giovanna 2005). NGO participation continues after their humanitarian mission has ended and involve in disaster resilience governance. However, most studies in disaster management focus on the involvement of NGOs in governing disaster resilience as they support the limited capacity of government that struggles to act on its own and resolve problems (Brinkerhoff, Brinkerhoff 2002).

It is argued that there is no ideal type of formal relationship between NGOs and government, it depends on the compromise between both parties (Tvedt 2002). The development of collaboration follows the needs and natures of the NGOs and their respected partners (Coston

1998). However, most of the relationship between the government and NGOs can be difficult to define and maintain (Owen 2000). In practice, NGO contributions are varied, including the support NGOs provide the government in disaster resilience governance at the local level after disaster (UNDP Indonesia 2012). For instance, the NGOs often provide additional support, creating partnerships, and consulting in policy making process (Young 2010). However, Christoplos (2003) has also questioned how often the NGO actions are in line with their campaign to promote disaster resilience, due to their tendency to follow the agendas of the donors.

2.2.4 Community-based organizations

The participation of civil society in disaster resilience governance is encouraged through collaboration with community based-organizations. Community-based organizations can make significant contributions that are relevant to the community needs and characteristics, particularly relating to local grass-root community that directly affected by disaster. These organizations have a great ability and opportunity to respond, channel the network, and utilize their knowledge of the local cultures and customs in disaster events (ASEAN 2016). Moreover, the contribution of community is beneficial to evaluate specific programs and policies where they are engaged and involved as participants, volunteers, or advisors (Weiss 1998). Admittedly, the engagement of community is a foundation of participatory governance that needs time, resources, and commitment (Reddel, Woolcock 2004).

As indicated, it needs to promote the community engagement in disaster management through sustainable financial funding, organizational, personal and behavioral support by connecting community organizations and other actors (Shaw, Goda 2004). These community-based organizations are sometimes not recognized at the local level. On the other hand, it is clear that the interests of community members to engage also depends on public policy support to improve the capacity of stakeholders to organize themselves and collaborate (Head 2007). For example, there is a need to invite community members to engage in public awareness, preparedness and prevention activities, and promoting inclusiveness (UNISDR 2015).

2.2.5 Vulnerable groups

Building disaster resilience requires the participation of the vulnerable population (Sullivan, Häkkinen 2006). The acknowledgment of the vulnerable with their specific needs and conditions are critical to open their access to the decision making process in emergency

response and preparedness (National Research Council 2011). Sullivan, Häkkinen (2006) identify several vulnerable groups who require significant attention and support in disaster planning and preparedness, including (1) persons with physical and mental disabilities, (2) elderly persons, (3) people with language barriers, (4) children and youth, (5) pregnant women, (6) the poor, (7) ethnic minorities, (8) undocumented persons, and (9) prisoners. The low income populations are vulnerable because their limited access to disaster services (Zakour, Harrell 2004). It is also important to identify the people who live in vulnerable areas and disseminate emergency response information and warning before the disaster (Birkmann 2007).

The government of Indonesia has identified two main vulnerable groups after the Indian Ocean Tsunami, they are (1) widows that need to single-handedly take care of children with no prior experience in the labor force and in an environment where communal networks have been lost, and (2) children who are orphaned and in need of care by other adults (Multi Donor Fund for Aceh and Nias et al. 2012). Youths have already demonstrated their interest in participating in the social reconstruction after the tsunami in Aceh, therefore stakeholders should open access to the youth organizations to participate in disaster prevention (UNESCAP 2008).

On the other hand, these vulnerable groups have significant roles to play in promoting disaster resilience to support the local government. The Sendai Framework for Disaster Risk Reduction (2015-2030) acknowledge these vulnerable groups as important stakeholders in collaboration to manage disaster resilience for their specific contribution, commitment, knowledge, and experience (UNISDR 2015). It is important to involve the grassroots women's groups (NGOs or faith-based organizations) to reach the vulnerable women in disaster preparedness programs and activities, particularly women with children, women living with HIV/AIDS, migrant women, homeless, and displaced women (Enarson et al. 2009).

A preliminary study on the participation of women in the post tsunami reconstruction in Aceh at the village level was undertaken by Thorburn (2007). This work took place in a specific village which had been applying gender-mainstreaming. The study showed a notable increase in the participation of women in governance and decision making was supported by the men and community members. Other activities in the tsunami recovery project for housing reconstruction, gender mainstreaming activities and sufficient investment in the resources such as gender training for facilitators is recommended to improve the progress of female participation (Multi Donor Fund for Aceh and Nias et al. 2012). These specific solutions have encouraged women to give their opinions and input in other aspects of project implementation.

As Birkmann (2006) points out that involving these vulnerable groups is a prerequisite to promote resilience at the community level, since building resilience has also to focus first and foremost on the most vulnerable.

2.3 Key characteristics of collaboration

As highlighted in the sections above, governing disaster resilience requires good strategies and approaches that integrate actor participation and promote inclusiveness. Although many efforts are undertaken by the local government to build disaster resilience, collaboration is one of the key strategies to encourage participation of local stakeholders. According to Tierney (2012), collaboration is an increasingly important strategy in governing disaster resilience. Collaboration is defined as “the cooperative way that two or more entities work together toward a shared goal” (Frey et al. 2006). According to Gajda (2004) collaboration is a journey and not a destination, so a collaboration develops in stages and grows over time.

The development of collaboration theory has helped to identify problems related collaboration in building resilience after disaster. Imperial (2005) argues that although collaboration is a useful approach to improve decision making and governance processes, collaboration cannot resolve all the disaster governance issues. On the other hand, the local government might lack the administrative ability due to an insufficient policy framework for collaboration and thus collaboration may simply be a formality without real outcomes (Kozuch 2009). In this regard, the government has the responsibility to maintain a continuous collaborative process in order to achieve effective engagement mechanism among the local actors (Brown, Keast 2003). At the same time, these collaborative efforts seek to develop networks, partnerships, and the inclusion of different organizations to deal with different problems and issues in the system (Bevir 2006; Rhodes, R. A. W. 1996).

There is a growing need to promote collaboration as an effective approach for the governmental and non-governmental organizations to cope with and prepare for disaster events (Kapucu, van Wart 2006), specifically the need to involve non-governmental sectors and actors that have previously had limited opportunities to contribute in disaster management programs and activities to achieve the effective disaster resilience governance (Simo, Bies 2007; O'Sullivan et al. 2012; Agranoff, McGuire 2004).

It is important to understand the local context in order to develop effective strategies for collaboration (Lasker, Weiss 2003). It is because collaboration among the local actors may take a long time and function appropriately (Peterson 1991). Community characteristics and social

vulnerability should be considered as critical factors to maintain disaster resilience (Jung, Song 2014). Effective collaboration to maintain disaster resilience is best developed by inviting various local actors and community members, with their diverse knowledge, capacities, and experiences (National Research Council 2011; Lasker, Weiss 2003; Champagne et al. 2014). Collaboration enables indigenous knowledge from local actors to be integrated with science leading to new strategies in managing disaster resilience (Mercer et al. 2010; Davies 2015).

Management of collaboration is the practical component to develop effective collaboration (Lasker, Weiss 2003). Managing collaboration refers to the process to overcome challenges presented during the collaborative process (Bryson et al. 2015). In this regard, it is important to develop criteria to determine the range of actors who should collaborate (Huxham, Macdonald 1992). These criteria include targeting of stakeholders, endorsement of collaboration, and the power to bring people together are crucial elements in collaboration (Lasker et al. 2001). In support, the literature acknowledges important criteria in a collaboration, including (1) clear purpose and mission of collaboration, (2) recruitment of committed key actors, (3) clear stage and structure of collaboration, (4) spatial dimension, and (5) detailed mechanism implementation, and (6) leadership (McQuaid 2002; Corwin et al. 2012).

National Research Council (2011) highlights challenges of collaboration to sustain community resilience: (1) the mismatches of scale resilience building activities and programs (2) diverging interests among the actors (3) the lack of coordination, inconsistencies, and fragmentation that occurs during the collaborative process. Further challenges to collaboration have been identified, (1) loss of control, (2) loss of flexibility, (3) loss of glory, and (4) direct resources cost (Huxham, Macdonald 1992).

Collaboration as a strategy to build resilience is helpful when the local government lack of political commitment and resources (UNDP 2014). Collaboration offers many opportunities to support the local government with a broad range of actors, particularly to find new solutions and overcome organizational and financial obstacles (Carnwell, Carson 2005; Corwin et al. 2012). These collaboration benefits include the creation of new funding sources, provision of human resources, and the possibility to perform good public relations in coping with disaster events (Kapucu et al. 2010). Sufficient funds are necessary to create and nurture effective collaborative works, specifically in the initiating phase (Mattessich, Monsey 1992).

2.3.1 Goals

The main objective to develop collaboration in building resilience after disaster is to achieve additional advantages that difficult to achieve without the collaboration (Huxham, Vangen 2002; Huxham, Macdonald 1992). For example, collaboration can enhance recovery, learning, and self-organization after disaster (DFID 2011). In this regard, goal setting is compulsory in a collaboration (Woodland, Hutton 2012). Mattessich, Monsey (1992) even considers goals setting as an exercise by which the stakeholders define the reasons, vision, and task that collaboration will accomplish clearly and realistically. A shared goal, interests and mutual benefits are ideally achieved by working together rather than through the independent efforts of individuals or single organizations (Jung, Song 2014). As Nayar (2014) suggests that a clear description of goals will direct to collaboration success.

In the collaborative processes, it is important for the collaborator to show their willingness and commitment to achieve shared goals, particularly through sharing responsibilities, rewards, and risks (Himmelman 1995). In the context of disaster management, goals are seen as the end products of complex political and administrative interactions which are essential for managing collaborative networks (Waugh Jr., Streib 2006; Collins, Kapucu 2008). The effective goal in collaboration is therefore concerned with the human dimensions (values, norms, cultures, attitudes, beliefs and relationships) in disaster management (Quero 2012). It is clear that strong will and capacity of key actors are two success factors to achieve the goals in collaboration to manage disaster resilience (Noran 2014a).

2.3.2 Trust

Building trust is critical to achieve effective collaboration in building disaster resilience (Lucini 2014). In practice, most collaborations to build disaster resilience lack of trust because of different organizational cultures, standards, and motivation (National Research Council 2011). Trust building activities include continuous efforts to understand these differences in collaboration (Bryson et al. 2006). A high level of trust is associated with substantial time commitments, honesty, and openness (Himmelman 1995; Mattessich, Monsey 1992).

A continued trust building exercise aims to achieve collaborative advantage and minimalizes the risks related to collaboration (Vangen, Huxham 2003). According to Vangen, Huxham (2003), the first step to develop trust is by taking joint projects and build trust through working together. In the context building resilience, trust is needed to provide better communication and coordination in a crisis situation (Longstaff, Yang 2008). Edelenbos, Klijn (2007) find that

the level of trust may increase when the actors interact frequently and have high competency. Interactions among collaborators not only advance the trust level but also sustain the motivation to collaborate (Emerson et al. 2012). A possible explanation for this might be that because trust functions well when the personal relationships, emotions, energies, and efforts are present in a collaboration (Gajda 2004).

2.3.3 Spanning boundaries

Spanning the collaboration boundary is one of the practical solutions to maintain medium and long-term disaster resilience. Spanning boundary in maintaining disaster resilience means to build awareness to overcome problems and conflicts among local actors in a collaborative process (Leung 2013). This includes inviting stakeholders from various organizations and cultures to reveal their concerns in disaster resilience (National Research Council 2011). It is also important to collaborate with the stakeholders from practitioners and academia to be able to incorporate the scientific and practical aspects (Vogel 2001). Besides, working with the local agencies and managing good relationships with the community will enhance the effectiveness of the collaboration (National Research Council 2011).

In the context of building resilience, communication to span the boundaries comprises of two aspects; communication among the collaborators and communication of risks (Aven, Renn 2010). Effective information sharing may facilitate better communication in a collaboration, specifically in performing emergency response (Kapucu 2006). The communication are complex because of lack of incentives and understanding among the collaborators, inappropriate systems and processes of communication, as well as emotional benefits associated with providing information for others (Bharosa et al. 2010). The internal communication activities compromise of frequency and open interactions, updates, sharing, and discussing issues and knowledge (Mattessich, Monsey 1992). The communication strategies are crucial for spanning boundaries (Burnside-Lawry et al. 2013). For example, Sever (2014) argue that it is important to open and create various communication channels for vulnerable groups, volunteer groups and disability organizations.

2.4 Resilience focused collaboration: a conceptual framework to maintain medium and long-term disaster resilience at the local level

The following section describes the resilience focused collaboration framework as an evaluation framework in this research. The aim of this framework is to facilitate an analysis of

the current disaster resilience strategies and activities after disaster at the local level. This framework takes the shape of a synthesis discussion of existing approaches and concepts from resilience theory, governance theory, and collaboration theory. It includes the governance and capacity to manage resilience theories (Lebel et al. 2006; Folke 2016), disaster resilience concept (Cutter 2016; Birkmann et al. 2015), and the collaboration theories (National Research Council 2011; Champagne et al. 2014; Kapucu 2006; Noran 2014a).

The important key concepts in this framework (disaster resilience, governance, and collaboration) have been clarified and reviewed in the previous sections (see sub chapters 2.1, 2.2 and 2.3). The development of this conceptual framework is inspired by Lebel’s framework (Lebel et al. 2006) that introduced the concept of capacity to managing resilience. At the same time, this framework will evaluate the key challenge of state and non-state cooperation to promote disaster resilience by National Research Council (2011). Figure 4 shows the resilience focused collaboration framework.

RESILIENCE FOCUSED COLLABORATION FRAMEWORK

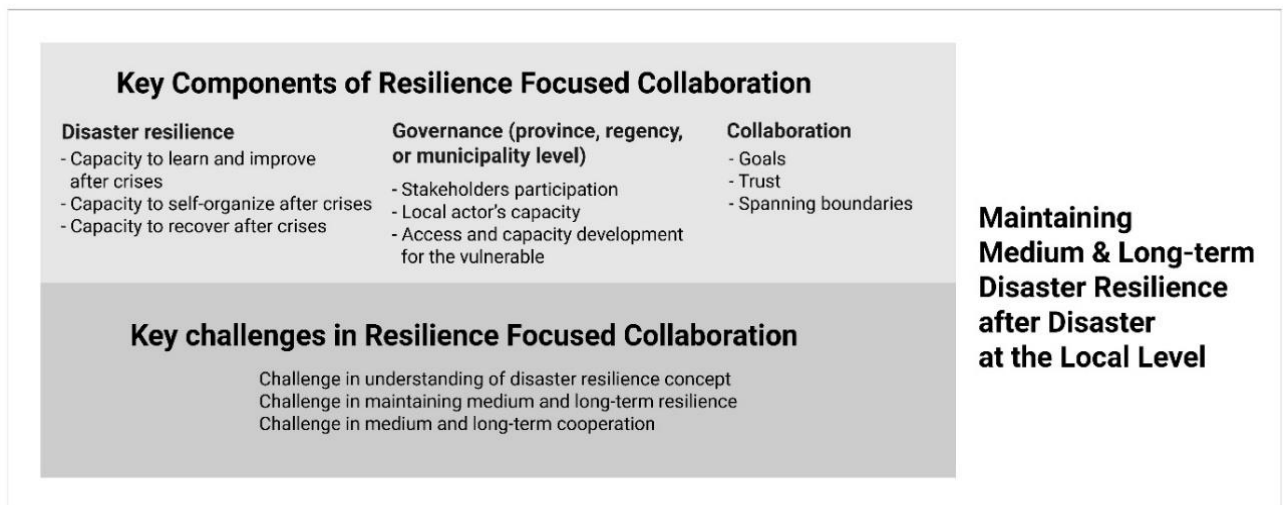


Figure 4 Resilience focused collaboration framework
Source: own

The goal of this framework is to analyze and examine the collaboration process that emerges after a disaster in order to build medium and long-term disaster resilience at the local level. The discussion of governance approach, for example, will reveal how the actor’s participation and capacity will contribute to develop this collaboration that aim to enhance disaster resilience. In other words, the resilience focused collaboration framework will provide an evaluation of the

conceptualization of disaster resilience, local actors strategies and approaches, and promoting collaboration as a concrete governance strategy to maintain resilience after a disaster.

Maintaining resilience in this study focuses on the development of local actor's collaboration after disaster to build and maintain disaster resilience. At the same time, building disaster resilience require capacity, capability, and competence of the individual or system to bounce back and recover from the disturbance, uncertainty or challenges (Koslowski, Longstaff 2015; Norris et al. 2008). In this context, the definition of maintaining disaster resilience is proposed as "the capacity of the local actors to recover, learn, and self-organize to maintain disaster resilience over time." In this study, governing disaster resilience indicates the invitation of various non-governmental actors and civil society organizations to participate in managing disaster resilience and increasing their capacities to collaborate (Bevir 2006). In other words, maintaining disaster resilience means to improve the network and collaboration between the governmental and non-governmental organizations by resolving the challenges in sustaining disaster resilience.

3 Methodology

This chapter discusses the methodology of the dissertation. This dissertation builds on the mixed-methods research that involves and integrate both qualitative and quantitative data collection and analysis (Creswell 2014). The qualitative phase includes semi-structured interviews and observations collected from 75 experts in three case study areas in Aceh Province. This body of qualitative data helps to explore the disaster resilience building in Aceh Province after the Indian Ocean Tsunami 2004. The results from the qualitative analysis are used to design a standardized questionnaire-based household survey. For this survey, 210 households were interviewed in the same case study areas to cross-check and compare the information from the qualitative expert interviews with insights received at the community level.

The purposes of this mixed-method research are (1) to explore in-depth knowledge and systematize the knowledge about how disaster resilience concept is translated to different policies and long-term development plans, (2) to assess how different stakeholders and local actors are involved in disaster resilience, particularly in learning and implementation of specific DRR measures to build disaster resilience, and (3) to explores the level of cooperation and the commitment of the institutions and local actors to implement of disaster risk reduction

strategies and approaches. In seeking to understand the process of building disaster resilience after disaster, this PhD research addresses one main research question: “How disaster resilience strategies and activities are defined and how different local state and non-state actors are cooperated to achieve disaster resilience in medium and a long-term”. The research addressed four sub-research questions: (1) How do different local actors define and conceptualize disaster resilience for the province of Aceh? What are key characteristics of building disaster resilience at the provincial and local level? (2) What strategies and approaches are employed and preferred by governmental institutions and community groups to build disaster resilience after the Indian Ocean Tsunami in 2004 in Aceh Province? Which differences exist between approaches employed? (3) How do local actors collaborate with each other in the development and maintenance of building resilience to disasters? and (4) What are factors that hamper the development and / or the sustainability of multi-actor and comprehensive strategies to promote disaster resilience at the local and provincial levels? To answer the research questions with a comprehensive and proper empirical data set, this study builds on an extensive fieldwork phase. The fieldwork was carried out in nine months divided into two stages in Aceh Province. The aim of the first fieldwork phase was to conduct qualitative data; the second fieldwork was meant to collect quantitative data based on the results from the qualitative data.

This chapter describes the study’s research methodology and includes discussions around the following areas: (a) description of case study selection, (b) rationale for mixed-methods research approach, (c) overview of research design (d) methods of data collection, (e) data analysis, (f) challenges in field research and limitations to conclude this methodology chapter.

3.1 Case study selection

Aceh Province consists of 23 regencies and municipalities. Half of these regencies and municipalities were affected by Indian Ocean Tsunami in 2004 (Republic of Indonesia 2005). In this research, the selection of the case study areas is based on a purposeful sampling procedure to represent the diversity of characteristics and conditions of regencies and municipalities in Aceh Province after this disaster. A purposeful sampling procedure is chosen because this sample strategy allows the researchers to implement their practical knowledge of the case study areas and to engage with the key informants that have special expertises and experiences that fit with the research purpose (Marshall 1996). In this context, the purposeful sampling method that apply to select the case study areas are based on these main criteria:

- All case study areas have a different level of impact caused by the tsunami 2004, including social economic and environmental consequences
- All case study areas have different exposure patterns with respect to current natural hazards identified by the local government
- All case study areas are characterized by different geographical conditions representing the range of characteristics in Aceh Province
- All case study areas have different population sizes and densities
- All case study areas have established disaster management agencies and enacted by the local regulations

Building on these criteria, three case study areas were selected. The selected municipalities and regency provide a basis for a comprehensive case study addressing disaster resilience building in the context of Aceh after the Indian Ocean Tsunami 2004 recovery. For this comparison, it is essential to select appropriate case study areas which cover as much of the range of local perceptions and peculiarities relevant to answering the research questions. Time constraint was also as the main consideration to decide only three municipalities and regency that include in this research which the maximum fieldwork duration allowed by the scholarship funding is nine months.

The selected case study areas are Banda Aceh Municipality, Sabang Municipality, and Aceh Jaya Regency (figure 5). The main characteristics of the case study areas are summarized in table 3. The characteristics and rationale for choosing these three case study areas are explained in the following sub-sections.

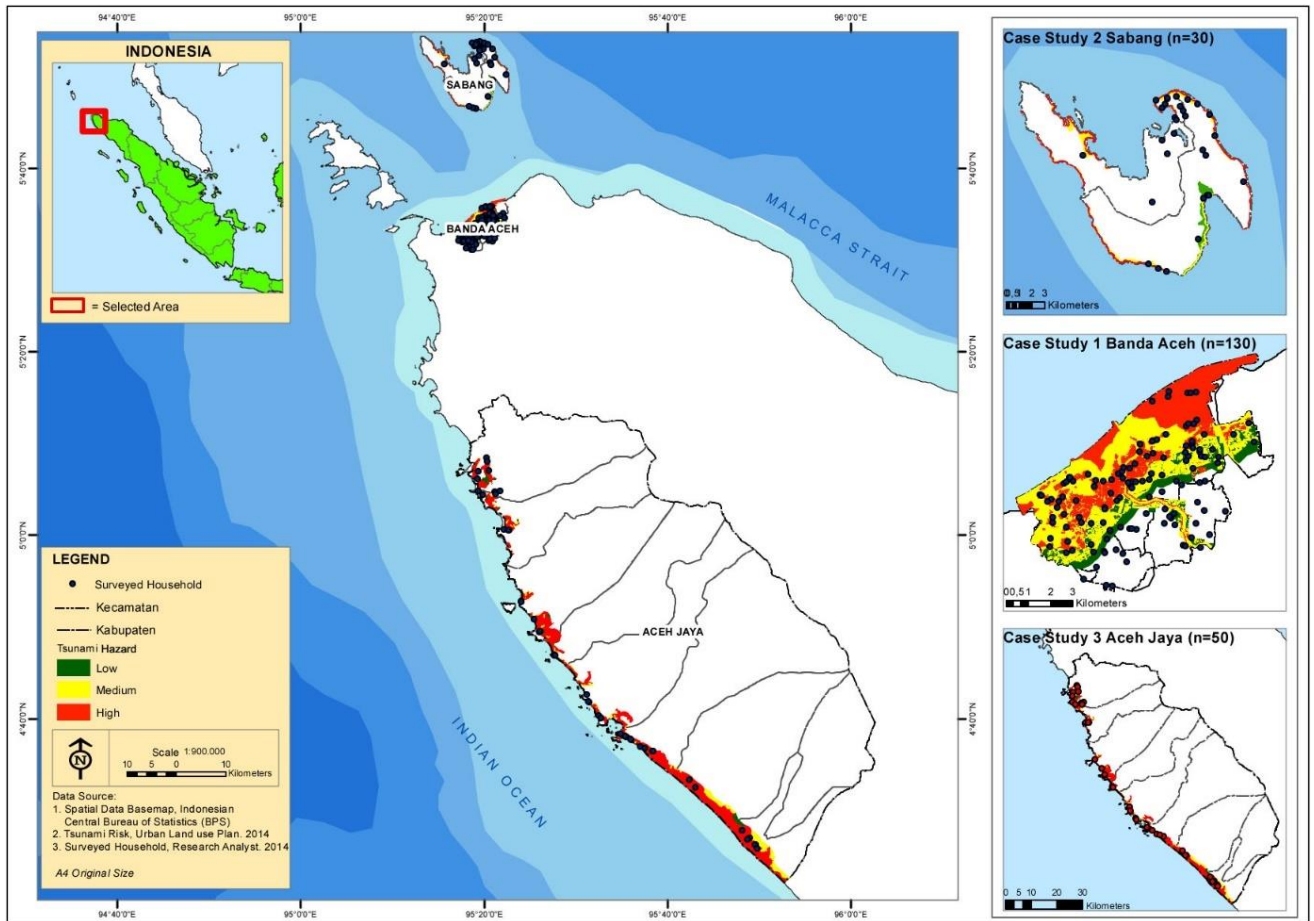


Figure 5 Map of the three case study areas
Source: own

Case study area	Number of victims of Indian Ocean Tsunami 2004	Exposure to natural hazards	Short characteristics of geographic condition	Number of population, population density (people/km ²), and households in 2016	Establishment of local disaster management agency/ local regulations	Number of expert interviews	Number of households participating in survey
Banda Aceh	High impact on human victims, infrastructure, housing, ecosystem and human environment, and livelihood. 15,394 people missing. 32,611 survivors displaced	Earthquake and tsunami	Urban areas , 9 districts and 90 villages	254 904 4 552 people/ km ² 62 774	2011 / Qanun number 3 year 2011	42	130
Sabang	Low impact on human victims and infrastructure 25 people died, 108 people missing, 7,096 survivors displaced	Earthquake tsunami, landslides, abrasion, high wind	5 small islands , 2 districts and 18 villages	33 622 276 people/ km ² , 8615	2011 / Qanun number 4 year 2011	16	30
Aceh Jaya	High impact on human victims, infrastructure, housing, ecosystem and livelihood. 16,797 people died, 77 people missing, 32,611 survivors displaced	Landslides, floods, abrasion, high wind, wildfires, earthquake, erosion	Rural areas , 9 districts and 173 villages	87 622 45 people/km ² 23 673	2010 / Qanun number 4 year 2010	17	50

Table 3 Case study areas description

Source: BPS Provinsi Aceh (2017), BPBA (2012), UNIMS, BRR (2005)

3.1.1 Banda Aceh

Banda Aceh is located in the northwestern of Indonesia and the capital city of Aceh Province. Banda Aceh represents urban geographic and demographic characteristics of the case study areas in Aceh Province. The number of people killed in Banda Aceh and Aceh Besar is 92,166 people (UNIMS, BRR 2005). This number of victims were aggregated with the number of victims in Aceh Besar because Banda Aceh is directly adjacent with the Aceh Besar, particularly along the coastal lines. This number is the highest number of the Tsunami victims in Aceh Province (Republic of Indonesia 2005).

More than 95 % of buildings in the coastal areas until 2 km to the city center were devastated by the earthquake and Indian Ocean Tsunami 2004, particularly in six sub-districts Meuraxa, Kutaraja, Kuta Alam, Syiah, Kuala, Jaya Baru, and a part of Baiturrahman (Satuan Tugas Penanggulangan Bencana Aceh 2005). The main infrastructures damage were public facilities (e.g. schools, hospitals and infrastructures) and government offices because of their structures were not designed to protect buildings from earthquakes (Satuan Tugas Penanggulangan Bencana Aceh 2005). The major environmental problems that affected by the Tsunami 2004 include damage to the coastal ecosystem, contaminated ground water, and undisposed waste (UNEP 2007).

Most of the local actors and organizations which were involved in the emergency response and the recovery were based in Banda Aceh. The community was involved in various disaster risk reduction programs and activities conducted by NGOs during the rehabilitation and reconstruction after the Tsunami in 2004 (Pemerintah Republik Indonesia and UN 2005). The academic communities and research organizations which contributed to disaster resilience building in Banda Aceh are also located in Banda Aceh, including Syiah Kuala University and UIN Ar-Raniry that actively conducted research related Indian Ocean Tsunami 2004 (Syahputra, Munadi 2011).

After the rehabilitation and reconstruction ended 2009, the Banda Aceh government has continued to develop various strategies related to disaster mitigation and building disaster resilience. During the formal recovery phase (2005-2009), local government has collaborated with various international organizations, civil societies, universities, and the central government to develop these strategies. For example, the local government supported by JICA have built four of the tsunami vertical evacuation buildings in the villages near the coastal areas

in Banda Aceh, including the Tsunami Museum (see picture 1) that can be functioned as a vertical shelter (Haiqal et al. 2016).



Picture 1 Museum Tsunami Aceh in Banda Aceh
An educational and exhibition centre for Indian Ocean Tsunami 2004 in Banda Aceh;
Source: own

The Banda Aceh local government main strategy to build disaster resilience is to integrate disaster mitigation into city, district and village spatial planning and the development agenda (Pemerintah Kota Banda Aceh - GTZ-SLGSR 2006). The new spatial and urban planning focus on the development of tsunami hazard buffer zones and open new evacuation routes (Pemerintah Kota Banda Aceh 2009). Banda Aceh is the only municipality in Aceh Province which has a Tsunami early warning system with several sirens located along its coastal areas (Tim Kaji Cepat 2012). In addition, the local government has planned to build more Tsunami vertical shelters and open more routes for tsunami evacuation.

3.1.2 Sabang

Sabang is the capital city of Weh Island and one of the outer municipalities of Indonesia located in the northernmost part of Sumatera. Sabang Municipality represents the small island geographic and demographic characteristics of the case study areas in Aceh Province. As seen in table 3, the damages caused by the Tsunami in 2004 were smaller than in most other regions, but this volcanic island was isolated for one week after the event. Sabang was a shelter for fishermen and Tsunami victims from Banda Aceh. The geographical condition of the island provides natural vertical shelters in case of a tsunami as it is surrounded by mountainous areas.



Picture 2 Sabang, the capital city of the Weh Island
Source: own

However, the tsunami 2004 affected the coral reef and mangrove ecosystems in this island, particularly in the eastern side of Sabang (Purbani 2012). Most of the reconstruction programs were therefore related to the restoration of coral reef ecosystems, fishery sectors and infrastructure (BRR 2006). Many of the fishermen villages were devastated by the Tsunami and had to be relocated during the rehabilitation and reconstruction stages. Beside the fisheries sectors, the main focus of development in Sabang is sustainable tourism. To support the tourism development, the Sabang government has included the tsunami zoning areas and mitigation plan in their current spatial plan after the Indian Ocean Tsunami 2004 (Pemerintah Kota Sabang 2012).

3.1.3 Aceh Jaya

Aceh Jaya is one of the new regencies that established in 2002 (Pemerintah Kabupaten Aceh Jaya 2014). It located in west coast of Aceh Province which was widely devastated by the Indian Ocean Tsunami in 2004 (UNIMS, BRR 2005). Aceh Jaya represents the rural geographic and demographic characteristics of the case study areas in Aceh Province. In the context of Indian Ocean Tsunami recovery, the local government had limited experience in development. The social and economic situation had been affected by the long-lasting local political conflict between GAM and Indonesian government (Mahdi 2005). This area was the basis of the GAM and military operation. The community members suffered from this conflict thereby often choosing to move from this regency away to safer places outside of Aceh Province.



Picture 3 Aceh Jaya, new Tsunami housing relocation in Calang
Source: own

As seen in table 3, most of the people in Aceh Jaya died, were injured or displaced internally and only 18.2% percentages of population survived (Brennan 2005). The rehabilitation and recovery programs focused on the development of main infrastructures such as roads, housing, government offices, and public facilities by BRR and international NGOs (BRR 2008). The local government has only slowly engaged in the resilience building process, including the establishment of the local disaster management agency, multi-stakeholder forum, and better tsunami evacuation routes in the spatial plan (Pemerintah Kabupaten Aceh Jaya 2014).

3.2 Rationale for mixed-methods to approach the disaster research

The selection and use of appropriate methods is vital in a research (Kumar 1999). Mixed-methods approach guides the analysis in this research. Mixed methods approach is often recognized as third of the three major research paradigms next to qualitative and quantitative research. It combines the qualitative and quantitative methods (Johnson et al. 2007). A mixed-methods approach provides in particular the following advantages: (1) different methods are used for different research objectives (2), triangulation can build on data from different methods, (3) data from different method can help explaining the results gained from different method, (4) qualitative theory development is supported by quantitative data, (5) it is possible to creating complementary data sets (Migiro, Magangi 2011). In this research, all the advantages of the application mix-methods will focus to understand the complex issues of building disaster resilience after disaster.

Mixed-methods approach defines as “an approach to research in the social, behavioral and health sciences in which the investigator gathers both quantitative (closed-ended) and qualitative (open-ended) data, integrates the two, and then draws interpretations based on the combined strengths of both sets of data to understand research problems.” (Creswell 2014). The combination of qualitative and quantitative approaches in both the data collection and analysis allows the integration of the meaning of actor’s experiences and the strategies evaluation in three case study areas to answer the research questions. In addition, this method is helpful to take on a local perspective and guarantee at the same time scientific reliability and validity research by separating between facts and speculation.

It was researcher’s intention to combine the qualitative and quantitative methods to elicit the rich data needed to answer the research questions in this study. In the researcher’s view, the fundamental assumptions and key features from the mixed-methods research would fit well with this study that involved not only the local stakeholders but also the community members to listen to their own voice and understand their perspectives of building disaster resilience. For this study, a mixed-methods approach is important to portray the complete picture of how the local actors achieve disaster resilience in medium and a long-term after disaster. At the end, this research intends to provide practical recommendations that can contribute in the development of disaster policy in Aceh Province.

The methodological design of this study aims to contribute to study extreme disaster and its consequences. Disaster is collectively experienced events (Norris 2006), that offered various knowledge exchanges and better understandings and explanations of the event and its consequences aftermath. Disaster research desires the comparison among different organizations and communities, regularities across events, and cross cultural responses (Drabek 1970). In this case, this post-disaster research intends to provide stories, perceptions and personals experiences from the actors involved in the resilience building process as well as from the community. This shall allow understanding the current efforts and strategies from various organizations involved in process.

Drabek (1970, p.1) argued “there is neither a special set of strategies, which might be referred to as disaster methodology, nor a separate set of techniques which might be labelled disaster research methods”. On the other hand, the disaster research needs the “best methodologies and robust theories” to extend the understanding of human ability and capability to copes with disaster events include the mitigation, preparedness, response, and recovery (Kennedy et al. 2009). This challenges the researcher to choose a simple, but sophisticated set of methods in

disaster research. As such, this mixed methods can answer the challenges to provide a robust research method that can provide policy impact and transformation especially for planning, response, and coping with the future disaster risk (Dynes, Drabek 1994).

3.3 Overview of research design

Research design comprises the development of research questions, data collection, selection of respondents, data analysis, and reporting the results (Marvasti 2004). The selection of an appropriate research design is crucial for enabling the researcher to have valid empirical, comparisons and conclusions (Kumar 1999). Figure 5 summarizes the exploratory sequential design employed in this research. As shown in figure 5, the design of this research is based on the single exploratory of mixed methods with one phase of qualitative data collection followed by one phase of the quantitative data collection. The aim to apply exploratory sequential design is to first explore the disaster resilience building problem through qualitative data collection (semi-structured interview) and analysis, then base on the qualitative results, develop the questionnaire for the quantitative data collection, and follow by conducting the household survey and analysis.

In mixed methods design, the dominant paradigm and the type of phase will apply in the research design such as concurrently or sequentially (Johnson, Onwuegbuzie 2004). In this research, qualitative research forms the dominant approach. It means that the quantitative data will support the qualitative findings that dominate in this research as a sequential exploratory design. Johnson et al. (2007) defines a qualitative dominant approach of research as “the type of mixed research in which one relies on a qualitative while concurrently recognizing that the addition of quantitative data and approaches.” This sequential exploratory design is well suited for studying the local actors’ experiences and stories in building disaster resilience as the main source of primary data. At the same time, the results of the household surveys are the different type of data that will be collected to supports these qualitative findings.

The integration issues are crucial in the mixed-methods approach. According to Creswell (2014), integration is the process to combine the qualitative and quantitative results in the mixed-methods research. In this research, the integration of the qualitative and quantitative results is applied in the research design, data collection, empirical analysis, discussion, and interpretation of results. This type of integration allows the researcher to collect data from various sources that important for the triangulation purpose in this research (Fielding 2012).

Triangulation plays a significant role in mixed-methods approach (Torrance 2012; Fielding 2012). Triangulation is “the process of drawing in different sources of perspectives” (Clifford et al. 2003). A mixed-methods design allows for four types of triangulation: (1) data triangulation, (2) investigator triangulation, (3) methodology triangulation, and (4) theory triangulation (Denzin 1973). In this study, triangulation has translated into various strategies. First, the data from different primary and secondary sources were gathered with different methods of data collection for the data and methods triangulation. Second, survey enumerators in the second phases of research were involved in a regular process of discussion and reflection of the research process. Third, three main theories (resilience, governance, and collaboration) were combined in the analytical framework to achieve theoretical triangulation. Triangulation allows an integration of theories and thereby more confidence and explanation of the research results (Jick 1979).

To gather the data, the researcher took nine months fieldwork in Aceh Province. The first phase of fieldwork aimed to collect the qualitative data by conducting semi-structures interviews and the second quantitative phase was a household survey. Both fieldworks allowed the combination of qualitative and quantitative approaches that include a range of data collection such as interviews, observations, and surveys (Marshall 2015). This multi-phase design fieldwork allows the integration of the qualitative and quantitative methods through data collection, data analysis and triangulation

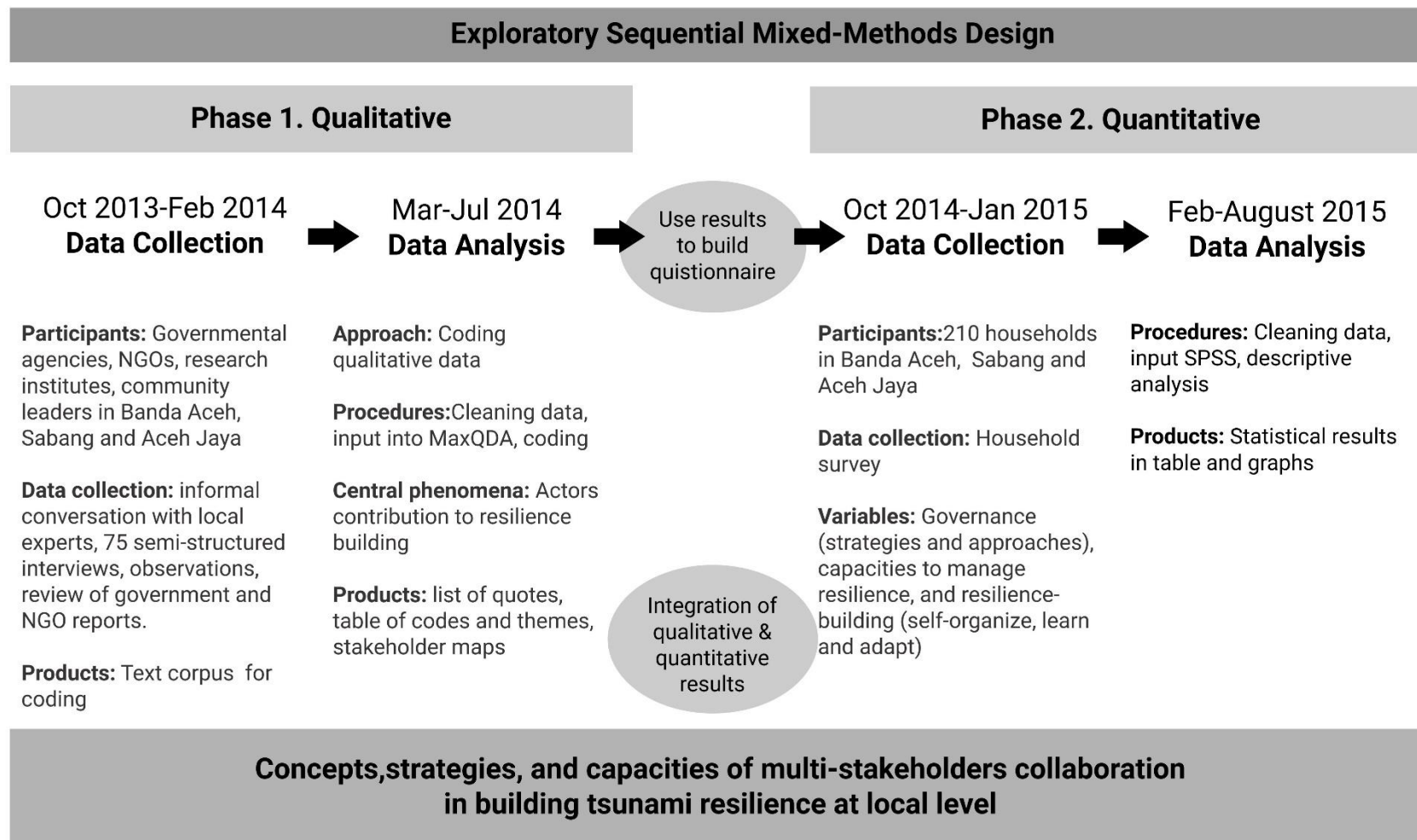


Figure 6 Exploratory sequential mixed-methods design
Source: own

3.4 Methods of data collection

Mixed methods approaches were chosen to collect and manage the primary data for this research through nine months of fieldwork three case study areas in Aceh Province. The informal conversation, semi-structured interviews, and observations were the main methods of data collection employed in the qualitative phase. The household survey was the main method of data collection in the quantitative phase. The secondary data was collected from the literature review of reliable sources relevant to this study. The integration of the two phases occurred during the data collection, analysis, and discussion of the results to answer the research questions. Table 4 shows a summary of the data collection methods and data analysis. The data collection methods employed in this research will be explained in the following sub-sections.

Table 4 Summary of research sub-question, data collection methods, and data analysis

Research sub-questions	Objectives	Data collection	Data analysis	Information collected
How do different local actors define and conceptualize disaster resilience for the Province of Aceh?	to explore in-depth knowledge and systematize the knowledge about how disaster resilience concept is translated to different policies and long-term development plans	Secondary literature collection Participant observation	Content analysis Coding	Review of the disaster resilience concept, disaster management institutions, and policies (Chapter 4 and 5)
What are key characteristics of building disaster resilience at the provincial and local level?		Semi-structured interview		
What strategies and approaches are employed and preferred by governmental institutions and community groups to build disaster resilience after the Indian Ocean Tsunami in 2004 in Aceh Province?	to assess how different stakeholders and local actors are involved in disaster resilience, particularly in learning and implementation of specific DRR measures to build disaster resilience	Secondary literature collection Semi-structured interview	Content analysis Coding	Identification of the strategies and approaches by the government and NGOs in building disaster resilience (Chapter 5 and 6)
Which differences exist between approaches employed?				

How do local actors collaborate with each other in the development and maintenance of building resilience to disasters?	To gain information on the current collaborative process in building disaster resilience To examine the problems in current collaboration	Semi-structure dinterview Participant observation	Stakeholders analysis Coding	Evaluation of the local collaboration in building disaster resilience (Chapter 7)
What are the remaining challenges and problems faced by the government and the community in building disaster resilience after the 2004 Indians Ocean tsunami in Aceh Province	To identify the remaining challenges in building disaster resilience	Household survey Semi-structured interview	Descriptive statistics analysis Coding	Community evaluation of the resilience building process Local actor's perceptions on challenges in building disaster resilience (Chapter 7 and 8)

Source: own

3.4.1 Secondary literature collection and review

One of the critical stages in data collection is to choose the most relevant, up-to-date and reliable literature as secondary data source (Healey 2003). In this research, the secondary data is collected from various sources such as government project reports, policy document, and papers on vulnerability, hazards and disaster risk from Aceh government and national offices, such as BPS (Central Statistic Office), BPBA (Aceh Disaster Management Agency), BRR (Aceh-Nias Rehabilitation and Reconstruction Agency) and Bappeda (Regional Development Planning Agency). The process of literature collection and reviews started one year before the fieldwork to develop a robust proposal and research design. The analysis of key scientific literature (e.g. The newest IPCC Report on Extreme Events, Sendai Framework, and UNISDR publications) and policy documents aims to provide a sound theoretical and conceptual framework for the PhD thesis. For example, different meanings and definitions of the term disaster resilience are examined and discussed from these secondary data (see chapter 4).

Most of secondary data was collected from the web in both English and *Bahasa Indonesia* from Germany. Acehnese online newspapers such as “*Serambi Indonesia*” are one of the relevant sources to browse the up-to-date issues related to disaster resilience at the regional scale. Most reports from the local government and NGOs are accessible online. Many books about the Tsunami in 2004 are available from local the publishers. They can be found in the local bookstore and public libraries in Banda Aceh. After the Indian Ocean Tsunami 2004, many

books were published to document the event and their implications to the Aceh society. In addition, the undergraduate and postgraduate theses, particularly from disaster management postgraduate program in Syiah Kuala University provide reliable references that fit well with this topic. These new sources of reference were very important to broaden and refine the research questions, identify the gaps, and improve the understanding of the case study areas.

3.4.2 Observation

Observation is defined as being a data collection method in qualitative research. It is about observing people and place in order to gather information (Creswell 2002). Observation is a comprehensive fieldwork strategy. It besides the process of observing, also a literature review, interviews, and introspection (Denzin 1973). Observation is directly connected with the research object (Laurier 2003). In this research, observation is employed in both stages of fieldwork to gather information and triangulate other data collection methods.

The purpose of observation is to understand the state of the art of the tsunami resilience building process, including the local actor collaboration and their contribution after the reconstruction and rehabilitation stages ended. Data was recorded in form of field notes, photographs for the participants, and activity descriptions. These data were transcribed and analyzed. The data from the observations, informal conversations, and discussions were very valuable as a comparison with the results from the semi-structured interviews.

Two forms of observation are part of this research. First, local disaster management-related events in Banda Aceh such as conference, seminar, meeting, and ceremony were observed. Some events were open for public, others only for invited participants. To participate in these events, the researcher needed permission from the respective agencies. Usually, with the research permit letter, the authorities allowed the researcher to take part at the event. In these events, the local actors from the governmental and non-governmental organizations interact and engage together. It was important to observe their behavior as local actors meeting and networking.

The second form of observation was carried out at the local disaster management offices in the three case study areas. It was meant to reveal activities and the government officers. As an observer, the researcher capitalizes on the informal conversations of local disaster management agency authorities from high level until the local level. During the observations, the observer is meant to notice the pattern of communication and interaction, the characteristics of the actors, and decision making process (Mertens 2014). These events open opportunities for the

researcher to connect with the disaster management practitioners and have informal discussions with experts.

Public events such as the tsunami commemoration which takes place once a year were also opportunities for observation. The Indian Ocean Tsunami 2004 commemoration at December 26th, 2013 and 2014 were big celebrations for the achievement and reflection of reconstruction and thereby provided important insights. The exhibition of international organizations working in rehabilitation and reconstruction on December 26th-28th, 2014 in Banda Aceh was a particularly important event to be observed and discussed with the key actors of the rehabilitation Aceh (picture 4).



Picture 4 The international exhibition on ten years of the Indian Ocean Tsunami 2004
Source: own

In this event, the Aceh government invited these organizations to exhibit their activities and projects after the Tsunami. The discussions were conducted with several organizations reflected their opinions about the changes which took place in Aceh during the last ten years. In general, the experts thought that development of the infrastructure is successful but lack of achievement in economic and livelihood activities for the society. These public ceremonies were important events to understand how people try to keep the memory of tsunami risk alive and to understand which lessons they derived from the disaster in terms of resilience building.

3.4.3 Semi-structured expert interview and selection of research participants

The semi-structured interviews were meant to understand the actual condition of the tsunami resilience building process in Banda Aceh after the reconstruction and rehabilitation stages finished. The aim of interview was to elicit this information from a wider range of perspectives,

including the views of local experts and practitioners. A semi-structured interview is a flexible method which helps exploring relevant issues according to an interview protocol prepared by the interviewer (Longhurst 2003).

The interview protocol was developed in order to investigate and discuss the main issues around disaster resilience building. Dunn (2010) suggests to prepare fully worded and “content-focused” questions relevant to the research questions, but which are flexible in terms of the order of questions. In this research, the formulation of the interview guidelines followed the resilience focused collaboration analysis framework. It was discussed with PhD colleagues and the supervisor prior to the fieldwork. The types of guidelines included a combination of questions to gather the details of events, people, places, and experiences and questions to ask about opinions in terms of disaster resilience.

After the acquisition of an official letter for a research permit from the Aceh government, the pilot testing started with a random selection of experts who were willing to get involved. These interviews served as pre-tests. After these interviews, the interviewees were asked to comment on the guidelines. This review was very useful to prepare a final interview guide for the remaining interviews. The pre-tests revealed that several questions were difficult to understand, needed long explanation, or redirected the conversations. The timing and order of questions have shown to be appropriate. This final interview protocol can be found in appendix 10.1.

Thereafter, the process of selecting and contacting interviewees started. First, governmental and non-governmental organizations were contacted who work in resilience building and tsunami risk reduction in Aceh province. These interviewees were chosen based on their roles and experiences in working in disaster management or teams during and after the 2004 tsunami. The selected respondents are government officials from different agencies and Non-Governmental Organizations (NGOs).



Picture 5 semi-structured interviews with key informants
Source: own

The selection of interviewees followed a purposeful sampling process according to preselected criteria and theoretical saturation of the research questions (Mack et al. 2005; Patton 2005). This purposive sampling strategy was applied because the interviewee must be selected from the institutions or organizations that have prior experiences or currently involve in disaster resilience building. For example, this sampling strategy was used for the interviewee from the government agencies. The mechanism to select the interviewee has been based on the introduction of the topic to specific governmental officers. Based on this introduction of the research topic, the governmental agencies and governmental staff decided whether they would be willing to give the interview. In most cases a connection to the officials and governmental employees helped to motivate respective persons to accept being interviewed.

Snowballing sampling was another strategy to recruit new respondents. With the help and reference of one interviewee it is possible to recruit another interview (Clifford et al. 2003). This sampling strategy aims to identify the interviewee that have the similar characteristics and interests to the research topic (Palinkas et al. 2013). In this research, snowball or chain sampling was mostly employed in case of the NGOs and civil society organizations. In these cases, trust and networks are important for being able to recruit respondents. A reference from a person who is well-known in the local disaster management community facilitated successfully recruiting another interviewee.

Most of the interviews were conducted at the organizations' offices. Several local NGOs and the civil society representatives were interviewed in coffee shops to ensure neutrality and available time reasons. The interviewee sometimes came with their colleagues who were

anticipated to be able to add valuable information to the topic. The interviews lasted between 45 minutes and one hour.

A list of 75 semi-structured interviews conducted in the three case study areas can be found in the appendix 10.2. The theoretical saturation was achieved after 75 interviews in four months of fieldwork. All the interviews were audio recorded and noted. The transcription was done simultaneously with the revision of the field note files to prepare for the next step of data analysis (coding transcripts). The sample of transcript from the government officer, NGOs, and community organizations that have translated from Bahasa Indonesia into English can be found in appendix 10.3, 10.4, and 10.5.

3.4.4 Household survey and selection of research participants

The purpose of this household survey was to support the qualitative findings of this research, as a quantitative phase in an exploratory sequential design for the mixed-methods approach. The quantitative phase is meant to complement the qualitative data generalize findings with a larger sample size (Creswell 2014). Household survey is one of methods to “approach a sample of persons who have been exposed to a set of events or experiences and interviews them with respect to these experiences” (Denzin 1973). The analysis of the qualitative data was conducted before the second fieldwork to design the questionnaire for the quantitative data collection. Mertens (2014) defines a *simple descriptive* approach which has also been chosen for this research as “a one-shot survey for the purpose of describing the characteristics of a sample at one point in time”. In this research, the purpose of the simple descriptive approach is to provide information of the household members’ perception and evaluation toward resilience building process.

The survey began with designing and pilot-testing of the questionnaire, then the best strategies of implementation were chosen and survey participants were selected and recruited (McLafferty 2003). Building on qualitative data for designing quantitative methods and complementing the respective other data set, is part of a mixed-methods approach aiming as described above in section. The survey questions were close-ended, in *Bahasa Indonesia* and were content-wise based on the analysis of the semi-structured interviews. The survey was conducted in form of face-to-face interviews. The questions that were difficult to for household members to answer were revised during the pre-test of the survey. In the end, 20 households were sampled in this pre-test phase.

The sample size was predetermined under consideration of availability of resources, including budgetary and time constraints (Kumar, Phrommathed 2005; McLafferty 2003). The number of selected households reflected size of the chosen municipalities, tsunami impact in 2004, urban and rural areas, and different governance approaches for tsunami resilience building (see table 3). The household survey conducted in all sub-districts and almost all villages in three case study areas with the non-probability sampling, specifically the incidental sampling strategy. This incidental sampling strategy suits well with the disaster research because this strategy offers high adaptability in data collection that important in disaster research (Phillips 2014). At the same time, this method allows the researcher to recruit community members who agree to be the survey samples when the researchers come to their village on the survey time.

The household survey started in Banda Aceh in November 2014. 130 households were surveyed in Banda Aceh. Following the field work in Banda Aceh, the survey was conducted in the municipality of Sabang. The researcher completed 30 households survey in Sabang. The last field research area was Aceh Jaya. Here, the survey comprised 50 households. The total number of households being surveyed was 210 over the course of three months (see figure 5). This number of households are not representative of the population but adequate to understand the community perceptions and evaluation on the disaster resilience building in Aceh Province.



Picture 6 Household survey in Aceh Jaya
Source: own

Two research enumerators were recruited to assist the researcher with the household survey. All of enumerators were able to speak the local language and finishing their undergraduate study from geophysics department in Syiah Kuala University, Banda Aceh. A week of training to introduce them to the research method and household survey was conducted before the pre-test survey for the research instruments. Before continuing to other field areas, the researcher obtained permission and acquired an official letter for a research permit from the head of the municipality and regency. Throughout the process the researcher undertook regular reviews and evaluations of the data collection process to build on lessons learned. On average, the interviews ranged from 45 until 60 minutes in length.

3.5 Data analysis

Data analysis is a process to manage, organize, and make sense of the data that have been collected from the qualitative and quantitative methods (Bloomberg, Volpe 2015). The primary data in this research are from semi-structured interview and household survey that have organized and prepared for data analysis. These raw data need to analyze and transform into empirical evidents and meaningful information. The secondary data include policy documents, reports, newspaper, and field notes from observations will analysed qualitatively through content analysis technique. The process of qualitative and quantitative data analyses is described in the following sub-sections.

3.5.1 Qualitative data analysis

An analysis of the first findings of the semi-structured interviews was envisaged in order to inform the further data collection, particularly, the household surveys in the three case study areas. The process of editing data started with transcribing the audio recording from the semi-structured interviews into text. The data was then combined with field notes from the observations. The next step was to prepare the data for coding by re-reading and examining the data. Subsequently, the text-based materials were coded to get the participant quotations and summarize the key findings before the findings are analyzed, synthesized, and interpreted. To perform these analyses, a computer software - MAXQDA11 - which assists the qualitative data analysis of semi-structured interviews and participant observations was used. The purpose of working with a qualitative data analysis software was to promote efficiency and flexibility in storing, organizing, and retrieving the data (Peace, Hoven 2010).

Coding is the process of organizing and evaluating the qualitative data by identifying categories and patterns in order to understand the meanings of a text (Cope 2003; Corbin, Strauss 2014). A code is “a word or short phrase that symbolically assigns a summative, salient, essence-capturing, and/or evocative attribute for a portion of language-based or visual data” (Saldaña 2009). In this research, the connection between descriptive and analytical codes was important to develop themes and form patterns. While descriptive codes provides labels, the analytic codes reflect interesting themes from the qualitative data (Cope 2010). Both codes were derived from the analytical framework in this research.

Content analysis procedure was used for the secondary data collection (documents, reports, and policies). This data collection was analyzed following the same coding that applied for the transcriptions of semi-structured interviews. According to Bowen (2009), document analysis is “a systematic procedure for reviewing or evaluating documents both printed and electronic (computer-based and Internet-transmitted) material.” This content analysis procedure considers as a qualitative data analysis.

The next qualitative data analysis technique is to perform stakeholder analysis. Stakeholders analysis refers to “an approach, a tool or set of tools for generating knowledge about actors – individuals and organizations – so as to understand their behaviour, intentions, interrelations and interests; and for assessing the influence and resources they bring to bear on decision-making or implementation processes is used to identify and reveal the interest, roles, responsibilities, and relationships of the local actors” (Varvasovszky, Brugha 2000). Stakeholders analysis is applied for the qualitative data from the semi-structured interviews, particularly to analyze the interests and roles of key informants in building disaster resilience.

3.5.2 Quantitative data analysis

The quantitative data from the survey was processed using the Statistical Package for the Social Scientist (SPSS). SPSS is a software package to assists the researcher to work and manage numerical datasets (McKendrick 2003). The steps in analyzing the data were coding, data entry, editing, imputation, weighting, and sampling variance estimation (Groves et al. 2011). Simple statistics methods were employed to enhance data interpretation and comparison (Dorling 2003). In this research, the quantitative data was analyzed with descriptive statistics analysis to compare with the results from the qualitative methods. The results of statistical analyses were presented in texts, tables, and charts.

3.6 Challenges in field research and limitations

The first challenge in field research in Aceh Province was to obtain the official permit from the provincial authority. The formal procedure of conducting fieldwork in Aceh Province requires a research permit from the province and municipality or regency governments, particularly official letter from *Dinas Kesbanglinmas*. At the same time, the local custom such as how to enter a village and introduce the research to the community should be followed carefully. The other significant considerations are the Sharia Islam law and history of local political conflict in Aceh which need to be understood in the context of asking questions and behavior in conducting the interview and household survey.

During the household survey, most of the experts and community members were reluctant to talk to outsiders. One reason for this is the long history of political conflicts between GAM and the government of Indonesia (TNI) for more than 30 years. At that time, free of speech was no longer existent. One of the case study areas, Aceh Jaya was affected heavily by this conflict. At this case study area, the researcher needed more time to introduce the research and develop trust to the respondents. The researcher was accompanied by two male research assistants during the fieldwork in order to be able to talk to the male interviewee and survey participants. This is part of the local custom in Aceh Province.

A fundamental challenge in conducting the household surveys in Aceh was that the content and duration of the questionnaire provided an initial barrier to participation. Many people refused to participate because, firstly, they could not see how they would directly benefit from the study. The researcher did not pay for their participation but gave a souvenir at the end to show the researcher's gratitude and help overcome this barrier. Secondly, the duration of the survey was 30 to 45 minutes which some people thought was too long for their busy schedules. Finally, people were reluctant to participate because they did not want to remember their experience related to the traumatic events of the 2004 tsunami.

The next challenge was the workload linked to the research in different cities. The pre-test survey and first household surveys were started in Banda Aceh. When the work in Banda Aceh was completed, the rainy season had started. This made access to the households in the mountainous areas particularly difficult. In Aceh Jaya, landslides occurred and challenged conducting the household survey.

During the fieldworks, most of the key informants that took part in the semi-structured interviews demand the researcher to share the important findings from this research. This is

also the main challenge to discuss the findings, particularly to choose the best sharing mechanism and making practical recommendation based on the emergent findings. As Torrance (2012) suggests the importance of involving the key actors in the research process to achieve more useful results. However, this sharing process with the communities under investigation should plan carefully as part of knowledge sharing from the Indian Ocean Tsunami 2004 in Aceh Province. For example, the recommendation (see sub chapter 9.2) in this thesis is specifically prepared for the practitioners and decision makers that can promote changes in disaster resilience building process.

4 The institutional architecture for building disaster resilience in Indonesia

One of the remarkable changes in the disaster management setting following the Indian Ocean Tsunami 2004 was the establishment of disaster risk management institutions and laws at the national, sub-national and local levels in Indonesia. Knowledge of the laws and disaster risk reduction at the national level, especially the institutional architecture of resilience building is an essential element of the empirical analysis and to answer the research questions in this study.

In this regard, a review of the changes in policy and institutional landscapes is an important part of learning to promote building disaster resilience (Miller 2010). In order to understand the policies and institutional changes, there is a need to examine (1) the strengths and gaps in the current disaster resilience approaches and strategies (2) the priority areas of the national and local regulations and plans (3) multi-stakeholder participation in the development of the existing legal framework and policy documents (IFRC and UNDP 2015).

This chapter aims to provide an analysis of the existing legal framework for building disaster resilience by answering three sub-research questions: (1) how disaster resilience is defined and conceptualized, (2) what the key characteristics of building disaster resilience are, and (3) what strategies and approaches are employed and preferred by government to build disaster resilience. The elaboration and discussion in this chapter were derived from the Indonesian government planning documents and reports that apply to the national and local government to govern the process of building resilience. Furthermore, the analysis examines various approaches and strategies in integrating and implementing disaster resilience plans and policies into the development agenda.

This chapter provides the basis of analysis for Chapter 5 which presents the empirical findings for the government political commitment and current gaps in translating tsunami resilience (e.g. The common understanding of the term of disaster resilience of the governmental and non-governmental organizations). This chapter also connects to Chapter 6 to provide a comprehensive understanding of the governance of resilience building, particularly the government strategies and approaches that apply at the local level (e.g. To introduce various key actors and their roles relating to the disaster resilience governance at the local level). This chapter is useful to discuss the current collaboration to promote disaster resilience (e.g. Explanation of the actor networks that collaborate in multi-stakeholder forums at the local level).

4.1 Building disaster resilience in Indonesia

The following section will analyze the process of building disaster resilience at the national level after the Indian Ocean Tsunami in 2004. In particular, this section will demonstrate how disaster resilience is defined and conceptualized by the Indonesian Government. The aim of the analysis in this section is to understand the changes in disaster risk management policies and the institutional architecture of disaster resilience at the national level providing context for changes at the local level. This analysis is important because the institutional architecture of disaster risk management in Indonesia is designed by the national government.

According to the conceptual framework for this study, the governance of disaster resilience requires a clear concept, functions, roles, and responsibilities of various actors from different levels of government (see section 2.3). The national framework is the main reference for the local government to plan, coordinate, finance, and integrate disaster resilience into the development agenda. In the context of disaster governance, the national government has a significant role in establishing the national systems and the means through which actors from different levels of government, NGOs, and civil society can interact. It is through these interactions between the various actors, particularly in planning, developing policies and mainstreaming disaster resilience that the process of change and learning occurs. (Lal et al. 2012).

The government of Indonesia started to define and conceptualize disaster resilience after the national disaster management law was enacted in 2007. For the first time, the concept of disaster resilience is presented as the responsibility of the government to protect the society from disaster:

“That Unitary State of The Republic of Indonesia shall bear responsibility to protect the entire nation of Indonesia as well as the whole homeland with the aim of providing protection for the life and livelihood, including protection against disasters, in order to attain public welfare based on Pancasila Ideology, as mandated in the 1945 Constitution of the Republic of Indonesia.” (The President of the Republic of Indonesia 2007)

The conceptualization of disaster resilience is very important because the goals and strategies for building disaster resilience will refer to the government’s working definition of this concept. This working definition of disaster resilience is officially introduced in a policy guideline on building disaster resilience in Indonesia titled “Building resilience country through disaster risk reduction”. The concept of disaster resilience is embedded, for the first time, into a disaster management terminology list in this guideline published by Bappenas in

April 2014. Bappenas adopted this resilience definition from the UNISDR definition of resilience,

Disaster resilience is the ability of the system and/or the community exposed to hazard to prevent, adapt, and recover from the hazardous impact efficiently and effectively. The ability of the system and/or the community to spring back from shock is determined by the availability of resources and the capability of systematic action before and after the shock. (Bappenas, 2014, p. 7)

Whilst, the terminology of “disaster resilience” is similar to a variety of words in the Indonesia language (*Bahasa*). The general meanings of resilience are ‘tougher’ (*ketangguhan*), ‘endurance’ (*ketahanan*), and ‘self-reliance’ (*kemandirian*). These three words have been adopted from different conceptualizations of disaster resilience in the existing policy document but are now part of the broader perspective of disaster resilience.

These common translated words of disaster resilience in *Bahasa* are used by different actors for a different purpose in their documents. For example, the government tends to describe disaster resilience as toughness (*ketangguhan*) and endurance (*ketahanan*). On the other hand, NGOs and community-based organizations define resilience as self-reliance (*kemandirian*). This self-reliance word refers to “the resilience community” which has become a key term for most of their projects on disaster risk reduction.

The introduction of the disaster resilience term in various policy documents have changed the point of view of most actors working together in disaster risk management. The actors realize that building community resilience is not solely the government’s responsibility, but the community members have significant roles to play in promoting disaster resilience. Change and learning can be considered as occurring through the involvement of the community in the interpretation of the disaster resilience concept. For example, different actors have defined disaster resilience based on their own perspectives and commitment to building disaster resilience. The different understanding depends on their experiences and contributions in involving in various programs and activities in disaster management.

Although the concept of disaster resilience was introduced after the Indian Ocean Tsunami 2004, this concept is emerging as an important notion in development and planning in Indonesia as a whole. The importance of the disaster resilience concept is influenced by the international development process on disaster risk reduction, particularly the Hyogo Framework for Action and attention to mega-disasters like the Indian Ocean Tsunami in 2004. Based on the concept of disaster resilience, the institutional architecture has been shaped by

how the term resilience has been translated in the existing regulations and planning documents. This varies depending on the actors involved, with different actors employing different approaches and strategies to integrate this concept into different policies and regulations. For example, the government tend to interpret resilience more in line with the Hyogo framework.

4.2 Key characteristics in building disaster resilience

This section focuses on the key characteristics in building disaster resilience as stated by the Indonesian government in various existing policy documents. It examines and discusses the prominent aspects that should be included and integrated into the process of building disaster resilience. The central question focuses on what the key characteristics of building disaster resilience are in Indonesia after the Indian Ocean Tsunami of 2004. The analysis is primarily based on the government disaster management policy documents and reports.

According to the conceptual framework for this dissertation, the key characteristics to build disaster resilience comprise of learning, self-organizations, institutional capacity, infrastructures and collaboration (see section 2.2.1, section 2.2.2 and section 2.2.3). Koslowski, Longstaff (2015) consider learning to be a key component and strong evidence that resilience has been integrated into a system. In addition, Cutter (2016) suggested that learning from the past is one of main factors that should be present to be considered as part of resilience (see section 2.2). Learning in the context of building resilience is related to the capacity to learn from emergency situations, preparedness, and recovery after disaster.

In the context of building disaster resilience in Indonesia, learning, as a key characteristic of resilience, is evidenced by the establishment of a comprehensive institutional framework for disaster management in Indonesia following the experiences of the Indian Ocean Tsunami in 2004. Furthermore, the Indonesian government has a strong commitment to learn from the recovery process and, as such, learning features as a key element in the vision to maintain long-term disaster resilience. In this regard, the government has highlighted three important lessons which contribute to building disaster resilience, enshrined in Law number 24 of 2007:

A new dimension in Disaster Management law include: (1) Disaster management is a comprehensive and proactive effort include disaster risk reduction, emergency phase, rehabilitation and reconstruction, (2) Disaster management involve various stakeholders with different roles and functions to work together, (3) Disaster resilience is part of the development process to build disaster resilience (BNPB 2014b)

Integrating these new dimensions, Law 24 from 2007 provides a new and strong institutional basis for resilience building going forward. To establish a comprehensive disaster management approach, the government has integrated disaster resilience into the development plan. The integration of the disaster resilience concept into the development process another example of the learning process of Indonesian government (Pemerintah Republik Indonesia, 2013) and the Indonesia government now perceives the integration of disaster resilience in development agenda is a must.

The next prominent characteristic building disaster resilience in Indonesia is collaboration. In the process of conceptualizing of disaster resilience in policy documents, the government recognizes that to be “a resilient country”, community members need to be involved and to work together. Community members should be a subject not only an object in building disaster resilience. As a subject, the community should understand the goals of building disaster resilience and contribute their knowledge and experiences to maintain long term disaster resilience. The incorporation of community knowledge and experiences as part of the learning process in building disaster resilience has been initiated by the government,

BNPB and DRR stakeholders have initiated activities to collect local experiences and traditional knowledge that have developed in many hazard-prone areas of the country. These knowledge and experiences have helped build community ’ s resilience to disaster. Efforts to integrate them into the local, sub-national and national DRR plans and activities in a meaningful way, however, have not been done in a systematic manner. The government needs to enhance further such an initiative. (BNPB 2014a)

The identification and invitation of stakeholders to collaborate in building disaster resilience has been one of the main tasks undertaken by the government (BNPB 2014b). In this, it has been crucial to invite the participation of grass root level organizations that have considerable experience of working with the community, such as local NGOs, community-based organizations, religious institutions, important civil societies and associations. The national and local governments both have responsibilities for connecting and cooperating with these institutions in building disaster resilience.

In terms of the institutional capacity, the conceptualization of disaster resilience and collaboration depends on the capacity of the disaster management agency to promote disaster resilience. The Indonesian National Disaster Management Agency (BNPB) has been established by the Disaster Management Law in 2007 to coordinate disaster management

activities with all stakeholders and community. To fulfil this mandate, BNPB has created various scenarios and plans to build disaster resilience,

The vision statement of disaster management in Indonesia is to be “a resilient country to disaster”. (BNPB 2014b)

This means that Indonesia is committed to building disaster resilience to face future disaster risks. At this point, the Indonesian government is aware that becoming a resilient country requires comprehensive plans, strategies, budget, programs, and activities. Therefore, at the beginning, the Indonesian government implemented the Hyogo Framework for action (2005-2015) to systematize the approach to building disaster resilience. The Indonesian government follows the five priorities of action in HFA framework and reports the progress openly.

However, in the National progress report on the implementation of the Hyogo Framework for Action (2013-2015), the Indonesian Government outlines key challenges in building disaster resilience,

The remaining challenge constitutes that the national strategy, albeit been drafted for some time, has yet to be implemented with sufficient funding support. The monitoring and evaluation of the process and outcome have also been limited. Lack of coordination; weak knowledge management; and poor communication strategy have also become obstacles in advancing public awareness to nurture a culture of resilience. (BNPB 2014a)

Together, these challenges show the Indonesian government has problems with stakeholder coordination, financial resources, learning and involvement of the community to build disaster resilience. In other word, self-organization, as one the key components in building disaster resilience is still missing. The government plays a significant role in organizing and controlling the disaster resilience programs and activities.

Despite the lack of self-organization, there is strong evidence of other aspects of resilience building being implemented at the national policy level. The next step is to nurture “a culture of resilience” which requires a longer time and greater effort to become one of the key characteristics in building disaster resilience in Indonesia.

4.3 The strategies and approaches in building disaster resilience at the national level

In order to explore the strategies and approaches that are employed and preferred by government institutions to build disaster resilience, the following section examines different strategies of various actors at different administrative levels. Overall, the analysis aims to

examine how resilience strategies and approaches have been designed and implemented by the national and local governments.

The commitment of a government to build disaster resilience is important and should be documented and implemented in appropriate strategies and approaches (see section 2.3.2). Governing disaster resilience requires strategies and actions of both governmental and non-governmental actors (Tierney 2012). The strategies in building disaster resilience include the establishment of disaster management structures and infrastructure (see section 2.2.2) as well as sufficient information and communication to the community (Cutter 2016).

Although the strategies and approaches are designed at the national level, the goal is to protect the most vulnerable communities in the rural areas,

A comprehensive strategy for awareness building for disaster preparedness has long been put in place by the government. Many awareness building drives, however, have mostly involved communities in rural areas. Guidelines and information about DRR have also been made available for grassroots communities particularly in hazard prone areas. (BNPB 2014a)

The government aims to empower local communities and increase their capacity in disaster resilience by developing a comprehensive strategies for disaster risk reduction (BNPB 2014b).

The Indonesian government has developed different strategies for national disaster management, resilience building, and tsunami resilience building (see table 5). Table 5 shows three main policy documents that describe Indonesian government strategies in building disaster resilience.

Table 5 The government strategies towards the disaster resilience building

National disaster management strategy (RPJMN 2015-2019)	Resilience strategy (RPJMN 2015- 2019)	Tsunami resilience building strategy (2012)
Strengthening the regulatory framework	Development of local government capacity, risk assessment, and integration of DRR into development plan	Strengthening the early system chain
Mainstreaming the disaster management into development agenda	Encouraging the central and local government to develop disaster management policy	Establishment and enhancement of temporary evacuation shelter
Increasing the effectiveness of disaster management	Strengthening coordination and harmonization of cross sector	Strengthening preparedness and disaster risk reduction capacities

Optimisation of community participation in disaster management	policies to support central and local disaster management	Establishment of self-supporting industries of disaster-related instruments
Increasing the multi-stakeholder collaboration	Strengthening the disaster preparedness and provision of early warning system in the high-risk area	
Increasing the effectiveness of prevention and mitigation	Exposure and vulnerability reduction in the high-risk area	
Increasing the preparedness for emergency response	Development of community disaster awareness through sensitization, education, and training	

Source: (BNPB 2014b; BAPPENAS 2014; BNPB 2012)

The national strategies for disaster management can be found in the national development plan and BNPB policy documents such as the national disaster management plan, master plan, and strategic plan. The disaster resilience strategies refer to disaster management national plans prepared by BNPB for five years since 2010. These plans highlight the national priorities for the strategies and approaches in disaster management. The most important aspect, detailed preparedness programs and activities to manage the situation before, during, and after the disaster is translated from these strategies. These strategies will provide the direction to achieve the Indonesian vision and mission statements in this policy documents.

In addition, the resilience building strategies prepared by Bappenas provide a clear guideline to integrate the disaster management strategies into the medium and long-term development plans. Both BNPB and Bappenas are responsible for ensuring that the sub-national and local governments are synchronized with the national disaster management strategies (BAPPENAS 2014). Furthermore, this document includes the guidelines to translate these strategies into a wide range of programs and activities in the context of building disaster resilience at the sub-national and local government levels.

In terms of learning from the Indian Ocean Tsunami in 2004 and 8.5 Richter scale Earthquakes in Banda Aceh in April 2012, BNPB developed a master plan to build Tsunami resilience in Indonesia. This master plan included specific strategies that developed from the evaluation of the government's response to the April Earthquakes in Banda Aceh (BNPB 2012). The evaluation reveals that that the government needs to strengthen the Tsunami Early Warning System (TEWS) and community response to the early warning to evacuate. From this

evaluation, the government developed national strategies in building Tsunami resilience (see table 5).

A key challenge identified in the analysis is the fact that various strategies and approaches are often not sufficiently linked and harmonization with each other that means some programmes and strategies of different actors might even compete against each other in terms of the logic and notion of building resilience. From the evaluation of the national disaster management strategy 2010-2014, the main challenge is the integration of disaster resilience strategies into various programs and activities in development agenda (BNPB 2014b). Most of these national strategies were not implemented at the local levels due to different development priorities and capacity of the local government (Pemerintah Aceh 2017).

At the national level, the strategy of building disaster resilience is more comprehensive to facilitate different characteristics of disaster risks in Indonesia. The current insights in building disaster resilience suggest that the implementation of the strategies needs time, commitment and hard work especially from BNPB and Bappenas to coordinate and synchronize programs and activities to build resilience at the national and local levels. The next measure is to collaborate with and involve the governmental agencies, non-governmental organizations and the community in harmonizing strategies and translating strategies into effective disaster resilience programs and activities.

As the changes and learning continue, the local government should be involved in developing national strategies to build resilience. The local government will have a significant role to play in evaluating the implementation of the national strategies and approaches at the local level. At the same time, local governments have a degree of flexibility to develop these strategies into programs and activities that fit with the local needs and budget allocation. This also opens opportunities for the local government to engage the community at the grass root level to create resilient communities through a bottom up approach.

5 Tracing the concept: resilience oriented-approach to disaster management policy in Aceh

Chapter 5 is the first empirical chapter followed by chapter 6 and 7 which also represent empirical findings of the research. This chapter examines how the government of Aceh has developed organizational and political capacities to become „a resilient province“ and how the concept of resilience has been translated into disaster risk management agendas. Chapter 6 and 7 explore the disaster governance and collaborative efforts to build disaster resilience in Aceh Province.

The findings of the chapter underscore that there is a strong structure of disaster management organizations and policies in Aceh province. However, the integration of the resilience concept into local development programs is lacking, particularly due to the fact that the local governments did not develop comprehensive strategies. The process of building disaster management structure can be traced from the key documents such as Aceh special law and regulations, government regulations and decrees for development planning and spatial planning, legal documents, and the local disaster resilience frameworks. This document analysis is helpful to detect the presence of disaster resilience in Aceh Province after the rehabilitation and reconstruction stages that ended in 2009 (see chapter 2.2).

Building and maintaining disaster resilience require capacity, capability, and competence of the actors to recover after a disaster (see chapter 2.2). Against this background the empirical analysis examines different capacities of local governments in Aceh to conceptualize and translate disaster resilience into various approaches and development strategies.

The chapter is structured into three sections. The first section argues that the Aceh government has developed strong regulations through a legal framework, planning, and development documents that assist the local government in integrating disaster risk reduction in the development agenda. This section aims to answer the research questions on how Aceh local government defines and conceptualize disaster resilience for the province of Aceh. The first section encompasses an in-depth analysis of key documents from the *Qanun* (Aceh special law and regulation), to government regulations and decrees for development planning and spatial planning. Most of the documents were prepared in collaboration between the Aceh government, the national government and international organizations working in Aceh in the recovery phase after the tsunami. These initiatives were to designed ensure that the Aceh government would have a strong structure of disaster management in place when the rehabilitation and reconstruction process has ended. The document analysis shows that the

concept of tsunami resilience in the province of Aceh is unique, meaning that this concept is developed from the experience of the Indian Ocean Tsunami 2004 and at the same time the Indonesian government build the national disaster management structure based on this learning process.

The second section aims to answer the research questions regarding key characteristics of building disaster resilience at the provincial and local level. This section substantiates the argument that the local government has learned how to build disaster resilience by providing evidence of the challenges encountered in translating the resilience concept. This suggests that a lack of political commitment from the government to integrate the resilience concept into the development agenda at the local level. The analysis is based on expert interviews conducted with people from different government agencies who are responsible for the implementation of disaster management through specific programs and activities related to tsunami resilience.

The third section examines strategies and approaches employed by governmental institutions and community groups to build disaster resilience after the Indian Ocean Tsunami in 2004 in Aceh Province. This section shows that the resilience concept has been translated and implemented into various strategies at the provincial level for example in terms of specific programs and activities. In addition, the section also examines how different NGOs evaluate the performance of building disaster resilience by governmental institutions. As such, the analysis is based on the expert interviews conducted with governmental experts.

5.1 Conceptualization of the disaster resilience in the province of Aceh

Based on the theoretical-concptetual discussion of disaster resilience, this chapter will examine three important criteria that affect the process of building resilience after disaster, (1) capacity to learn and improve after crises, (2) ability to self-organize after crises, and (3) ability to recover from crises (see in detail chapter 2.2). In this context, the common understanding of disaster resilience is important in order to develop a shared vision in building disaster resilience. However, it is also evident that it takes time and resources for the local actors to build knowledge, act, communicate and reflect, learning and self-organization are important components to achieve resilience (Berkes, Turner 2006; Lebel et al. 2006; Tschakert, Dietrich 2010). In this regard, the study here is in the position to focus on a longer time frame since the tsunami has hit Aceh. Consequently, the analysis can also explore whether and how these resources have been developed. In the first place, this chapter focuses on how disaster resilience as a capacity of Aceh government to learn and improve after the Indian Ocean Tsunami 2004

has been conceptualized. It is argued that the efforts of the government to conceptualize and implement disaster resilience in important policy documents is an important step as well as the communication about the concept to local stakeholders and community groups shows capacity building and learning activities after the mega disaster.

The concept of disaster resilience for the first time was introduced by the Indonesian government in an important policy document, five months after the Indian Ocean Tsunami. This document called “The master plan for the rehabilitation and reconstruction of the regions and communities” (Republic of Indonesia 2005). This master plan was the first reference developed by the national government to conduct the recovery process for five years (2005-2009) in Aceh and Nias. The next important decision following the introduction of the disaster resilience concept was the establishment of BRR as a special national government agency that responsible to implement this master plan:

„In Indonesia’s case, the central government established a new agency because the tsunami had debilitated the local government – killing one-third of local civil servants and destroying government records and buildings – Indonesia lacked a suitable central government institution that could coordinate such a massive rehabilitation and reconstruction effort without undermining its existing responsibilities elsewhere in the country. Also, in Aceh, there was a longstanding resentment of the central government stemming, in part, from decades of secessionist insurgency, making it difficult for any existing central government agency to operate effectively in Aceh on a short notice.” (BRR, 2009, p.13)

It can be argued that after the tsunami mega disaster, resilience became a new concept approached from the viewpoint of human security. The Indonesian government decided to take the opportunity to create a community resilient not only towards mega disasters but also resident to the political conflict that has created vulnerable communities in Aceh Province. The rehabilitation and reconstruction policies are designed to enhance security, law and order, and political stabilization in order to facilitate a recovery from both mega disasters and conflict situations:

“Reconstruction of community by restoring the aspects of religious and social-cultural life, and community resilience, including education, health, science, legal sectors and religions as well as traditional institutions.” (Republic of Indonesia 2005)

This master plan introduced “community resilience” as one of the important concepts that should be included in the BRR strategies and activities. In the plan, a resilient community can be achieved by rebuilding the basic socio-cultural, health, religious institutions that were devastated by the tsunami in 2004. Because of the prolong period of conflict, the peace building

process was an important part of resilience building in Aceh province. To address resilience problems, the government identified the post-disaster community problems as (1) the vulnerable conditions of the community, (2) limited role of community institutions, (3) relatively high intensity of threats and disturbances of security and order, (4) seriously damaged facilities and infrastructure for law and order institutions as well as casualties on the part of Indonesian national armed forces and police (TNI/POLRI) (Republic of Indonesia 2005).

At that time, the Aceh government collapsed due to the impact of the mega disaster. The central government took a human security approach to integrating the resilience concept in the master plan. Before the Indian Ocean Tsunami in 2004, the Government of Indonesia experienced a long-standing conflict with the separatist Free Aceh Movement, *Gerakan Aceh Merdeka* (GAM), that caused human rights problems in Aceh for over 30 years. This historical background was also a human tragedy. The number of victims were killed is approximately between 10.000 to 30.000 people, particularly during military operations in 1989-2004 (Amnesty International 2015). It is one of the reasons the Aceh government takes the peace agreement as a starting point for building resilience in the province:

“The consolidation of peace in Aceh rests ultimately with the structural reform of society towards predictable, fair, and transparent rules, mechanisms, and procedures for the legitimate conduct for all levels of government, business, and civil society. The tenets of democratic decentralization, good governance and economic justice entrenched within the LoGA offer unprecedented opportunities in Aceh for peace, prosperity and progress. That constructive dialogue continues on key tenets of MOU implementation in the broader context of active efforts for recovery in Aceh bodes well for sustainable peace and development.” (Pemerintah Aceh 2008)

In addition, this peace agreement presents an opportunity to strengthen the political commitment of Aceh government to build disaster resilience. This makes building disaster resilience as one of the development priorities after the resolution of Aceh political conflicts and Indian Ocean Tsunami 2004. Building disaster resilience is one of the important aspirations from the peace agreement between Indonesia government and GAM,

“Disaster can destroy social life and governance in Aceh, physically and non physically, so that we need to prevent or reduce the disaster impact and protect the society, to achieve the aspiration of Memorandum of Understanding in Helsinki, August, 15, 2005.” (Gubernur Aceh 2010)

Following the peace agreement with Indonesian government in 2005, the Aceh government granted a special degree of autonomy by Law number 11 year 2006 (Presiden Republik

Indonesia 2006). This special autonomy enables the Aceh government to include disaster resilience as an important aspect in the development plan and to require that this must be accounted for amongst the various stakeholders, including the governmental agencies and non-governmental organizations. This special autonomy also means that the Aceh government should invite and actively engage with Aceh traditional and customary institutions, to promote different strategies at the village level to build disaster resilience (Husin, Alvisyahrin 2014).

According to *Qanun* Aceh number 10 year 2008, there are thirteen customary institutions that have been established in Aceh province since the era of Aceh kingdom that rules different public affairs in Aceh community, particularly include political and religious institutions. These informal institutions are important actors at the grass root level. The Aceh government has involved these customary institutions to promote disaster management programs and activities, especially at the village level. For example, informal leader at the district and village levels and the informal leader for environmental affairs (e.g. *Keujreun blang* and *Peutua Seunebok* for agriculture affair, *Panglima Laot* for fisheries affair, and *Pawang Glee* for forestry affair) (Gubernur Nanggroe Aceh Darussalam 2008). Most of these institutions are invited to contribute actively in building long-term disaster resilience since they have authority in managing environmental affairs traditionally (Soelaiman 2011).

In term of learning after disaster, Aceh customary and local institutions are important actors that have local knowledge and that might be able to develop and sustain a long-term vision for building disaster resilience. A dedicated special law for engagement and collaboration with local stakeholders is *Qanun* Aceh number 5-year 2010. In this special law (*qanun*), local stakeholders are encouraged to promote and participate in activities to build disaster resilience (Gubernur Aceh 2008). Currently, not all these institutions do exist in all districts and villages. Often the existence of these institutions at district or village level also depends on the interest of the respective administrative institutions to preserve and account for traditional and indigenous knowledge often linked to issues of cultural heritage. On the other hand, the minority groups in Aceh, e.g. Christian or Chinese community are acknowledged by these traditional institutions. These minority groups are in often involved in various activities as part of their responsibility as community members in a village.

The Aceh government, with its special autonomy, has defined Islamic teaching as a key activity and reference point in developing the local disaster management. The government assumes that the integration of Islamic teaching in a local regulation for DRR can persuade more stakeholders to participate and contribute in resilience building. The main involvement strategy

is by involving *ulama* (muslim scholars) to promote disaster resilience. *Ulama* has a significant capacity to promote community participation in building disaster resilience. Although the Aceh government did not define the role of *ulama* in resilience building precisely, *ulama* has the power to activate the islamic community to actively engage in various disaster resilience building activities and programs. The Aceh government encourage *ulama* to preach that a strong connection between building disaster resilience and the Islamic teaching is positive and needs to be enforced. In addition, to the integration of disaster preparedness in Islamic teaching also by developing a special training module about roles of the Islamic leader in promoting disaster management (TDMRC 2011).

The experience of the Indian Ocean Tsunami in 2004 directs the Aceh government to focus on the future risk of tsunamis during the transitional period. Aceh government prepared an Aceh Recovery Framework (ARF 2008-2011) as a transitional framework from the BRR era to the local government initiatives. The recovery framework aimed at providing a solid foundation to continue the process of maintaining disaster resilience. The ARF is an Aceh government multi-year transition framework. It was prepared by the Aceh government and donors as the roadmap for the transition from Aceh-Nias Rehabilitation and Reconstruction Agency (BRR) to the Aceh government for the management of the continued recovery process. It represents as a proof of the strong commitment of the Aceh Government to promote disaster risk reduction as one of the seven development priorities of which DRR is presented as a cross-cutting issue. In this framework, the Aceh government described their future strategies on how to incorporate disaster risk reduction into the development agenda:

“Further steps should be taken by the government and civil society to assist the community to prepare action plans for DRR, to establish mechanisms for incorporating DRR into the government planning and budgeting process for development programs, and to design regulatory and policy instruments. Since the community should play a central role in the process, particular emphasis should be placed on engaging women and more vulnerable groups in the decision process.” (Pemerintah Aceh 2008)

BRR and other organizations that worked in emergency response and recovery had begun to promote the concept of resilience through the concept of building back better. In five years (2006-2009), the BRR provided not only infrastructure but also a strong foundation for the development of policies related to tsunami resilience. A core aspects of the building back better framework is the goal to improve community resilience to future disasters:

“Prepare the community for future disasters. Given the geological conditions surrounding Aceh, the possibility of another tsunami strike on the province seems more likely a matter of when rather than if. It is thus important that the reconstruction took some measures to improve the preparedness of the community.” (BRR 2009).

The next important element of the disaster management structure in Aceh is the retri-fication from the international guidelines and global frameworks for disaster risk reduction, particularly the Hyogo Framework for Action (HFA) in 2005. HFA is the most important framework that affects the disaster management structure in Aceh after the Indian Ocean tsunami in 2004,

The Hyogo Framework for Action 2005-2015: Building the Resilience of Nations and Communities to Disasters provides guidance for a strategic and systematic approach to reducing vulnerabilities and risks to hazards. To this end, the Hyogo Framework makes DRR a priority at the national and local levels to provide a strong institutional basis for implementation.”(Pemerintah Aceh 2008)

After the Indian Ocean Tsunami in 2004, the Government of Aceh has learnt to cooperate with and engage various stakeholders to strengthen disaster resilience. These experiences can potentially enhance the advancement of the development of a disaster management structure with high organizational and political capacities. However, all the regulation and planning documents were prepared by the Aceh government with the assistance of the international organizations that retained a presence after the reconstruction had finished. Consequently, it is still very relevant to examine whether these activities and structures continued after these institutions have left Aceh.

One of the prominent assistances is to resolve the lack capacity and funding of Aceh Government to finalize various local regulations drafts and prepare its implementing strategies. This assistance was provided by UNDP and Multi Donor Fund (MDF). UNDP and MDF supported Aceh government for the preparation of policy documents and local regulations in building disaster resilience, through the project, “Making Aceh Safer through Disaster Risk Reduction in Development (DRR-A)”. DRR-A is a project that involves cooperation of international NGOs, local NGOs, national and local governments for the development of local disaster management policies and institutions,

“The design of the DRR-A project was consistent with efforts to support the implementation of national policies and priorities that respond to the urgent need for the Aceh Provincial Government to establish better arrangements and environments for disaster management to be operative in Aceh. The project’s relevance was also enhanced by the flexibility of its design, allowing it to respond to changing priorities and need.” (UNDP Indonesia 2012)

Table 6 shows the regulations that have been enacted by Aceh government with the support of the DRR-A project:

Table 6 Regulations that have been conducted with the support of the DRR-A project

Law	Regulations	Goals	Characteristics
Qanun No.5/2010	Disaster management in Aceh	to implement disaster management in Aceh	This law shall come into effect as of the date of its promulgation
Qanun No.6/2010	Establishment of organizational structure „Aceh Disaster Management Agency “	to provide legal basis for establishment of Aceh Disaster Management Agency	This law shall come into effect as of the date of its promulgation
Governor Reg. No.43/2010	SOPs for TEWS	to equip government with urgent standard mechanism for disaster preparedness	This regulation is valid until the revision of SOPs and TEWS regulation is necessary
Governor Reg. No.51/2011	Provincial disaster management plan for 2012-2017	to provide strategic plan for disaster management in Aceh	This regulation shall come into effect only for five years
Governor Reg. No.48/2012	Local action plan for DRR 2010-2012	to provide a comprehensive approach to DRR in Aceh	This regulation shall come into effect only for five years
Governor Decree No.360/6a/2011	Establishment of DRR forum	to serve as platform for all stakeholders concerned with DRR in Aceh	This decree shall come into effect only for the establishment of DRR Forum at that year

Source: own

To strengthen the disaster management policy at the regional and local level, the Aceh government has enacted regulations (*Qanun* and Governor Decree) related to disaster management to show the government commitments to mainstreaming disaster management into the development pathways. *Qanun* Aceh is a provincial law or regulation governing the conduct of government and social life in Aceh (Presiden Republik Indonesia 2006). In general, *qanun* is a local regulation that enacted by the house of representative and provincial and local government in Aceh. The *qanun* enables special consideration of the local needs not otherwise regulated by the national policy.

The Aceh government has enacted two local regulations, first is *Qanun* No.5/2010 derived from the Indonesian management law (Law No.24/2007) (see table 6). This *qanun* decrees the responsibility and authority of the Aceh government in disaster management:

„Disaster management is the responsibility of the government, Aceh government, and the municipality governments implemented through the plan, coordinated, professional and comprehensive.” (Gubernur Aceh 2010)

There are three levels of government that work together at the local level, the central government, provincial government and local government, however the main actor is the local government at the municipalities. The central and provincial governments have the coordinating line, but it is the authority of the local government over disaster management to plan, implement, and evaluate disaster management at the local level. To fulfill this responsibility, the Aceh government enacted *Qanun* No. 6/ 2010 (see table 6) on the establishment and organizational structure of the disaster management agency at Aceh Province (Gubernur Aceh 2010).

Both laws were the main reference to governing tsunami resilience in Aceh Province. These two *qanun* are followed by two planning documents, first is “*Rencana Aksi Daerah Pengurangan Risiko Bencana Aceh tahun 2010-2012*” (local action plan for DRR) enacted by Aceh Governor regulation no 48 in 2010 (see table 6),

“Aceh is among the few provinces to have initiated the development of its own action plan, in line with the Hyogo Framework. Once completed, the plan can serve as a reference for other regions facing similar risks and can inform the National Action Plan (NAP-DRR) Framework.” (Pemerintah Aceh 2008)

The disaster management planning needs to apply considerable efforts to collect and synchronise data, however, without support from the non-governmental organizations, this can not be sufficiently achieved. The assistance from international organizations to produce the disaster management plan has also been important in order to ensure that this planning process has been seen as a top priority including its integration in development planning. The plan functions as an important stimulus to ensure that other governmental plans and programmes consider DRR and allocate a respective budget for it. This action plan is the first policy document that conceptualizes disaster resilience for the Aceh government. The Aceh government has defined resilience as the following:

“Disaster resilience is to understand the existing disaster risk, eager to act based on self capacity and ability to take an active role in disaster management to achieve prosperous and justice in Aceh” (Pemerintah Aceh, BPBA 2012)

The second planning document, Aceh disaster management plan 2012-2017 (*Rencana Penanggulangan Bencana Aceh 2012-2017*) elaborates the disaster management and the resilience building process for a five-year period. The government of Aceh defines that resilience building concept and strategy in Aceh Province as:

“Our intention for Aceh to become a sustainable and disaster resilient province is to change the paradigm of the disaster management, from emergency response to a culture of disaster preparedness. Resilience is understanding the risk, being eager to act based on personal capacity and being able to play an active role in disaster management in order to achieve a prosperous and fair Aceh.” (Pemerintah Aceh, BPBA 2012)

Both plans also outline clear responsibilities in terms of “who plans what” and “who does what“. Consequently, the plans provide clear guidance for various stakeholders in the field of disaster management in Aceh. The intended function of this planning document is firstly, as a guideline for disaster management stakeholders, secondly, to create development plans for disaster risk reduction, thirdly, to synchronize the development programs for the local governments in Aceh, and finally, to support the implementation of disaster management in Aceh (Pemerintah Aceh, BPBA 2012).

The preparation of these planning documents involved the government agency and NGOs from the provincial and municipality levels. Its aim is to provide comprehensive strategies and hence, avoid the overlaps and ineffectiveness structures. These comprehensive strategies mean that the local government is in charge of resilience building in Aceh Province. These plans are from the stakeholders and to the stakeholders:

“The planning mechanism is coordinated and developed in accordance with the local government planning principle, starting from the village, district, municipalities and provincial levels. The planning is based on the priority scale and municipality or provincial budget availability and the regulation about the authority of the central, provincial, and local government, the national and international organizations, and the community participation.” (Pemerintah Aceh 2009)

Ultimately, the government hopes that the local stakeholders including the governmental and non-governmental agencies will have a sense of ownership of these plans and participate as engaged participants. In managing disaster resilience, the Aceh government’s role is only to facilitate the process of participation and collaboration from the beginning and to promote

bottom up approaches in the planning process:

“Further steps should be taken by the government and civil society to assist the community in preparing action plans for DRR, to establish mechanisms for incorporating DRR into the government planning and budgeting process for development programmes, and to design regulatory and policy instruments.” (Pemerintah Aceh 2008)

The local disaster management plan and local action plan for DRR provides an important reference point for the mid-term development plan (RPJM) at the provincial and municipality levels. The policy statement for disaster management is implicitly integrated in the municipality’s mid-term development plan and spatial plan (RTRW) prepared by the local government as the guidelines for the five-year period of development. RPJM helps the local government to plan programs, activities, and to allocate a budget for disaster management based on the government’s political commitment and priorities. These two documents are associated with the commitment of the Aceh government to integrate disaster management in the development agenda.

During the five-year planning period, the governmental agencies should translate and define the strategies related to their programs and activities every year in order to respond to current disaster management problems in building resilience. At the local level, Bappeda as a local planning agency, and BPBD, as the local disaster management agency, work together to integrate the disaster management plan into the development plan:

“This disaster management plan is an inseparable document from the Aceh mid-term development plan (RPJMA) that contains the implementation of disaster management in Aceh” (Pemerintah Aceh, BPBA 2012)

The mid-term plan is a political statement of the governor; as a result, different governors have different levels of commitment towards disaster risk reduction. The RPJM must provide measurable indicators for the development and implementation of the plan in terms of targets and budget allocation. At the provincial level, the RPJM is called the Aceh Mid-term Development Plan (RPJMA). This planning documents are a reference for various government agencies in order to demonstrate their activities in integrating disaster resilience into their development programs.

The first RPJMA after the Indian Ocean Tsunami 2004 was prepared by the governor and presented as the new regime’s vision and mission. This is a remarkable transformation in the development plan that the Aceh governor for the first time began to mainstream disaster

management as one of the development priorities. The governor elected for a five-year period (2007-2012) was Irwandi Yusuf that has a strong commitment to implement the disaster management as one of his key goals in development agenda, particularly on collaboration to build disaster management:

“Disaster risk reduction is responsibility of Aceh government, community, and community-based organizations, working together, with the principal of partnership and equality, so we need good policies in building disaster resilience.” (Pemerintah Aceh 2007)

Five years after RPJMA 2007-2012 had been implemented, the elected governor for 2012-2017, Zaini Abdullah, combined disaster risk reduction strategies with environmental management. After the reconstruction, the local government traced the source of disaster back to a lack of environmental protection. In this regard, the governor had defined the problems of disaster management in Aceh as follows:

We understand that Aceh’s geographical, geological, hydrological and demographic conditions require a comprehensive framework for disaster management, both during a disaster, after a disaster, and for future disaster risk. That effort is an Aceh governmental responsibility to protect people lives and livelihood, including the protection of disaster victims (Pemerintah Aceh 2012).

Contrary to the expectations, ten years after the Indian Ocean Tsunami 2004, disaster management is not a key subject in the Aceh development plan (RPJMA 2012-2017). Disaster management is part of environmental management and therewith primarily seen as an environmental problem. Illegal logging and illegal mining are identified as factors that might trigger more frequent floods and landslides in Aceh Province. This shows that tsunamis and earthquakes are not seen as the top concern and key issues for disaster risk management and adaptation in Aceh.

These findings show that resilience concept has been introduced into local disaster management plans and mid-term development plans. This is particularly the fact, since the Aceh government wants to communicate the meaning and importance of disaster resilience to local governmental agencies. Through mid-term development plans, the government translated the resilience concept into more comprehensive planning approaches. In this context, the government of Aceh also defined the involvement of various stakeholders as a priority in the development agenda and thus also for building disaster resilience.

In summary, this section shows – based on the document analysis –that the conceptualization of tsunami resilience by Aceh government in the aftermath of the 2004 mega disaster began

during the reconstruction process with the principles of “building back better” and “resilient nations” from the Hyogo Framework for Actions. In the transitional period, the Aceh government prepared the Aceh Recovery Framework to continue building resilience and take over full responsibility for this after the reconstruction phase is finished. The Aceh government, with its special autonomy, has defined resilience as an important aspect in development plan and thus, promoted its consideration among various stakeholders, including the governmental agencies and non-governmental organizations. These activities and achievements discussed before (legal framework, integration of resilience into planning documents, etc.) are a clear sign that the Aceh government has been able to recover from the disaster and was able to build capacities to enhance resilience even after such a mega-disaster. However, the shift from focus on tsunamis towards different environmental issues (e.g. landslides, floods, and forest management) are depend on the new governor political interests and commitments during election campaign that have to translate into RPJMA. This is a key problem in maintaining long-term disaster resilience in Aceh.

5.2 Translating the concept of disaster resilience into practice

This section aims to answer the question on how the Aceh government translates the concept of disaster resilience into practice and to discuss the translation of this concept into various programs and activities to build disaster resilience. After reviewing Aceh disaster management documents in chapter 5.1, the analysis in this section is based on the semi-structured expert interview with members of local government agencies and non-governmental organizations that involved in disaster risk reduction and tsunami resilience building.

As explained by Freeman (2009), policy translation means the implementation of policy into practice in a reflexive, conscious and critical manners. In the context of translating the concept of disaster resilience into practice, Aceh government should have not only the capacity to implement the disaster resilience strategies, but also the capacity to reflect critically in the implementation of these strategies. The Aceh government capacity to reflect on the process of translating the concept of disaster resilience is one of the learning components from the Indian Ocean Tsunami experience.

After BRR finished their mission in Aceh, the local government struggled to continue the “building back better” concept in the development agenda. When the donor returned to their home countries, the efforts to build and maintain disaster resilience in the medium-run were quite a challenge. Key informants explained that when the donor organization’s missions

finished, the government appeared to slow down their pace of activities significantly:

After the UNDP Project (DRR-A) finished (in 2012), the government did not really care about the disaster mitigation. Even though Tsunamis are a mega disaster and Aceh is a Tsunami high risk area. When the donor left Aceh, we could see that the government was not really serious about continuing with the disaster mitigation sensitization activities. (11-NGO-BNA)

At the same time, several stakeholders began to shift to other development goals (e.g. education, public health management, and poverty alleviation) that were seen as more urgent because then years after the tsunami had been passed and thus the relevance of the resilience concept for local government officers and, in particular for local NGOs, was decreasing:

In the past, we could work actively because the UNDP supported us with funding, but when they left, we found ourselves struggling. However, (at the present) the disaster management issue is not sexy anymore. (11-NGO-BNA)

In this regard, it is important to note that there was mechanism in place for the knowledge management transfer among actors in the rehabilitation and reconstruction phase. The Aceh government did not invite the stakeholders to be involved in conceptualizing tsunami resilience and to think about the new goal after the rehabilitation and reconstruction phases. According to one respondent, the Aceh government is still trying to define the concept and thus does not have the clear regulations to support the policy:

In my opinion, what happened now in Aceh, we still try to find the concept. We should have a moment to meet our common interest in Aceh. Our current problem is not our (relationship) problem between us and Jakarta (the central government). We know that the follow up of law number 11 (Aceh special autonomy law) is not finished yet, there are also several regulations that have not yet been enacted and the Aceh government authorities are not clear on their roles and responsibilities yet. But, the most important thing is that Aceh has a big goal that (the government and people in Aceh) want to achieve. We have an internal contradiction. We need a momentum to create a big common goal that all of us understand well. But I think we don't have it yet. (51-NGO-BNA)

One of the government interests in translating the concept is to concentrate more on the emergency response side and to help the victims in local disaster events, rather than focusing on comprehensive prevention strategies. This policy is also shown in the current RPJMA that focus on the emergency response (see sub-chapter 5.1). On the other hand, this policy is not reflecting the Aceh resilience concept that aims to address resilience more comprehensively for example in the entire disaster management cycle, including mitigation, prevention, and preparation for future disaster risk. The Aceh government struggles to shift the focus from the

emergency response into disaster preparedness as a key-informant reveals:

At the moment, the resilience building concept is like the rice and instant noodle concept (analogy). It means that (the government) only prioritized the emergency response. The disaster resilience building already became part of development plans and the budget comes from the province and local government budget (APBA and APBD). On the other hand, both the legislative body and government authorities, the politicians and bureaucrats lack disaster resilience awareness. They only make the plans, but they never evaluate these plans. They allocate the budget for them but they never have an intention to integrate the disaster resilience issues into the development policy. (18-NGO-BNA)

According to the key actor interview (18-NGO-BNA), the local government did not evaluate the effectiveness of the disaster resilience plans in term of the implementations and its progress in building disaster resilience. Mostly the evaluation focused only on a balanced budget and the time of respective programs and activities. Consequently, the local government had limited capacities and perhaps also limited interest to evaluate and reflect critically on the process of translating disaster resilience into other planning programmes. Various stakeholders interviewed recognize the lack of dedication to plan, integrate and evaluate activities regarding disaster resilience appropriately and mindfully. There is no real evaluation of past activities related to the resilience building programs and activities, even though resilience itself underscores the importance to learn from past experience. The stakeholders have questioned the government's commitment and are aware of the criticisms that are frequently addressed towards the government policy:

I am not sure about the government (commitment), but the government has received many critiques. For example, the false tsunami alarm in 2007 increased the lack of public trust in the government. The government still has a lot of homework that they should work it on, especially, the government authorities and agencies. (10-NGO-BNA)

The government appears to have a substantial amount of unfinished business relating to preparedness and mitigation activities in the past. One of the remaining problems is for example the limited capacity of the government to operate the early warning system effectively. This is a major issue because the false alarm in 2007 could happen again in the future if the government does not demonstrate their commitment to learning from past experiences. This commitment is dependent on the political will of key government actor. It seems to be difficult to align political will with the need to build resilience, with significant consequences that can sometimes be opposite with the different political agenda:

The resilience building process is dependent upon the government's political

will. Whether the government pro people or pro their group? But the most important thing is to ensure that the economic machines is still working. (06-NGO-BNA)

The unclear political position provides the community with a negative perception and lack of faith in the government policy. It is difficult to invite the community to be involved when the government cannot show their sincere interests in building resilience. In terms of the government's accountability, the informants think that there is a lack of trust which prevents the community from being involved and working with the government. The community's lack of trust in the government has a negative effect on the process of building resilience:

The community's lack of capacities, (is because) the community works alone, and the government works alone. The community's level of confidence in the government is low, so they just give up (on the government). (53-NGO-BNA)

On the other hand, the Aceh government has launched the concept that is written in the planning document to explain the goal of the resilience building in Aceh. However, it seems that this official concept statement did not reach the stakeholders and public. The policy has implications are the stakeholders will have different perspectives towards the government policy. The process to promote the official concept becomes is complicated because the regulations and planning document are not enough to guide the local government in translating the concept into the development agenda:

In the past, we used the community resilience concept in our programs, but now we want to be clearer about what the meaning of community resilience and how we identify different indicators to achieve community resilience. Although people will used different indicators, but I think it is not a problem, as long as the goals is to achieve community resilience. We (our organizations) haven't started it yet but in the future, we will initiate the idea to have our own community resilience indicators. (24-NGO-BNA)

The integration of the resilience concept into development programs remains weak, meaning that not all of the concept can be utilized as a learning outcome from the disaster experience. One of the important practices from the NGOs during rehabilitation and reconstruction was to involve and approach the targeted community by asking what the community needs and wants. This learning practice is missing from the disaster resilience programs and activities that not specifically design base on the need of the targeted areas or communities. It is particularly because most of the programs and activities are planned and designed by the local government agencies without public consultation.

Findings from the semi-structured interviews show different perspectives and understandings

of the implementation of Aceh government's tsunami resilience concept. The translation process is based on the local government's experience, resource and capacities to interpret the central and local government policies. The process of translating and integrating the concept into the development agenda faces challenges because the foundations and understanding of the concept are not clear from the outset.

The main attempt to implement the resilience concept is toward the tsunami resilience principle in spatial planning. The spatial plan allows the government to include the resilience concept in the development agenda:

Before the tsunami we never thought that a mega-disaster would happen. After the tsunami, we started to design and think forward about all of the tsunami impacts, spatial planning, and community livelihood. (41-GO-SBG)

However, the idea to integrate the resilience concept into the spatial plan was not new. Before the Indian Ocean Tsunami in 2004, the initiative to plan a safer city from flood, fire and storm had already been highlighted in the Banda Aceh spatial plan:

Before the tsunami, we had already integrated flood, fire, and storms as disaster risks into the Banda Aceh Spatial plan. We have prepared for these kinds of disasters, but after the tsunami we began to consider extending the preparedness measures to include tsunami risk. (07-GO-BNA)

After the tsunami, the BRR prepared a master plan to "build back better" where the tsunami had been particularly devastating. In general, the BRR focused on the relocation of the people and located housing aid to the safer zone based on the master plan. However, the arrangement ultimately failed to relocate people or set up the city based on the new master plan. This was because most of the local government and community members were reluctant to relocate their dwellings and business centre to the safer place suggested by the master plan:

We have nothing in Aceh Jaya. Then BRR has proposed a spatial plan for Aceh Jaya, named Aceh Jaya Metro City but we never referred to that plan. In the rehabilitation and reconstruction stage, we also had a master plan related to relocation, but nothing worked. Now, we make a new spatial plan based on the government agency proposal. It is not detailed; it is instead very general. (64-GO-CLG)

Furthermore, the interviewee (64-GO-CLG) revealed that housing relocation was particularly conducted for people who lost their houses and plots of land due to various reasons. For example, for Tsunami victims that lived in the rented housing or the land of their houses have washed away (Matsumaru et al. 2012). In some cases, they can rebuild their houses in the previous location but, in many cases the rebuilding of the house in very exposed zone was

prohibited after the disaster. Most of the relocation areas (including for the governmental agencies offices) were far from the (previous) city center and difficult to access because the supporting infrastructures were not sufficient or provided yet, such as proper roads, schools, and public transportations. As a result, only 40 percents of the houses are occupied in the relocation settlement in Aceh Jaya (Arif 2014). The rest of the residents went back to their villages in the coastal areas.

Although the rehabilitation and reconstruction failed to follow the master plan, the local government has prepared another spatial plan to fulfil the central government regulations. The central government obliges the local government to follow the spatial plan in development. However, the local government's spatial plan is not better compared to the BRR master plan. It is a starting point to reflect on the importance of having a good spatial plan. This time, the local government understands that the spatial plan can be used to guide the development agenda inline with the concept of resilience:

Before the tsunami, we had a city plan based on disaster risk reduction, but it was not obligatory and there was no detailed plan for its implementation. At that moment, we only thought about landslides and storms. Tsunami's are a new thing in Aceh and people were really shocked when they experienced it. If it was a matter of coastal disaster, we only thought about abrasion. (39-GO-SBG)

The next attempt to utilise the resilience concept in the development agenda was by incorporating the concept into the development plan. The regional development and planning agency (Bappeda) integrated the tsunami resilience concept into the mid-term development program and coordinated with the government authorities to ensure that the agency follows the guidelines:

From the planning mechanism, we have included disaster risk reduction as a strategic program for RPJMA (mid-term development planning) 2012-2014. (07-GO-BNA)

Although the definition of the resilience concept is still not explicit in the development plan, the action plans and strategies support the concept. According to the interviews, the goal of achieving tsunami resilience is more important than the agreement on an exact definition of the concept. The awareness to translate the concept into the development plan is the result of the learning process and reflection after the mega disaster:

The most fundamental thing is the concept (resilient city). If we prepare plans for disaster mitigation, it means we will have policies and plans (related to it). If we focus on disaster mitigation, our aim is to have strategies. We will

have various strategies, including a strategy to provide infrastructure, tsunami evacuation shelters, spatial planning, and budgets to fund the activities. (25-GO-BNA)

The interviewee (25-GO-BNA) indicates that the Banda Aceh local government is committed to using tsunami resilience as a foundation for the development plan after the reconstruction phase has finished. To support this strong commitment, the government started to provide the infrastructure and facilities to build disaster resilience, for example, open new evacuation routes and build more vertical evacuation shelters. These strategies are one of the translations of the disaster resilience concept and the realization of the commitment to be “a resilient province”. Consequently, the budget systems have also changed to accommodate the new disaster risk reduction programs and activities in the development plan:

We have changed our budget system through RPJMA (mid-term development planning). We have modified our spatial planning base on the resilient city and Madani (civil society) city concepts. (07-GO-BNA)

In translating the concept, one of the local government strategies is to juxtapose the local concept that related to the resilience in order to simplify and understand the concept. Although the “*madani*” concept is also abstract and difficult to understand, and the government did not provide a clear definition, the community interprets “*madani*” as a good civil society with strong law enforcement. This means that resilience is a good concept the same as the “*madani*” concept.

There is a difference between the preceding and present condition. From the perspective of spatial patterns, in the past, we had a grey area. But now, we have dedicated the coastal area to green open space by reducing the residential area. We have a clear regulation for spatial planning and the law enforcement for the plan. (25-GO-BNA)

The Banda Aceh local government has used “*madani*” and “resilience” for the city’s branding. It indicates that the concept of tsunami resilience has been transformed into a wider concept. When the concept was translated into the local context, it had to be consistent with the local values, norms, laws, faiths, science, and technology. After the Indian Ocean Tsunami 2004, the concept of “*madani*” includes building disaster resilience as one of the important components in city development. This new city branding is one of the results from the learning process and reflection after the mega disaster.

In contrast, although Aceh Jaya was severely affected by the Indian Ocean Tsunami, the local government did not have a clear idea of tsunami resilience. Prior to the tsunami, resilience was not recognized as a critical part of the development agenda for the local government. This

changed following the reconstruction of Aceh Jaya. The local government prefers to focus on build back the livelihood sectors such as fisheries and tourism:

Here in Aceh Jaya, we do not focus on disaster mitigation, but we want to develop Aceh Jaya as a region based on fisheries and marine sectors for community livelihood from the fish processed industry and marine tourism. (64-GO-CLG).

On the other hand, the local government has a lot of work to do to deal with the annual flooding that affects the livelihoods and communities in most areas of Aceh Jaya. The medium-term development programs accommodate flood risk in only a few villages in Aceh Jaya under disaster mitigation efforts. As such, the concept of disaster resilience is focused only on floods that are certain to occur every year but not tsunamis that happened in the past but cannot be predicted.

A different concept of tsunami resilience is presented by Sabang local government. Although, the community had not thought that tsunamis were a disaster risk that they faced, Bappeda, the local government planning authority, placed great emphasis on building a tsunami resilience. Disaster risk reduction is the main planning concept for development before and after the Indian Ocean Tsunami:

Before the tsunami, we had city planning based on disaster risk reduction, but it was not an obligation and there was no detailed plan for it. At that moment, we only knew about landslides and storms. Tsunami is a new thing in Aceh and people really shocked when they experienced it. If it related to coastal disaster, we only know about abrasion. (39-GO-SBG)

As a small Island, Sabang local government realizes that their areas are vulnerable to coastal risk. Although Sabang was not severely impacted by the Indian Ocean Tsunami in 2004, the mega-disaster was a tipping point for the government to start to prepare also for tsunami risk and to promote tsunami resilience. With support from the central government and non-governmental organizations, the Indian Ocean Tsunami in 2004 offered possibilities for the government to enhance and improve their capacity for disaster risk reduction. In contrast, various public institutions and local communities in Sabang did not perceive tsunamis as a risk. More specifically, they conclude from their experience of the Indian Ocean Tsunami in 2004, that Sabang is a safe area:

We never experienced a Tsunami here. If an earthquake occurs, people will not evacuate in panic. It is not like in Banda Aceh when people run desperately. Here in Sabang, we are calm and confident when an earthquake strike. (43-NGO-SBG).

The perception of the respondent reveals that people think that tsunami resilience is already present in Sabang because the recovery time was very short, and people returned to their normal life right after the disaster. Furthermore, people from Sabang even helped the tsunami victims in Banda Aceh. The tsunami risk is acknowledged as a risk factor, but from past experiences they are confident that they are able to manage risk and raise awareness. Consequently, they assume that they have already learned how to deal with mega-risks.

The empirical analysis shows that integrating the concept of resilience into spatial and development plans is challenging. Significant gaps between the planning documents and the concept and operationalization of resilience were revealed and are a major challenge when aiming to sustain long-term resilience particularly at the local level. According to the Aceh government survey on the progress of the implementation of the Hyogo Framework (Action 21) municipalities in Aceh, on average, have been active in applying the respective indicators, but only reached level two in the overall implementation. Level 2 means “minor progress achieved in disaster risk reduction, with no systematic commitment” (UN/ISDR, 2008, p. 40). This progress survey was part of the disaster management plan in 2012 and the progress assessment is called the “*Indeks Ketahanan Aceh*” (Aceh Resilience Index).

According to the expert interviews, the Aceh government has prepared a complete disaster management planning document, but the document has become a piece of paper rather than a living document that holds significance in efforts to build resilience. It is difficult for the government to introduce the plan to the stakeholders and community because the government lacks commitment and capacity to implement the document. The government has never achieved an effective planning document due to a lack of synchronization between planning and development:

We have prepared the action plan for disaster risk reduction for Aceh Province in 2010. After three years, there has been no follow up for that plan. Then we made a disaster management plan for Aceh Province (2012-2017). These documents are the companion documents for RPJMA (the long-term development plan). But there is no guarantee that the government will use the action plan and disaster management to support the development plan. The problem is that no one is responsible for integrating these plans into the development plan. They make the plans, but they will not implement them. (26-NGO-BNA)

According to the respondents, the planning document is not used as a main reference in the current development. This is because there is no mechanism to ensure that development will comply with the development plan. Consequently, the limited effectiveness of development

planning itself hampers also the implementation of resilience building through such instruments and measures. The only obligation is that municipalities have this document at hand, but whether development follows the guidelines in the document is often a very different question. The Aceh government's efforts to provide the document are not based on a deep understanding of the importance of the planning document but rather simply to comply with the central government regulations.

Aceh has a comprehensive planning document, but we should check it fits with our needs. The challenge is that when those planning documents are prepared, and then the authority stores them in the cabinet, where the document will be on display so that if the central government authority asks about the document, they can show it to them. But we never know; has the government made the community aware of that document? That is the big question; do the community members know about that document? If the community is not aware, they need to be informed that document is available. (24-NGO-BNA)

According to one respondent, the local government's lack of informing the community is a bargaining position in the decision-making process. It means that the opportunity for the community members that affected or targeted to comment or discuss the planning document is very limited. This is one of the government strategies to accelerate the decision-making process without having the obligations to answer the comments. The intention to involve the community in the process fails because the community's opinion is not listened to by the government:

We try to participate in the spatial planning process; we give many inputs and suggestions to the government, but we often face problems. We cannot begin the discussion until the plan reaches the legislative level. We open dialogues with the government authorities. We try to open the space for public discussion, with many stakeholders, with the press. Then we have problems because we have no power to follow up our input. We cannot advocate this until the decision maker level of government. No stakeholders can back up our efforts to give the government some input. That is our weakness. (16-NGO-BNA)

Indeed, civil society rarely provides input to the government because the decision-making process related to the input is a long process and there is no guarantee that government will accept it. There is a general option for the community to comment and discuss plans developed by the local government, but whether the comments and critiques is taken into considerations remains unclear. (20-NGO-BNA)

There is a lack of evidence that the government will follow up on the advice that is given from the stakeholders and community:

We try to give our input to the government, but our ability to advocate the suggestion is weak. We are not able to guard it and to push our concerns in their discussions. (20-NGO-BNA)

It seemed that the implementation of a bottom-up approach was difficult to conduct. The evidence of successful bottom-up approaches for participation is limited. The local government often prefers to take a “top-down” approach based on the common procedures. The respondents are aware that their efforts to contribute in the process will be fruitless:

The government still applies a top-down approach to planning. As a result, the planning at village level is never recognized in the government’s development agenda. (06-NGO-BNA)

In summary, the interviews reveal that in terms of conceptualizing resilience at the local level, there is a lack of common understanding in translating the policies into various programs and activities. The government has a lack of capacity and political commitment to translating the resilience concept into the spatial and development plans. The significant gaps in translating the concepts evolve around the capacity of government to invite the disaster management stakeholders and community to contribute to the process of the translating the resilience concept. The government prefers, instead, to implement a top-down policy in decision making and the lack of the attention to the community voice in governing current disaster management in Aceh Province results.

5.3 Evidence of resilience building process

This section focuses on examples and the evidence based for building disaster resilience in Aceh after the mega-disaster. According to Davies (2015), community involvement and stakeholders partnerships are key in order to maximize the affectiveness and to ensure benefits in the implementation for various stakeholders. The findings show that the disaster resilience concept has been translated into different strategies and approaches to govern the disaster resilience at the local level, however, various approaches lack comprehensive community involvement and comprehensive approaches that connect different actors and capacities effectively. Consequently, various approaches examined fall short in enhancing coordination and collaboration. Most of the governmental organizations have integrated their programs as part of their obligation to mainstream disaster risk reduction into development planning. On the other hand, NGOs worked together with the grass root level community groups and introduced

new strategies that in some cases provided approaches for better connecting different stakeholders. However, these approaches often were dependent on additional funding of specific donors. In this regard, this section will also examine the differences between approaches employed by governmental agencies and NGOs.

Table 7 shows the current programs, activities, and legislations to promote Tsunami resilience in Indonesia. These programs and activities were the translation and interpretation of the concept of Tsunami resilience by BNPB, as indicated in the Tsunami resilience master plan (BNPB 2012). This Tsunami master plan is a main reference for the local governments to design and implement programs to achieve Tsunami resilience particularly in high Tsunami risk provinces and municipalities.

Table 7 National Tsunami Resilience Programs and Activities

Programs/Activities/Exercises	Regulation/Guidelines/SOP
Evacuation route map	Planning evacuation route and evacuation sign board
Evacuation route maps and evacuation steps/stairs	Development of tsunami risk map at district/city level
Evacuation signboards and warning boards	Management of tsunami evacuation shelter
Sensitization and dissemination of temporary evacuation shelter	Community-based preparedness to anticipate earthquake and tsunami
Resilient villages	Planning for the installation of sirens and community based EWS
Volunteer groups and strengthening volunteers' capacity	Tsunami drill
Emergency response logistics and equipment	Integration of DRR into spatial planning
Emergency operation center	Temporary evacuation shelter
Sirens warning with modest technology	Review of Tsunami master plan
Shelter or tsunami evacuation shelter	Standard operating system for decision making on evacuation at local level
Formulation of disaster management planning and contingency planning at local level	The preparedness capacity building Source: (BNPB 2012, 2014b)
Table top Tsunami evacuation exercise	
Community self-evacuation	

As the concept of resilience has been translated into different programs and activities by different stakeholders (e.g. Government, NGOs, academia, and community), the approaches, and the targets vary (BPBA 2012; UNDP Indonesia 2012). In general, the target groups include school communities, persons with disabilities, women, and communities in tsunami risk areas. The different stakeholders have a particular target group that they aim to work with to promote resilience. The governmental organizations prefer to work with the formal institution such as school communities or at the village level government, whereas, the NGOs work in their community-based practices with more detailed programs and clear objectives. But, most of the strategies have been translated into disaster mitigation programs and activities:

If we focus on disaster mitigation, our aim is to have strategies. We will have various strategies, including strategy to provide infrastructure, tsunami evacuation shelter, spatial planning, and budget. That is the difference between the previous and present-day conditions. (25-GO-BNA)

According to the tsunami master plan, the Indonesian government has three core strategies to build tsunami resilience, (1) strengthening the early warning system chain, (2) establishment and enhancement of temporary evacuation shelter, and (3) strengthening preparedness and disaster risk reduction capacities (BNPB 2012). From these three strategies, different programs and activities were derived by governmentals and non-governmental actors (NGOs). Table 8 provides an overview of key strategies of governmental and non-governmental organization and actors to promote resilience building.

Table 8 Stakeholders strategies, programs and activities for building tsunami resilience

Strategies	Programs/activities/projects	Stakeholders	
		Governmental Agencies	NGOs
Strengthening the early warning system chain	Warning and communication system	BMKG, BPBD	RAPI
Establishment and enhancement of temporary evacuation shelter	Evacuation areas	BPBD, Dinas PU, Bappeda	
Strengthening preparedness and disaster risk reduction capacities	Scientific research related tsunami		Aceh Institute, ICAIOS Karst, Walhi
	Local hazard mitigation planning		SIBAT, PMI, Tagana
	Civil volunteer organization	Dinas Sosial	
	Evacuation routes and signs	Dinas Perhubungan	
	Educational program	Dinas Pendidikan, SMP Negeri 1, SAR	
	Public awareness programs		YRBI, PMI, American Red Cross, Solidaritas Perempuan, IOM, WCS, FFI, Informal leader, Professional association
	Tsunami safety drill	BPBD	

Source: own from the semi-structured interviews

The experts semi-structured interviews revealed that the programs and activities in building disaster resilience in Aceh follow three core strategies that are mentioned and outlined in the Tsunami master plan (see table 4). Most of these projects were part of the rehabilitation and reconstruction efforts (2005-2009). The number of projects reduced significantly after the rehabilitation stages ended in 2010. This finding shows that non-governmental actors

significantly reduced their activities after a while and in many cases the question is whether or not governmental agencies are willing and able to continue respective efforts and to insert such strategies and measures into their regular development budget.

5.3.1 Strengthening the early warning system and evacuation

The Tsunami Early Warning System (TEWS) is the main strategy to promote tsunami resilience in Aceh Province. TEWS is one example of the collaboration between international organizations, different levels of governmental organizations, and community groups to reduce future tsunami risk. Key actors involved in the TEWS such as BMKG, BNPB, LIPI and local governments have clear roles and responsibilities related to awareness raising and the preparation of potentially affected communities (BMKG 2010). At the local level, the local authority's capabilities and preparedness are main factors that decide about the effectiveness of the early warning system, even though the warning itself comes from the national level. The local regulations, technical capabilities, awareness, coordination and collaboration are important elements that need to be strengthened by actors at the local level, particularly governmental actors. On the other hand, NGOs are expected to evaluate the performance of TEWS, especially after a big earthquake occurs.

This research found that the regular maintenance and testing of Tsunami sirens at the local level are rarely conducted. For example, the false Tsunami alarm on 4 June 2007 was happened when the Tsunami warning sirens were activated without BMKG official warnings (BNPB 2012; Oktari et al. 2014). On the other hand, the evaluation of the Tsunami warnings activation at 12 April 2012 found that the Aceh government did not activate the alarm after BMKG issued the first Tsunami warning. At that time, the warning operational centre was locked and there was no governmental official that ready to disseminate the warnings from BMKG (Tim Kaji Cepat 2012). After these warning cases, people questioned the commitment of the Aceh government to participate actively in the dissemination of TEWS.

In addition, the effectiveness of the early warning system is also hampered by the fact that various local stakeholders and communities lack knowledge on how to respond to the warnings. After the earthquake and warning dissemination many people went to the street and showed a panic reaction that also caused chaos and traffic jams (Goto et al. 2012). Evacuation is difficult in such chaotic conditions:

At this present, we do not have a good (early warning) system, especially, in Banda Aceh. If we want to evacuate, the traffic jams are everywhere. (17-NGO-BNA)

and

When the earthquake occurred, the electricity was shut down which made the tsunami alarm inactive. Later when the power returned, the alarm was automatically activated, but people didn't care about the warning, they didn't trust the early warning system anymore. (52-NGO-BNA)

TEWS is the responsibility of both the BMKG and local government but many local governments seem to be reluctant to play their significant part and be directly involved in the management of TEWS. The local regulations to support the system have led back to the local regulations, evacuation plans and a contingency plan for local stakeholders. However, as the main actors responsible for sustaining the early warning system, the local government still fails to take a position of leadership to strengthen the early warning chain. The political commitment from the local government leader is missing:

We have a SOP (Standard Operating System) for early warning system, but we do not know if the government implemented the SOP and do the government authorities that have a significant role in that process, realize that they have this role? For example, we have a new governor and new chef of agency; but do they know that they have a significant role in the early warning system? We need an update for this process. We should anticipate, that we are wasting our SOP. This is currently a big problem, and it is because our institutional ego still strong. (10-NGO-BNA)

The interview result indicates that the governance of the early warning system in Aceh needs significant improvement. It shows that the question whether the roles of the institutions in the early warning chain are clearly defined is an open question and not sufficiently clarified. Many local government stakeholders have not realized that they have key responsibilities and duties in TEWS. Also changes in staff and limited TEWS infrastructures maintenance hampers the system effectivity. In addition, the non-governmental sector and non-governmental actors were not sufficiently invited to engage in the TEWS and the preparedness activities of communities to respond to early warnings. The findings of this survey reveal that the community is not properly aware of the TEWS system and in some cases has also only very limited trust in the system and respective institutions. This is also due to the fact that communities have experienced false alarms and delays in warnings being issued. This affects the community's perceptions of the effectiveness of TEWS:

I am not sure that Banda Aceh has a SOP (Standard Operating System) for an early warning system, I am not sure whether they (the government) have raised awareness about the procedures or perhaps, they will not raise awareness because they struggle to understand the system (24-NGO-BNA).

The local government has various programs and activities to support the warning and communication system. The evacuation of residents after the warning has been issued or released is the next challenge that the local authorities face. One of the programs aims to provide sufficient evacuation infrastructure and the establishment of the effective escape routes in order to ensure anticipated responses. Local authorities often have established these system and strategies for evacuation based on the experience and studies of evacuation behaviour after big earthquakes occurred (e.g. 8.5 on the Richter Scale earthquake in 11 April 2012). This program aims to extend the road and provide alternative routes for the community:

We have established escape routes. In the past the road was narrow and now we have wide road for evacuation. After the tsunami, we started the road-widening projects and enacted the name of the roads that used as the evacuation routes. We planned the north ring roads (in Banda Aceh) as the buffer for the evacuation routes. We also started the road-widening projects to Ulee Lheue and plan to widen the road to Syiah Kuala and the street villages in that area. This plan has established the BRR blue print concept and now we have adopted it into the Banda Aceh spatial plan. (25-GO-BNA)

The local authorities have collaborated with many stakeholders to respond to the challenges linked to the providing of safe evacuation routes. In this regard, suitable evacuation routes and signs, widening of roads, and awareness raising activities for safe evacuation routes were important activities. After the tsunami, the local authorities evaluate the rehabilitation blue print that was prepared by BRR and modify it with the current spatial plan. It has been argued that the local governments are keen to learn and adapt based on their experiences of managing evacuation. Furthermore, the local authorities plan to conduct traffic simulations to consider the behaviour of people evacuating by personal automobiles:

We have planned to make a traffic simulation for tsunami evacuation. The (Banda Aceh) Mayor has instructed to make it. We will have a responsible officer in every evacuation point that has to manage the evacuation traffic. For example, from the police officer and army that have their offices are located near the evacuation routes (02-GO-BNA)

The interview result indicates that the governance of the early warning system in Aceh needs significant improvement. It shows that the question whether the roles of the institutions in the early warning chain are clearly defined is an open question and not sufficiently clarified. Many local government stakeholders have not realized that they have key responsibilities and duties

in TEWS. Also changes in staff and limited TEWS infrastructures maintenance hampers the system effectivity. In addition, the non-governmental sector and non-governmental actors were not sufficiently invited to engage in the TEWS and the preparedness activities of communities to respond to early warnings. The findings of this survey reveal that the community is not properly aware of the TEWS system and in some cases has also only very limited trust in the system and respective institutions. This is also due to the fact that communities have experienced false alarms and delays in warnings being issued. This affects the community's perceptions of the effectiveness of TEWS:

I am not sure that Banda Aceh has a SOP (Standard Operating System) for an early warning system, I am not sure whether they (the government) have raised awareness about the procedures or perhaps, they will not raise awareness because they struggle to understand the system (24-NGO-BNA).

The collaboration to enhance the capacity of local actors to strengthen the early warning system and resident evacuation is needed. Many of local actors are highly motivated to be involved in the governance of the TEWS. These local actors have gained own experience with the TEWS and developed high expectation towards the effectiveness of TEWS. The development of early warning systems was not completed when the infrastructure and technical system were established.



Picture 7 The control room for the earthquake events in BMKG office Mata Ie
source: own

According to the interviews conducted, the most important thing is to fill the gap between good technical systems and infrastructures and to raise local stakeholder's awareness of the need to sustain the early warning system. The challenge is to identify the type of collaboration that can

best engage the local actors to share and exchange their experiences related to TEWS.

5.3.2 Establishment and enhancement of vertical evacuation shelter

Banda Aceh has three vertical shelters or escape buildings (in Alue Deah Tengoh, Deah Glumpang and Lambung in Meuraxa Districts) that were constructed during the rehabilitation and reconstruction phase by BRR and contributions from international organizations. One of the escape buildings is in Ulee Lhee and managed by TDRMC (Tsunami Disaster Research Mitigation Centre) which conducts research related to tsunamis. People from Banda Aceh city centre also can evacuate to the Museum Tsunami. The escape building in Aceh Jaya is even used as the BPBD office.



Picture 8 Aceh Jaya BPBD office
Source: own

The tsunami evacuation shelter is an important asset for managing tsunami resilience. The construction of the building is a valuable asset that should be preserved as one of the lessons learned from a mega disaster. At the local level, the escape buildings are maintained by the local government. BPBD's role is to promote and establish the local regulations related to the function of shelters as the evacuation building. Dinas PU (Public Work Agency) is responsible for maintaining and managing the physical structure of the escape buildings to ensure that they are able to resist the earthquake and tsunami impact. Bappeda manages the capacity of the local government to integrate the escape buildings into the spatial plan and to ensure that BPBD has sufficient programs and activities to maintain the function of the vertical shelters.



Picture 9 Tsunami evacuation map in a village in Aceh Jaya
Source: own

These facilities need special management (for example: structure of the building, accessibility, drinkable water access, phone, lights, and emergency kits) due to their functions to provide protection from tsunami inundation. However, under the local government management, the effectiveness of the escape building as the main evacuation place is still low. The community who live near the shelters rarely use the building for evacuation:

I have seen the vertical shelter for tsunami evacuation, but I think if the tsunami comes again, people will not use that building for evacuation. Anyone that has experienced the tsunami (in 2004), they know the height of a tsunami wave. So, if they decide to evacuate there, I am sure they will feel insecure and wonder if the building is strong enough to withstand the tsunami wave. They will evacuate as far as possible and I am sure people will never want to use these buildings for evacuation. (16-NGO-BNA)

The community lacks trust in the capacity of the evacuation buildings to protect them from a tsunami inundation. One of the reasons is because the location of those evacuation facilities is also not seen or perceived as appropriate based on the tsunami inundation area in 2004. The traumatic experience of many people in that area that were hit by the Indian Ocean tsunami combined with the lack of capabilities to ensure that communities evacuate to the facilities in the case of an emergency limits the value and effectiveness of the evacuation shelters. It appears that during large earthquake events, and following the Indian Ocean Tsunami, people would prefer to evacuate overland by car. The community has learned from past experience that the height of a tsunami wave can be higher than the evacuation building, and hence they are afraid that the building may collapse or not be sufficiently high for providing a safe place. These

comments and findings are based on interviews conducted with NGOs that were invited to discuss the effectiveness of the existing escape buildings as part of their projects (16-NGO-BNA).

In addition, the location and the design of the vertical shelters does not match the needs of the local community's needs, particularly for the elderly and disabled people:

(Evacuation) infrastructure is not used optimally by people. People do not evacuate to the vertical shelter for tsunami evacuation. For example, in Lambada (name of one village near Banda Aceh), the staircase to evacuate to the hill is too steep (19-NGO-BNA)

The local actors should maintain tsunami evacuation as a structural mitigation effort to support the evacuation plan and other regulations that are related to the management of these shelters. The local government ignored the comments related the community perception of the escape building capacity. The results underscore that the local actors lack of capacity to promote these escape buildings as a safe evacuation shelter. The community needs more sensitization about the structure of the building and more supporting system to improve the effectiveness of these structural mitigation structures:

I think people in Banda Aceh do not want to use the (vertical shelter evacuation) building because they also want to save their property too. The information about where to evacuate, the condition of the evacuation building, and other information related to that, at this moment has not yet become a critical discussion point for organizations that have worked in Banda Aceh (24-NGO-BNA)

The interviews reveal that BPBD, Dinas PU and Bappeda have collaborated to manage the escape building. However, it is equally important to invite the participation of the non-governmental sectors and communities to increase the effectiveness of the escape building. The building authorities allows the community to use these buildings as a community center, but the maintenance of these buildings is remaining unclear. The establishment and enhancement of temporary evacuation shelters is dependent upon the government strategies that rely on collaboration with local actors. This collaboration should encompass also activities to sustain preparedness and the evacuation shelters and therefore additional stakeholders are invited not only for using but also for regular maintaining these facilities.

5.3.3 Strengthening preparedness and disaster risk reduction capacities

The strategy to strengthen the preparedness and disaster risk reduction capacities has been translated into various programs and activities from different organizations that worked during

and after the rehabilitation and reconstruction in Aceh Province. The findings of this research and particularly the interviews underscore, that a variety of different measures and strategies has been developed and conducted to build resilience, however, their effectiveness, acceptance, and implementation is still not sufficient and the analysis hints towards areas that need more attention, such as the acceptance and maintainance of the evacuation shelters.

In term of strengthening preparedness and disaster risk reduction capacities, the planning programs and activities include important activities, such as awareness rising, knowledge management, and procedures for evacuation. However, the document analysis also revealed that community training is a common method to promote public awareness. The training targets the community members that live in the high tsunami risk areas and trains them on how to react to a tsunami. More targeted training was conducted for the women who were identified as having a low capacity and need special assistance for being better prepared for disasters:

We organised disaster risk reduction and first aid training. This training saw five hundred women participate from the grass roots level, from 19 women's groups in 19 villages in Aceh. (04-NGO-BNA)

The training primarily aims to prepare women to evacuate and can help other victims as well. This is based on the data of victims from the Indian Ocean Tsunami 2004 that more than 80 % women and children died in some villages (Frankenberg et al. 2011). This specific program is a common NGO activity designed to carefully target particular participants and special vulnerable groups. The NGOs have examined the backgrounds of the target group and mapped out their needs. This strategy improves the effectiveness of the training because it is specifically designed to fit the needs of the target group.



Picture 10 Disaster management training for the village leaders in BPBD Banda Aceh
Source: own

On the other hand, to maintain and increase the effectiveness of the training, the organizations have to build informal relationships with the target groups and design follow up activities. These follow-up programs intend to maximize the training benefit and to empower the participants to act as volunteers with sufficient disaster management knowledge:

BASARNAS conducted training for the people in the municipalities based on the disaster risk in their area. This volunteer is a community member that received the training from the Basarnas (09-GO-BNA)

Public safety education is conducted at school to improve the knowledge of children on how to behave correctly in emergency situations, particularly if an earthquake or tsunami strikes the community. BPBD encourages schools to establish school-based disaster preparedness activities (*sekolah siaga bencana*):

After the Tsunami (in 2004), we wanted to establish sekolah siaga bencana. The student of this school will learn how to react in case of a tsunami (02-GO-BNA)

The concept of *sekolah siaga bencana* depends on the project or organizations understanding on how to prepare school communities to evacuate safely in disaster events. This program targets schools that were affected by the Indian Ocean Tsunami 2004. However, the numbers of schools and organizations that have organized this program remains unclear in Aceh Province. Interviewee 02-GO-BNA hopes that the local government and communities can support schools and participate in this program, however, a systematic overview is missing.

It is noteworthy, that the concept of school-based disaster preparedness is not prepared by the education agency. The initiative and intention to include tsunami preparedness in the school a

curriculum is discussed often rapidly between different local stakeholders, however, the implementation in Aceh is still not sufficient according to the interview results:

The education agency did not have a special program (for disaster preparedness) that were integrated into the school curriculum or local-content curriculum even though Aceh is an earthquake high risk. (13-NGO-BNA)

Even though the implementation of tsunami preparedness is not a legal requirement in schools, many schools integrated disaster preparedness into their school curricula and initiated activities to strengthen tsunami knowledge of school children and teachers. Various schools encouraged teachers to discuss the tsunami and individual preparation activities with the students:

We have integrated (the disaster preparedness) course as part of the geography, biology, Bahasa Indonesia courses in schools (03-GO-BNA)

During the rehabilitation and reconstruction phase, the establishment of school-based disaster preparedness were part of the main strategy of various NGOs to build disaster resilience. The challenge is to sustain and support the schools that participate in this program after the NGOs projects have been finished and financial support has run out. In some cases, several schools have continued to develop programs and activities by their own funding because they realized that this program is useful and important for their students. They try to continue these activities with their own initiatives:

We have conducted tsunami drills and self-evacuation training five times since 2009 (in our school). Self-evacuate training is a training for the students to be able to evacuate in the case of a tsunami with their friends and with no need to wait for the school committee. It is school policy to conduct this training annually. We often invite expert (disaster management expert), for example the red cross organization (for trainee). (03-GO-BNA)

The coordination between NGOs and local government still needs to be improved in order to create more synergies between governmental and non-governmental organizations and their activities and training programmes:

Basarnas has conducted program „SAR goes to school “. This program is a sensitization program for SD (primary school), SMP (junior high school) and SMA (high school) students. This program raises awareness of what to do in the case of a disaster and provides training for evacuation (09-GO-BNA)

Although many schools participated in school-based disaster preparedness in Aceh Province, the effectiveness of the implementation is still not sufficiently evaluated by these schools and other stakeholders. On the other hand, *sekolah siaga bencana* is not only developed in Aceh,

but BNPB has replicated this educational program in other provinces, for example in Yogyakarta and Jakarta. To support BNPB in conceptualization of *sekolah siaga bencana*, the Indonesia consortium for disaster education has developed the policy document and framework to establish more *sekolah siaga bencana* in Indonesia (Konsorsium Pendidikan Bencana Indonesia 2011). This framework is important to encourage the respected stakeholders to evaluate this program before developing and replicating it.



Picture 11 SMP 1 Banda Aceh as on of the school-based disaster preparedness
Source: own

Overall, the findings show that various preparedness programs and activities have conducted in schools, however, activities to maintain these programmes and the progress made is needed in the future. Collaborations may enhance the realization of the remaining programs in the future:

There are many actions that are still not yet done, such as the installation of evacuation signs, construction of tsunami escape buildings and raised areas, as well as disaster education materials for school children(64-GO-CLG)

The semi-structured interviews with the experts found that disaster preparedness at the local level is dominated by activities related to awareness raising. The results underscore that the strategies to promote disaster preparedness through various educational programs aim to transfer the tsunami experience and knowledge gained during the emergency response, rehabilitation, and reconstruction by learning and reflecting from the existing preparedness programs. The legacy of the 2004 tsunami is the main tool to promote public awareness of the need to educate the next generation.

5.3.4 Summary

This chapter has presented the empirical findings for the conceptualization of tsunami resilience and how the local governments translate the resilience concept into development agenda. In the first part, the document analysis revealed that the Aceh government has developed a strong structure of disaster management organizations and policies in Aceh Province. The local disaster management regulations and policies (see table 6) are in place and show the general long-term political commitment to maintain and build disaster resilience in Aceh. This formal rule system encompasses governance rules, particularly also issues of collaboration to build disaster resilience in Aceh Province. The content of these laws is comprehensive and clear that can be used as a main reference in conceptualization and translation of disaster resilience after the Indian Ocean Tsunami 2004. The Aceh government has capitalized on the post-disaster principle to build back better with assistance from the external organizations that worked on the rehabilitation and reconstruction process. As a result, Aceh province has established various local regulations and planning documents (e.g. Establishment disaster management, collaboration, DRR action plan, and SOP for TEWS) to build a strong foundation for new systems of governance in disaster risk management in Aceh Province.

The analysis in the second section focused on local government efforts to translate the concept of tsunami resilience into practice at the local level. The resilience concept has been introduced to local governments or applied by local governments through the integration of the concept into the spatial and development plan. It is suggested that the integration of the resilience concept in development programs is still weak, particularly the set-up of specific strategies and measures, such as evacuation routes, location of the vertical evacuation building, and maintenance of the existing evacuation facilities. That means that the local government still struggles with the implementation of current programs and activities to enhance strategies and approaches to maintain long-term disaster resilience in this area.

The mechanism for translating the concept into practice are still weak. Particularly, the incorporation and application of participatory approaches is needed in order to shift from a top-down to bottom-up approach and to promote self-organization in communities exposed to potential tsunami risks. Although the procedural rules to include public participation is highlighted in local regulations, local governments struggle to follow up the comments from the community related their policies and actions. The consideration of comments by different community groups in public planning and public participation procedures is still weak and

needs to be improved in order to use the full knowledge within these communities to build disaster resilience.

The analysis of preparedness and awareness raising activities in schools underscored that various activities have been conducted and that many schools are still actively promoting disaster preparedness in terms of tsunamis. However, the analysis also showed that the educational ministry for example has not been a major player in this context and also a systematic overview of the activities conducted in schools is still lacking. Consequently, it is difficult to evaluate whether the preparedness activities in schools for teacher and students cover all schools or only those that were active from the beginning. More systematic information and evaluation tools would be needed to improve the knowledge about the maintainance of these activities in all schools.

Overall, the process of translating the resilience concept into practice lacks the integration of participatory approaches and principles, since stakeholders and the community cannot directly contribute to the development of the strategies and the decision-making process. Therefore, a stronger commitment to learn and critically reflect current activities is needed by local governments that also involve other local actors in the process in order to maintaining long-term disaster resilience. This collaboration is not only needed during concrete activities, but also within the definition of the specific meaning of the concept of disaster resilience for a specific community.

6 Tracing the governance: maintaining medium and long-term disaster resilience

In the previous chapter, the conceptualization and translation of disaster resilience have been discussed to understand the government strategies and approaches to build resilience after the Indian Ocean Tsunami 2004. After having analyzed the conceptualization of the tsunami resilience in the province of Aceh and the problems in translating the concept of resilience from local actors to various development plans and programs, this chapter will highlight the governance aspects in managing resilience at the local level.

This chapter aims to answer one sub-research question: how local actors collaborate with each other in the development and maintenance of building resilience to disasters. The collaboration that is mentioned in this chapter, refers to informal and formal efforts between different stakeholders, particularly their various approaches and strategies (e.g. Establishment of local disaster management agency and enactment of local disaster management regulations) in building tsunami resilience after the Indian Ocean Tsunami in 2004.

According to Ostrom (2009), the regulations, laws, and rules that have established to maintain long-term disaster resilience consider as the key component in disaster resilience governance system. In this chapter, disaster resilience governance system considers as the important components in managing disaster resilience at the local level. The analysis of these important components focuses on learning and self-organization in the governance process of stakeholder collaboration to maintain long-term disaster resilience following the Indian Ocean tsunami in Aceh province.

This chapter argues that the disaster resilience governance is weak in stimulating or organizing the room for self-organization and learning in managing disaster resilience and that this has affected the effectiveness of the collaboration. This is problematic since self-organization and learning were defined as important characteristics of resilience building in social-ecological systems, like coastal communities (Birkmann et al. 2016a). Self-organization and learning refer to the ability of the actors to capitalize on the mega disaster experience to enhance their ability to manage disaster resilience.

This chapter is divided into five sections. The first section presents three important features of governance; the initiation of collaboration to manage resilience, the range and plurality of stakeholders and the various strategies that have been translated into programs and activities for managing disaster resilience. As such, the analysis will discuss self-organization and learning that direct the integration of the resilience concept into governance practice at the local

level. The second section substantiates this argument by giving the analysis on the stakeholder's roles and participation in building disaster resilience. The third section discuss the changes in the roles of NGOs, particularly after NGOs contribution in the recovery efforts. The fourth section provides a brief overview of the establishment of the "*Forum Pengurangan Risiko Bencana*", a local multi stakeholder forum at the provincial and municipality levels under a government strategy to invite various stakeholders to be involved in building disaster resilience. The report's findings from the interviews carried out with local actors that are currently engaged in the collaboration. Some of the informants have been involved in setting up the multi-stakeholder forum from the outset. The last section is concluded what appeared as the key findings from this chapter.

6.1 Governing disaster resilience at the local level

This section evaluates the governance process in managing disaster resilience through the governmental and non-governmental perspectives. The analysis of household surveys is also presented to provide an evaluation from respondents at the community level that look at the governance of disaster resilience in Aceh Province during and after the recovery process ended in 2010. Bevir (2011) defines governance as "the complex processes and interactions that constitute patterns of rule." In this chapter, governing disaster resilience refers to the process of government, NGOs, and community manage the specific interactions and processes of building disaster resilience.

The involvement of the governmental authorities, NGOs, and community in resilience building is one of the Indonesian government's recent strategies to implement the national disaster management law that was enacted in 2007 (BNPB 2012). This disaster management policy entrusts the local government with collaborating with the governmental and non-governmental stakeholders in resilience building. It could be argued that the collaboration between the government and NGOs in building resilience at the local level was intended to enhance the effectiveness of managing resilience through the engagement of different actors that have experienced and learned from the Indian Ocean Tsunami in 2004 in Aceh Province.

The process of sharing power with different stakeholders and creating networks began immediately after the emergency phase. At that time, the local government was only a spectator and the community were still suffering from the disaster impacts. However, the attributes of governance that can be translated into good governance began to be promoted by the non-governmental and international organizations that worked in Aceh. Part of their mission was

to hand over the reconstruction and learning process to the local government. The process was not simple given the pre-existing lack of trust between the local government and the NGO organizations, particularly the need to promote collaboration in maintaining long-term disaster resilience.

After the emergency response was completed in 2005, the BRR was the only government authority that was able to collaborate with the non-governmental organizations. The BRR coordinated with many organizations and developed networks during the rehabilitation and reconstruction phase. On the other hand, the BRR invited a small number of government agencies to engage in the rehabilitation and reconstruction effort. At the local level, the government authority's role was to support and coordinate with the BRR. During the transition period, the NGOs wanted to hand over the reconstruction lessons learned before they had completed their mission in Aceh Province.

According to Linden (2002) collaboration can benefit the organizational and individual learning. The results underscore that the local actors learned about and introduced disaster management during the rehabilitation and reconstruction phase but the ability to transfer the lessons learned to the community was particularly low. The local actors realized that their ability to learn from their experience decreased over time and without further concerted efforts, it was difficult to maintain the knowledge:

“After the tsunami we received much assistance and learned from the NGOs and volunteers, but we never wanted to reflect upon and take care of all the that what we received. This shows that we are not wise because we are not learning lessons from what we experienced. We have already forgotten what we had learned from the Indian Ocean Tsunami “(71-GO-CLG)

Collaboration is one strategy to sustain the knowledge and continue the learning process between local actors. One means to implement this strategy is by requiring the NGOs that worked in Aceh to report their activities to the government and collaborate with the government authorities. This continual learning and sharing between key actors is one of the reasons to collaborate. On the other hand, the collaboration purpose is difficult to identify. The purpose of collaboration currently exists but is not stated formally in the document or formal agreement. The local actors rarely discuss their common goals, so the goal is not present in the first place:

“I think we don't have a good system to manage disaster. The government, community, and stakeholders didn't have a common purpose to manage disasters. When the community wants to engage in disaster management disaster, the government and the stakeholders should provide the opportunity for participation and when the government invites the community and

stakeholders to collaborate, they should accept the invitation.” (11-NGO-BNA)

The understanding of the purpose is needed to motivate and increasing interest to participate and improve the collaboration process. Collaboration occurs to create better disaster management by inviting local actors from the non-governmental organizations, private sectors, and community to be involved in managing disaster resilience. The local government realizes that their current capacities to manage resilience are not sufficient to achieve their goals in disaster management:

“We have managed the disaster, but it is not sufficient because we have many other problems, not just how to manage disasters. For example, poverty, moral degradation, urban dynamics in Banda Aceh, and the heterogenic society becoming a plural society. But if the earthquake suddenly struck again, then people will remember about disaster management” (07-GO-BNA)

On the other hand, disaster management competes with other issues that appear more urgent and important for the government to react to. The focus of the multi-stakeholder collaboration is to leverage synergies from existing and different actors that can contribute more and attract new resources from other organizations that are interested in managing disaster resilience. Even the Aceh government has solid local regulation but to sustain the disaster resilience, requires the capacities to implement and improve the quality of regulations:

“If we want good disaster management, we should have many things, such as legislation, regulation, law, planning, budgeting, institutions, and capacity development. Aceh has all of those instruments. We only have it in terms of the quantity. The quality of those instruments, that’s the next problem.” (26-NGO-BNA)

In other words, the purpose of the collaboration among the local actors is to promote better disaster management in Aceh Province. Although Aceh currently has solid local regulations and structures to manage disaster resilience, the sustainability of the process needs a common purpose to direct the ideas, actors, and strategies. The common purpose is important to fill the current gaps between the concept and implementation of good governance in managing disaster resilience in Aceh province.

6.2 Stakeholders roles and participation

The local government, NGOs, and their networks are found as the key stakeholders that manage the process of building disaster resilience. Local stakeholders are the key components

responsible for establishing collaboration. In this research, the local refer to the individuals, groups or organizations that engage in collaboration for tsunami resilience building collaboration through their programs or activities, during the rehabilitation and reconstruction phase or in the current situation in Aceh province. The stakeholder's participation and contributions can create the systematic and interactive learnings. These learnings strengthen the local governance system (Pretty 1995).

The range of actors that involve in managing disaster resilience includes the local, provincial and national governmental agencies, NGOs, academia, and civil society. Most of these actors had experiences of working with different types of organizations during the emergency response, rehabilitation, and reconstruction in Aceh Province. At that time, the international NGOs searched for local partners and local expertise for collaboration with their organizations.

The Aceh government capitalized on the post disaster opportunities by inviting many stakeholders to collaborate in disaster management. After the establishment of local disaster management, the collaborative process between the local stakeholders became the responsibility of the BPBD. BPBD is a key actor that requires the invitation of local actors to be involved in managing disaster resilience at the local level. BPBD's role is to develop strategy for the collaboration between governmental and non-governmental organizations in disaster management:

Before the BPBD was established in 2011, disaster management was under the jurisdiction of the Kesbanglinmas (Welfare Agency). The structural organization of Kesbanglinmas is different to BPBD. BPBD recruited new staff but they also took on the former Kesbanglinmas staff because the staff understood the job. However, there were some changes to their tasks and roles in BPBD. Actually, under Kesbanglinmas, disaster management was only a formality, we never actually did anything related to disaster management. All of the programs and activities were handled by the social agency. We had no role in the emergency response after the tsunami. We also did nothing in the rehabilitation and reconstruction phase. At that time, we only had the label of the institution but without activities. (30-GO-BNA)

The background of the establishment of BPBD was to provide the local government with an agency that would can manage disaster resilience at the local level. BPBD has a primary responsibility and role to develop good approaches and strategies for managing disaster resilience:

We hope we can build a disaster resilient community in Sabang. We will have resilient villages and communities as the output of our programs and activities in the end. (36-GO-SBG).

The approach of the BPBD for building resilience is not only through their programs and projects but also to promote their institution, as the main agency that facilitates collaboration for tsunami resilience building. Their approaches and strategies to introduce their identities to all stakeholders become crucial because they should show that they are open for all collaboration and at the same time, they must learn to collaborate with various stakeholders.

In terms of the governance process at the local level, the research considered how the BPBD has promoted their agency as the main institution for disaster management:

BPBD is responsible for coordination with the governmental and non-governmental organizations that work in disaster management. Coordination is an important aspect of disaster management. After the Indian Ocean Tsunami in 2004, we didn't experience another mega disaster, so BPBD has no experience in managing the disaster emergency response. I think that the most important thing is coordination and collaboration and that we should control our organization's ego when we are working together. We should remember that our goal is to help the community (29-GO-BNA)

The main approaches of BPBD in managing resilience include promoting their institution as the main agency concerned with and responsible for tsunami resilience building. BPBD might therefore consider their role as an important but new player in managing disaster resilience. This research found that after five years since its establishment, 61 % of the households surveyed had heard about the local disaster management agency as a governmental authority that works in disaster management. 31 % of survey participant were not aware of the establishment of this local disaster management agency in Banda Aceh, Sabang, and Aceh Jaya.



Picture 12 BPBD office in Sabang
Source: own

It is equally important for BPBD to have leadership and capabilities to develop and maintain disaster management at the local level. This agency has coordination functions but their position as a local agency obliges them to govern disaster management through the *Sekretaris Daerah* (Secretary of the Municipality). The *Sekretaris Daerah* has to approve any action related the emergency response and disaster management. BPBD has to utilize its power of coordinating with other agencies because *Sekretaris Daerah* holds the highest position in the structural organization of the local government and all of the local agencies have to obey the *Sekretaris Daerah*'s command:

“We meet and talk to the Sekretaris Daerah almost every day and discuss our problems and anything that we need related to disaster management. We follow whatever the Sekretaris Daerah tells us to do. Our Sekretaris Daerah is very proactive. If the Sekretaris daerah doesn't support us we have difficulty coordinating with the other agencies, because the head of BPBD is echelon IIb and Sekretaris daerah is the higher echelon, IIa. So, it will be easier for Sekretaris daerah to commad anything to the agencies. The approval of Sekretaris daerah is our key strategy to in ensuring collaboration from the other agencies because Sekretaris daerah has the power to require the other agencies to coordinate with BPBD” (56-GO-CLG)

It appears that the bureaucratic constraint affects the ability of the BPBD to act autonomously without the intervention of *Sekretaris Daerah*. This bureaucratic constraint refers to the legal procedures to make decisions or actions that must follow the hierarchy between institutions or people working and representing institutions. In the case of BPBD, this bureaucracy takes time and complicated, so they have to follow the procedures and wait for *Sekretaris Daerah* to make a decision. At the same time, as the local disaster management agency, particularly in an emergency situation, they have no time to follow this procedure.

BPBD acknowledges that their leadership capacity is limited to govern the collaborative process among the stakeholders. BPBD collaborates with Bappeda (the development and planning agency) regarding the target and budget allocation for disaster management programs and activities each year. The initiatives to integrate disaster risk reduction into the agency's program should consult with Bappeda. Bappeda is, therefore, a key actor that helps BPBD and other governmental agencies to create their programs, budget planning, and share responsibilities each year. Bappeda is, therefore, BPBD's consultation partner to develop annual activities and programs:

We plan our program for five-year periods then we prepare an annual action plan. We work before the disaster and our activities include sensitization, training, evacuation signs and community-based disaster management in three villages in Banda Aceh. (02-GO-BNA)

The mechanism of planning programs starts within each division in BPBD. BPBD is mandated to design and propose disaster management programs and to budget for every year. The mechanism to design the program is through the staff who are required to submit the programs. After all the programs are collected, the BPBD will have a meeting to decide and choose programs that BPBD will propose for one year. BPBD will then send their programs proposal to Bappeda and the local people's representative council at the municipality or regency level (DPRK). Bappeda will check the suitability of the programs against the development plan and DPRK will verify and decide on the programs that fit with the local community needs and budget allocation.

According to the expert interviews, a main problem regarding efficiency and implement ability of the local strategies and programs is the limited budget available for BPBD. That is not only a problem for this specific strategy, but for the entire institutions or DPRK. The budget problem related to different priority or commitment that DPRK decided to the number of budgets that can manage by BPBD. On the other hand, the people's representative council of Aceh (DPRA) at the provincial level claimed that they have passed 330 Billion Rupiah in 2015 and 333 Billion Rupiah in 2017 for disaster management programs and activities in Aceh Province (Abda 12/24/2018). This massive budget deal is increased every year, to show legislative authority's commitment in maintaining long-term disaster resilience in Aceh Province. However, the number of budgets allocated for BPBD is limited, particularly for the non-infrastructure programs and activities, such as sensitization and training (57-GO-CLG).

The DPRK budget cuts decrease the quality of the programs and the number of outcomes that can be fulfilled. As a coordinating agency, sometimes it is challenging for the BPBD to negotiate with the DPRK to increase their budget allocation for disaster management programs and activities. This may be related to difficulties in establishing communication channels between DPRK and BPBD. The local disaster management officer stated that BPBD has problems with obtaining clarification as to why their proposed programs have been rejected by DPRK:

“We have proposed one program to maintenance tsunami evacuation routes, but it was not approved by DPRK. At the beginning, when we had meetings with the DPRK, they said, they would accept it but at the final decision, this program was missing. I think they should just say no from the beginning. We tried to get the confirmation about the refusal but had no response from them. They said that the budget allocation is limited, and they will consider this program again for the next year.” (61-GO-CLG)

The local government are not aware that BPBD demands more support to manage disaster resilience, particularly to increase their agency capacity to lobby budget allocation. The execution of the strategy to manage resilience relies on budget allocation and the agreement of legislation bodies to accept the proposed programs and activities. The commitment of the local government to support BPBD will affect the capacity of BPBD to perform better and take their responsibility to manage disasters:

“We have the same programs from last year because we cannot cover all of the targets. The budget was not sufficient. We decided to propose the same programs again with the bigger budget and we planned this program for a five-year period instead.” (57-GO-CLG)

In most cases, BPBD give up the programs that cannot be implemented due to insufficient budget allocation for this agency. It is challenging for BPBD to propose new programs because the local government needs to guarantee that the programs will be successful. This indicates the limited space to create and propose new programs and activities. On the other hand, the BPBD capability, creativity and innovation to design good programs that can be accepted by the legislation body is low. Consequently, most of the programs are the same every year and it be the continuity of programs and modification of different targets and areas.

All the programs and their implementation are monitored or evaluated by Bappeda, particularly by requiring budget and development progress reports. At the same time, the impacts and benefits of the programs and activities are difficult to evaluate. It is because of the evaluation indicators and mechanisms for programs are not clear from the planning process. In this regard, the learning procedures to have better programs and their implementation for next development year are not included in the local government practice.

In terms of the local disaster management roles and responsibilities, the household survey found three main roles of BPBD that were considered by the community as the main tasks of BPBD More than 70% of respondents recognized that the BPBD roles and responsibilities are to perform emergency response (78 %), 19 % recognized BPBD’s role in disaster preparedness, and a minority recognized that BPBD is responsible for coordinating the local disaster

management stakeholders (3%). It shows that the BPBD performs well in emergency response evacuation, however, the disaster preparedness programs and activities, including training, disaster education at school, and sensitization were not effectively achieved. This is due to the fact that the BPBD programs and activities related to the disaster preparedness are constrained by bureaucracy and budget issues, as outline above. The respondents struggled to identify the roles of BPBD to coordinate and collaborate with different institutions and community. As such, it appears that the evidence of good coordination and collaboration was quite low.

This household survey reveals that BPBD should promote their role as the coordinating agency and invite the local actors to collaborate. Their approaches and strategies should include strategies to raise awareness of their role among the stakeholders. This becomes crucial to show that they open for all collaboration with various stakeholders. The local government agencies have significant roles to support BPBD. The local agencies have high tacit power that BPBD should empower these agencies to work together.

The stakeholder analysis has been conducted to identify the stakeholders that involve in managing disaster resilience at the local level. The summary of their roles, main contributions and the current state in the disaster resilience governance are shown in table 9.

Table 9 Roles and contribution of governmental agencies in managing disaster resilience

Stakeholders	Roles	Main contribution to disaster resilience governance	Current state and challenges regarding integrated and effective disaster resilience governance
<i>Badan Penanggulangan Bencana Daerah</i> (BPBD) Local Disaster Management Agency	Responsible for disaster management at the local level (before, during, and after the disaster)	Coordinating agency and main hub for multi-stakeholder collaboration to manage disaster resilience	Lack of capacity and trust to manage stakeholders collaboration
<i>Badan Perencanaan Pembangunan Daerah</i> (Bappeda) Local development and planning agency	Responsible to ensure BPBD has appropriate programs that in line with mid-term the development plan	Supports BPBD to coordinate and collaborate with other local agencies through controlling the programs and budget allocation for disaster management	Assist and support BPBD to have a good disaster management programs and activities
<i>Dewan Perwakilan Rakyat Daerah</i> (DPRK) Local people's representative council	Responsible to control and evaluate the performance of BPBD through the programs and budget allocation	Political commitment to support the activities of BPBD	Lack of the support and attention to prioritizes BPBD programs and activities
National, provincial and local government agencies (Social Affairs agency, health agency, education agency, SAR, BMKG etc)	Responsible to support BPBD as the technical and implementing agency for BPBD programs and activities	Coordinate and collaborate with BPBD to manage disaster resilience	Lack of motivation and support to develop strong coordination and collaboration with BPBD

Source: own based on stakeholder analysis from the informant semi-structured interview 2014

From the research findings, various local actors have been involved disaster resilience governance after the Indian Ocean Tsunami in 2004. The planning and development agency (Bappeda), social affairs agency, search and rescue (SAR), health agency, education agency, public works agency, transportation and tourism agency all contribute to disaster resilience in accordance with their roles and responsibility. Most of the government technical agencies have roles as consultancy bodies, working partners, or coordinating partners for resilience building. Those agencies also play an important role as the institutional basis for the implementation of

programs and activities related to tsunami resilience. As summarized in table 8, these agencies play important roles in managing disaster resilience.

The analysis indicates that BPBD has collaborated with various agencies from different levels of government as well as NGOs. The local government agencies are obliged to support the BPBD in disaster management. BPBD acknowledges their main partners and maintains the formal relationships with these agencies:

Our main partners are the Bina Marga (infrastructure) division in the public works agency, the disaster management division in the health agency, the social assistance division (Tagana) in the social agency, TNI (the Indonesian Army), PMI (the Indonesian Red Cross) and SAR (search and rescue). We don't have problems in coordinating with partners, we can work together. (56-GO-CLG)

BPBD's main partners are the local actors that are involved in emergency response. The partners are important in supporting BPBD with emergency response. Without the contribution of various partners, BPBD is unable to respond and manage catastrophes effectively. BPBD has formed the *Tim Respon Cepat* (TRC) or fast response team that aims to help local disaster management agencies in emergency response. The establishment of this team based on the regulation of the head of BNPB No.9/2008 about SOP for the Fast Response Team of Indonesian National Board for Disaster Management

BPBD collaborates with TRC or fast response team for emergency response. The members of this team are TNI (the Indonesian Army), POLRI (the Indonesian Police), RAPI (Radio community), PU (Public work agency), Dinas Sosial (Social affair agency), and Tagana (volunteer). The members will receive rewards. We have established this team for one year. They always stand by in our office. They also have special meetings for emergency response and disaster logistics. (02-GO-BNA)

The TRC members are from different organizations that have skills to help the disaster victims. The key tasks which these team members should perform in disaster response are to perform rapid assessment and identification of a disaster situation, the number of disaster victims, loss and damage to the critical infrastructure. Most of the members have certificates as disaster management volunteers who have competencies in emergency response:

The members of TRC are competent in disaster management. They are the certified (emergency response) volunteer. (29-GO-BNA)

Experiences show that BPBD lack the capacity to coordinate and organize emergency responses effectively. BPBD knows its weakness but does not learn from their mistakes to

improve their management skills. One interviewee thinks that the BPBD should reform the long disaster management bureaucracy in emergency response and build BPBD capacity to organize and coordinate the response team members:

Why can't we just help people in the emergency situation and then after that we can make the report. We always wait for the report before we can help people. BPBD cannot solve that problem. How can they manage the stakeholders? They even do not have skill to manage their own organization. They should know their weakness, I think they know, but they don't want to improve their capacities. For example, when we went to Takengon for the emergency response, they did not provide the car for us because it was their task to provide the transportation for the emergency response team. The money that they spend on the emergency response is also from the society. I think, the BPBD capacity to take care of disaster management is low. We need more capacity building for the government authorities and communities. (20-NGO-BNA)

BPBD is concerned about their capacity to coordinate the emergency response. This fundamental concern arose because BPBD has received many open critiques from other stakeholders and communities:

Actually, the government had installed the evacuation signs and conducted the tsunami drill once a while before. We also get evacuation sensitization from the government, but this was not detailed, such as where to gather and where to evacuate to. BPBD is in charge, but we are not sure if BPBD can handle such a huge tsunami like what happened in 2004 without the support of others (44-NGO-SBG)

It is always a difficult task for BPBD to show their capabilities in coordinating and collaborating with the other partners in emergency response. From BPBD's perspective, as a coordinating agency they have already made significant efforts to show their best performance:

"When disasters happen, we should help the community, but when they are not satisfied with our service, they will get angry. It is okay for us; the most important thing is what more we can contribute to help the community. When disasters happen, the communities should receive relief, but we don't have enough logistics for disaster relief. The head of BPBD has to come to the disaster location. If the head of BPBD isn't present, the community will blame him because they think that he did nothing and stayed at the office. The Sekretaris Daerah will be angry too. On the other hand, I have to coordinate and communicate with the other organizations from our office. This means that BPBD is always in trouble." (56-GO-CL)

Disaster management, particularly at the local level, should do more than perform emergency responses during the disaster event. The before and after disaster situations call for programs that frequently involve many governmental agencies. Most of the governmental agencies have

one or two programs related to tsunami risk reduction as their programs in each development year. BPBD has principal responsibility for coordinating and collaborating with these agencies. The aims of coordination and collaboration are to maximize the contribution of their programs in managing disaster resilience. For example, social agency has the responsibility to help people with financial aid, distribute food and provide shelter for victims during an emergency until panic period over. The coordination between BPBD and social agency is important to increase the effectiveness of this post disaster assistance.

The provincial government and central government are important disaster management stakeholders at local level. The central and provincial disaster management agencies provide support with the infrastructure and expertise that the local government cannot afford to provide themselves. For example, BMKG has a special mandate from the central government to monitor tsunami risk and BMKG is responsible for managing the Tsunami Early Warning System (TEWS) in Aceh Province:

Before the Indian Ocean Tsunami in 2004, we didn't have the Tsunami Early Warning System. Since we established the TEWS, we always coordinate with the central, provincial and local government. We have a good coordination system, technical support, and clear bureaucratic systems that give the local government the authority for decision making in a disaster event. (75-GO-BNA)

The contribution of the governmental agency to disaster resilience governance is dependent upon their policies to integrate disaster risk reduction into their programs and activities. Although the general guidance to incorporate the disaster resilience concept as the main consideration stated in the mid-term development plan, but the agency needs more flexibility to contribute to managing disaster resilience. The problem is the synchronization of the development planning across sectors and levels of government to integrate disaster risk into the development plan:

There is no synchronization between planning at the municipalities and provincial levels. And we didn't have the planning for disaster risk reduction. (53-NGO-BNA)

Bappeda's contribution is to prepare the development plan that will accommodate resilience building as a comprehensive action. Bappeda is a supportive partner in disaster management and resilience because, as the development and planning agency, Bappeda has a good understanding of the resilience concept and a strong commitment to incorporating disaster resilience into the development plan:

For Bappeda, the tsunami (resilience) related issue is familiar, but for other government agencies, is it so difficult to establish the same perspective, (of preparation) because one day tsunami will have struck again. Are we well prepared? If at that time only an earthquake were to strike, would the community evacuate successfully? Do we have a proper (evacuation) infrastructure? Because during our last evacuation experience (April 12, 2012 earthquake 8.6 SR in Banda Aceh), many people evacuated by cars and thus, at that time, there were many car accidents. (07-GO-BNA)

The governance of disaster resilience at the local level invites the non-governmental sectors to engage and contribute in managing the resilience process. Although the non-governmental organizations have learned and gained a lot of experience during the rehabilitation and reconstruction phase, the connection with the governmental authorities are not properly developed. Following the establishment of BPBD, there has been more pressure to collaborate with non-governmental stakeholders. The non-governmental organizations that are involved in the current collaboration include local, national, and international NGOs. The second group is civil society that participates with different types of organizations community members, such as an informal leader, the self-employee consultant, association, volunteer, independent forum, and community-based organizations. The last group comprises academic experts which are established under the local university in Aceh, Syiah Kuala University and Ar-Raniry Islamic University. Further description of these relevant organizations and their objectives will be presented in the stakeholder's analysis. The summaries of the roles of the different groups of NGOs are shown in table 10.

Before the tsunami, many local NGOs had been working on human rights and conflict resolution issues. Aceh has a long history of conflict and invited many organizations to be involved in building peace and mediating between the Aceh free movement (GAM) and government of Indonesia. The NGOs have strong ability to influence and maintain contact with vulnerable groups; promote volunteering and help communities to become organized. The following section will introduce different local actors from NGOs and individual community members that are involved in managing disaster resilience in Aceh Province.

Table 10: contributions of non-governmental actors to maintain disaster resilience

Stakeholders	Main contribution to maintain disaster resilience	10 years after the Indian Ocean Tsunami 2004
Local, national, and International NGOs	Experience, knowledge, human resources, funding	Limited new projects and partnership related to disaster resilience
Civil Society (local leaders, consultant, volunteer groups, professional groups, journalist groups, community-based organizations)	Self-organization and learning process at the community level to promote disaster resilience	Lack of funding and coordination with the governmental authority to engage in various activities related to disaster resilience
Academia (University, research institute)	Research to support the stakeholders in managing disaster resilience	Progressive movement to promote local student and researcher to actively engage in enhancing disaster resilience

Source: own based on stakeholder analysis from the informant semi-structured interview 2014

The local, national and international NGOs have gained much experience when working in Aceh during the rehabilitation and reconstruction process. These organizations have a strong desire and motivation to collaborate with the local government. The NGOs try to find donors to fund various projects related to disaster risk reduction in Aceh Province. These programs and activities often target specific aspects related to DRR such as women needs, environmental protection or humanitarian aid. The connection with these long-standing issues helps to maintain DRR efforts in the long-term. For example, Women Solidarity for human rights (*Solidaritas Perempuan*) and The Indonesian Planned Parenthood (PKBI) are NGOs that still promote various activities on disaster risk reduction, particularly building women's capacities for disaster prevention and mitigation. The Indonesian Red Cross (PMI) is one of the key organizations that has a very good reputation for work on humanitarian aid. PMI also has a neutral political position as their work is simply to rescue and help people with no hidden agenda. PMI has also worked during the local conflict to rescue victims from dangerous areas. Both GAM and the Indonesian Army has shown respect to the PMI for their mandate on humanitarian aid.

The non-governmental sectors are heavily involved in managing disaster resilience at the local

level. This research reveals that after the Indian Ocean Tsunami in 2004, Aceh Province saw the establishment of various stakeholders as groups or individuals with learning and self-organization experience stemming from the rehabilitation and reconstruction process. These local actors have a unique and tacit capacity to collaborate with the governmental authority. As such governance of the disaster resilience should maximize the involvement of the wide range of stakeholders in managing disaster resilience.

This research has considered how the community evaluates the contribution of the governmental and non-governmental contributions to disaster resilience governance in Aceh Province. The performance of the government and NGOs during and after the rehabilitation and reconstruction were completed. This result shows a comparison between the roles of government and non-governmental organizations in managing disaster resilience. Most of respondents (64%) stated that NGOs are the most important institutions that have significant role in managing disaster resilience compare to the government (36%). This highlights the value of community level activity in contributing to disaster resilience.

The result from the community evaluation towards two different groups of stakeholders that contribute various strategies, approaches, programs and activities. Although most of the NGOs had completed their mission in Aceh in 2009, most of the respondents (81%) agree that the NGOs performed well in their contribution. However only 19% of respondents stated the government has performed well in managing disaster resilience.

The results underscore that the community has better impressions of the performance of the NGOs during the emergency response, rehabilitation and reconstruction than the government agencies. The current performance of the local government was evaluated as quite low compared to the past performance of the NGOs in Aceh. The capacity of local government to promote their achievements and intentions to sustain disaster resilience in Aceh is not well recognized at the community level.

6.3 NGOs contribution

Prior studies that have noted the importance of the participation of NGOs in governing disaster resilience to support the local government and to achieve effectiveness in disaster management (Brinkerhoff, Brinkerhoff 2002; Young 2010). NGOs not only support in term of completion of their project but also how NGOs shows different activities, standards and how they perform their roles. NGOs involve and serve their beneficiaries from the beginning of the projects and map their needs and aspirations. In general, NGOs approach their beneficiaries personally to

accelerate their project progress. These were new practice that never been done in Aceh in the last thirty years of conflict periods. The citizen participation considers in the government development process. It is somewhat surprising that the community perceived that the NGOs have better contributions in recovery, even after many years of NGOs operations. This good impression showed by the better evaluation of assistance and service provided by the NGOs compare to the government contribution.

It is important to note that the number of NGOs were decreasing significantly in the last few years in Aceh. Therefore, the decreasing number such NGOs has affected the number of disaster resilience building projects and activities organized by those NGOs (e.g disaster preparedness and disaster education projects that involved the grass root community). The contributions of NGOs in resilience building in Aceh were significant. Although the duration of their mission was relatively short but in general many NGOs had clear ideas about what they wanted to achieve in this process. During emergency response and reconstruction (2005-2009) at least 300-500 agencies responded and concentrated in Aceh (Masyrafah, McKeon 2008; Canny 2005). At the beginning, the NGOs focused their primary mission on humanitarian relief as emergency response, technical and political supports during recovery process.

However, the contribution of NGOs in resilience building decrease significantly after the rehabilitation and reconstruction periods ended in 2009. The number of international and national NGOs that provide resources and services decrease significantly ten years after the Indian Tsunami to be less than twenty local and international NGOs. The main reason that NGOs leaved Aceh because they have completed their projects, but several did not have funding to continue their projects. Disaster management activities or in the bigger efforts to build disaster resilience gradually become unpopular topic for the donor. On the other hand, several International NGOs works for long term and expand their projects creatively, for example IOC committed to work fifteen years in Aceh. With the strict timeline, most of the NGOs completed their project on time and follow by various methods of project evaluation. In some case, NGOs backed to Aceh to conduct a long-term evaluation for their beneficiaries to replicate their project.

The expert semi-structured interview reveals that many strategies that implement by the local NGOs to survive with limited funding to have small scale projects and activities. For example, the local NGOs must show their existence by promoting their own projects and activities. The active local NGOs need to prove that they have a small project, partner with national NGOs, and members of NGOs networks. By being active as a local NGOs, the local government will

invite these NGOs into various meetings, seminars, and discussion that related to their NGOs working areas. These survival strategies were born through networking that initiated and manage during the rehabilitation and reconstruction periods, including barter resources and technical skills in implementing their projects.

The other strategies are to form a small coalition of several local NGOs with the same focus, for example, women NGOs (*Solidaritas Perempuan*) or environmental NGOs (*Walhi*), human right NGOs (*Koalisi HAM Aceh*) to apply for grants to sustain their activities. This coalition also has many benefits for their members in term of efficiency and effectiveness of programs and the mechanism to provide funding and human resources to survive. Therefore, many local NGOs that empowered by partnership and networking during recovery phases start to take the important roles as important local stakeholders that intent to continue NGOs contribution in resilience building process.

6.4 The local multi-stakeholder approach

According to Comfort (1994), the process of self-organization can be stimulate by providing space to exchange information, learning, and working together. Local actor's collaboration involves learning, sharing information, and networking, in exchange to characterize the process of self-organization. In this forum, the local actor supposes to learn together and create networks as part of the self-organization process. In this section, the analysis base on the expert interviews and local newspaper articles to examine the current progress in the development of local multi-stakeholder forum.

The governmental and non-governmental collaboration exists among local actors that are involved in disaster management governance in Aceh Province. The direct involvement of the local government authorities and NGOs can be traced through their contribution to the development agenda and collaboration with the local disaster management agency in managing disaster resilience. Local disaster risk reduction multi-stakeholder platform (DRR Forum) is one example of a formal collaborative initiatives between governmental and non-governmental organizations. This forum is a platform for stakeholders to collaborate and support disaster risk reduction programs and activities at a local level (province or municipality).



Picture 13 Banda Aceh multi-stakeholder forum meeting
Source: own

The Aceh multi-stakeholder collaboration initiatives began after the BRR completed their mission in Aceh in 2009. The Aceh government want to collaborate with the NGOs that continued their projects in Aceh. One of international NGOs revealed the history of the early process of NGOs and governmental agencies collaboration at that time:

At the provincial level, (our collaboration) with the government (governor), was facilitated by Biro Kesra (the division of welfare), now the department have changed their name to Biro Keistimewaan (Aceh special autonomy division) at the Aceh governor office. But we suggested building collaboration with Bappeda, because at that time, several NGOs that have worked in the rehabilitation and reconstruction phase had established an NGO forum in collaboration with Bappeda. We often coordinated with Bappeda. Bappeda invited us to the meetings. (74-NGO-BNA)

Bappeda as a development and planning agency was the authority responsible for facilitating this collaboration at the time. The NGO forum was established at the provincial levels to facilitate the informal collaboration between the governmental agencies and NGOs after the BRR finished. The problem is that the governmental partners and the mechanism for collaboration was not clear. The NGOs have to choose their governmental partner based on a fit with their activities:

“We coordinate with the social agency for the tsunami orphans project. We coordinate with the education agency, if we have issues with education. We coordinate with the public health agency if we want to consult on our health projects, and children protection agency. At the Kecamatan (sub-district), we have a strong collaboration with the head of the sub-districts because they always helped us with our program” (74-NGO-BNA)

The need to establish the platform for multi-stakeholder collaboration came from the lack of

government transparency in the development process. For example, the government and the NGOs had no trust to each other to work together. One of the reasons for this was because information has not been shared properly and the public were excluded from of the development process:

“The problem is that we did not communicate with the public, about what we are working on and what our problems are. The only mechanism was Musrenbang (The development communication forum), but Musrenbang is the forum to share our vision in the future, and not a forum where we can evaluate what we have done in the past. So, our evaluation and monitoring mechanism is very weak, we can even say we don’t have it at all. We don’t have good development. Our development is not good. We have a bad evaluation mechanism, so we don’t know what our needs are, and we develop what we actually don’t need. We don’t have a comprehensive planning mechanism, but fragmented planning.” (28-NGO-BNA)

The platform for the public to discuss issues related to disaster risk reduction and their contribution to building resilience is needed. Disaster Risk Reduction multi-stakeholder forums are a platform for disaster management stakeholders to work together and discuss building resilience building at the local level. The establishment of this forum, facilitated by NGOs and invites government organizations, NGOs, research institute, and private sectors, is to share ideas and make joint activities to activate this new forum. The main NGOs supports in establishing this forum were lobbying and consolidating the local actors so they agree to be the members of this forum. However, the establishment of this forum is the main responsibility of the local disaster management agency (BPBA and BPBD).

One of the reformation strategies to invite many stakeholders to be involved in the resilience building process is through the establishment of the *Forum Pengurangan Risiko Bencana*, (disaster risk reduction multi-stakeholder forum) at the province level through the Governor Decree No.360/6a/2011. With this special force, the government authority was able to begin their collaboration in the resilience building process. This forum should serve as platform for all stakeholders concerned with DRR in Aceh:

“The public has joined the disaster risk reduction multi-stakeholder forum. This forum is a platform for collaboration with different stakeholders from the private and business sector, BUMN (state own enterprise), banking, and the university.” (02-GO-BNA)

The establishment of the disaster risk reduction multi-stakeholder forum is a new approach to promote collaboration between governmental and non-governmental organizations. The formal collaboration between government and NGOs is crucial to sustain the resilience building

process. It indicates that the government should support local NGOs and community organizations to fund their strategies. Without permission from the local government, the NGOs cannot work with the community. On the other hand, the contribution of NGOs with their projects and activities in disaster risk reduction will support government capacities to work at the grass roots level.

“We always have problem with coordination in the field. We can see in the emergency response, groups or institutions egos are not controlled. If we are on a field mission, we should know our positions and coordinate with the incident commander.” (73-GO-BNA)

After the establishment of the multi-stakeholder forum at the provincial level, the government established a forum at the municipality levels. The establishment of the multi-stakeholder forum at the municipality level comprises a collaboration between BPBD and IOM. IOM is currently conducting a disaster risk reduction project in Aceh province. The aims of this project are to build local government and community capacity in disaster management and resilience building. IOM has identified the gap between the central government expectations and the local government capacity to build resilience:

“We work to strengthen the local government capacity at the policy level. We have a capacity gap between the national and local government. We started to develop the disaster management system at the national level, while at the provincial and municipality level, the capacity remains weak. So, we need a good regulation that will help the government and community as a legal framework to build disaster management.” (27-NGO-BNA)

It is clear that one of the goals of the establishment of the multi-stakeholder forum is to build the capacity of the local actors in maintaining long-term disaster resilience by learning together. In this regard, without a collaboration initiative, the local actor will miss the opportunity to reflect on past disaster experience and evaluate their contributions to the resilience building process.

The story behind the establishment of the multi-stakeholder forum is different in every municipality. In general, the IOM and BPBD have a significant role to play in preparing the legal framework and organizational structure for the forum. The coordinator of the Banda Aceh multi-stakeholder forum illustrated the process of the establishment of the forum in October 2013:

“We established the multi-stakeholder forum in Banda Aceh. This is one mechanism of BPBD to encourage the community to become involved in building resilience. Before we established the forum, there was no collaboration platform for the government and NGOs. We started the process

on June 2013, facilitated by IOM, before the earthquake hit Central Aceh. We had ten meetings before we agreed to establish a multi-stakeholder forum in Banda Aceh. Then we formed the committee that prepared the legal framework for the forum and which included the BPBD, Hibeuna (the student association of magister of disaster management in Syiah Kuala University), IOM, RPUK (Disaster management NGO), and Walhi (Environmental NGO). We had our first meeting in BPBD's auditorium but the organizer was IOM. All of the preparation and the requirement to establish the forum were provided by IOM. We also had several informal meetings in the coffee shops and the head of BPBD's office. We need a "motor" to initiate the establishment of this forum. We had a really simple process because this was our first step." (15-NGO-BNA)

The explanation about the establishment of the multi-stakeholder forum in Banda Aceh hints at how hard the process to initiate a collaboration, but they claimed it was a simple process. IOM organized many informal meetings to persuade the local actors to contribute in the process of the establishment. The IOM needed to lobby the BPBD to accelerate the paperwork process, particularly to prepare the decree that enactment by the Mayor. On the other hand, BPBD as the leading agency failed to be a main "motor" in this process that able to take their responsibility to invite the stakeholders. BPBD still need assistance from the NGOs, particularly to approach the stakeholders that never engage in this forum. These stakeholders are from the private sectors, such as banks, insurance companies, and other private sectors that have identified can have significant roles and contributes in this forum.

The initiation of the establishment started in 2013, when Banda Aceh has established the forum. In 2014, Aceh Jaya launched the forum and invited the disaster management stakeholders to become a member of this forum. The vice Mayor of Aceh Jaya has inaugurated the multi-stakeholder forum in Aceh Jaya on October 2014, in his speech he hoped that this forum would solve the collaboration problems between the government and the public:

"The multi-stakeholder forum should develop a good collaboration mechanism in accordance with the government collaboration regulation. We hope the stakeholder's involvement will be an effective strategy to enhance our disaster risk reduction effort in the future" (Serambi Indonesia 10/4/2014)

On the other hand, the process to establish the disaster risk reduction multi-stakeholder forum was more challenging in Sabang. It took two years to consolidate the local stakeholders that would work together in this forum. The head of Aceh disaster risk reduction multi-stakeholder forum (forum PRB), Cut Faisal said in the local newspaper:

"The establishment of Forum PRB in Sabang had been initiated since 2013. But in this year (2015) we finally have established it." (Serambi Indonesia 8/22/2015).

Sabang is a small municipality that has limited actors that worked or interested in disaster resilience activities. The consolidation process included the initiatives to ensure more stakeholders that not directly related to the disaster management will realize that they can contribute in disaster resilience building by participating in this forum. They decided to have more organizations engage in this local multi-stakeholder forum, so it takes two years to invite new members.

The establishment of this forum is evidence of the collaboration between the local government and NGOs. In general, the stakeholder attitudes to participate in the resilience building process are very positive because of their experience of tsunami. The NGOs have supported the Aceh government to increase their capacity to build tsunami resilience after reconstruction. These NGOs were not only providing funding but also involved directly in designing project related to development capacity for local government agencies.

However, the number of INGOs decreased significantly after the reconstruction phase. The remaining local NGOs try to survive with limited donor funding. This has a significant effect on the government and NGOs, helping them realize that they should work together. It makes senses to collaborate if it has direct benefits for most of the members of this forum (local NGOs), particularly when the new projects are difficult to have. In this case, to have a joint program or activities that involve all of the stakeholders contributing as a group can cause the high-level interests in collaboration.

Although the stakeholders understand that collaboration is important for building tsunami resilience, it is difficult to make the members contribute more to building strong relationships. This forum was expected to be able to solve the collaboration problems between the governmental agencies, NGOs, and the communities, particularly to have better communication, and have a joint programs and activities:

We should solve our collaboration problems in the multi-stakeholder forum, but the forum is not active in Aceh. We tried to have a common program for the members of the forum after the 11th April 2012 earthquake. The earthquake at that time was a good moment for all stakeholders to reflect; have we done the right thing, and have we achieved good outcomes for the tsunami resilience? The big earthquake is an exact test of our current strategies. We really wanted to have a monthly meeting for discussion and reflection. But only a few members can be actively involved, and I see this forum becoming a place to achieve their personal interests. So, it is not working well, we don't have good communication in this forum. (24-NGO-BNA)

They have missed the opportunity to reflect on past disaster experience and evaluate their contributions to the resilience building process because they even do not meet regularly. They expect that they can bring some knowledge back for their professional capacities and for the organizations. Sharing, learning, and knowledge transfer appeared to be an efficient strategy to achieve the collaboration goals. These aspects also become a good incentive for members to contribute in this forum. The regular meeting for the face to face dialogues rarely happen. The members are busy with their own organizations and it is difficult to set a time for regular meetings:

As a multi-stakeholder forum, our current problem is that many of the organizations members still difficult to collaborate, because they do not care about anything but their own interests. (15-NGO-BNA)

The forum has become an arena to gain their own benefits and promote other agendas that are not related to the original aims of this forum.

According to the member's evaluation, the forum faced many challenges to effective collaboration. It appears that the establishment of the multi-stakeholder forum cannot solve the collaboration problems between the stakeholders. One of the challenges comes from the difficulty to have better relationships and trust. This forum has failed to improve the coordination between the stakeholders and provide information about the current projects or activities that it would be possible to collaborate in:

Here, we have a Forum Pengurangan Risiko Bencana, we can find the governmental agencies and NGOs sitting together. But I don't know the effectiveness of this forum. I mean, do they have frequent discussions? I suspect this forum is not performing as well as we expected. This forum should be a forum for coordination, for example, we should know what other organizations are working on (their project, program, or activity), so there is no overlap and it will promote effectiveness and efficiency (in the resilience building process). (10-NGO-BNA)

On the other hand, the forum needs a facilitator who can organize the meetings or other activities for the members. It appears that the members would prefer to have a neutral facilitating body, free from political or organizational agendas:

"I think our problems are time and who will facilitate the meeting. It is time consuming because all of stakeholders have their own work. So, if there is someone facilitating the meeting, the stakeholders will think that the facilitator is under qualified. But maybe if the stakeholders believe and have the qualifications to facilitate, they will come. Maybe the academics or researchers can facilitate this forum, because they are neutral. They prefer to come to the scientific discussion rather than a regular meeting. The

members are eager to come because they want to learn something. For example, after earthquakes, floods or other disasters, it is better to organize a scientific meeting to focus on the study and academic discussion. (10-NGO-BNA)

This is a further example that collaboration should have better opportunity for individual and organizational learning, such as how to have effective regular meetings that benefits the members. The multi-stakeholder failed to provide space to exchange information and learning to the members, particularly to increase their scientific knowledge in disaster management. As the collaborative efforts get started, these problems are part of the collaboration journey. To maintain long-term disaster resilience, the local multi-stakeholder should have strong commitment to resolve these collaboration problems.

In terms of the establishment of the local multi-stakeholder forums at the local level, the research found that almost 80% of household survey respondents are unaware of this platform. Respondent's knowledge about this forum is significantly low. This lack of awareness may be due to the fact that, at the municipality level, the forum is not established yet, although the intention and initiation of this platform began during the establishment of local disaster management agency.

The survey indicates that most respondents (97 %) perceive that the local multi-stakeholder forum is an important arrangement to manage disaster resilience. As the collaboration platform, the function of this forum is to facilitate local actors to communicate, discuss, and learn together. Most respondents agree that this forum can enhance the collaborative process among the stakeholders. The most important thing is to increase the effectiveness of this forum to transfer past experiences and lessons learned from the Indian Ocean Tsunami in 2004.

The establishment of this forum is one of the local actor's achievements in managing disaster resilience. However, this research found that this forum struggles to perform its functions. After the establishment of the platform, local actors lacked motivation to be involved in this forum. In this instance, this forum becomes only a symbol of collaboration and the collaborative process does not take place. Over time, the efforts to maximize the functionality of this platform at the local level have been part of the self-organization and learning elements in managing disaster resilience.

6.5 Summary

This chapter has explored different components of the governance structure of disaster management and disaster resilience, including local actor roles, budget allocation, and the collaboration process between the state and non-state actors to build disaster resilience in Aceh Province. The governance structure in managing disaster resilience is complicated and complex in terms of structure and interactions particularly between the various governmental institutions, but also in terms of the coordination and cooperation between governmental and non-governmental organizations in Aceh Province. While the general attitude of many local agencies and actors to collaborate with each other is positive, the practical results show that various actors have not learned to collaborate and therefore also maintaining a long-term collaboration and a shared vision of tsunami resilience are still challenges.

The respondents are aware of various preparation and mitigation strategies that have been promoted by the local government and NGOs following the Indian Ocean Tsunami in 2004. In this regard, the contributions of NGOs are recognized as important activities in promoting disaster resilience. However, the integration and implementation of the strategies into formal tools and measures, such as the current development plan is insufficient. The interviews revealed that strategies were often a continuation of previous programs and there was limited space for new approaches, also due to budget problem and the complicated procedures to establish new programs. On the other hand, positive changes were identified in relation to the establishment of various disaster preparedness and mitigation measures. The findings imply that evacuation infrastructure and local government performance in promoting disaster resilience has improved since the mega disaster significantly.

The last section analyzed the establishment of multi stakeholder forums to promote collaborative governance at the local level. The expert interviews revealed that the members of this multi-stakeholder forum struggled to see the concrete benefits of this collaboration. This forum has not been able to connect the local actors to learn together and have a joint projects or programs as an important collaboration outcome that expected by most of the members of the forum. According to the key informants, this local forum does not function properly also due to limited trust between the different actors involved. This multi-stakeholder forum needs better leadership and a collaboration framework that encourages wider participation of actors and fosters better and more intensive collaboration.

7 Tracing the collaboration: strategies and approaches

After examining the concept of resilience and tracing the governance process of managing disaster resilience, this chapter provides an evaluation of various strategies and approaches base on the resilience focused collaboration framework that has been described in the theory chapter (see sub chapter 2.5). Based on the conceptual discussion of collaboration, the criteria about the importance of the local actor capacity to build and communication and collaboration will be used for the empirical analysis here. To establish an effective collaboration in maintaining long-term disaster resilience, it is critical to evaluate the existing informal and formal collaborative efforts to build disaster resilience. The previous chapter found that the current local collaboration efforts deal with the complex challenges. The central question in this chapter is what are factors that hamper the development and / or the sustainability of multi-actor strategies to promote disaster resilience at the local and provincial level. To answer this question findings from a community-based household surveys and results of interviews with key actors were triangulated.

This chapter is divided into three sections. The first section begins by analysis of the household survey that provides insights from the local community perspective towards the perception of risk, uncertainty and disaster preparedness. These survey findings demonstrate that collaboration between the local actors has improved their preparation and knowledge following the Indian Ocean Tsunami in 2004. It will then go on to the second section that describes the challenges of collaboration in managing disaster resilience and provides an overview of the challenges that the local actors face in their current collaborations. This research was also informed by the theoretical and conceptual chapter (chapter 2). Finally, the last section gives a brief summary of the findings.

7.1 The evaluation of the governmental and non-governmental strategies

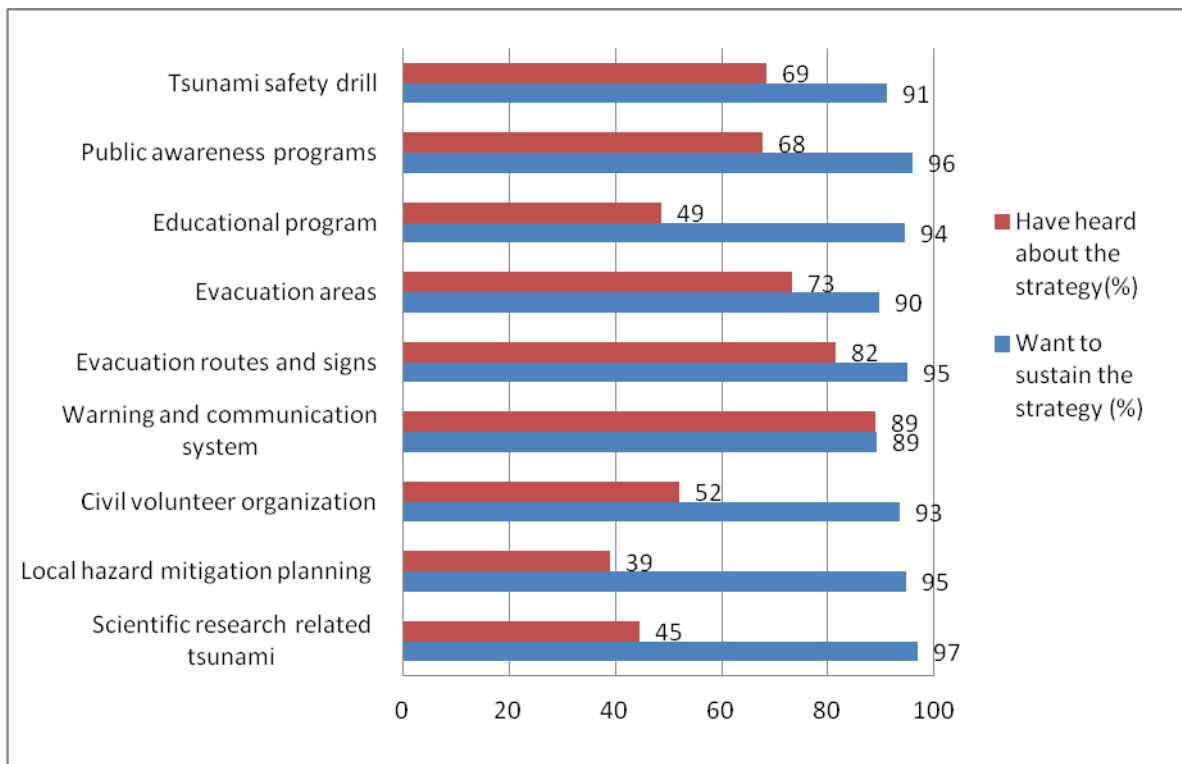
Various strategies related to disaster resilience can be found at the community level. This research has examined the level of community knowledge and awareness of government actors/institutions and NGO's to manage disaster resilience. The findings reveal that the majority of respondents are aware of different programs and activities that have been conducted during the rehabilitation and reconstruction phase as well as present day activities that continue to take place at the local and community levels.

According to 89% of respondents, they are aware and have participated or been involved in different strategies, such as the development of evacuation roads, sensitizations, and trainings.

Most of the respondents that are aware of evacuation strategies have also visited the evacuation shelters, but only a few have evacuated to these shelters in the recent earthquake events, such as on April 2012. A relatively low percentage of respondents (11%) is not aware that the government and NGOs continue to develop and conduct various strategies related to disaster resilience – after the rehabilitation and reconstruction phase. For example, although respondents were aware that the government has widened many roadways in Banda Aceh, they did not notice that these roadways widened projects are for the Tsunami evacuation purposes. This indicates that the strategies to manage resilience are not effectively packaged and promoted as special programs to manage and enhance resilience. As a result, the communities struggle to differentiate between disaster resilience strategies and other development programs/strategies.

Figure 7 shows the levels of knowledge and expectations for sustaining current strategies developed by the government organizations and NGOs. The community level of knowledge is revealed by their awareness and knowledge about the existing programs and activities. The household members asked to evaluate the current preparedness strategy from “have heard about the strategy” or “want to sustain the strategy”. The response “have heard about the strategy” means that the community members know about the strategies, but they do not have more information about the strategies. The response “want to sustain the strategy” means that they know about the strategies and see the necessity that these activities are continued because they either have informed and consult about these activities or have engaged in these activities in their villages.

Figure 7 Community knowledge of the preparedness strategy



Source: own analysis based on the household survey 2015

The first level of community knowledge refers to the awareness regarding existing strategies and approaches from governmental and non-governmental agencies that conducted during and after the recovery stage. This knowledge or information about the strategies and approaches is essential to help raise awareness about the current activities because the community can access and benefit from these strategies. The next level is moving beyond simply identifying the strategies and approaches, the respondents understands the importance to sustain these strategies in the future. The knowledge and information about the importance and need to sustain specific strategies can help respondents to decide to continue or support or even terminate own activities to support these strategies.

Interestingly, the household survey shows that in terms of tsunami preparedness strategies, local hazard mitigation planning (39%) and scientific research related to tsunamis (45%) are less recognized than the early warning system (89%), evacuation routes and signs (82%), and evacuation shelters (73%) at the community level. This is likely to be due to the fact that disaster management planning and hazard and risk mapping are prepared by the disaster management agency at the municipality level and in contrast evacuation routes and signs are visible for the public. On the other hand, it reveals that the awareness of the plans and maps

are deficient. Most of the household survey participants were not aware of local hazard mitigation planning and mapping for their communities, hence they might miss specific knowledge that could help them to improve their own household preparedness. The planning and mapping are sometimes carried out by the local government sometimes but there is a lack of awareness of these activities at the community level.



Picture 14 Information board on Tsunami evacuation procedure in Aceh Jaya
Source: own

The information related to early warning systems and evacuation are important for safe evacuation and individual preparedness. Most of the community members experienced the Indian Ocean Tsunami in 2004 and the subsequent earthquake event. Through those experiences they have learned how to evacuate and have established their own evacuation behaviour. The learning system and evacuation strategies are part of the individual learning and self-organizing that require them to seek further information related to those strategies. Moreover, recent earthquake events that also triggered a tsunami warning have most likely been experienced by all households, while the risk maps are still mainly used by governmental agencies.

In addition, the household survey found that a high percentage of respondents have participated in the public awareness programs such as awareness raising and training (68%) and their children or family members have also participated in tsunami educational programs (49%). The respondents were generally aware of the tsunami safety drill (69%), although the majority of the respondents had not actually participated in drill. Similarly, 53% of the respondents were

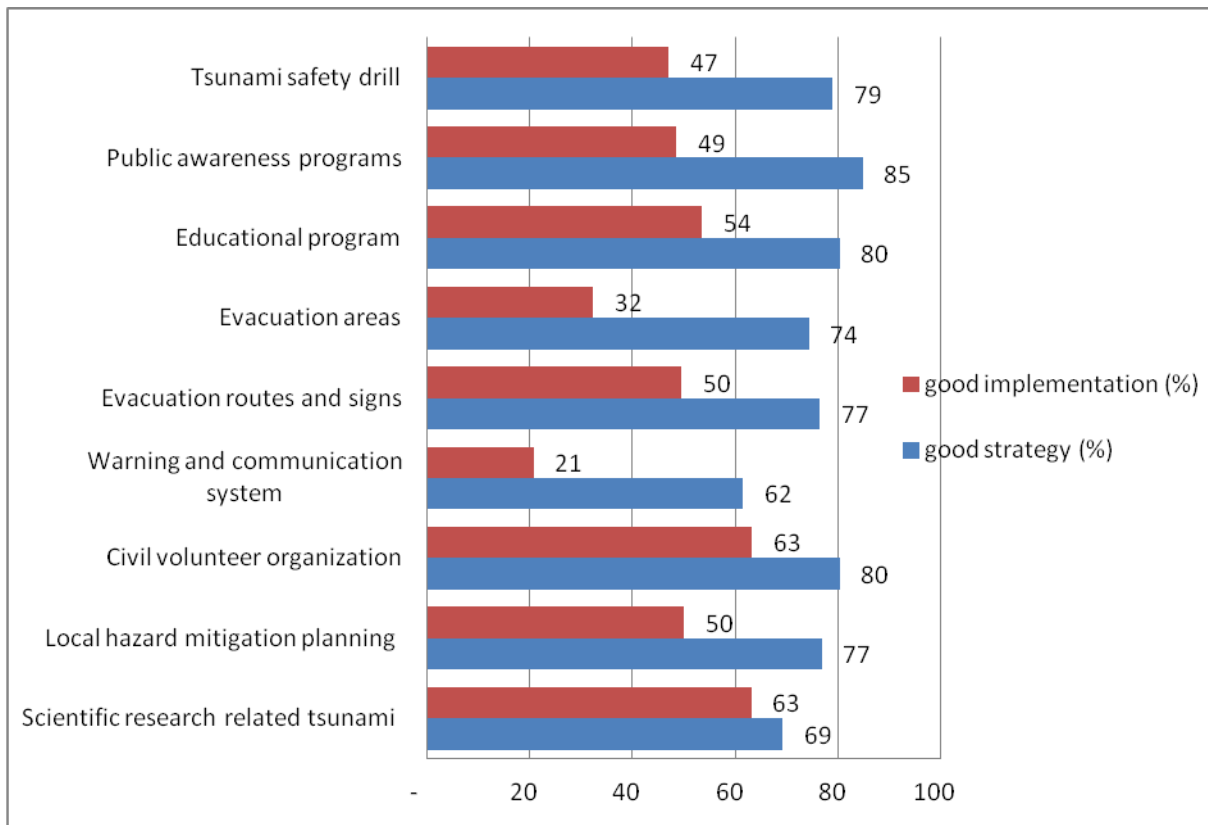
aware of volunteer-led disaster resilience programs, which have been established at the village level (*Tagana* and *Sibat*). More than 80% of the respondents wanted all of the programs and activities to be sustained. The respondents felt that the strategies needed to be sustained to manage disaster resilience in the future. Most of the respondents realized that the number of programs and activities decreased significantly after the rehabilitation and reconstruction in 2009. Early warning system and evacuation are important strategies that the local government should sustain at the community level.



Picture 15 Access to the evacuation hill in Aceh Jaya
Source: own

Figure 8 shows the evaluation of various programs and activities related to the strategies to manage disaster resilience. This survey compared the quality of individual programs with the quality of implementation at the community level. The evaluation from the respondents was based on their experience of participating in those programs, their knowledge of the programs from various sources of information such as newspapers, television, or coffee shops. In general, more than 69% of respondents had a positive perception of the programs. However, most respondents evaluated the implementation process and outcome of the programs as less effective compared to the original goals, strategies and concepts defined in the programs.

Figure 8 Evaluation of strategies and approaches to build disaster resilience



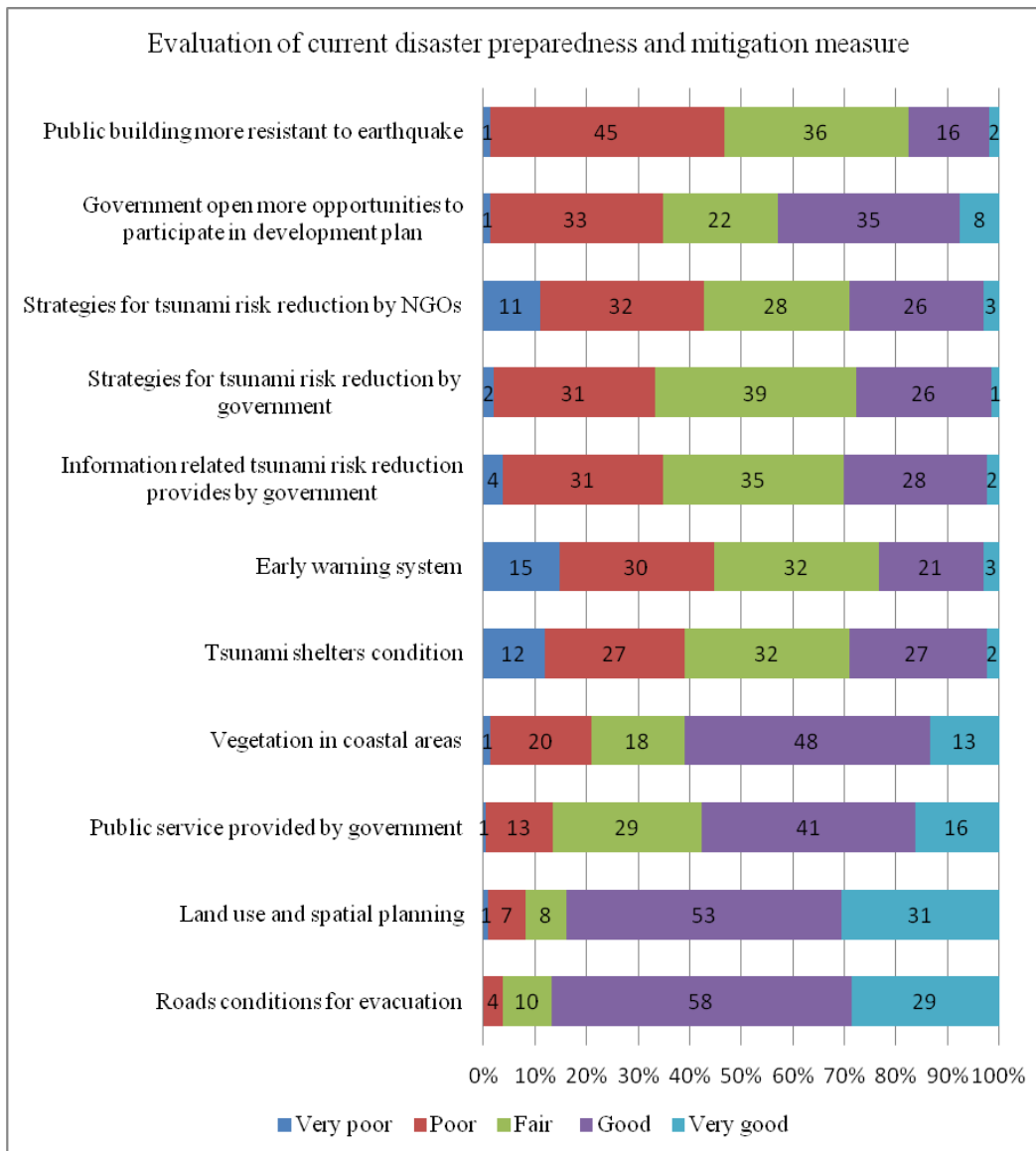
Source: own analysis based on the household survey 2015

According to the survey, warning and communication systems have the lowest implementation rate compared to other strategies. The concept of an early warning system was seen as a good strategy by more than 60% of the respondents, while its implementation is seen as less advanced and effective. Only 21% of the respondents evaluated the implementation as “good”. The community highlights false alarms and delay in warning dissemination as affecting their perception of the TEWS. However, the respondents were aware of the importance of a good TEWS, finding the management of the current tsunami warning system in Aceh Province to be deficient. That also means that the trust in the current warning system is limited. However, the survey revealed the community knowledge of local hazard mitigation and planning is 50%. This indicates that the respondents who aware of these strategies know that the Aceh government has enacted various local regulations in relation to hazard planning and mapping. Although respondents were not aware of the strategies but the evaluation about the implementation scientific research related tsunami (63%) is relatively high. The research institute, for example, TDMRC and ICAIOS conducted scientific research on Aceh’s experience during the emergency response, rehabilitation and reconstruction phase. This research has been part on a joint international research initiative, including conferences on

disaster risks reduction and other related topics on Indian Ocean Tsunami.

The survey results reveal that there is a significant gap between the concept and the formulation of strategies and its implementation in disaster management programs and concrete activities. The challenge remains to increase the quality of the implementation process and to design and develop programs in line with community needs. It is likely that feedback from the community would improve stakeholder capacity to manage disaster resilience. However, the community did not receive feedbacks on their comments regarding governmental strategies. Furthermore, the findings show that the perceived low performance in implementing for example the tsunami warning system might also result in a significant lack of trust in the entire system. The analysis and evaluation of changes after the disaster is discussed more in-depth in the following section.

Figure 9 Evaluation of the current disaster preparedness and mitigation measures



Source: own analysis based on the household survey 2015

To better understand how respondents frame the post disaster context, nine years after the Indian Ocean Tsunami, respondents were asked to evaluate various changes that they perceive in disaster preparedness, mitigation measures and strategies and the disaster resilience management governance (Figure 9). The findings reveal that, most of the respondents evaluate infrastructure development such as the building code for public buildings, tsunami shelters and land use and spatial planning as having improved since the tsunami. These positive results stem from preparedness and mitigation measures that were established as a result of the Indian Ocean Tsunami, as part of post disaster rehabilitation and reconstruction process. The respondents emphasized this as a key difference between Aceh which was severely affected by the tsunami

and other Indonesian provinces.

More than half of the respondents (58 %) think that the evacuation roads in Aceh are in good condition and 29% give higher evaluation for this important infrastructure for evacuation. This result reflects joint efforts by the local government and NGOs during the rehabilitation and reconstruction phase to open new roads and improve the road conditions for evacuation routes.

On the other hand, the respondents have provided different impressions of the early warning system in Aceh. Although this early warning was not established prior to the Tsunami the evaluation of the effectiveness of this system is low. 15 % respondents evaluate the tsunami warning system as very poor and 32 % said that the system is in poor condition. This impression is due to their experiences during several big earthquakes where the warning system did not work properly and produced false alarm.

At the community and family levels, an important knowledge of how to evacuate and communicate during disaster events have learned by most of the interviewee from many sources. Many activities for examples, open new evacuation routes in the villages, meetings to share new knowledge, and organize activities at the community level. The access to new information related to disaster was provided directly by the government and by social media. The voluntary groups who provide emergency response have also established and trained. All these achievements and progresses showed that the resilience pattern can be traced at the community levels. These kind of findings were also found by (Mardhiah 2013) who conducted her research on the same case study area in Krueng Sabee district, Aceh Jaya regency and (Febriana 2015) in Meuraxa district of Banda Aceh. They indicated the community had sufficient knowledge of tsunami preparedness especially how to evacuate and choose the evacuation shelters. The similar research also found that knowledge is related to awareness and preparedness for future disaster risk (Sari 2016).

On the other hand, the evaluation on the Earthquake and Tsunami April 12th, 2012 concluded that people in Aceh had problems with evacuation strategies as has been reported that the traffic jams were everywhere, and people flocked on the roads. These happened because people did not want to evacuate to the vertical evacuation shelters since they could still see the sea from these buildings. They did not even believe that these buildings were safe from Tsunami. They saw that these buildings had not tested yet. Therefore, the community had a negative perception and lack of faith of the government policies to evacuate people to these buildings. As a results, only a small number of people who run to the escape buildings (Tim Kaji Cepat

2012). Some people decided not to evacuate because of many reasons, for example, difficulties to reach the evacuation shelters and could not confirm that Tsunami will come again (Goto et al. 2012; Seni 2013). It was commonly assumed from this event that the community preparedness and evacuation infrastructure needs regular improvement and evaluation (Abidin 2013; Fauziah 2014). On the other hand, this research found that the community were less motivated to participate these preparedness programs, as, the sensitization or drills were seen as repetition, so they did not think these skills were necessary anymore since they already did it several times.

These inconsistencies may be due to many factors such as traumatic experiences in past Tsunami events. One possible implication of this is that people choose the spontaneous evacuation without any consideration to apply effective evacuation strategies. They choose their evacuation route based on their own choice. There are no evacuation maps that introduced and promoted by the local government (Arfiya 2015). Another possible implication of this is that people experienced difficulties to use alternative evacuation strategies. The evidence from this study suggest that people know where to flee but they did not know how to get there safely and shortly. In general, the community has lack of confidence of the reliability of the tsunami evacuation infrastructures and in maintenances. It is almost certain that these situations could be attributed to the fact that most of the evacuation buildings were lack of maintenance and damages (Ofiani 2015).

It is interesting to note that the respondent's evaluation of many local government services is fair, except the low implementation of the early warning system. For example, participation in the development plan (33 %), strategies to manage disaster resilience (39%), public service (41%), access to information (35%), and land use and spatial planning (53%). It means that the local government has worked to increase the quality of public services slightly. These results show a strong connection between local government and society which has been a result of bureaucratic reformation since the Indian Ocean Tsunami. The amandement of the public service delivery system was part of the rehabilitation and reconstruction projects (see also Australian National University 2012).

As shown by this figure, various positive changes have arisen following the Indian Ocean Tsunami, especially in terms of disaster preparedness and mitigation strategies. Nevertheless, the local government and local actors should increase their performance and capacity to sustain the current strategies that have been positively evaluated by the respondents. However, this would require ongoing learning and collaboration with various stakeholders, the maintenance

of good communication with communities and the continuing promotion of good governance in managing disaster resilience.

7.2 Resilience focused collaboration approach

In this section, the factors that hamper the development and / or the sustainability of multi-actor strategies to promote disaster resilience are presented base on the resilience focused collaboration framework. In this conceptual framework, the barriers of collaborative resilience includes (1) increasing the capacity and access of evacuation strategies for the vulnerable, (2) perceptions of risk and uncertainty, (3) scales of collaboration, (4) diverging interests, (5) trust between collaborators, (6) information sharing, (7) spanning boundaries, (8) Fragmentation, inconsistencies, and lack of coordination. The key actors semi-structured interviews revealed that the current collaboration in managing disaster resilience in Aceh would face the same problems. This section aims to respond to the research questions by detailing the range of challenges noted by the informants in the collaborative process between with local actors.

7.2.1 Capacity and access of the vulnerable groups

The results from the semi-structured interview suggested that the resilience building process should encompass a higher or better gender sensitivity that can increase the capacity and participation of women. The research found that various vulnerable groups were invited to engage and collaborate in managing disaster resilience. Many NGOs focused on promoting the rights of vulnerable groups after the Indian Ocean Tsunami 2004 in Aceh Province. The legal protections in disaster management have been initiated by the NGOs concerned with the vulnerable groups which had been established through local regulations, but the local government had not followed up on the recommendations and requirements:

We should include disabled and the marginalized groups in disaster management. We must promote their participation in disaster preparedness activities. We must place special attention on these vulnerable groups, such as elderly people, pregnant women, women and children. (26-NGO-BNA)

In fact, we never acknowledged the (existence) of vulnerable groups, there was no attention on them. They special needs but the government never made a policy to fulfill their special needs. (10-NGO-BNA)

During the rehabilitation and reconstruction phase, many vulnerable groups were involved with various organizations related to disaster risk reduction, including disabilities groups, pregnant women, children, elderly people, and members of ethnic minorities in Aceh Province. The inclusion of these vulnerable groups in collaboration activities depend on the efforts of the governmental authorities, NGOs and the communities to acknowledge and specifically include these groups as part of the community to be included in a collaboration effort. However, at that time, basic data on vulnerable groups did not exist at the community level. This lack of basic data contributed to the invisibility of these groups and a subsequent lack of support to fulfill their specific needs in disaster management. The findings of the interviews highlighted that NGOs have started to collect the data on these vulnerable groups in order to prepare recommendations for the local government:

We focus on and research marginalized communities, such as disabled groups, as part of the disaster risk reduction framework. We suggest (the stakeholders) involve these vulnerable groups in their programs. (26-NGO-BNA)

However, the intention to protect vulnerable groups in disaster events is not implemented appropriately. The emergency preparedness and local regulations to protect vulnerable groups are not prioritized by the government. The strategies and approaches applied by the vulnerable groups to promote their special needs and attention in disaster management differs considerably and it depends on the NGOs and community to promote better protection of these groups.

The women's NGOs demonstrate progressive efforts to promote female participation in managing disaster resilience. Most of the women NGOs were established in Aceh Province before Tsunami in 2004. As such, they already had experience in supporting women who were affected by the political conflict between the Free Aceh Movement and Indonesian government. After the Indian Ocean Tsunami 2004, women suffered different disaster impacts to men. For example, the problems related finding new jobs and change of marital status that increase women vulnerability after disaster (Daly et al. 2013; Deviani 2013).

At the same time, the local government was ineffective at responding to the specific needs of women during the disaster. Moreover, the women NGOs are eager and open to collaborate with other stakeholders and support women contributions at the grass root level.

One of the woman's NGOs revealed that most of the Indian Ocean Tsunami victims were women because women did not have the capacity and knowledge to safeguard their lives. The direct impacts of earthquakes and the tsunami in 2004, showed that more women than men

died in Aceh Province:

Most of the Tsunami (26 December 2004) victims were women because women didn't know what they should do in the event of a tsunami. They were panicking. They also cannot read the natural warning signs of tsunami, so they fled in to the coastal areas after the huge earthquakes. (04-NGO-BNA)

The experience and lessons from the 2004 Tsunami encouraged many local and international women NGOs to improve woman's access and responses to early warning systems. However, in the traditional societies, this is less effective because there are so many barriers for women in the villages to participate in various sensitizations and training, for example, husband permission and household chores (Deviani 2013). This adds to the vulnerabilities of women for future disaster event. It is interesting that after the lessons were learned and interventions put into place by the various women's NGOs, women have still been excluded from various preparedness activities at the village and community levels:

"In the community, there is no attention to fulfill particular needs of women. The evacuation routes not introduced to women. Village hazard mapping does not involve women. Sensitization is conducted in a general way and specific information for women is very limited." (04-NGO-BNA)

The central issue is the role of women in society. The simple technical problems such as invitations to participate, information, and timing of the meetings make it difficult for women to contribute to the development of policies and programs at the community level. This hampers their participation and representation in the village meetings:

There is patriarchal culture, a woman is seen as less important in a village meeting and often only men can attend the meetings. This causes the needs of women to go unfulfilled. Usually, announcements are placed on the board in the Musala (small praying room), but often it is also difficult for women to go to the Musala because they have no time; they must take care of their children instead. (04-NGO-BNA)

The inclusion of women in managing disaster resilience often requires specific consideration because they have to take care of children and sometimes have to work to support their family. One of the women's NGOs suggested that men should change their mindset toward the role of women in society. The religious leader and village leader can support women's contributions through religious teaching that's which acknowledge the important role of women in society:

To make changes, women must be involved in disaster management meetings where men are also invited, so women and men can communicate directly. The community leader must also be present at the meeting. This hopefully can change the patriarchal culture. (04-NGO-BNA)

Women remain marginalized in the development process because of the dominance of men and it is difficult for women to participate in decision making especially at the village level. This research found that mainstreaming gender inclusion in managing disaster resilience has been introduced by NGOs that work at the village level. They support women's participation in planning and preparedness programs that fit with women's needs. It started with women efforts to voice their needs and develop planning, mapping, and warning systems that women can manage and organize themselves based on their own experience and environment:

We have to increase women's knowledge about disaster preparedness. They can discuss their needs. They can make their own decisions regarding how to deal with disaster management in their village. They have mapped hazards and risk in their areas and chosen a woman to organize the activities related to disaster risk reduction. (04-NGO-BNA)

It could be expected that after the NGOs leave; the local women leader can continue the process to promote female participation at the village level. The contribution of the women's NGOs has integrated gender perspectives in managing disaster resilience. On the other hand, the learning and self-organization process of the women's groups at the community level is important for engaging in current development programs and promoting the roles of women in managing disaster resilience.

The other vulnerable groups that started to address the need for critical support and assistance programs for the disaster emergency are the disability groups. During the rehabilitation and reconstruction phase, several NGOs focused on disability issues and worked with these groups through various projects and activities. They tried to increase public awareness to include the persons with disabilities in managing disaster resilience:

There are some marginalized groups that have become well. They have established a formal institution, so they can access the government and to other related institutions to petition for assistance. Recently, they conducted an activity facilitated by disaster management agency, I can say that these groups are quite good, maybe because they were initiated and empowered by the NGOs. But it still depends on government willingness to support and help these organizations to sustain. (26-NGO-BNA)

Being well organized organizations is important for promoting their special needs and assistance required during a disaster or emergency. Many disabled people's organizations have been established to facilitate their representation and inclusion in development programs and plans. However, after the reconstruction and rehabilitation phase, people with disabilities still lack awareness and are often excluded from various preparedness programs, such as training and tsunami drills run by the local government. Although they are sometimes reluctant to be

involved in these activities because they lack confidence due to their conditions:

Yes, I asked them (the NGOs and government) to invite us (persons with disabilities), particularly for my friends who have severe disabilities, so they know what they must do if a disaster happens. There is a possibility that they are not getting involved because the awareness raising programs for disabled people may make them feel offended. (05-NGO-BNA)

From the perspective of the persons with disabilities, they often experienced a lack of assistance during the disaster events. This is partly because community members lack awareness and fail to take responsibility to assist people with disabilities. They suggest increasing public awareness and sensitization for community members on the need and information on how to provide assistance to people with disabilities in a disaster or emergency situation:

Disabled groups should be the main priority in an (tsunami) evacuation, but in a tsunami event, they have to flee and evacuate themselves without assistance. We have discussed these problems, but the community tends to evacuate their own family members, and disabled people have to rely on their own family members to help them to evacuate. 05-NGO-BNA

The inclusion of disabled groups in managing disaster resilience is needed to overcome the increased risks these groups face and to promote broader community resilience.

To conclude, in this research women and persons with disabilities are recognized as vulnerable groups and have been facilitated by NGOs to participate in managing disaster resilience. However, the engagement with other types of vulnerable groups is needed to facilitate greater community resilience.

7.2.2 Perceptions of tsunami risk and uncertainty

This research has found that religions and culture affect perceptions of tsunami risk and uncertainty. Community knowledge about Tsunamis as a hazard largely began after the Indian Ocean Tsunami in 2004:

People in Aceh never knew what a tsunami was, and then after we experienced it, we started to understand what a tsunami really means. (09-GO-BNA)

Most people are more familiar with other hazards such as floods and landslides that strike more frequently. In addition, before the 2004 tsunami, disaster mitigation was integrated with the spatial planning, but the Tsunami risk was not included in the spatial plan:

“Before the tsunami, we had city planning based on disaster risk reduction, but it was not an obligation and there was no detailed plan for including tsunamis. At that time, we only thought about landslides and storms. Tsunami is a new thing in Aceh and people were really shocked when they experienced it. If we thought about coastal disasters, we only thought about abrasion.” (39-GO-SBG)

The perceptions of earthquakes and tsunamis are significantly different between the tsunami survivors and people who did not directly experience the 2004 disaster. Past disaster experience has influenced how they perceive and respond to future tsunami risk:

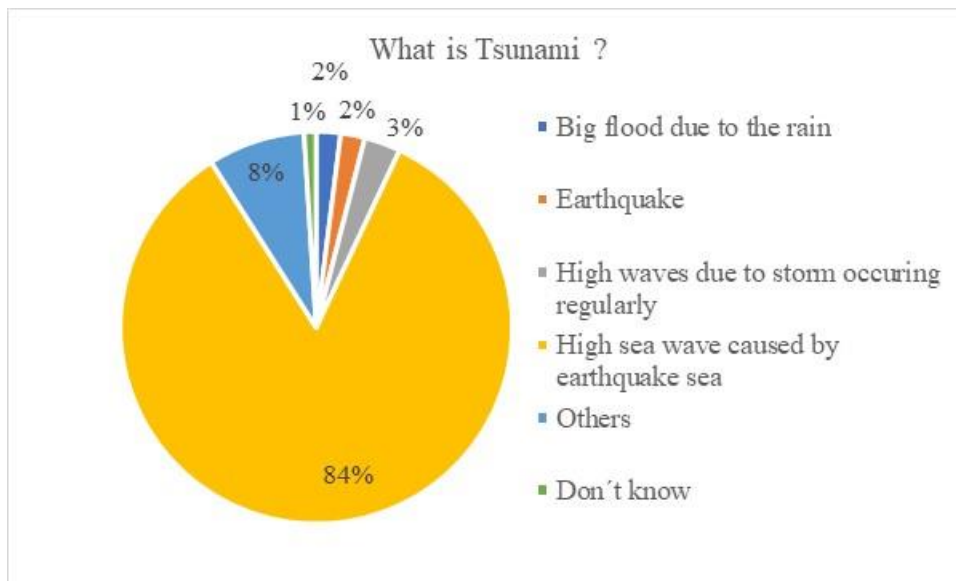
“We never experienced tsunamis here. If an earthquake occurs, people will not panic, and they will evacuate. It is not like in Banda Aceh when people flee desperately. Here in Sabang, we stay calm and confident when an earthquake strike.” (43-NGO-SBG)

The results from the household interviews showed that almost all of the respondents (99 %) had heard about “Tsunami” and more surprisingly a small group of the respondents even knew about the indication that the earthquake in 2004 could generate a tsunami (12%).

The knowledge about earthquake as an indicator of a tsunami was from the indigenous knowledge that is passed across generations. For example, one of the respondents explained that her grandmother has told her to flee into the hill after the big earthquake. But her grandmother did not explain why. Another story told by one of the respondents that was aware that a big wave could follow a big earthquake knew this from a song that she remembered from her childhood. She used to sing that simple song whilst playing with her friends.

As for the knowledge of tsunami as a natural hazard, most of the respondents (84 %) understand what a tsunami is (Figure 10). These results may be also influenced by various public awareness and sensitization campaigns about tsunami preparedness during the rehabilitation and reconstruction phase through efforts by NGOs and local government.

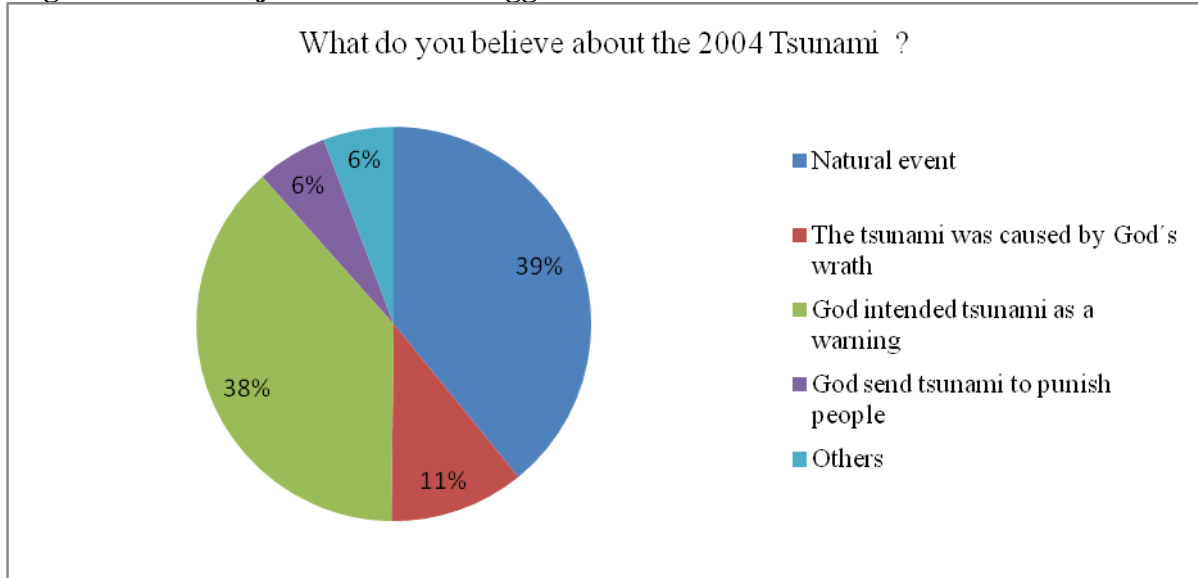
Figure 10 The perceptions of tsunami risk and uncertainty



Source: own analysis based on the household survey 2015

Disaster experience affects personal beliefs and interpretations of the causes of a disaster. This research found that tsunami risk is often perceived as God's will in the context of Islamic teaching. The analyses of the respondents' beliefs in the causes of the Indian Ocean Tsunami in 2004 provides the same insights. Just over one third (39%) of the respondents perceived the Tsunami as a natural event (39%) (Figure 10). However, almost the same proportion (38%) perceived the tsunami as a warning from God, 11% as God's wrath and 6% as a punishment from God.

Figure 11 The major factors that trigger a tsunami or the Indian Ocean Tsunami 2004



Source: own analysis based on the household survey 2015

Most of the respondents told a different story of their interpretations of the cause of Tsunami and why the disaster impacts were so high. The stories were related to the social and political conditions that did not follow the Islamic teaching at that time.

These findings indicated that interpretation of the cause of disaster challenges the prevention, preparedness, and mitigation programs that call for community participation:

“In Aceh, we face a difficult situation because people think that disasters come from God and we cannot against fate.” (11-NGO-BNA)

This creates considerable challenges for the organizations that aim to increase public awareness and sensitization to promote disaster preparedness. The organizations have had to use many approaches to explain the relationship between natural disasters and religious teachings:

“The challenge is the community mindset that considers disasters as something that they cannot prevent. This mindset is the main challenge because people have a lack of disaster awareness and aren't prepared.” (48-GO-SBG)

They tried to change people's perceptions that preparedness is important to reduce future disaster risk:

“The challenge is related to what the community believes, sometimes the community members consider that they cannot prevent disasters. Disasters come from God ... We must realize that we are also involved in taking action to make disasters happen, we also have to accept the risks. Thus, the main problem in dealing with disaster mitigation is the people's mindset.” (45-NGO-SBG)

Community rejection in participating in disaster preparedness programs or activities is also related to various interpretations of tsunami risk. For example, the discussions during a sensitization campaign or training about past tsunami events can increase the risk of tsunamis in the future:

“Few people still think that when we remember about tsunamis, it means, we ask God to give us tsunamis again in the future.” (05-GO-BNA)

On the other hand, the religious leaders can help to awareness and in some cases also change community perceptions towards tsunami risk and tsunami preparedness options. One of the Islamic leaders explained that there are also options to refer to Islam when promoting risk awareness:

“We should learn how to prepare for disaster. If we do nothing resignedly and despair when disasters happen, we are totally wrong. We should save ourselves; it is what God has told us to do.” (05-NGO-BNA)

After the tsunami in 2004, the authorities from this agency visited villages that were affected by the tsunami and met community members to give counselling for trauma. At that time, the campaign for increasing preparedness had also begun and it asked the community not to mourn for too long and to start their new lives because God has given them the opportunity to live:

“The community has started to have an awareness about the importance of evacuation in the case of a disaster, even though, many people still think that disasters are the will of Allah and thus unavoidable.” (69-NGO-CLG)

The roles of the religious leaders to motivate the community to be involved in the preparedness programs are very important. The community motivation and interest in participating in public awareness programs and activities decreased after the rehabilitation and reconstruction phase. One of the reasons for this is because people perceive that they now have sufficient knowledge to respond to tsunamis in the future:

“Our challenges and obstacles are that when we visited the community, most of the community members have not responded well when we sensitized them about disaster preparedness. This is because they felt that they already understood and know what to do to respond to a disaster.” (59-NGO-CLG)

However, according to the household survey, a majority of respondents (67%) are still interested in to participating in disaster risk reduction activities in their village (figure). Those respondents who are reluctant to participate in disaster risk reduction (33%) are so because they have no time to participate, not because they feel they already have sufficient disaster preparedness knowledge.

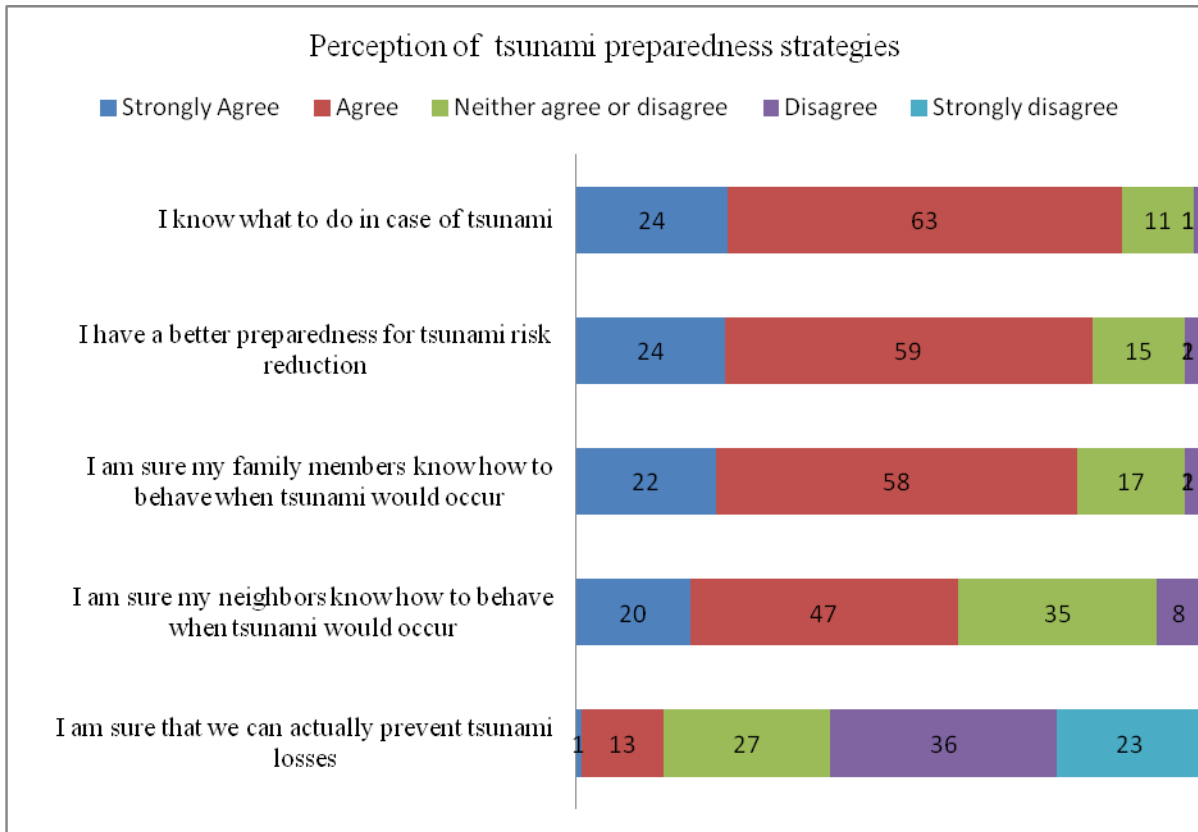
In contrast, most people still panic during a large earthquake event. This indicates that they perceive that they know what to do in the case of a disaster, but the tsunami risk and uncertainties are difficult to imagine. In this situation, the tsunami preparedness programs and activities are still needed. One of the NGOs distinguished challenges to continue work with the community that are bored and fed up with scientific and formal forms of awareness programs:

“Even though the tsunami happened over nine years ago, people still panic, they evacuate by motorcycle to somewhere else besides the escape building, as the door of the escape building is locked, and they cannot access the second floor, so there are still a lot of problems. People are having too many lectures, and this is also the case for children. So, our organizations try different methods to build public awareness, using local culture approaches (e.g. through additional theater performances) so it is interesting but also easy for them to understand. This is the easiest way to “approach” the people” (52-NGO-BNA)

The variation of targeted groups for disaster preparedness programs such as working with children to enhance their risk awareness is important. Approaches for increasing risk awareness that refer to and use cultural approaches and religious symbols are needed to reach people effectively.

The respondent’s perceptions about various tsunami strategies, such as capacity to evacuate and prepare for tsunamis has changed following their experiences of disasters and participation in many preparedness programs and activities. The majority of respondents (87%) are confident that they have the capacity and knowledge to responds to tsunami warnings and evacuate (Figure 12). Moreover, they are also confident because they feel better prepared compared to the situation before 2004 (83%).

Figure 12 Perception of tsunami preparedness strategies



Source: own analysis based on the household survey 2015

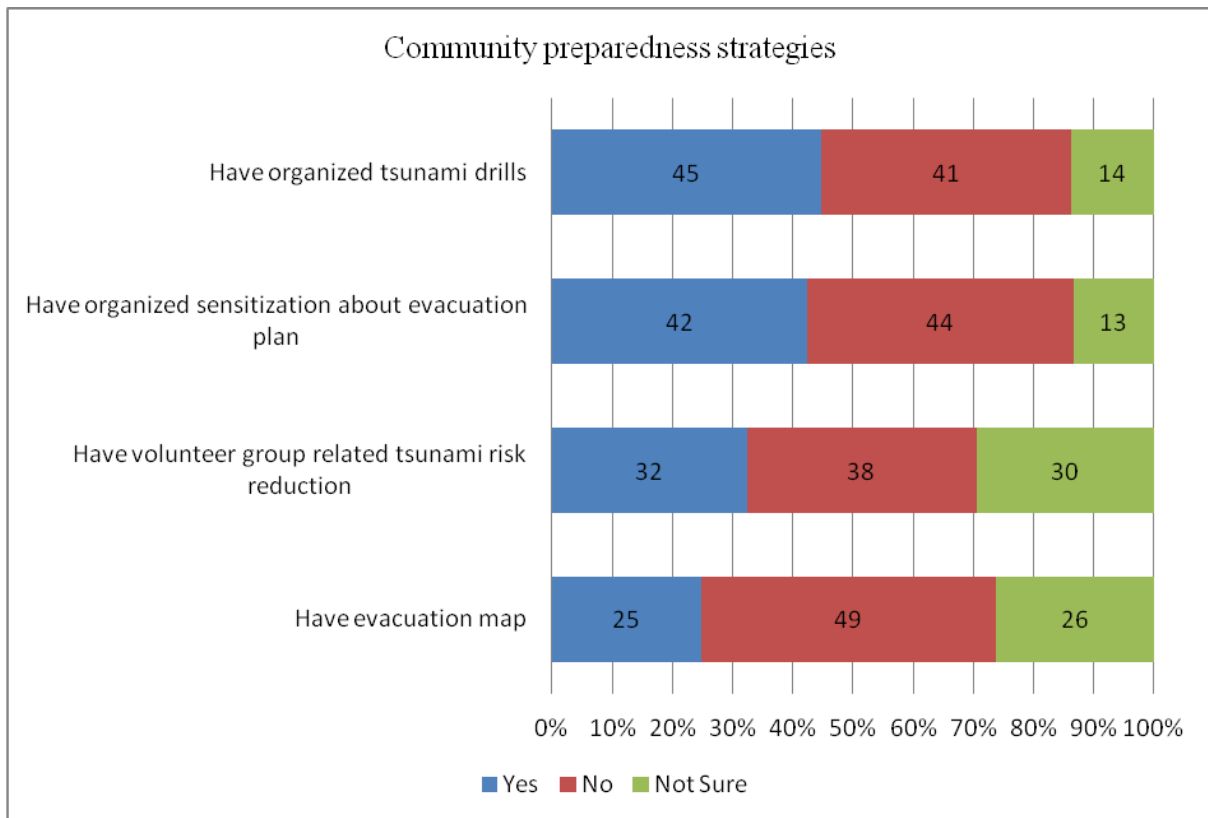
The respondents believed that their family members (80%) and neighbors (67%) have sufficient knowledge and capacities to respond to a future tsunami. Regarding these perceptions about the family members and neighbor preparedness levels, most of the respondents have also discussed preparedness strategies with their fellow household members and people in their villages.

However, the perception of their own capacity to prevent tsunami losses is low (14%). The respondents believe that there will be difficulties in preventing losses because of the high uncertainty of tsunami consequences. Mitigation and preparedness measures may prevent the losses but the respondent’s lack of capacity to predict the tsunami impacts. However, due to their past experiences, the most important thing is to save their lives and the lives of their family members.

It can be argued that the levels of knowledge and preparedness of the respondents are influenced by various preparedness programs and activities at the community level. Most

respondents are aware and have participated in various preparedness activities during and after the rehabilitation and reconstruction phase. The community has organized several tsunami drills (45%), sensitization about the tsunami evacuation plan (42%), volunteer groups such as Tagana and Sibata (32%) and evacuation maps (25%).

Figure 13 Knowledge about the community preparedness strategies at village level where the household members live



Source: own analysis based on the household survey 2015

The interview results show that these strategies at the community level are not well managed or need to be improved. Some households were not sure where the evacuation map is located, although they are sure that their village has prepared this map. Others did not know how to become involved in the various activities and programs. Moreover, after the rehabilitation and reconstruction had finished, preparedness activities were rarely organized at the community level.



Picture 16 Tsunami evacuation sign in Bahasa Indonesia and Acehnese language
Source: own

Stakeholder collaboration is important to address community perceptions of tsunami risk and uncertainty. This has implications for designing suitable approaches and strategies for community disaster preparedness in the future. The effective collaboration can promote a better understanding of tsunami risk in the future, particularly where stakeholders can contribute to risk appraisal and try different methods to mitigate the risk.

7.2.3 Scales of the current collaboration

This research highlights that collaboration to manage disaster resilience exists at the local level and involves various stakeholders, predominantly representative's local government agencies, NGOs and community-based organizations that focus on disaster management. BPBD as the main disaster management agency have collaborated with stakeholders from different level of governments and different levels of organizations.

Although the current collaborations do involve several stakeholders, the involvement of key actors from the community level, such as individual and household members is still particularly necessary. Inclusion of individual and household members would increase the capacity of the local government to manage disaster resilience:

“Community disaster preparedness is important as well as family preparedness for disaster. In the past we have seen it as a separate issue, but now we should acknowledge that household members are part of the resilience community. Because when disasters strike, the external emergency

response is no longer effective after 6 hours but usually reaches communities 24 hours late. As such, the community must be built to deal with a disaster more rapidly.” 24-NGO-BNA

One mechanism to increase the effectiveness of collaboration with community members is by establishing disaster risk reduction forums at the village level. Community forums can enable community members to organize disaster management programs and activities in their villages. Consequently, this forum can enhance collaboration at the municipality levels because the members of the village forum can be part of the local multi-stakeholder forums:

“We need to establish disaster risk reduction forums in every village for disaster preparedness. The members of this forum will determine the roles of the community members in disaster management. This is one approach to organize the community. The community needs communication and collaboration because most of them are still traumatized from the tsunami in 2004. We should update the disaster risk data every six months in every village. We should update the data on the number of pregnant women and women with babies below one year old every year.” (04-NGO-BNA)

This forum may aim empower community members to participate in disaster preparedness programs and activities, hazard mapping, and data collection that is needed to establish and maintain the community preparedness plan. The intervention of local government to facilitate these processes is needed to sustain community knowledge. During rehabilitation and reconstruction many villages were facilitated by NGOs with many community or village-based disaster management projects and activities. This indicates that the community has collaborated with various organizations from different levels in the past. Most of the projects and activities finished and were handed to the community to continue the programs. The problem with this was that the local government was not aware of most of the NGO projects that were accomplished during the rehabilitation and reconstruction phase:

“So, it is now a question of how to ask the government to continue to empower the community. Otherwise, all that we have done will be wasted. That’s the reason why the capacity building must reach all of the community as well as the government. For example, the disaster mitigation program was only shared at the level of community without involving government, the situation turned into chaos when trying to communicate and coordinate with government because they weren’t aware of what was happening.” (26-NGO-BNA)

In order to maintain the sustainability of community disaster preparedness, BPBD has collaborated with IOM to establish the disaster resilient villages. According to the local

regulations the government is obligated to local the traditional community leaders that exist at the village level. As a result, it is difficult to introduce the same programs at the villages that have been targeted before by the NGOs. In addition, the local government asks for the full commitment of the village authority to organize the community members:

“We have planned to establish disaster resilient villages: kampung Pande, Lampulo, dan Ganoë (name of three villages in Banda Aceh). Our selection criteria are based on the intention of the village authority, the community and village leader response. The village leader has to commit, agree, and be eager to mobilize the community. The other coastal villages (in Banda Aceh) have implemented the same programs but were organized by the different NGOs. (The consequence is that) we have to choose the villages that are not located near the coastal areas (02-GO-BNA)

These findings have found that cross-scale and multi-scale collaboration are present at the local level in managing disaster resilience. The local government should find the strategies to enhance the collaboration across scales and invite more stakeholders to collaborate at the local level.

7.2.4 Trust among the local actors

This research has found that there is a lack of trust among the stakeholders in their current collaboration to manage disaster resilience. The issues of trust mainly arise between the government authorities and the non-governmental actors who have experienced working together during disaster emergency response. It seems that BPBD as the main coordinator for disaster management has a lack of competency in disaster management. This has affected the level of trust of other collaborators to engage in various activities that are coordinated by BPBD:

It is normal to have such a distressed feeling when listening to the lectures from the government authorities who portray themselves as the „disaster management hero “, as they did nothing except for ceremonial activities. But we put aside these feelings, and think that we must cooperate, work together, no matter who the people we work with are, we have to put aside our concerns on this disaster management program (20-NGO-BNA)

The absence of trust appears to arise because BPBD, the responsible government authority, often has not acted in conjunction with their promises. This becomes worse because the governments dictated the other party and fail to enact the leadership in the collaborative process.

At the same time, the community lacks trust in the government’s capacity to manage disaster

resilience. As trust in the government was not generated during the rehabilitation and reconstruction phase, the community perceives the NGOs as more trustful than the local government. This happened because the local government did not show leadership and maintain good communication with the community. The government authorities have rarely conducted public meeting and interacted with community members:

It is difficult to overcome the issue of the community lacking trust in the government, but it is supposed to be overcome through disaster risk reduction. The community, government and stakeholders should be put in one triangle in the DRR framework with leadership and participatory methods. This can be achieved through public meetings at the village, district and province levels for the disaster management plans (53-NGO-BNA)

Although there have been some attempts to develop trust, the local actors understand that the local government should show their leadership in that process. The ideal condition is difficult to achieve but future collaboration needs to be more trusting to effectively manage disaster resilience.

7.2.5 Sharing information mechanism

This research has found that the system for sharing information in pre- disaster stage among the local actors is not well developed. At the government agency level, the type of information that they exchange is internally related to knowledge about the agency's progress and performance in managing their development programs. In addition, meetings offer a communication channel to discuss community responses to their programs or activities as laid out in the development plan. The cross-agency information flows between the governmental actors through weekly formal meeting:

"We have a joint meeting with the Secretary of the city every Wednesday in Banda Aceh. In this meeting all of the agency heads will discuss their progress, problems and community complaints. This is an opportunity to get to know each other's work and coordinate. The meeting report is then sent to the Mayor." (07-GO-BNA)

Inter-agency communication between the governmental agencies and NGOs are also not managed formally. The current multi stakeholder forums have failed to provide the platform to exchange information between the local actors. Most of the information related to the current government policy in disaster management is not available for the public. Alternatively, NGOs will request a meeting or send a formal letter to the government agency if they need information. The NGOs know which agency will provide the information that they request:

Whenever Walhi (NGO name's) needs any information, Walhi will request the government authority to explain. There is no information proactively shared by the government. The government is open minded, they have a willingness to share information, it is just that they are still slow in acting as they also have some internal problems (06-NGO-BNA)

This research suggests that the government agencies are eager to share information with the NGOs and communities but that the information sharing mechanism is not managed properly by the government. The local government has the responsibility to share information related to their operations, programs and activities with the community. The formal information sharing mechanism is to invite the community to be involved in the public discussion or hearing that organized by the government. The complicated bureaucracy affects the sharing of information between different levels of government and the community. Sometimes, the head of the village and the community are not aware of the programs and activities that take place in their villages:

The challenge is the bureaucracy, if any activity is to be held, the government must pass information to the head of the sub district, and then to head of the village, and the community leader. But sometimes, the head of the village was not made aware of the activity held in his own village. Even though we know the problem, we think it is the head of the village's responsibility to know what is happening in his village and to pass that information to the community (38-NGO-SBG)

As such, the formal method for sharing information is not effective, especially with regard to sharing information about preparedness programs and activities. The local government has a limited budget to organize formal public meetings and the costs of such of meetings are high. The research findings indicate that the exploration of informal information dissemination is needed to increase the public awareness to engage actively:

Regarding the method of engaging in dialogue with the community, it can be more effective, if it is done not only in formal meetings, but also through informal meetings in coffee shops, community activities, Friday prayer, or in the Islamic teaching gathering. The community has less enthusiasm if the dialogue happens in more formal meetings (45-NGO-SBG)

A major issue is that the local government lacks strategies to empower many informal communication channels that exist at the community level. For example, to maximize the roles of religion or community leaders that have established many activities which could be used to provide information. These informal organizations can back up the communication between the government and communities.

7.2.6 Spanning boundaries

The research findings indicate that the boundary-spanning activities should include efforts to identify and invite more stakeholders that represent the diversity of the following the Indian Ocean Tsunami. Vulnerable and marginalized community members have learned that without a formal organization they struggle to be recognized and acknowledged. However, the recognition and acknowledgment of marginalized and vulnerable community groups is important as local actors that play significant roles in managing disaster resilience.

For example, the Chinese ethnic community established a community-based organization to help their community engage in various governmental and social activities:

“This is the time when we think we must find a formal Chinese ethnicity organization in Aceh. There was no organization for the ethnic Chinese before 2004, when the tsunami happened. We need this organization to help us, in case the (political or ethnicity) conflicts occur or we have problems with the government (...) Also, in case there is a tsunami in the future, the disaster relief (for our group members) can be organized by this organization.” (22-NGO-BNA)

After this self-organization effort, the Chinese organization promoted the importance of including ethnic minorities in managing disaster resilience. As a minority group, their inclusion and representation are sometimes neglect in disaster preparedness programs and activities.



Picture 17 Hakka Organization as one of the Chinese organizations that contribute in disaster resilience building in Banda Aceh
Source: own

Since the rehabilitation and reconstruction phase, the governmental authority and NGOs started to invite organizations from different ethnic minorities ethnicities and religions to promote diversity in managing disaster resilience. The engagement of these populations is recognized

as boundaries-spanning activities which can exchange and link different values and knowledge from different community groups which is important for managing disaster resilience:

“We invited Sekolah Methodist Banda Aceh (the name of Chinese ethnicity group school) to participate in our activity because most of their students are Chinese and Christian. So, the participants will come from different ethnicities and religious backgrounds. The students from ethnic and religious minority groups have been less frequently invited to be involved in disaster management activities by the NGOs and the government. We should help each other in disaster events without looking at their ethnicity and religion. Thus, in our activities they will be together, get to know each other to better understand about pluralism in disaster management. This is indeed about pluralism because, when the tsunami happened in Aceh, the disaster relief did not only come from Muslims, but from all nations, tribes and religions. So, why do we discriminate based on ethnicity and religion now?” (52-NGO-BNA)

In addition, the engagement of the Lesbian, Gay, Bisexual, and Transgender (LGBT) groups in disaster management has been initiated by the BPBD and IOM through their current projects. The LGBT groups were invited to participate in the local multi-stakeholder forum and were trained for disaster preparedness. Because of the cultural and religious situation in Aceh, the training was held outside Aceh, where the LGBT can show their identity and feel secure in participating in this training:

“For the transgender groups, they had basic training for disaster preparedness which was facilitated by IOM. IOM gave the training to the groups. But maybe because there was no special module or interesting method that prepared their group for training, the training was very boring and not attractive for the participants. It only consisted of a lecture and no interactive training. Actually, the method needs to be reevaluated and must find a method that is acceptable for the groups so that they feel that the training is important for their groups.” (10-NGO-BNA).

A special training module should have prepared because of the LGBT have different needs and capacities. However, the active participation of this LGBT group should be supported by the government and community because of the discrimination is faced by this group in Aceh society. The community has learned from the Indian Ocean Tsunami in 2004 that in a disaster event, the most important thing is solidarity without discrimination. The disaster relief during the Tsunami In 2004 has been sent by people from different countries, ethnicities, religions, and sexualities.

7.2.7 Complexities

Research found that the complexities in managing disaster resilience after the post disaster are

mainly caused by fragmentation, inconsistencies, and a lack of coordination in managing the local actors during and after the rehabilitation and reconstruction phase. The lack of coordination and transparency began during the rehabilitation and reconstruction phase, for example in the distribution of disaster relief and housing benefit for the disaster victims:

“Looking back at the rehabilitation and reconstruction in 2005, it was supposed to have good coordination and transparency to avoid the incorrect targeting of programs or approaches delivered to the community. There was no planning, no coordination and no transparency. At the post disaster phase, the transparency was at zero, so that many aspects were unclear such as support, funds, and its independency. In Sabang, the issue was not very high concern, but in Banda Aceh, one person could get seven houses in some locations. For example, it happened in Lampulo that one person got eight new houses, whereas some people got none. There was no justice and it happened because of the lack of coordination and transparency.” (44-NGO-SBG).

At that time, BRR coordinated the rehabilitation and reconstruction projects. This agency has reported their accountability and transparency in managing the rehabilitation and reconstruction. The lack of coordination affected the location and construction of the vertical evacuation building:

“During the post tsunami rehabilitation and reconstruction, the NGO built the escape building; there was no coordination with the respective community and local government. We, as well as the BPBD Aceh Jaya, were not yet established. There were also few not so returned community members as Aceh Jaya had been flattened to the ground.” (61-GO-CLG)

As a result, the effectiveness of the evacuation building is low because not many people evacuate to these buildings. Coordination and communication are important to avoid overlapping programs and to targeted communities. The coordination between the NGOs during the rehabilitation and reconstruction phase was difficult as such many NGOs worked with the same programs and targeted community:

“Since the disaster management involved a lot of factors, coordination and communication become very crucial. I have one experience that when we were involved in rehabilitation and reconstruction in one area, it was found that another NGO has had done the same work as we have. That’s why in every phase of disaster management such as risk reduction, emergency-response, rehabilitation and reconstruction, and mitigation, communication and coordination is an essential thing to do.” (10-NGO-BNA)

After the rehabilitation and reconstruction phased finished, BPBD’s role was to coordinate the local actors in disaster management However, the BPBD did not manage to communicate well with the local agencies and NGOs. The communication and coordination were performed when

BPBD needed the contribution of other agencies but the efforts to maintain coordination formally and informally did not exist:

“The problem is complicated; we were not involved from the beginning (by BPBD) and we did not understand their program. They only coordinated with us when they needed our help, for example, when they needed to install the disaster evacuation signs.” (66-GO-CLG)

The complexities of the collaboration challenge were limited by rewards for the other collaborators to engage in various programs and activities. During the rehabilitation and reconstruction phase, many NGOs paid the community members for their participation in rehabilitation and reconstruction activities, meetings, public discussions, or drills. This “cash for work” culture created a new generation of community that is difficult to self-organize because it expects monetary rewards as motivation to participate:

“The “community participation” jargon is apparent because it is not guaranteed that the community will participate actively (in the resilience program). They want to participate if (the organizer) compensates them for their participation. For example, when the UNDP organized the tsunami drill, they are reluctant to participate, but in the middle (of the event), they just realized (that it is important for them). (On the other hand) the community has to leave their work and they incur transportation costs, (so if they receive the compensation) the drill will be a bit more successful.” (53-NGO-BNA)

After the rehabilitation and reconstruction, volunteerism in disaster response was introduced. Besides the formal disaster management volunteer groups such Tagana and Sibat, at the community level, many volunteer groups were established during the emergency response. This voluntary action is a new form of self-organization that previously did not exist in Aceh:

“When the disasters happened, many volunteers helped the disaster victims, such as from TNI and foreign countries as well as FPI (Islamic Organization), whereas the volunteers from Aceh were in small numbers. There was still a lack of awareness as they were not used to being in such a situation. There is no more awareness to help each other because there is no more money available like it was in post tsunami phase where NGOs gave money for people to work.” (52-NGO-BNA)

However, there is a need to increase voluntary action since the current collaboration needs more volunteers to work on promoting disaster risk reduction at the local level.

7.3 Summary

The key findings of this chapter suggest that the perceptions of tsunami risk and uncertainties are key challenges for the local actors to continue preparedness programs and activities. Most of the community members are aware about the establishment of diverse strategies and approaches to build disaster resilience after the Indian Ocean Tsunami. The household surveys have shown that the community is in the position and able to evaluate the effectiveness and importance of these strategies. The evaluation shows that many valuable strategies have not been sufficiently implemented or the knowledge about the implementation is limited. The interviewed households also suggest sustaining strategies that contribute to building disaster resilience. Hence, many still see the need to continue activities even for such a rare hazard phenomenon.

The second section explore the current collaborations and the challenges and obstacles that hamper effective collaboration between different actors. It has been shown that particularly the limited experience of working together in the past also hampers an effective cooperation in the post-tsunami context. Problems related to a shared vision, a joint leadership and building trust between different actors and agencies have been identified as key. The collaboration of the local actors has faced various problems, but the results show that these problems remain unsolved also due to the fact that there was no mechanism (procedure) established by the provincial and local government to discuss and develop the collaboration. The collaboration between governmental and non-governmental organizations is critical for maintaining long-term disaster resilience, particularly to encourage public and institutional learning.

In the following chapter (see chapter 8), the challenges concerning collaboration that have been identified in this chapter will be discussed in terms of their implications for maintaining long-term disaster resilience. A particular focus will be given to the challenges of shared goals and challenges related to trust within collaboration processes.

8 Discussion and interpretation

The purpose of this chapter is to summarize, discuss, and interpret key findings from the document analysis, semi-structured interviews and household surveys in the three case study areas in Aceh Province. After highlighting important findings in three previous empirical chapters (see chapters 5, 6, and 7), this chapter aims to critically revisit and interpret these findings and for formulate some conclusions for building disaster resilience in Aceh Province. This chapter summarizes key problems identified by local actors (e.g. government, NGOs, or community) and also discusses tools that are currently used for maintaining disaster resilience (e.g. local regulations, learning and collaboration). At the same time, this chapter will revisit the challenges and barriers regarding the process of building disaster resilience. According to Bloomberg, Volpe (2015), the reflection of findings aims to reveal the significance and deeper meanings of the empirical evidence, by looking at differences, similarities, and relationships between the findings and theories.

In this dissertation, the discussion and interpretation take into consideration the literature on resilience, learning, governance, and collaboration. The resilience focused collaboration framework (see sub chapter 2.5) and the empirical findings generated through the different research methods applied. The objective of this discussion chapter is to answer the main research question of how disaster resilience strategies and activities are defined and how different state and non-state actors cooperate to achieve disaster resilience in the medium and long-term future at the local level. Most of the disaster risk research conducted in the context of the Indian Ocean Tsunami still focused on the disaster impact or the phases directly after the tsunami. The question on how to secure long-term resilience more than 13 years after the disaster has not been sufficiently addressed in the past. In this regard, the discussion of key findings and the development of recommendations also should also inform local and national stakeholders in order to strengthen and improve strategies and approaches for maintaining long-term disaster resilience in Aceh Province.

Upon careful analysis of the key findings, the core challenges in building disaster resilience identified relate to issues of (1) finding and developing a common understanding and concept of the disaster resilience, (2) building coherent and joint strategies for disaster resilience, and (3) enhancing and establishing effective collaboration between different governmental agencies and governmental and non-governmental actors. However, the empirical findings of the dissertation also underscore that some efforts to maintain disaster resilience have failed due

to the complexities of the system and the various challenges (outmigration of international NGOs, closing of funds, etc.) that local actors face in promoting changes after a disaster.

The following chapter is differentiated into seven sections. The first three sections focus on the discussion and interpretation of disaster resilience and disaster resilience strategies that were found in the empirical chapters (see chapters 5,6, and 7). The remaining chapter critically revisits on the theoretical basis, methods used and the limitations of the research within the context of the dissertation process.

8.1 Challenges in a common understanding of disaster resilience concept

Although Aceh currently has solid local regulations and structures to facilitate disaster resilience, the sustainability of the process requires a common understanding of the meaning of building disaster resilience. This common understanding is necessary to direct ideas, actors, and strategies to collaborate and coordinate effectively in maintaining disaster resilience over time. As such, the first empirical chapter examined the conceptualization and translation of disaster resilience into various strategies and approaches that have been developed by the local government, particularly the strategies that involve local stakeholders (e.g. NGOs and customary institutions) in building disaster resilience after disaster. The empirical evidence confirms that the development of a common understanding and vision of disaster resilience has not sufficiently been achieved among state and non-state actors and therefore also strategies and projects are not coherently linked and connected. Against this background, the following sections examines challenges and options on how to better promote a common understanding and translation of the disaster resilience concept, particularly through a participatory approach.

8.1.1 Challenges to translate and communicate the meaning

The concept of disaster resilience was introduced by the Indonesian government and international organizations during the phase of recovery from the Indian Ocean tsunami. As such, the local actors had to interpret the concept for operationalization into practical action. This process of interpretation is normally an important learning process as the local government, NGOs, and community need to develop a common understanding and shared meaning of disaster resilience to coordinate and maintain long-term disaster resilience. In addition, a shared understanding of disaster resilience and how to build disaster resilience in the long-term is important to build trust and enhance self-organization among local actors (Lebel et al. 2006). Based on the empirical analysis and as shown in Table 11, three major gaps

in translation the concept were identified that hinder the establishment of a common vision in Aceh.

Table 11 Translation gaps and their implications

Translation gaps	Benefits for common understanding	Benefits for maintaining long-term disaster resilience
Different perspectives and interpretations of the concept	A mechanism to open dialogues to discuss different tools that used by local actors	To propose a common understanding and meaning
Lack capacity and political commitment to translate the concept	Interventions and initiatives to strengthen the commitment	To sustain various strategies and approaches
Knowledge management	Relevant tools for sharing information and knowledge transfer	To sustain the learning process and knowledge transfer

Source: own analysis

The first gap in the translation of the disaster resilience concept arises from the different perspectives and interpretations of the concept of resilience. The empirical analysis highlighted that in the context of Aceh, there was no shared definition of the resilience concept proposed by the local government and by NGOs. In this regard, the disaster resilience concept mainly refers to international and national discourses, such as the Hyogo framework and the Indonesian disaster management law. Consequently, the concept has not sufficiently been translated for the specific local context of Aceh and the local government therefore also struggles to integrate the resilience concept into local strategies that need to be compatible with the specific local conditions (e.g. post conflict development approaches, post conflict societies).

The analysis revealed that the differences in meaning of disaster resilience occur because there are different perspectives and approaches in building disaster resilience. One key explanation behind different levels of understanding of this concept is because the meaning is affected by organizational backgrounds, experiences, and capacities of different actors and organizations. Different perspectives and understandings of the meaning of the resilience concept are influenced by local actor's identity as either governmental and non-governmental actors.

The governmental actors, specifically those working in the disaster management agency, encounter the resilience concept through the policy making process. As such, they tend to interpret resilience more in line with the Hyogo framework. In contrast, the NGOs and

community-based organizations tend to encounter the disaster resilience concept through their projects and programs which are designed to achieve a specific outcome of resilience and in most cases these organizations focus on specific target groups. These actors have often well-developed skills and experience of working with the local community. However, as the NGOs have limited funding, they tend to operate through projects that focus on particular community groups such as women, disabled people, fisheries communities or other livelihoods. In this way, they view resilience as the community empowerment and self-organization. In this regard, disaster resilience means that the community has a sufficient knowledge and experience to behave effectively and appropriately in disaster events, here in a tsunami event.

The second gap relates to local government commitment to implement local disaster management regulations and plans, a commitment that decreases over time. Most of the disaster resilience programs are infrastructure projects for emergency and structural mitigation purposes such as, building new evacuation shelters, opening new evacuation routes, and widening the roads for evacuation. It is difficult to finance these projects and their subsequent evaluation programs. For example, according to the local disaster management law, BPBA should evaluate and renew the disaster risk reduction plans every five years, however, a budget (money) for this purpose has not been made available as other competing issues have begun to take precedence. In this case, it is essential to sustain resilience building as a priority in the current development programs including the allocation of a budget for these activities.

The final translation gap is that there were few appropriate tools for knowledge management, particularly for communicating the meaning of disaster resilience. Knowledge management and exchange can promote common understanding of the meaning of building resilience after disaster (Kaklauskas et al. 2009).

The popular knowledge management tools after the Indian Ocean Tsunami in Aceh are for example web-based Geographic Information Systems (GIS). This finding is in line with findings from Greve's (2002) which showed that GIS is one of the most powerful decision-making tools for governmental and public sectors. For example, TDRMC developed the Aceh Tsunami Digital Repository and Disaster Risk Management Information System (DRMIS) (Syahputra, Munadi 2011). The DRMIS is particularly helpful for enabling the decision maker and community to generate thematic maps that help demonstrate disaster risk in Aceh Province (Ardiansyah, Munadi 2016). However, these knowledge management tools are difficult to finance in the long run at the local level. For example, the Aceh Disaster Data and Information (DIBA) (<http://diba.acehprov.go.id>) website and *Pusat Informasi Bencana Aceh* (Aceh

Disaster Information Centre) website (<http://piba.tdmrc.org>) are two websites that were established as a repository system for material, information and geospatial data sharing but both are now closed. In addition, this method for knowledge transfer also requires technological literacy, particularly skills in GIS application. These skills are not available and not maintained over time because of the limited GIS literacy programs provided by the government, NGOs, and universities.

To maintain long term disaster resilience, the governments, NGOs, and community need effective knowledge management tools that sustain their learning process. In this regard, multi-stakeholder forums can facilitate knowledge transfers and exchanges between the local actors, such as sharing information, collaboration, and discussion. On the other hand, to be able to facilitate the learning process, these multi-stakeholder forum needs to be active and supported by the local stakeholders.

8.1.2 Challenges to invite participation

Maintaining long-term disaster resilience correlates strongly with the participation of local actors learning and working together. Effective collaboration to maintain disaster resilience is best developed by inviting various local actors and community members that can contribute with their diverse knowledge, capacities, and experiences. The empirical analysis explores some of the participation gaps associated with building disaster resilience, particularly in practice. Three major gaps emerge from the empirical analysis that highlight challenges in local actor participation, these are shown in Table 12.

Table 12 Participation gaps and their implications

Participation gaps	Benefits for common understanding	Benefits for maintaining-long term disaster resilience
Lack capacity to invite local actors participation	Local actors empowerment	To learn how to collaborate with various local actors
Interests in participation	Clear and simple mechanism to participate	To offer the clear mechanism for participation
Community did not receive feedbacks on their comments	Open the dialogues to discuss the community interests and expectations	To follow up the community interests and expectations

Source: own analysis

The first significant gap associated with local actor participation is the capacity of government to invite the stakeholders and community members to participate in building disaster resilience. The disaster management laws require the government to invite local actors, such as schools, customary and religious groups, women, disabled people and community members in general, to participate in developing and maintaining disaster resilience (see chapter 6.2).

The findings show that the local government prefers to implement a top-down policy in decision making and the local disaster management agency (BPBD) has also adopted a top-down planning for disaster resilience programs at the local level (Ahdi 2015). As White (1996) suggests, this discourages community participation. With the top-down planning mechanism, the community are aware that their efforts to contribute in the planning process at the village level will be fruitless.

On the closer inspection, most of the resilience building programs are proposed by the local government. These programs were often a continuation of previous programs and there was limited capacity, also due to budget problems and bureaucratic procedures to establish new programs. This meant that because the programs weren't tailored specifically to maintain long-term disaster resilience. Investing more time into learning the needs and expectations of targeted beneficiaries could have improved the program planning and implementation.

In future, local actors should be able to participate in designing the programs, to recommend that the government uses particular approaches or strategies and an evaluation of the effectiveness of the government programs should be part of the design. As Cornwall (2008) highlight, it is crucial to invite community participation while encouraging community empowerment. Here, empowerment refers to increasing the community's capacity to highlight their interests and expectations in the development agenda (White 1996). In the context of promoting a common understanding, empowerment of the community is also important for translating the resilience concept into appropriate programs that are suited to the community's needs.

The next gap is associated with the current participatory mechanisms, particularly for public involvement in making decisions that matter for maintaining long-term disaster resilience. The local government have only one participatory mechanism for development planning. It is a local stakeholder consultation forum for development planning (*Musrenbang*) among representatives at the village, regency and municipality, and province levels. However, the legislative committee or commissions (DPRA or DPRK) play powerful roles in determining

the budget and deciding which programs should be implemented each year. This highlights that the local government should increase this local stakeholder consultation forum (*Musrenbang*) accountability by reviewing their participatory mechanism to increase a better community participation. In the Aceh context, following the long political conflict, the invitation to participate is not sufficient because there is a lack of trust which prevents the community from being involved and working with the government. The local government must show their sincere intentions and strong commitment in building resilience together with the community.

The final gap in participation relates to how to respond public comments associated with maintaining disaster resilience. While in theory (see e.g. Hattie, Timperley (2007) feedback provided by the community is valuable to evaluate and improve government performance in building disaster resilience, the findings, however, show that most comments submitted by the public have been ignored by governmental agencies. Indeed, the comments from the community could improve local government capacity to maintain long-term disaster resilience. This feedback can be helpful to increase the local government capacities to tailor new programs and strategies that fit well with the community needs. However, the overall mechanisms need to be improved to ensure that the comments are considered and that those who provided comments also get a feedback on how their comments were considered in the process. That means there is a need to follow up the community comments and learn together by providing the space and time for direct participation in planning, implementation, monitoring, and evaluation of the current strategies to maintain long-term disaster resilience. These comments are the important learning sources in evaluating the progress of resilience building as a whole process over time.

8.2 Challenges in maintaining medium and long-term disaster resilience

The second empirical chapter (see chapter 6) analyzes the governance structure of building disaster resilience, specifically looking at various tools and strategies that are preferred by the local actors to maintain medium and long-term disaster resilience. The findings in the disaster resilience governance chapter (see chapter 6) underscore that the challenges in maintaining long-term disaster resilience comprise challenges to increase the local actor's capacity and challenges to evaluate the process of building disaster resilience.

8.2.1 Challenges to increase the local actor capacities

As highlighted in the theory chapter (see subchapter 2.3.2), various strategies have been implemented to enhance local actor capacities to maintain resilience. Turning to the issue of the existing gaps between the expectations and capacities in maintaining long-term disaster resilience, the research found that the local authority capacities should be improved to better maintain long-term disaster resilience. Table 13 lists the main gaps in increasing the local actor capacities and their implications in maintaining long term disaster resilience.

Table 13 Capacity gaps and their implications

Capacity gaps	Benefits for maintaining-long term disaster resilience
Capacity to stimulate learning and self-organization	Learning and self-organization to build local actor capacities
Capacity to negotiate and communicate	to negotiate and communicate better

Source: own analysis

The empirical evidence shows that the internal problems for example linked to the the capacity, capability, and competency of the local authorities are associated and connected with the willingness and political commitment of the government to improve human resources at the local disaster management agency (BPBA/BPBD). Although the Aceh government has solid local regulations, to maintain disaster resilience, the local authorities have to enhance their capacity to implement the regulations. More precisely, local disaster management agencies in Aceh often lack capability and capacity due to organizational problems such as attitudes and local expertise to manage disaster resilience.

A key challenge is that the current resilience governance is weak in stimulating learning and self-organization for the actors responsible for managing disaster resilience. This is problematic since learning and self-organizations were defined as important characteristics of resilience building in social-ecological systems, such as coastal communities (Birkmann et al. 2016a). Learning refers to the ability of the actors to capitalize on the mega disaster experience to enhance their capacity to manage disaster resilience. The local government missed opportunities to learn due to bureaucratic constraints that affects the ability of actors to improve the regulations and strategies. BPBD realizes that their current capacities for maintaining disaster resilience are limited, particularly their capacity to learn from experience in building disaster resilience. This is because BPBD was established after the recovery ended, so BPBD

did not have in-depth experiences working together with various international, national, and local actors.

In practice, most of the BPBD staff have limited educational backgrounds and experience in disaster management. Consequently, strong political support is needed to develop the capacity of BPBD staff through, for example, training and scientific discussions. This strong political support is important, particularly to allocate a significant budget for the BPBD staff's trainings or capacity development programs continuously. At the same time, it is also difficult to increase the quality of the staff because the rapid changes and transfers of people who have prominent positions in this agency. In fact, most of the local disaster management staff interviewed for this research have since transferred to other positions or other offices. Some of them have retired because they started to work in the agency during their preparation for retirement.

The next gap is to increase the capacity to negotiate and communicate with various local actors. This capacity relates to the ability to ensure that communication is not complicated. The findings show that the capacity of BPBD is limited to negotiating and communicating with various stakeholders. The core problem also lies in establishing communication channels between DPRK and BPBD. BPBD often complains that they suffer from a limited budget, particularly for non-infrastructure programs and activities, such as planning, sensitization, and training. The findings revealed that the DPRK budget cuts have decrease the quality of the programs and the number of outcomes that can be fulfilled. As a coordinating agency, it can be challenging for BPBD to increase their budget allocation for disaster management programs and activities as this will mean compromising other areas of work. To resolve these problems, it might be best to open dialogues and communication with NGOs, academia, and communities. At the same time, BPBD should seek greater political commitment to supports their performance in maintaining long-term disaster resilience.

8.2.2 Challenges to evaluate the process of building disaster resilience

Despite the urgency of building disaster resilience, a credible evaluation of strategies and approaches for maintaining disaster resilience is a must. In the long run, the main objective to conduct various evaluations is to enhance and secure effective strategies to maintain disaster resilience. However, the impacts and benefits of resilience building programs are difficult to evaluate because the tools for evaluation are not set from the outset. Numerous questions related to the effectiveness of design, implementation, and impacts of these programs remain to be answered by a useful evaluation framework.

Two major points emerging from the empirical analysis related to the gaps in evaluation of the current strategies in maintaining long-term disaster resilience are shown in Table 14.

Table 14 Evaluation gaps and their implication

Evaluation gaps	Benefit for maintaining-long term disaster resilience
Evaluation of implementation	to provide recommendations for improvements
Evaluation of performance, outcomes, and impacts	to promote learning and accountability

Source: own analysis

The first gap in evaluation is to evaluate the current strategies and approaches in building disaster resilience, particularly the needs of programs for the stakeholders. The findings indicated that there remains a challenge to design and develop programs that must meet the needs of stakeholders. These stakeholder needs are associated with their interests, expectations, and problems in building disaster resilience. As Rossi et al. (1999) highlighted, problem identification and need assessment should be conducted to ensure an effective program. More often, the evaluation aims to improve local government transparency, accountability, and performance (Newcomer et al. 2010).

However, many of the strategies that were developed and implemented were not compatible with stakeholder needs and expectations. It means that the local government has limited capacity to plan and design programs that are compatible with stakeholders needs. At the same time, targeted stakeholders should understand the goals of the programs. It is almost certain that the key stakeholders will be involved in the evaluation of the process.

The starting point to create a useful evaluation is to plan and design the evaluation so that it can improve local government performance in implementing the programs. The findings show a lack of local government evaluation for planning, implementation, and outcomes of the programs. According to Newcomer et al. (2010), to measure the impacts and outcomes of the programs, it is necessary to look at the level of implementation, whether the programs are implemented as planned and designed. One question that arises from the program planning is how to structure the planning process in a way that its implementation and impacts can be effectively evaluated. In planning, the local government have stated their goals, budget, and set

a definite timeline that can be evaluated. Planning evaluation will help to provide reliable options and suggestions to improve the programs going forward.

The findings reveal that development programs are evaluated by Bappeda, particularly for program expenditure and levels of implementation. In practical way, the local government prefers infrastructure projects rather than the non-infrastructure programs. For example, the Banda Aceh Tsunami structural mitigation measures were evaluated to assess their progress over time. The local government evaluation approach is a general quantitative analysis to evaluate the programs and activities. This measure is associated with the budget expenditure and planning that takes place at the end of the year. This means that the government only evaluates programs through budget allocation and review processes (UNDP–DRR ACEH 2011). A more comprehensive evaluation that also involves the perspective of other actors is absent.

BPBD's exposure to budget cuts affects their capacity to propose new programs as they often fail to achieve support from DPRK. This results in many new programs never being initiated. As such, BPBD's reduced budget expenditure translates into a decrease in the quality of the programs and the number of outcomes that can be fulfilled. For example, the local government has built a new vertical evacuation building, opened new evacuation routes, and widened the road for evacuation but these have been implemented almost without any follow up awareness programs, such as drill activities and sensitization programs. It is difficult to propose regular drill activities or sensitization programs that embedded in the development of these evacuation facilities.

An additional gap relates to the evaluation of outcomes and impacts. Because the current evaluation framework remains ineffective, the impacts of the programs, including impacts of evacuation training and sensitization, are difficult to measure. As Hatry et al. (2010) point out, the main advantage to conducting an evaluation is to assess the effectiveness of the programs so that the local government can either make adjustments or learn for the future. Thus, the main consequence of ineffective evaluation processes is that the government will never receive feedback from the intended beneficiaries of the programs. This feedback is important to improve strategies to maintain resilience.

Participation is also essential in communicating the evaluation findings to key stakeholders, specifically to improve the policy and local legislations. Conducting an evaluation is part of the learning process for the local actors to enhance the outcomes of the implementation of local

policies (Newcomer et al. 2010). Ultimately, the key objective of effective evaluation is to implement good governance practice, particularly the accountability of local authorities in maintaining long-term disaster resilience.

8.3 Challenges for collaboration

The final empirical chapter (see chapter 7) focuses on dealing with the existing collaborative efforts to build disaster resilience after the Indian Ocean Tsunami in 2004. These collaborative efforts were developed as the critical strategies to maintain long-term disaster resilience. Emerging from the key actors interviews are complex challenges that affect collaboration in building resilience. The key findings highlight how local actors struggle to participate in resilience focused collaboration efforts. At the same time, it is difficult for local actors to benefit from their current collaborative efforts because there are no useful activities in their current collaboration. The main gaps in collaboration include a lack of shared goals and open and trusting collaboration. In the following sections, some of the complex challenges concerning local actor collaboration are discussed and interpreted.

8.3.1 Challenges to have shared goals

As highlighted in the empirical chapters, collaboration is one of the main strategies that has been promoted by the Aceh government to maintain resilience after the Indian Ocean Tsunami in 2004. The empirical analysis found that the development of the current multi-stakeholder forum is problematic. It is believed that if these problems were addressed and discussed, the local actors could better collaborate to better maintain long term resilience. The summary of specific collaboration goal gaps is illustrated in the table 15.

Table 15 Specific goals gaps and their implications

Specific goal gaps	Implications for collaboration	Benefits for maintaining-long term disaster resilience
Unclear purposes	Discuss and communicate local actors interests, expectations, and needs	to find considerable shared goals and agreement
No space to exchange information and learning	Creative space to which learning take place	to open communication share ideas, and information
Limited resources	Attract new resources	to invite and involve more local actors to bring more resources

Source: own analysis

The first gap in collaboration is in the formulation of common goals for maintaining long-term disaster resilience. The purpose of collaboration may exist, but it is not stated or understood and implemented by the local actors. Although Aceh currently has local regulations and structures to manage disaster resilience, the sustainability of this process requires a common purpose to drive the actors to work together. As Nayar (2014) suggests, a clear description of purpose will help provide direction for collaboration success. To formulate this shared goal, the local actors should communicate their interests, expectations, and needs for this collaboration. At the same time, they have to realize that accomplishing these goals on their own is difficult. In the end, it is also essential for the local actors to be able to articulate these shared goals to strengthen their commitment to collaborate in maintaining disaster resilience.

The second gap centers on the limited opportunities for knowledge sharing and learning. According to Bryson et al. (2015), effective collaboration can stimulate joint learning for stakeholders benefits. The ultimate goal is to establish a local multi-stakeholder forum is to facilitate collaborative learning. However, the empirical analysis in this research has found that the local actors are interested in collaboration for the purpose of learning, particularly through increasing their scientific knowledge and capacity to practice disaster management. Although local actor interests in learning is a positive contribution to maintaining disaster resilience, the multi-stakeholder forum failed to provide space for this learning activity. For example, public discussion series on building disaster resilience that were organized by ICAIOS. International, national, and local researchers and experts were invited to present their research projects or their works in disaster management, particularly researches or projects that conducted in Aceh.

The purpose of this public discussion is to share and disseminate lesson learned from their works. However, the disaster resilience topics are decreased significantly in this public discussion series, due to shift in research interest and NGOs projects in Aceh Province. To foster collaborative learning, the local government should provide space in which learning can be facilitated. Local actors can then start to learn from each other by opening communication to share information that important for managing disaster resilience.

The next gap is associated with the lack of resources in the current collaborative efforts to maintain long-term disaster resilience. The findings show that the most challenging aspects for local NGOs and communities to participate in maintaining disaster resilience is their limited resources in crafting new projects, accessing funding, and limited resources to finance and pay their staff. At the same time, the new resources refer to relevant ideas, knowledge and practices that can increase the local actors capacities to maintain disaster resilience. To deal with the complex challenges that arise due to severely limited resources, local actors hope that this collaboration can open their opportunities to attract new resources, particularly to have joint projects and better leadership.

One of the more effective ways to attract new resources is to invite and involve more local actors who, in turn, bring more resources and encourage wider participation, fostering collaboration. In Aceh context, this is also a means to start inviting the business and private sectors which, can invest new resources, to work in partnerships. This strategy was already implemented by inviting several local banks and insurance agencies to engage in the local multi-stakeholder forum. These joint projects may sustain the organizational and public learnings between the local actors.

It is evident that local actors need to be explicit in their expectations and priorities from the collaboration. Collaboration is effective only if local actors can find considerable shared goals, specifically agreeing on the problems that they may then attempt to solve together in order to support the maintenance of long-term disaster resilience. Creating partnerships involves leveraging synergies from various actors to contribute towards a shared purposes real (Linden 2010). In the Aceh context, the shared goals include joint learning and attract new resources to maintain better disaster resilience. However, achieving these collaboration goals will take time and the commitment of the local actors.

8.3.2 Challenges to have open and trusting collaboration

Although, collaboration theory clearly outlines the importance of building trust (Lucini 2014; National Research Council 2011), in reality, this has been a particularly challenge due to a range of factors. The findings of the analysis highlight that trust and leadership issues were remain problems in local actor collaboration. The initiative to establish a multi-stakeholder forum was from the central government and as such, it was a top down policy, whereas the provincial and local government must set up this platform for the local actors to meet and collaborate. On the other hand, from the outset, the local government realized that they lacked the capacity to lead this collaborative process and that they are not ready to take full responsibility to drive this process. The three major gaps that have emerged from the empirical analysis, relating to the challenges of ensuring open and trusting collaboration in maintaining long-term disaster resilience, are shown in the table 16.

Table 16 Gaps for open and trusting collaboration and their implications

Gaps for open and trusting collaboration	Implications for collaboration	Implications for maintaining-long term disaster resilience
Lack of trust	Opportunities to build trust	to build open and trust relationship among each other
Leadership	Improvement of the leadership roles, practices, and skills	to develop collaborative leadership
Collaborative culture	Promoting collaboration advantages	to nurture collaborative culture

Source: own analysis

As highlighted in the theory chapter, collaboration develops in stages and takes time to evolve and grow (Gajda 2004). It is useful to examine relationship issues between the local actors and then take significant action to build trust. The analysis of the current collaborative efforts relating to the resilience focused collaboration framework (see chapter 7.2) found that local actors faced trust and relationships problems. According to Vangen, Huxham (2003), the first step to develop trust is to develop joint projects and build trust through working together. This strategy for building trust was implemented by BRR and the non-governmental organizations through joint rehabilitation and reconstruction programs during the recovery process. At that time, BRR collaborated with 900 organizations, including governmental authorities, donor countries and organizations, Red Cross organizations, international and local NGOs, and local and private sectors. The trust building in this initial collaboration was initiated by promoting

integrity, credibility, transparency, leadership, and solving the coordination problems (Mangkusubroto 2011).

In practice, opportunities to build trust are difficult to create. As Longstaff, Yang (2008) suggested, ongoing communication and coordination can stimulate trust. For example, the local actors can begin to acknowledge many “sensitive” issues that are local actors currently avoid discussing openly. Without trust and an open relationship, it is difficult to complain, or express any collaboration discouragement. Trust is a particularly complex issue for governmental authorities and NGOs. As the findings show, local actors are reluctant to express their criticisms in this forum openly. Criticism tends to be perceived as an attack that can destroy the current “good” relationship among the local actors. In the multi-stakeholder forum, BPBD is a common target of criticism relating to their capacity to lead the process of maintaining disaster resilience.

Although most of the local actors had known each other for more than ten years and most had experienced working together during the recovery, the findings show that they still find it difficult to communicate openly and clearly through each other. It is obvious that the purpose of the multi-stakeholder forum is to provide opportunities for local actors to have face to face dialogues and, to communicate their interests and needs. However, the empirical evidence shows that this local forum did not function properly, and the members do not have trusting relationships with one another. They do not function properly because there is no significant activities or contributions to facilitate the process of learning together. The findings show that there are various inconsistencies between policies and actions or words and actions. This is particularly evident in the local government strategies designed to implement various local regulations relating to disaster management. For example, the local government commits to maintaining long-term disaster resilience, but at the same time, disaster resilience is not a priority in the current development agenda (Pemerintah Aceh 2017).

A consequence of this is that local actors have often questioned the leadership roles of the local government. Leadership here refers to “the consistency between words and actions” that affect trust and performance of the local government (Palanski, Yammarino 2007). Trust is difficult to achieve when many collaboration problems remain unsolved and while the mechanism to discuss the collaboration is not sufficiently facilitated. In this regard, increasing the local government leadership capacity and then showing these improvements in practice is critical. For example, the analysis thus far suggests that the multi-stakeholder forum needs a competent facilitator who can not only organize the meetings or other activities but also manage trust in

this collaborative effort. Although BPBD is mandated by the law to take more responsibilities in facilitating the multi stakeholder forum, they lack the strong leadership capacity to maintain this process (Indriyan, Hariani 2014; Hapsari, Djumiarti 2016). For example, from the experiences of the local actors working with BPBD, BPBD has struggled to coordinate and organize the stakeholders in many emergency situations effectively as a result of complexity of bureaucracy.

Changes to improve the situation could begin by BPBD focusing on improving their leadership role, practices, and skills to improve the quality of collaboration (Bryson et al. 2015). The findings also suggest that the personal informal relationships, such as friendships among the local actors, can foster collaboration. This friendship allows local actors to communicate better and to feel secure in performing cooperation without having to deal with the judgement and criticisms. Better leadership practice may encourage wider participation and foster collaboration. The local government needs to learn from their experiences and mistakes to address leadership and trust issues in managing long-term disaster resilience.

The current collaboration of local actors shows various collaboration failures, including communication, trust, and leadership. These problems deal mainly with the dynamic of local multi-stakeholder who have found it difficult to function effectively. These problems reflect cultural issues, particularly, in social behavior which, to some extent, affects the collaborative process. First, various people and actors interviewed in Aceh find it difficult to be assertive and express their own views, particularly in a formal forum. This makes it difficult to challenge, disagree, and refuse ideas under discussions. Second, people tend to take criticism too personally, and therefore think that critiques are impolite and rude. Thus, it is difficult to have an open discussion as people prefer to resolve their conflict personally. Third, the leader is elected through personal relationships rather than by their capacity, intellect, and charisma. That makes it also more complicate to criticize him or her directly.

This study also confirmed that the problems of collaboration relate to the decades long political conflict taking place in Aceh. According to (Fara 2012) the loss of communal togetherness was due to the controls and restrictions of the authority (GAM and TNI) so that the freedom to speak and express themselves were limited during that time. This made Aceh a closed society where people tended to mistrust new people. It has been reported that the situation during the time of conflict was very sensitive and anything could happen to people, including the loss of their lives, if one is suspected by both parties in the conflict. It seemed to take time for people in Aceh to heal their trauma and build their confidence to collaborate without this fear.

Despite perceiving these behaviors as disadvantageous aspects in a collaborative process, (Thomalla, Larsen 2010) encouraged people to understand various aspects of cultures that can be later used to raise awareness and to resolve problems in promoting disaster resilience. This can be done by exploring and selecting some shared local beliefs and cultures to confront these challenges for local actors to collaborate. As indicated, the exploration of culture suitable for promoting resilience is possible since collaboration is part of Aceh culture. It is useful to harness cultural context in maintaining long term disaster resilience, particularly to promote resilience focused collaboration. Culture refers to practices, behavior, attitudes, beliefs, knowledge, tradition, customs and norms that have high position in Aceh society. In the past, Aceh Kingdom governed people based on these cultural aspects to protect the Islamic religion. Aceh people perceived their cultures and identities as Muslim and as such, the customs and religion have been inseparable (Zainuddin 2012).

The findings underscore that the religion and culture affect the motivation of the local actors to collaborate in building disaster resilience, particularly for the community based-organizations to work together with the government agencies in emergency response voluntarily. In Acehese culture, creating partnerships requires strong cultural and historical roots. Collaboration or “*meuseuraya*” means working together to benefit people and the well-being of the community. The definitive goals of these collaborations are to have sincerity, comfort, and reward from God. Furthermore, (Soelaiman 2011) describes three kinds of traditional collaboration practices in a village in Aceh: (1) collaboration for individual concerns, for example helping a neighbor in house construction (2) collaboration for the community, for example: cleaning up the environment and public facilities, and (3) collaboration as a custom and tradition, for example in funeral and religious ceremonies and rituals.

Hasdy (1994) highlighted two “*Hadih Maja*” (proverbs) that illustrate how Acehese perceived collaboration in their daily life. As the Acehese proverb goes “*Hase ngon meufakat, kuat ngon meuseuraya*”, which means that success can be achieved by collaboration and “*Meunyo ka meupakat lampoh jirat ta peugala*”, (If we have agreed, we can sell our farm and grave yard), where farm and burial ground are most valuable to the Acehese since the farm is their livelihood resources while the grave yard symbolizes family and religious dignity. Both proverbs explain that collaboration has been practiced in the past. This means that the Acehese have a clearly understood philosophy and conceptualization of collaboration. Furthermore,

these traditional collaboration practices are strongly based on the Islamic teaching that has encouraged the community to work together and help each other:

“Help one another to do what is right and good” (The Feast verses 2) (Abdeel Haleem 2010).

This is one example of an entry point to promote the development of disaster risk reduction capacity by harnessing religion (Schipper 2010). In this case, using Islamic teaching can change the perspectives of local actors and increase their motivation to participate in resilience focused collaboration.

Mattessich, Monsey (1992) argues that collaboration based on a shared historical background and courage was most likely to be successful. In addition, maintaining long-term tsunami resilience is a process of “reconnecting it with the cultural past” (Daly, Rahmayati 2013). This reconnection helps to sustain various strategies and approaches due to the community’s familiarity with their cultural identity, rather than overwhelming them with new concepts around maintaining disaster resilience. This cultural framing helps people to understand and accept that maintaining disaster resilience is a part of their local wisdom.

However, these cultural spirits of collaboration are decreasing over because of the domination of personal interests and activities. Aceh cultures and past are betting on the process of social transformation after suffering the long-lasting traumatic conflict and mega disaster (Feener 2011). To foster a collaborative culture, linking cultural contexts and resilience focused collaboration is useful but does not guarantee success. After the tsunami, through which the cultural and social values have changed, it is important to ensure that other factors influencing the success of collaboration are present. This collaboration culture is needed to maintain medium and long-term disaster resilience, however, direct rewards and benefits of participating in collaboration are crucial to foster.

8.4 Reflections on theory and conceptual framework

Selecting and writing the theoretical and conceptual framework for such a complex topic and research object was a challenging task. At the beginning, this research intended to follow the grounded theory, methodology and construction theory, allowing the researcher to apply flexible strategies in developing systematic data collection and analysis (Charmaz 2015). However, during fieldwork, the qualitative data collection was conducting by semi-structured interviews following the interviews protocol in investigating the processes of building disaster resilience. This interview protocol was designed using a prior literature reviews that focusing

on governance and capacity to manage resilience (Lebel et al. 2006) applied in the context of post disaster at the local level. Within the process of writing and conducting the PhD thesis it became evident that different theoretical approaches need to be combined and need to inform the empirical analysis in order to capture the multifaceted nature of building long-term disaster resilience after disasters. In this regard, it was useful to combine theoretical concepts particularly from resilience theory (learning and self-organization in the context of crises) (Folke 2016; Cutter 2016), governance theory (Tierney 2012; Lebel et al. 2006), and collaboration theory (National Research Council 2011; Noran 2014b)

A conceptual framework was developed to show the interlink of concepts aimed to give integrated understanding and interpretative approach to a social reality (Jabareen 2009). In this research, the concepts and category were based on the qualitative data. These data from the first stage using mixed methods were analyzed by open coding and writing memo to build the questionnaire for the household surveys. During analyzing the initial and open coding procedures, the themes related governance and collaboration were frequently found in the interview transcripts. Altogether these three approaches were identified from the findings that related to the problems and challenges of building disaster resilience.

The conceptual framework of resilience focusing on collaboration to maintain resilience at the local level was inspired by the National Research Council (2011) that introduced “challenges to sustainable resilience-focused collaboration”. In this research, the direction of the framework was shifted from “sustaining collaboration to build resilience” into “maintaining medium and long-term disaster resilience”. This framework means to focus on collaboration as one of many modes in governing disaster resilience to keep resilience alive now and in the future. The framework was based on the resilience theory in directing the governance and collaboration of the local actors. These three concepts were synthesized and analyzed to answer the main research questions.

The process of making more sense and connections among this concept were repeatedly mentioned to increase understanding of the process of maintaining resilience at the local level. During this iterative process, the initial concept of building resilience changes that maintaining disaster resilience may contribute more to the resilience literature. The conceptual framework was the main consideration in empirical analysis and guide the discussion in this research. To identify the disaster resilience factors and key components of resilience focused on collaboration, the research findings were referred and synthesized. At the same time, theorization process was supported by literature relevant to this conceptual framework, such

as: learning, self-organization, participation, capacity development, evaluation, leadership, and, trust building. These theories are used continuously in discussion and interpretation chapter to understand the meaning of the empirical evidences.

The construction and operationalization of this conceptual framework were based on the research questions and research findings. However, this framework has some certain limitations related to theories and concepts emerging from the epistemological and methodological consequences of this research. This thesis applied the general theory of resilience, governance, and collaboration. On the other hand, it is difficult to capture the process of building resilience, learning, and collaboration over a long-term. Using different approaches and theories were possible, particularly specific theories (e.g. organizational learning or a community-of-practice approach), instead focus on general theories to explain the resilience building process. However, these general approaches were used as the starting points to identify factors affecting the learning and collaborative efforts to maintain long-term resilience, specifically enhancing the local actor's capacities in post disaster context.

8.5 Reflections of the mixed-methods research

The main purpose of applying the mixed methods research is enrich the data to answer the main research questions. To answer the questions related to sustaining disaster resilience and proposing "resilience focused collaboration" need not only the local actors and community experiences in addition to their perspectives, but, also their perceptions towards the current and future collaboration. This mixed methods data collection has allowed the researcher to have qualitative and quantitative data format and conducted triangulation analysis in this research.

The design of methods applied in this research were formulated during the first fieldwork. To collect the qualitative data, the researcher explored and tried different methods such as focus group discussion and scenario building as the triangulation methods from the first phase of the mixed-methods. However, the pilot of group interviews was facilitated by BPBD Banda Aceh that who formally invited to the *Geuchik* (village leaders) whose areas experienced the Tsunami in Banda Aceh as part of their disaster management training activities. These focused group discussion (FGD) aimed to enable the local actors to talk and share their experiences in answering the questions at the same as the semi-structured interview protocols. During the discussion, various of the leaders were quiet and reluctant to speak, indicating that they were not familiar with this interview methods. Other factors that made the researcher did not use the

FGD because the number and wide range of the potential interviewees needs to invite more people, but and the availability and priority time of the participants were limited.

Another method that was also tried during the research was scenario building aimed to predict the process of maintaining and sustaining disaster resilience. The pilot of scenario building simulations was facilitated by the ICAOS by inviting the participants who were interested in the research topic in a discussion section. In this section, most of the participants were refused to participate in this process as well preferred to share their prior experiences in emergency, rehabilitation, and reconstruction phases (2004-2010). The evaluation process revealed that the participants had problems to predict the future but, prefer to analyze what happened in the past. In this case, this method was difficult to conduct because they were reluctant to participate in this scenario building process.

The semi-structured interview was the main data collection method in this research. In conducting these interviews, it was effective in selecting and meeting the key local actors who were targets in this research. Making appointment with the interviewees for the semi-structured interviews was more flexible to follow the schedule of the interviewees. It would be easier to make the appointment if the researcher could refer to one name who happened to be his or her has personal relations or whom was respected by the interviewees. Most of the interviews were recorded but several interviewees objected to record their answers. This made different scales of detail in transcribing and analyzing the answers.

Although the semi-structured interview has large number of respondents and local actors (75 respondents) who chosen by snowballing method but most of the respondents did not understand and had no prior experience with the resilience building process. The understanding and familiarity of the respondents were different from three case study areas, particularly the local actors in Sabang and Aceh Jaya who were left behind the knowledge and experiences of the respondents in Banda Aceh. The actors who worked for the university and local NGOs was difficult to meet in Sabang and Aceh Jaya. Most of the NGOs ended their missions after the rehabilitation and reconstruction stages. The domination of respondents from the Sabang and Aceh Jaya were working for the government agencies that made it is challenging to analyze the contributions of the non-governmental actors in resilience building. This showed that the discourse of disaster resilience was concentrated in Banda Aceh as the capital city of Aceh Province.

The findings from the three case study areas were potentially comparable, but the analysis suggest that the answer from the local actors and community at large were identical regarding the collaboration process, their problems, and challenges at the local level. Various analysis themes and open coding can be developed to explore opportunities to link among different characteristics of urban, rural, and small island represented by these three case study areas. On the other hand, the findings are used good examples to illustrate the current practices in building disaster resilience and predicting local actor's strategies in maintaining long-term resilience in the future at the local level in Aceh Province.

The number of households involved in this research were limited due to the budget and time constraints, but this number is sufficient. This quantitative data was useful to diversify and strengthen the robustness of qualitative data from the semi-structured interviews. It could be much better if the household involved in this survey were selected more systematically, in term of numbers and their locations in term of the Tsunami impact zones in 2004.

It was interesting that the duration of the respondents to answer the household surveys that was conducted in Aceh Jaya on the average was longer than in Banda Aceh and Sabang. The main reasons were that Aceh Jaya was a rural area where people have more time and happier to share their experiences. Most of the household surveys in Aceh Jaya were conducted in local language (*Bahasa Aceh*) encouraging the participants to talk and share their experience although the answers were not related to the survey questions. The stories told by the participants were interesting, however during the survey the opportunities to takes the stories in the answer sheets were limited.

The high number of researches also affected the expectations of the respondents of the semi-structured interviews and the household surveys participants to gain the direct benefit of the research. For example, the rewards of answering many survey questions that the researchers often pay an amount of money after the completion of the survey. On the other hand, the interviewee from the local NGOs and civil society organizations ask how the research can change or answer the current problems in building resilience. The interviewee from the governmental agencies request the researcher to share the findings and policy recommendation related to this research topic. In the efforts to fulfill the inquires of the transferability of research findings, it is important to send summary of findings to the respected interviewee from the governmental organizations.

On the other hand, most of the basic questions related to disaster event, disaster memory, and individual, and family evacuation planning were familiar to the participants. After the Indian Ocean Tsunami 2004, many international and local researchers came to Aceh conducting studies related to this mega disaster. However, the participants were bored and exhausted answering the same types of questions. Although the aims of the studies were varying greatly, but the focus of the study was related to the impacts of the disaster. It was important to formulate the questions creatively and innovatively, not only in rewording the questions, but also in how to address them.

After the fieldwork, an extensive volume of data was also collected using mixed-methods research. The process has allowed the researcher to examine and analyze various aspects in greater detail. On the other hand, the analysis and interpretation of this substantial volume of qualitative and quantitative data requires more time than was anticipated. In this case, the researcher had allocated more time to familiarize and learn how to analyze quantitative and qualitative data. The process of analyzing the qualitative and quantitative data were incremental and simultaneous with reviewing the literature and developing conceptual framework. In this regard, the triangulation process was feasible with different data collection methods and analyses.

8.6 Research contribution

This dissertation extends the knowledge of the key tools and strategies that preferred and implemented by Aceh government to maintain medium and long-term disaster resilience after disaster at the local level. This research is also unique because it provides the evaluation of the challenges in the current multi-actor collaboration by proposing resilience focused collaboration framework. The empirical findings are also innovative, since most studies focus on the disaster event and the reconstruction phase.

The empirical findings in this study can make several contributions to the current resilience literature. First, the main strength of this study is the exploration of the meaning of building and maintaining medium and long-term disaster resilience at the post disaster context. It means that this research provides certain empirical works to enrich the resilience theory, particularly how the local actors common understanding of resilience and how they operationalize this concept in practices at the local level (Bhamra et al. 2011). Secondly, this research added to the growing body of literature on maintaining disaster resilience by providing foundation to shift research from building resilience during recovery to sustaining resilience for a long run

following a mega disaster. This study has also provided additional evidences to the key tools and strategies to manage long-term resilience.

Although the study was based a case study in Aceh Province after the Indian Ocean Tsunami of 2004, the findings suggest that maintaining medium and long-term disaster resilience require better strategies and approaches beyond building resilience following disaster. This research also provides a new understanding of the key challenges in local actor's capacities to achieve resilience by evaluating the current strategies and practices. The analysis of local actors' contribution have extended our knowledge about the gaps between the concept developed and translated these concepts into the policies and practices at the local level. Taken together, these findings underscore that a resilience-oriented approach can contribute more to the current disaster management policy in Aceh Province. The gaps identified in this dissertation are very concrete and therefore show areas and processes where changes and modifications are needed.

Resilience focused collaboration as an evaluation framework which is proposed in this dissertation has also made several contributions to the literature. This framework has identified the relevant components of the collaboration which are important to maintain disaster resilience. Furthermore, this framework shows the linkages among these components that can applied in maintaining long-term disaster resilience. In the operationalization of this framework, the findings provide also additional tools to evaluate the multi-actors capacities to maintain resilience at local level.

However, the most important thing is that this research has several practical applications and recommendations for the local government in the three case study areas: Banda Aceh, Sabang, and Aceh Jaya and the Aceh Provincial government. This evaluation framework also applied to evaluate their current strategies in maintaining disaster resilience. Thus, it points out that there are problems and challenges faced due to a neglect or unconsciously forgotten by these local governments. This research can contribute to open new discussion and dialogue among the local actors (different governmental actors as well as governmental and non-governmental actors) by articulating these problems. At the same time, to rethink on how to maintain disaster resilience and keep it alive for the future disaster risks in Aceh Province. The findings, however, are also important for international actors (e.g. UN institutions) if they design new strategies and approaches for building disaster resilience in post disaster regions.

8.7 Limitation of the research

The scope of this research is limited in terms of the generalizability of the disaster resilience concept and definition. In this case, the evaluation of resilience building is focused on the current approaches and practices of local government and non-governmental actors following the Indian Ocean Tsunami 2004. These limitations mean that the empirical evidences need to be interpreted cautiously particularly on the term of maintaining long-term resilience that specifically defined and discussed in this dissertation. These results may not be applicable to measure resilience and explain the results of the resilience building process quantitatively.

Other limitations of this research are related to the methodology, especially in excluding the potential respondents that who might contribute to this research to enrich the data and analysis. This group of people include Indonesian National Police (*Kepolisian Negara Republik Indonesia*) and Indonesian National Armed Forced (*Tentara Nasional Indonesia*) who have significantly contributed to emergency response and recovery after the Indian Ocean Tsunami 2004. Some potential names of respondents from the police and military institutions were available from the snowball method used to select them considering that them already had prior experience working together with the police and army in building disaster resilience. However, it is very difficult and complicated to obtain permission from the authority to interview police and army groups and therefore the possibility to succeed was low. The procedure to obtain the interview permission was strict due to their tight policy of sharing their information with others outside of these institutions. Another disadvantageous factor is because the research was conducted by a student from a foreign university.

The other respondents who were absent when the data collection was done were from the business communities, private sectors, and financial institutions. According to Sendai Framework UNISDR (2015), the business and private sectors are the important stakeholders in building disaster resilience by supporting investments, business continuity and development of research and innovation. The involvement and direct contribution of the private sectors in building disaster resilience were not found during the fieldwork in Aceh Province. However, when the first meeting of the establishment of local multi-stakeholder forum in Banda Aceh on October 2013, the representatives from the local banks were present and they acknowledged that they were interested to join this platform, but at that time they did not have any ideas, programs, and activities related to disaster resilience building. This means that there is a possibility in Aceh that the private sectors will contribute in maintaining disaster resilience in

the future. But this can only be achieved by inviting and engaging the business community in resilience focused collaboration.

But unfortunately, the study did not include the vulnerable populations such as: The Lesbian, Gay, Bisexual, and Transgender (LGBT) groups and those people with HIV/AIDS (Human Immune Deficiency Virus, Acquired Immune Deficiency Syndrome) found in Aceh Province. These group of people, however, are often marginalized and were not willing to contribute due difficulty to approach them. However, during the fieldwork, the invitations to interview were rejected because they were not interested in contributing to this research. But the secondary data related their condition were obtained by interviewing one of the NGOs who has worked with these vulnerable groups in promoting disaster resilience.

This study is also limited by the numbers of municipalities and regencies that chose to include as the case study areas. The different characteristics of the impacts of tsunami in Aceh Province can be discussed more comprehensively by including for example, West Aceh regency that has only slightly different characteristics with Banda Aceh and Aceh Jaya but, providing more strategies and achievements in building disaster resilience. On the other hand, this research is relevant to look at the disaster resilience governance at the local levels and the strategies of the local government in maintaining disaster resilience.

9 Conclusion and Recommendations

The purpose of this research was to provide in the in-depth knowledge and systematize the knowledge about how disaster resilience concept is translated to different policies and long-term development plans, particularly in learning and implementation of specific DRR measures to build disaster resilience. The conclusions from this study follow the research questions and the findings and therefore address four areas: (a) conceptualization of disaster resilience and key characteristics of building disaster resilience at the local level; (b) strategies and approaches employed by state and non-state actors to build disaster resilience; (c) local actors collaboration in the development and maintenance of building resilience to disasters; and (d) challenges to the development and / or the sustainability of multi-actor and comprehensive strategies to promote disaster resilience at the local level. Following is a conclusion drawn from this research. This conclusion is followed by the research's recommendations for practioners and decision making and recommendations for furture research needs.

9.1 Conclusion

This study focuses on the process of resilience building that emerged after the rehabilitation and reconstruction phase following the Indian Ocean Tsunami in Aceh, Indonesia. Through this case study, the research aims to understand whether and how post-disaster resilience can be maintained in the medium to long term. In this regard, a conceptual framework based on resilience theory, governance theory and collaboration theory has been developed and contextualized for the case study of Aceh Province. As described empirically throughout the case study, the study identified key problems to implement disaster resilience strategies after the tsunami for local actors (e.g. government, NGOs, and community members) as well as tools that are currently used for maintaining disaster resilience (e.g. local regulations, learning, and collaboration).

The major finding of this research is that governmental and non-governmental actors have conceptualized and translated disaster resilience based on their perspectives and interpretations of the concept of resilience. The different interpretations of resilience manifest in different approaches to building disaster resilience that influenced by their identity as either state and non-state actors that learn how to see and understand about the resilience after the Indian Ocean Tsunami 2004.

Local government actors tend to interpret resilience in line with the Hyogo framework which provide priorities for action and implementation strategies. The local government interpretation

which is closely linked to the Hyogo Framework itself, lead to a focus on developing comprehensive disaster resilience policies, legislation, and institutions. In this regard, the Aceh government has successfully established various legal tools to integrate disaster resilience in the medium and long-term development plans, such as local regulations, standard operating procedures, management plans, and local action plans for disaster management. In contrast, NGOs and community groups see resilience as learning and self-organization in building disaster resilience lead to a focus on practical efforts such as learning to evacuate and self-organization in an emergency event (tsunami or earthquake). In this way, most of the NGOs perceived resilience as community empowerment and self-organization, particularly to promote disaster preparedness and awareness through their projects. In addition, community members tend to understand disaster resilience as their capacity to respond to disaster events. As such, they focus on developing individual and family evacuation plans to prepare for future tsunami events

Theoretical approaches have underscored that learning, self-organization, and collaboration are essential for building resilience and maintaining medium and long-term resilience. The empirical findings of this study confirm that the local actors have learned from the recovery process and are still learning, more than ten years after the Indian Ocean Tsunami of 2004. Over the past decade, evacuation strategies and infrastructure, establish the vertical evacuation shelters have been developed to strengthen preparedness and disaster risk reduction capacities. Despite this and the recognition of local actors realize that learning is important in building disaster resilience, the learning process is limited by local government, local NGOs, and community's lack of learning resources, funding, time, and motivation. In this regard, false alarms from the early warning system have demonstrated the weak commitment of the local government to learn from past experience as people may ignore and underestimate these warnings in the future.

The next key characteristic of disaster resilience at the local level is related to self-organization after the disaster. Self-organization is considered as a process of change that focuses on the governance system, institutions, cooperation, and actor networks at the institutional level. This was manifest in Aceh through the government's introduction and integration of new legislation, rules and structures for disaster resilience building into their development agenda. At the same time, self-organization is revealed as changes at the community level, particularly in how the new legislation, plans, and strategies are viewed and received by the community. The perceptions of tsunami risk and uncertainties are key challenges for the local actors to

encourage community self-organization. However, community members have an awareness and ability to be able to evaluate the effectiveness of diverse strategies and approaches to build disaster resilience after the Indian Ocean Tsunami. This is because most of the community members have seen or involved in the recovery process after the 2004 Indian Ocean Tsunami.

Although learning and self-organization are the key characteristics of disaster resilience, the local actors believe their instruments and tools (laws, programs, and activities) are more important than the monitoring and evaluation of their current strategies and approaches in maintaining disaster resilience. This is problematic because the evaluation is needed to achieve effective strategies in maintain long-term disaster resilience. In addition, stakeholders and community members cannot contribute directly to the development of these strategies and the decision-making process which results in participation gaps and the process of community self-organization. These community members involvements are restricted because of the top-down approach in planning and decision making that is employed by the local government in building disaster resilience. The top-down approach is problematic because it creates participation gaps, particularly for the community members to participate in decision making and get feedbacks on their interests, comments, and expectations. Local government, therefore, needs to develop a mechanism to enable learning through critical reflection on their existing activities.

In the Aceh context, local actor collaboration is the key characteristic of the development and maintenance of disaster resilience. Local actor attitudes towards collaboration are very positive because of their experiences of working together during the recovery phase and this has encouraged continued engagement. On the other hand, between provincial government and local government, there was no effective mechanism or procedure established to discuss and develop collaboration. The local multi-stakeholder forum that was established by the provincial and local governments have struggled to facilitate the collaborative process between the state and non-state actors in maintaining medium and long-term disaster resilience. This is due to trust issues among the different actors and limited leadership of interventions of the local government to encourage a formal long-term collaboration.

The main strategies and approaches employed by state and non-state actors to build disaster resilience centred on developing a strong structure of disaster management policies and organizations, including new local regulations, establishment of the local disaster management agency, and establishment of local multi-stakeholder forums at the local level. The next strategy is to set up various preparedness and mitigation measures, such as an early warning system, evacuation strategies and infrastructure, and buffer zone in the spatial plans. However,

more systematic information and evaluation tools would be needed to improve knowledge about the maintenance of preparedness and mitigation activities, particularly at school and village level.

In terms of encouraging a range of participation, the government invited NGOs, civil society organizations, and community members to participate in various programs and activities. A particular effort was made to invite vulnerable groups such as elderly people, women, children, and disabled groups. In this regard, women have been involved in building disaster resilience, however, this has not led to fully gender equitable resilience as it is difficult for women to participate in decision making process, meetings, trainings or sensitizations due to technical problems (e.g husband permit and household chores). Gender inequity hampers the implementation of an effective preparedness strategy in the long-run.

Furthermore, the range and plurality of the local actors who dealt with the disaster risk reduction and resilience building decreased significantly over time as the local NGOs struggled to maintain their contributions as donor funding became harder to attract.

The findings from the household survey suggest that the disaster mitigation infrastructure and local government performance in promoting disaster resilience have improved. However, there are three main challenges to the development and sustainability of disaster resilience at the local level, (1) challenges in a common understanding of disaster resilience concept, (2) challenges in maintaining medium and long-term disaster resilience, and (3) challenges for collaboration. The root causes of these challenges are the different concepts and perspectives of resilience, different understandings and priorities in translating resilience, and different modes of operations among the government, NGOs, and community. This is particularly pertinent at the local government level which has been found to be struggling to integrate the resilience concept into development strategies. This stems from an inadequate translation of the resilience concept into the specific local context of Aceh as a post conflict society which needed a development approach that accounted for this post conflict situation.

These challenges are complicated and remain unresolved while the local actors not aware of these challenges to improve the capacities to maintain long-term resilience. Local actors need to articulate and discuss these problems actively to be able to collaborate better in maintaining medium and long-term disaster resilience.

9.1 Recommendations for practitioners and decision makers

This research sheds light on the challenges, mismatches, and problems that have affected the maintenance of resilience in Aceh. However, this highlights the need to focus on maintaining an ongoing collaboration between different actors in order to keep maintain resilience over time. Based on the empirical and discussion chapters (see chapters 5,6,7, and 8), the recommendations to maintain medium and long-term resilience are highlighted below:

Recommendation 1: Promoting common understanding of the conceptualization and translation of disaster resilience

This research found the gaps in the translation of resilience concepts into policies and practices at the local government level. Maintaining disaster resilience requires a long-term political commitment and willingness from the government and other local actors, particularly in monitoring and evaluating existing programs. Therefore, the promotion of a common understanding of the resilience concept is key, particularly for communicating it clearly to the different stakeholders. It is recommended that the learning process in translating and integrating the resilience concept into development plans and action programs is strengthened by continually reviewing and evaluate the implementation of disaster resilience building strategies and approaches.

Recommendation 2: Inviting and involving local actors and the community at large

This research highlights that the implementation process was weakened by programs that had not been designed and developed in line with community needs. In complex contexts such as post-conflict Aceh, it is essential that care is taken to develop approaches that enable effective community collaboration for the design of approaches that fit with local needs, culture, and beliefs. Efforts are needed to review the current participatory mechanisms to invite and include a more diverse set of actors in maintaining resilience. This particularly applies to the participatory mechanism at the village level (*musrenbang*). The local government needs to learn to implement a bottom-up approach instead of the current top-down way of working. At the same time, local government needs to follow up on community engagement to provide feedback. Another option may be for the government to provide rewards for local actors (local government, NGOs, and community) that offer and implement the best strategies for maintaining disaster resilience over time. These rewards could be awards or offers of funding. This would be particularly beneficial for the local NGOs and community based-organizations

that contribute actively in this process but struggle to maintain their commitments over time as funding wains.

Recommendation 3: Improving the capacities of the local actors

The findings have identified that there are gaps between the expectations and capacities of the local government that are not sufficient to achieve their goals in disaster management, particularly in terms of leadership and communication strategies. There is a need to make improvements in the human resources capacities of the disaster management authorities, as relevant skills and knowledge of disaster recovery processes are lacking and must be improved in order to ensure that their roles and responsibilities as the main governmental agency for building resilience can be met. The local government should choose their staff based on their educational background, interest and skills in disaster management rather than general administrative skills. Staff should be well prepared through training in leadership programs and the provincial government should carry out periodic assessments to measure the performance of the local disaster management agency. It is also important to provide assistance (funding, expertise, or consultation) to support the local NGOs, civil society, and research institutions to develop their capacities in sustaining disaster resilience over time.

Recommendation 4: Conducting credible and useful evaluation

The findings address the challenges to the design and development of programs that meet with stakeholders needs. It is important to conduct an evaluation of the impacts and benefits of current strategies and approaches in maintaining long-term resilience as part of a continuous learning process. This evaluation should aim to improve the local government performance by offering options for better strategies and recommendations. In this regard, the key stakeholders should be involved in this evaluation process. It is also important to communicate the evaluation findings to the key stakeholders in order to promote learning and accountability. The most important thing is to encourage uptake and integration of the evaluation findings by decision-makers in the medium and long-term development plans.

Recommendation 5: Shared goals in collaboration

The study found that the process of building resilience is hindered by fragmentation, inconsistencies, and a lack of coordination among the local actors. The purpose of the multi-actor collaboration may exist but is not stated and understood by local actors. Bureaucratic constraints affect the communication between different levels of government and key

stakeholders. Therefore, it is recommended to identify shared goals by discussing the interests and expectations of the local actors pertaining to the maintenance of medium and long-term resilience with the stakeholders and communities.

Recommendation 6: Open and trusting collaboration

The analysis findings highlight that trust and leadership issues were the key barriers to multi-actor collaboration. To improve collaboration, it is useful to examine relationship issues between the local actors and then take significant action to build trust. Efforts are needed to improve the local government leadership roles, practices, and skills. It is highly recommended that the local government promotes collaboration advantages and nurtures a collaborative culture in managing long-term disaster resilience. At the same time, it is important for the local government to improve their formal and informal relationship and communication with the local NGOs, civil society, and academic communities in maintaining disaster resilience over time.

Recommendation 7: Strengthening the contributions of local NGOs and civil society (informal leaders, consultants, professionals, volunteer groups, community based-organizations)

These organizations should initiate and take steps document and disseminate the lessons learned from the rehabilitation and reconstruction stages that are important for sustaining disaster resilience. Non-state actors should collaborate with the local government by introducing various programs and activities, such as providing feedback on government policy and exchanging information on effective disaster resilience processes. It is also important to work collaboratively to empower the community to contribute in managing long-term resilience.

Recommendation 8: Enhance academic community contributions

Academia should conduct research and policy analysis to respond to the problems in sustaining disaster resilience over time. These efforts can be used to develop targeted interventions that provide actionable recommendations. Therefore, the recommendations and feedback from academic communities are needed to improve the local actor capacities in maintaining medium and long-term resilience. It is important that research findings for the state and non-state actors are effectively disseminated so that local actors can understand and learn together. In addition, the maintenance of the GIS as a knowledge management tool could be achieved through a joint effort by local authorities and universities or similar academic institutions in Aceh.

9.2 Recommendations for future research needs

Although various research has been undertaken to investigate the implications of the recovery process directly after the Indian Ocean Tsunami 2004, it is evident that further research is needed to evaluate the progress of maintaining resilience over time. Further research in both theoretical and practical aspects of maintaining resilience is important as a largely neglected aspect of disaster resilience research. This is the right moment to shift research directions from building resilience in the post-disaster context to evaluating these processes over time.

This dissertation focuses on the evaluation of disaster resilience ten years after the Indian Ocean tsunami in 2004. As shown, this research has provided a foundation for resilience studies by examining the conceptualization and translation process of this concept among different actors in Aceh Province. This research has clarified different roles and contributions of local actors and how they are influenced by different interpretations of resilience. The research has focused on how resilience building has emerged after the rehabilitation and reconstruction phase, particularly the conceptualization, interpretation, and challenges to promote disaster resilience through collaboration in maintaining disaster resilience over time.

Based on this study, further research is needed to identify and provide a better understanding of the variables that can nurture the collaboration between state and non-state actors in maintaining medium and long-term disaster resilience at the local level. What is now needed is a new culture of leadership for maintaining disaster resilience. This should be led by local government with careful attention to the religious and cultural beliefs that can stimulate other local actors to participate in this process. On the other hand, it is recommended that further research be undertaken to determine the willingness and capacities of local NGOs and civil society organizations. This work should pay particular attention to long term funding mechanisms or incentives to maintain contributions to maintaining long-term resilience. It would also be interesting to assess the contribution of these non-state actors particularly the private and informal sectors in maintaining disaster resilience, in terms of their contribution to learning, self-organization and adaptation process.

Regarding the long history of political conflicts and uncertainties in the government commitment to support the resilience process, future research should therefore concentrate on the exploration of various strategies that can be applied not only by the local government but also the private sector and academic communities. It is also important that the future research builds on prior research and early insights that have been obtaining in the last ten years. More possible future studies are highly recommended to establish a better understanding of long-

term aspects of disaster resilience. Further research should progress and extend methodological and theoretical approaches to assess the long-term process of building and maintaining disaster resilience and their integration in long-term development plans.

10 Appendices

10.1 Protocol for semi-structured expert interview

Governance and Collaboration

1. What strategies and approaches are employed and preferred by the government and the community to build tsunami resilience after the Indian Ocean Tsunami in 2004 in Aceh Province?
2. How do these approaches differ from concepts and strategies conducted before the Tsunami 2004?
3. What are the remaining challenges and problems faced by the government and the community in building tsunami resilience after the 2004 Indians Ocean tsunami in Aceh Province?
4. What are key stakeholders and networks that deal with disaster risk reduction and resilience building at the local level (municipalities) in the province of Aceh?

Capacities to manage resilience

5. What do you think, today, if the tsunami early warning system rings and tell people that tsunami will approach, do the community members know how to save their life, if they are in their houses, at their offices or anywhere in this city?
6. What community members still need so they can safe from the future tsunami?
7. Do you consider, the government, non-government organizations or the community can provide it?
8. Do you reckon, all the plans, infrastructures, and efforts that government and community provide for tsunami resilience building are fit with the community members need?
9. How community members gain the knowledge about the evacuation plans and routes, evacuation building and where they must run to save their life in future tsunami event?

Resilience

Self-Organization

10. What evidence is there of change in the community after the 2004 Indians Ocean Tsunami in Aceh province in term of building tsunami resilience?

Learning

11. What do you learn or what can be learned from the 2004 Indian Ocean Tsunami in Aceh Province experience?

12. Do you still learn now?

13. What limits it?

Evaluation of the disaster resilience building strategies

14. What do you think, the progress of tsunami resilience building in Aceh province after the 2004 Indian Ocean tsunami in Aceh province?

15. How strong is your commitment to involve in tsunami resilience building in Aceh province?

10.2 List of semi-structured interviews

Code	Type of organisatiton/ agency	Organization/Agency	Administrative Entity	Administrative level/ responsibility	Date of Interview
01-NGO-BNA	Non-Governmental	PMI (Indonesian Red Cross)	Banda Aceh	Province	10.10.2013
02-GO-BNA	Governmental	Banda Aceh Disaster Management Agency	Banda Aceh	Municipality	11.10.2013
03-GO-BNA	Governmental	SMP Negeri 1 (Junior High School) Banda Aceh	Banda Aceh	Municipality	22.10.2013
04-NGO-BNA	Non-Governmental	Solidaritas Perempuan (Women Solidarity, NGO)	Banda Aceh	Province	23.10.2013
05-NGO-BNA	Non-Governmental	Young Voice (organization for disable person)	Banda Aceh	Province	25.10.2013
06-NGO-BNA	Non-Governmental	Walhi (Environmental Organization, NGO)	Banda Aceh	Province	28.10.2013
07-GO-BNA	Governmental	Bappeda (Regional development and planning agency)	Banda Aceh	Municipality	4.11.2013
08-GO-BNA	Governmental	Dinas Sosial (Social agency)	Banda Aceh	Municipality	7.11.2013
09-GO-BNA	Governmental	SAR (Search and rescue)	Banda Aceh	Province	7.11.2013
10-GO-BNA	Governmental	Balai Arsip Tsunami (Tsunami archive agency)	Banda Aceh	Province	8.11.2013
11-NGO-BNA	Non-Governmental	Forum Jurnalis Aceh Peduli Bencana (Journalist Forum for Disaster awareness)	Banda Aceh	Province	8.11.2013
12-NGO-BNA	Non-Governmental	PKBI (Persatuan Keluarga Berencana Indonesia)	Banda Aceh	Province	8.11.2013
13-NGO-BNA	Non-Governmental	JKMA (Jaringan Komunitas Masyarakat Adat) (Indigenous people network)	Banda Aceh	Province	12.11.2013
14-NGO-BNA	Non-Governmental	JKMA (Jaringan Komunitas Masyarakat Adat)	Banda Aceh	Province	12.11.2013

		(Indigenous people network)			
15-NGO-BNA	Non-Governmental	Disaster Risk Reduction Forum Banda Aceh	Banda Aceh	Municipality	13.11.2013
16-NGO-BNA	Non-Governmental	Rumpun Bambu Indonesia	Banda Aceh	Province	14.11.2013
17-NGO-BNA	Non-Governmental	ICAIOS (International centre for Aceh and Indian Ocean Studies)	Banda Aceh	Province	18.11.2013
18-NGO-BNA	Non-Governmental	Prodeelat	Banda Aceh	Province	19.11.2013
19-NGO-BNA	Non-Governmental	Yayasan Pena	Banda Aceh	Province	19.11.2013
20-NGO-BNA	Non-Governmental	RAPI (Radio communication community)	Banda Aceh	Municipality	19.11.2013
21-NGO-BNA	Governmental	Dinas Perhubungan dan Infokom (Transportation and telecommunication agency)	Banda Aceh	Municipality	20.11.2013
22-NGO-BNA	Non-Governmental	HAKKA (Chinese community organization)	Banda Aceh	Municipality	20.11.2013
23-NGO-BNA	Non-Governmental	Majelis Permusyawaratan Ulama (Islamic religious leaders agency)	Banda Aceh	Municipality	21.11.2013
24-NGO-BNA	Non-Governmental	American Red Cross	Banda Aceh	Province	22.11.2013
25-NGO-BNA	Governmental	Dinas Pekerjaan Umum (Public works agency)	Banda Aceh		25.11.2013
26-NGO-BNA	Non-Governmental	CRRC (Community rehabilitation and research centre)	Banda Aceh	Province	26.11.2013
27-NGO-BNA	Non-Governmental	International Organization for Migration	Banda Aceh	Province	26.11.2013
28-NGO-BNA	Non-Governmental	Aceh Institute	Banda Aceh	Province	28.11.2013
29-GO-BNA	Governmental	BPBD (Local disaster management agency)	Banda Aceh	Municipality	27.11.2013
30-GO-BNA	Governmental	BPBD (Local disaster management agency)	Banda Aceh	Municipality	28.11.2013
31-GO-BNA	Governmental	DPRK Banda Aceh (The people's representative council)	Banda Aceh	Municipality	2.12.2013
32-NGO-BNA	Non-Governmental	PMI	Banda Aceh	Municipality	5.12.2013

		(Indonesian red cross)			
33-GO-BNA	Governmental	Dinas Kebudayaan dan Pariwisata (Tourism and culture agency)	Banda Aceh	Municipality	10.12.2013
34-GO-SBG	Governmental	Dinas Pendidikan (Education agency)	Sabang	Municipality	12.12.2013
35-GO-SBG	Governmental	Tagana Sosial (Disaster mitigation volunteer)	Sabang	Municipality	12.12.2013
36-GO-SBG	Governmental	BPBD (Local disaster management agency)	Sabang	Municipality	12.12.2013
37-GO-SBG	Governmental	Dinas Kelautan dan perikanan (Marine and fisheries Agency)	Sabang	Municipality	12.12.2013
38-NGO-SBG	Non-Governmental	Balohan Village	Sabang	Municipality	12.12.2013
39-GO-SBG	Governmental	Bappeda (Regional development and planning agency)	Sabang	Municipality	13.12.2013
40-NGO-SBG	Non-Governmental	RAPI (Radio Communication Community)	Sabang	Municipality	13.12.2013
41-NGO-SBG	Non-Governmental	PMI (Indonesian red cross)	Sabang	Municipality	14.12.2013
42-NGO-SBG	Non-Governmental	Flora Fauna International (FFI)	Sabang	Province	14.12.2013
43-NGO-SBG	Non-Governmental	JKMA (Jaringan Komunitas Masyarakat Adat) (Indigenous people network)	Sabang	Municipality	15.12.2013
44-NGO-SBG	Non-Governmental	World Conservation Society (WCS) Marine Aceh	Sabang	Province	17.12.2013
45-NGO-SBG	Non-Governmental	KNPI (The national comittee of Indonesian youth)	Sabang	Municipality	18.12.2013
46-NGO-SBG	Non-Governmental	PMI (Indonesian red cross)	Sabang	Municipality	19.12.2013
47-NGO-SBG	Non-Governmental	SAR (Search and rescue) Volunteer	Sabang	Municipality	19.12.2013
48-GO-BNA	Governmental	Balai Arsip Tsunami Tsunami Archieve Agency	Banda Aceh	Province	3.1.2014
50-NGO-BNA	Non-Governmental	Disaster Management Consultant	Banda Aceh	Municipality	7.1.2014
51-NGO-BNA	Non-Governmental	Aceh Civil Society	Banda Aceh	Province	7.1.2014
52-NGO-BNA	Non-Governmental	Tikar Pandan Community	Banda Aceh	Province	8.1.2014
53-NGO-BNA	Non-Governmental	Karst Aceh	Banda Aceh	Province	8.1.2014

54-NGO-BNA	Non-Governmental	Indonesian Doctor Association	Banda Aceh	Province	9.1.2014
55-GO-CLG	Governmental	BPBD (Local disaster management agency)	Aceh Jaya	Municipality	21.1.2014
56-GO-CLG	Governmental	BPBD (Local disaster management agency)	Aceh Jaya	Municipality	21.1.2014
57-GO-CLG	Governmental	BPBD (Local disaster management agency)	Aceh Jaya	Municipality	21.1.2014
58-NGO-CLG	Non-Governmental	Women Leader	Aceh Jaya	Municipality	21.1.2014
59-NGO-CLG	Non-Governmental	Sibad, PMI	Aceh Jaya	Municipality	22.1.2014
60-GO-CLG	Non-Governmental	Sibad, PMI	Aceh Jaya	Municipality	22.1.2014
61-GO-CLG	Governmental	BPBD (Local disaster management agency)	Aceh Jaya	Municipality	22.1.2014
62-GO-CLG	Governmental	Dinas Sosial (Social agency)	Aceh Jaya	Municipality	22.1.2014
63-GO-CLG	Governmental	Dinas Kesehatan (Health agency)	Aceh Jaya	Municipality	22.1.2014
64-GO-CLG	Governmental	Bappeda (Regional development and planning agency)	Aceh Jaya	Municipality	22.1.2014
65-GO-CLG	Governmental	Dinas PU (Public works agency)	Aceh Jaya	Municipality	22.1.2014
66-GO-CLG	Governmental	Dinas Perhubungan dan Pariwisata (Transportation and tourism agency)	Aceh Jaya	Municipality	22.1.2014
67-GO-CLG	Governmental	Dinas Perhubungan dan Pariwisata (Transportation and tourism agency)	Aceh Jaya	Municipality	22.1.2014
68-NGO-CLG	Non-Governmental	Aceh Jaya Search and Rescue Volunteer	Aceh Jaya	Municipality	23.1.2014
69-NGO-CLG	Non-Governmental	RAPI (Radio Community)	Aceh Jaya	Municipality	23.1.2014
70-GO-CLG	Governmental	Dinas Perikanan dan Kelautan (Marine and fisheries Agency)	Aceh Jaya	Municipality	23.1.2014
71-GO-CLG	Governmental	Dinas Pendidikan, Pemuda dan Olahraga (Education, youth, and sport agency)	Aceh Jaya	Municipality	23.1.2014
72-GO-CLG	Governmental	DPRK Aceh Jaya (The people's representative council)	Aceh Jaya	Municipality	23.1.2014
73-GO-MBO	Governmental	Bappeda Aceh Barat (Regional development and planning agency)	Meulaboh	Municipality	24.1.2014
74-NGO-BNA	Non-Governmental	Organization of the Islamic Conference (OIC)	Banda Aceh	Province	27.1.2014
75-GO-BNA	Governmental	BMKG, UPT Mata Ie	Banda Aceh	Province	30.1.2014

10.3 Sample of transcript interview from government agency

Code: 07-GO-BNA

Governance and Collaboration

1. **Apa kontribusi dari organisasi ini untuk meningkatkan kemandirian dan ketahanan masyarakat dalam menghadapi risiko bencana?**

What strategies and approaches are employed and preferred by the government and the community to build tsunami resilience after the Indian Ocean Tsunami in 2004 in Aceh Province?

Dari segi perencanaan memasukkan pengurangan risiko bencana sebagai program strategis RPJM 2012-2014. Bappeda akan memprioritaskan anggaran PRB untuk infrastruktur escape route dan jalan. Perawatan escape buiding dan memanfaatkan escape building sebagai tempat pemberdayaan masyarakat. Kerja sama ini sedang diijak dengan JICA.

Selain itu, pemerintah kota juga memfasilitasi kerja sama antar lembaga sehingga terbuka peluang dibangun fasilitas dengan bantuan dari pihak luar.

Adanya kerja sama untuk melakukan research tsunami dalam bentuk kajian.

Adanya kurikulum tambahan di sekolah.

Fasilitasi pembentukan forum pengurangan risiko bencana dan aktif di dalamnya.

Terus melakukan kerjasama-kerjasama. Misalnya dengan Jepang dalam memberdayakan escape building dan meminta bantuan pusat untuk membuat escape building di tibang.

Masyarakat sulit langsung untuk berpartisipasi, kecuali mereka memiliki wadah khusus. Misalnya jika terjadi gempa, masyarakat dapat melihat langsung apakah ada aparat pemerintah yang siap dan membantu.

Cara yang lain adalah dengan mengirimkan SMS kepada walikota

Menulis di surat kabar

Dan mendirikan forum untuk berdiskusi. Diskusi biasanya dilakukan melalui BPBD.

Semua hasil ini kemudian disampaikan kepada walikota.

Jika masyarakat komplain bisa didiskusikan di rapat-rapat yang dilaksanakan

Perencanaan ini dilakukan dengan mekanisme bottom up, melalui musrenbang masyarakat bisa mengusulkan kebutuhan mereka misalnya tanggul air untuk gelombang pasang.

Pemerintah juga bisa memberikan kebutuhan masyarakat yang tidak diusulkan tapi dianggap penting, misalnya pelebaran jalan untuk escape route.

Kebutuhan-kebutuhan ini juga akan dibicarakan di musrenbang. Kebutuhan yang kecil akan dipenuhi oleh pemko. Jika besar maka akan ditanggung bersama antara pemko dan provinsi. Jika besar maka akan diusulkan ke pusat.

Jika keputusan sudah disahkan maka tidak bisa lagi diubah. Misalnya RTRW, jika sudah diundang-undangkan tidak bisa lagi diubah.

Jika mau mengubah harus sebelum disahkan dan sudah ada mekanisme untuk itu yaitu melalui public hearing sebelum dijadikan peraturan daerah.

Namun biasanya rencana-rencana ini akan lebih mementingkan kepentingan masyarakat.

Masyarakat tidak akan pernah merasa puas. Satu sisi pemerintah juga sudah melakukan yang terbaik. Komplain akan selalu ada karena dana yang sedikit sementara usulan dari masyarakat sangat banyak. Jadi pemerintah akan menetapkan prioritas apa yang akan dikerjakan terlebih dahulu dan sisanya akan dikerjakan untuk tahun depan. Yang paling penting adalah memberikan penjelasan yang baik kepada masyarakat.

PAD harus disubsidi silang karena pembangunan di satu wilayah biasanya dibangun dengan sumber dana dari wilayah lain.

Masyarakat dari wilayah yang memiliki PAD kecil sebaiknya jangan terlalu banyak meminta.

Informasi-informasi ini diberikan melalui poster APBD yang dikirim ke desa-desa dan dapat diakses secara online melalui website pemko.

Pemko juga memiliki aplikasi e-monev, e-kinerja dan e-planning yang memuat usulan dari masyarakat namun akses untuk aplikasi ini masih terbatas namun saat ini masih dalam proses agar bisa dibuka untuk umum.

Kualitas dari setiap informasi ini sangat baik karena data yang dikumpulkan langsung dari pihak yang berwenang.

Semua pelaporan dilakukan dengan baik. Ada laporan fisik dan hasil setiap tahun. Biasanya penyusunan laporan terkendala terbatasnya waktu untuk mempersiapkan laporan tersebut.

Diskusi selalu dilakukan dengan SKPD melalui pendiskusian anggaran. Proses komunikasi dengan masyarakat dilakukan dengan mekanisme musrenbang. Masyarakat akan diundang melalui camat dan kepala desa akan memilih siapa yang akan datang mewakili desa ketika musrenbang. Bukan Bappeda yang menentukan daftar undangan.

In term of a planning to include the Disaster Risk Reduction (PRB) as the Midterm Development Plan (RPJM) strategic program for 2012-2014, Bappeda will prioritize the PRB budgets to build escape route infrastructure, to enlarge road, to maintain escape building, and to support community-based activities and trainings regarding the utilization of escape buildings. In order to achieve those targets, Bappeda will join a team with JICA to objectify the plans.

In addition, Bappeda and local government will join force to facilitate a teamwork between agencies in order to provide opportunities to build the escape building infrastructure with the help of central government or other private organizations in Indonesia or overseas.

Besides, Bappeda plans to create a collaboration with any relevant institutions to conduct research regarding tsunami issues as well as to insert the PRB information into

the school curriculum. Moreover, Bappeda will facilitate the establishment of PRB forum as a place for the communities to actively participate in reducing the disaster risk. However, if communities are unable to participate in the forum, they can send direct messages to mayor and/or to write news in the local newspaper.

The Disaster Risk Reduction (PRB) programs are designed with the bottom-up mechanism or deliberative planning. Through this method, the communities can propose their needs, such as a need for water levee to prevent the overflow of tidal waves. Additionally, the government can also provide people's needs, which are considered essential, but are not proposed, such as road's widening for escape route. Generally, the small needs are the responsibility of local government, while the large one will be proposed to the central government.

Before any decisions related to PRB programs are officially accepted, any considerations that may disrupt the implementation of the plans should be seriously taken into account. If the decisions are approved, then they could no longer be changed. The changes must be done before the approval and usually the public hearing mechanism is used to make a change to the proposed programs prior to being made as local regulations and the changes need to be more concerned with the interests of society.

The society will never be satisfied with government efforts. Although the government have done their best, they may find many complains if they could not fulfil communities' demand. One of the reasons that triggers critiques from communities is insufficient fund. In this case, the government may not be able to meet all the needs of society. In general, the government will set priorities of what should be firstly done and what could be postponed.

The local revenue should be cross-subsidized or distributed evenly to all areas due to the development of an area is usually built with the budgets from other areas. Therefore, the government usually urges any areas that has low local revenue to limit their demands. In addition, the information regarding the proposed programs is informed through the budget poster that will be distributed to all villages as well as could be accessed online through the official website of the local government. Besides, the local government also have mobile applications that can be accessed through smartphones, such as e-money, e-performance, and e-planning. Unfortunately, those applications are currently only accessible to certain circles and in the process to be opened to the public.

The quality of information is very good because of the data was collected directly from the authorities.

All reporting is done well. There will always be an annual physical report as well as its results at the end of the year. Usually, the only obstacle in writing an annual report is the limited time to prepare the report.

Discussions are always done, particularly the discussion about the budget on education. We communicate with the public through the mechanism musrenbang. The public will be invited through the district and village leaders will choose who will come to represent the village when musrenbang. Not Bappeda that determines the list of invitees.

2. **Apa yang membedakan pendekatan ini dengan strategi yang dilakukan sebelum tsunami 2004?**

How do these approaches differ from concepts and strategies conducted before the Tsunami 2004?

Sebelum tsunami, tata ruang kota Banda Aceh sudah memasukkan ancaman bencana seperti banjir, kebakaran dan puting beliung. Pemko sudah mempersiapkan itu. Setelah tsunami, semuanya diarahkan menghadapi bencana tsunami.

Before tsunami, Banda Aceh city planning has included the threat of disasters - such as floods, fires and tornados - into its design. However, today, every disaster planning is designed to be ready to face the tsunami disaster.

3. **Tantangan dan masalah apa yang masih dihadapi organisasi anda untuk melakukannya setelah tsunami 2004?**

What are the remaining challenges and problems faced by the government and the community in building tsunami resilience after the 2004 Indians Ocean tsunami in Aceh Province?

Untuk Bappeda, isu tsunami telah familiar, namun di dinas lain sangat susah agar semua dapat berpandangan sama bahwa suatu saat tsunami akan datang lagi. Apakah kita siapa? Jika pun hanya terjadi gempa, apakah masyarakat siap untuk melakukan evakuasi dengan baik? Apakah fasilitas mencukupi ? karena dari pengalaman terakhir evakuasi dilakukan dengan kendaraan sehingga banyak terjadi kecelakaan lalu lintas.

Masyarakat juga belum siap, seperti untuk melakukan tsunami drill, apa yang harus disiapkan?

Dari segi perencanaan juga belum baik, fasilitas vital masih berada di daerah rawan tsunami, meskipun pemko banda aceh sudah memindahkan fasilitas seperti rumah sakit, namun masih banyak sekolah di daerah rawan tsunami.

Masyarakat juga masih memiliki kebiasaan untuk menyekolahkan anaknya tidak di wilayah tempat tinggalnya, sehingga ketika terjadi gempa semua orang kembali untuk mengambil anaknya, tidak langsung menyelamatkan diri.

Bappeda tidak bertemu dengan masyarakat kecuali pada saat musrenbang. Pada saat musrenbang ketika masyarakat memiliki masalah maka Bappeda memberikan informasi. Masyarakat selalu datang jika diundang mengikuti musrenbang.

Karena meminta bantuan dari pihak lain maka harus menunggu kepastian jadi atau tidaknya. Sampai saat ini belum dilakukan.

For Bappeda itself, tsunami issues are familiar things. However, it is still difficult to share similar ideas regarding tsunami, which may happen in the future, with other departments. Are we prepared? Even if it is only an earthquake, is the public ready to evacuate well? Are the facilities adequate? Based on the last experience, the evacuation is conducted with vehicles. As the result, many casualties and traffic accidents were occurred during the process.

Besides, communities tend to send their children to school that are located far away from their home. In this case, when an earthquake occurs, people may likely be returning to school to pick up their children instead of escaping to a secure location to save themselves.

Based on the above story, it can be concluded that the communities are not ready yet to face another potential threat of tsunami. In conducting tsunami drill, for example, the communities are still not sure what to be prepared. The planning itself is not good enough, many vital facilities are still located in areas prone to tsunami threats.

4. **Dengan siapa saja atau organisasi apa saja, anda bekerja sama dan berkoordinasi?**

What are key stakeholders and networks that deal with disaster risk reduction and resilience building at the local level (municipalities) in the province of Aceh?

Pada level kabupaten/kota, Bappeda bekerja sama dengan semua SKPD dan BPBD. Pada level provinsi, Bappeda bekerja sama dalam bidang anggaran, misalnya dalam pembebasan tanah untuk jalan atau usul untuk membuat escape route. Pada level pusat, bantuan rambu-rambu arah evakuasi dan pelatihan-pelatihan. Forum PRB dan PMI dengan memfasilitasi pertemuan. Bappeda menyediakan peta dan data mitigasi untuk pihak-pihak yang membutuhkan. Bappeda juga bekerja sama dengan lembaga dari dalam dan luar negeri, khususnya mahasiswa atau lembaga penelitian yang melakukan kajian tsunami.

At the district or city level, Bappeda usually cooperates with the local agencies (SKPD) and the local disaster management agency (BPBD). Meanwhile, at the province level, Bappeda joins a team with the provincial financial department to handle budget spending issues, such as in paying the land acquisition to be used for the road or in designing a budget proposal to build escape routes. Additionally, in term of the needs for the evacuation signs and trainings, Bappeda generally consults the central government to provide all the needs for them.

Moreover, Bappeda will facilitate meetings with other groups that are incorporated into the local multi stakeholder forum (PRB). Bappeda also provides maps and mitigation data for every party that needs them as well as cooperates with both national and international agencies, particularly research students or institutions that conduct tsunami studies.

Capacities to manage resilience

5. **Apakah menurut anda, saat ini, jika terjadi peringatan sirene akan terjadi tsunami masyarakat akan aman atau mampu menyelamatkan diri jika anda berada di rumah, di kantor atau sedang berada dimanapun di kota ini?**

What do you think, today, if the tsunami early warning system rings and tell people that tsunami will approach, do the community members know how to save their life, if they are in their houses, at their offices or anywhere in this city?

Aman tidaknya masyarakat tergantung skala gempa dan tsunami yang akan terjadi. Tidak semua akan selamat karena fasilitas belum mencukupi.

Secara mental lebih dari siap karena akan banyak korban karena fasilitas jalan kecil dan berputar-putar, simpang, jalan buntu dan vertikal building belum banyak.

The safety of a community will depend on the scale of an earthquake or tsunami. It is currently predicted that not all people will survive the disaster due to inadequate facilities, such as narrow and circuitous roads, too many dead-end roads and lack of vertical buildings.

6. **Menurut anda, apa yang masih dibutuhkan agar jika terjadi tsunami masyarakat dapat selamat dari bencana tersebut?**

What community members still need so they can safe from the future tsunami?

Infrastruktur yang lebih baik dalam kuantitas dan kualitas.

Penyadaran dan pembiasaan terhadap masyarakat masih kurang harus terus menerus melakukan tsunami drill untuk semua lapisan masyarakat. Masyarakat tau tapi tidak ada biasa melakukannya. Harus ada komitmen dan paksaan dari pemerintah.

People are in needs of better infrastructure in both quality and quantity. Raising public awareness of tsunami through tsunami drill activities is one way of educating the community on how to survive another tsunami threat in the future. In doing so, there must be a commitment and an interference of local government in order to guarantee the successfulness of activities.

7. **Apakah menurut anda pemerintah, LSM, atau organisasi anda mampu menyediakan semua kebutuhan tersebut?**

Do you consider, the government, non-government organizations or the community can provide it?

Bisa tapi bertahap karena dana yang tidak mencukupi sehingga penyelesaian kegiatan-kegiatan itu membutuhkan waktu untuk menyelesaikan. Harus ada bantuan dari pihak-pihak lain.

Yes, they could. However, it could not be done at once due to insufficient funds. The availability of supports from other parties will be much appreciated.

8. **Menurut anda, apakah semua rencana, fasilitas, dan usaha pemerintah dan masyarakat untuk meningkatkan kemandirian dan ketahanan masyarakat dalam menghadapi risiko bencana sudah sesuai dengan kebutuhan masyarakat?**

Do you reckon, all of the plans, infrastructures, and efforts that government and community provide for tsunami resilience building are fit with the community members need?

Idealnya harus memenuhi kebutuhan masyarakat karena sulit untuk menyesuaikannya dengan kebutuhan masyarakat. Pemerintah memenuhi kebutuhan ini secara paralel dan bertahap.

Not all the needs of community have been fulfilled because it is hard (for the government) to fit (the budget) with the community needs, but the local government will gradually accomplish it from time to time.

9. **Darimanakah masyarakat mendapatkan pengetahuan tentang apa yang harus dilakukan ketika suatu saat terjadi tsunami untuk menyelamatkan diri (evacuation plans and route, evacuation building?)**

How community members gain the knowledge about the evacuation plans and routes, evacuation building and where they have to run to save their life in future tsunami event?

Resilience

Self-organization

10. **Perubahan-perubahan apa saja yang terjadi untuk meningkatkan kemandirian dan ketahanan masyarakat dalam menghadapi risiko bencana setelah tsunami 2004?**

What evidence is there of change in the community after the 2004 Indian Ocean Tsunami in Aceh province in term of building tsunami resilience?

Sistem anggaran berubah sekarang menggunakan RPJM. Tata ruang disesuaikan dengan konsep resilient city dan kota madani.

Infrastruktur sudah banyak dan penataan ruas jalan, pemukiman yang lebih baik.

Currently, the budget system has changed into the midterm development plan. The spatial concept is adapted to fit with the concept of resilient city and civil society.

We have better infrastructure, road, and housing now.

Learning

11. **Apa saja yang telah organisasi anda pelajari dari pengalaman tsunami 2004?**

What do you learn or what can be learned from the 2004 Indian Ocean Tsunami in Aceh province experience?

Kota Banda Aceh rentan terhadap tsunami sehingga ini menjadi dasar dalam melakukan perencanaan dan kegiatan. Baik dalam melakukan sistem transportasi publik semuanya harus dilihat berdasarkan ancaman tsunami. Jika terjadi tsunami apakah infrastruktur akan bertahan, apakah akan aman, inilah yang menjadi pertimbangan dalam melakukan perencanaan.

Banda Aceh city is vulnerable to tsunami treats, in that case, every plan, particularly the public transportation, and activities has to be designed to survive all-natural disaster threats, particularly tsunami. If the Tsunami come, we have a good infrastructure, so if the question, do we have a robust infrastructure, this is our main consideration in planning.

12. **Apakah proses belajar ini masih berlangsung?**
-

Do you still learn now?

Proses belajar ini masih berlangsung dalam proses perencanaan dan monitoring. Tsunami adalah rahasia alam sehingga manusia hanya bisa berusaha. Jangan tidak melakukan apa-apa padahal sudah tau ada ancaman tsunami.

The learning process is still under way in terms of planning and monitoring. Because tsunami is a natural disaster that can occur anytime, the community have to be prepared in order to survive. Do not do nothing, we all know that we have tsunami risk

13. Apa yang membatasi proses belajar ini?**What limits it?**

Bahan belajar kurang, bahan kajian kurang karena tenaga ahli tidak berkontribusi dan tidak mau membagi hasil kajian dengan pemerintah. Pemerintah juga sangat terbatas waktunya sehingga harus berkolaborasi dengan ahli-ahli. Harus ada sinergitas antara masyarakat dan pemerintah.

Lack of learning materials and resources. Experts do not want to contribute and share their research with the local government. We as the local government have a limited time to learn, so we have to collaborate with the disaster experts. We have to create synergy between the community and the government.

Evaluation of the disaster resilience building strategies

14. Menurut anda, bagaimana perkembangan dari proses meningkatkan kemandirian dan ketahanan masyarakat dalam menghadapi risiko bencana setelah tsunami 2004 di masa yang akan datang?**What do you think, the progress of tsunami resilience building in Aceh province after the 2004 Indian Ocean Tsunami in Aceh province?**

sudah dilakukan tapi masih kurang karena masih banyak persoalan lain selain masalah bencana. Misalnya masalah kemiskinan, penurunan moral, dan perkembangan kota banda aceh menuju urban sehingga berubah masyarakatnya dari heterogen menjadi plural. Jika terjadi gempa, baru masyarakat teringat kembali.

The local government has done their best efforts to prepare and train communities to be ready in facing tsunami threats in the future. However, due to the availability of other issues, such as poverty, moral decline, and the development of Banda Aceh city toward the urban community, which is changes from a heterogeneous community to become a plural one.

15. Bagaimana komitmen organisasi anda untuk terus melakukannya?**How strong is your commitment to involve in tsunami resilience building in Aceh province?**

Perkembangannya akan semakin baik. Pembangunan infrastruktur mitigasi tsunami sudah sejak tahun 2008. Awalnya tidak jelas domain siapa dan semua diserahkan kepada Bappeda. Kegiatan ini semakin terorganisir sejak ada BPBD and TDMRC. TDMRC sudah melakukan banyak pertemuan internasional dan melakukan diskusi yang membahas masalah sosial korban tsunami.

Komitmen tetap kuat, harus siap menghadapi tsunami. Perencanaan akan terus dilakukan dalam mempertimbangkan semua aspek ancaman tsunami. Juga berkomitmen untuk menjadikan kota resilient dan madani. Siapapun yang akan menjadi walikota tetap akan mempertimbangkan kedua konsep kota ini. Mungkin hanya akan menentukan arahnya kemana dan penyesuaian-penyesuaian.

The construction of tsunami mitigation infrastructure was begun in 2008. At the beginning, it was not clear whose responsibility it was, and all the burden is directed to the local government officials (Bappeda). However, this activity was properly organized since the establishment of the local disaster management agency and the TDMRC. TDMRC has conducted a lot of international meetings and discussion on social issues of tsunami victims.

Our commitment to be ready to face any potential tsunami threats remains strong. All planning to build a better city will consider all aspect of tsunami threats. Also committed to making cities resilient and civil. Anyone who will be the mayor will still consider both the concept of the city. Perhaps only will determine the aim and the revision of the plan.

10.4 Sample of transcript interview from NGO

Code: 24-NGO-BNA

Governance and Collaboration

1. **Apa kontribusi dari organisasi ini untuk meningkatkan kemandirian dan ketahanan masyarakat dalam menghadapi risiko bencana?**

What strategies and approaches are employed and preferred by the government and the community to build tsunami resilience after the Indian Ocean Tsunami in 2004 in Aceh Province?

Dulu organisasi kami pertama kali datang ke Aceh karena ada recovery program tsunami, dan kegiatan tersebut menyediakan budget yang cukup besar yaitu 300 juta USD. ada beberapa program yang dikerjakan. Kalau terkait ketangguhan masarakat dalam menghadapi resiko bencana saya melihat ada dua aspek, yang pertama memang ada program khusus yang menjalankan program mengurangi resiko bencana, saat tsunami dulu kita mulai. Kita jalankan program ini dulunya di 19 desa yang ada di Banda Aceh dan Aceh Jaya pada tahun 2010-2011. Dengan rincian 9 desa di Aceh Jaya, 10 Desa di Banda Aceh. kita jalankan setelah 2011 kita jalankan program berbasis masyarakat. Tapi kalau sebenarnya kita bicara berbasis masyarakat community based, itu istilah yang banyak orang pakai, tidak hanya disuport oleh satu program saja tapi banyak program-program lain. Kita juga punya livelihood, ada program air bersih dan sanitasi, sosial dan kesehatan, kemasyarakatan dan itu dapat menunjang ketangguhan masyarakat. ada yang di dekati secara langsung, ada yang tidak dengan program pengurangan resiko bencana. Dampak yang lebih luas dari program yang lain.

At first, our organization came to Aceh for the tsunami recovery program, and it provided a quite big amount of budget which was around 300 USD. There were several programs we worked on at that time. When it comes to the resilience of community in managing risks of disasters, I can see that there are 2 aspects here. First, indeed we had a special program that was specifically created to restrain the risks of disaster, which was started after the tsunami. We ran this program back then on 19 different villages within Banda Aceh and Aceh Jaya in the years of 2010-2011. To be more detail, 9 villages in Aceh Jaya, and 10 villages in Banda Aceh. After 2011, we started to run community-based programs. But when we're talking about community-based program, a well-known term used by many, it was not only supported by one program but also by many other programs. We also had livelihood program – such as clean water and sanitation, social and health programs, and community programs – which were expected to be able to increase the community resilience in managing the risks of disaster. Sometimes we used direct approach, and sometimes instead of using disaster risk reduction programs, we used programs that could give broader impact.

Jargonnya program kita partisipatory yang dalam perencanaannya mengumpulkan masyarakat dan ini menjadi tantangan bagi kita. Kurang kadang-kadang kelompok termaginalkan di masyarakat ini merasa berkenan atau tidak cukup dapat kesempatan dalam kesempatan itu. Nah cara mengatasi itu ada beberapa komponen, kalau untuk gender untuk siaga bencana itu di setiap desa kita bentuk 50% laki-laki 50% lagi perempuan, kemudian kelompok-kelompok dengan kebutuhan khusus seperti ibu hamil, orangtua, anak-anak, difabelitas ini menjadi kelompok rentan, ketika kita buat

rencana kontigensi mereka perlu mendapatkan perbuatan khusus untuk evakuasi dan lain-lain.

Within the programs, we used term “participatory” which was initially planned to gather all community and then turned out to be another challenge for us. In this term, the participatory was not enough. Sometimes we also had to deal with the marginalized group of societies who feel neglected and did not get enough chance to be engaged with the programs. Well, in coping with these issues, we had several components. First, by giving 50-50 quotas gender-based allocation for the disaster-response team. Secondly, by creating group where the people with special needs such as pregnant women, elders, children, and people with disability were joined as the vulnerable group which in our contingency plan would be receiving more attention in terms of evacuation, and so on.

Mekanisme itu setiap desa kita bentuk tim siaga bencana, ini jadi modifikasi di tim siaga bencana ini, kalau ada ya ada, jadi disanalah kadang-kadang fungsi kami cuma mengingatkan aja, kenali kelompok-kelompok dengan kebutuhan khusus dan perlu mendapatkan perhatian khusus. Tapi sejauh ini ada kelompok yang berkebutuhan khusus menyampaikan konsen mereka secara langsung, bisa jadi link dengan PMI, tim PMI dengan tim SIBAT (Siaga bencana berbasis masyarakat), tim SIBAT dengan masyarakat, karena tidak ada komunikasi dengan mereka.

These mechanisms were applied to each village by forming a disaster risk reduction team, with several modifications to suit the participation on site. Our roles were mostly to remind them, and to engage with those with special needs within the society as the vulnerable group who required more of our attention. But so far, we had groups with special needs who spoke up their concerns directly [to the American Red Cross]. Otherwise, they [the American Red Cross] would talk to PMI before the communication would go from PMI to SIBAT [Community-based disaster management] and SIBAT to community, because there is no direct communication in between.

Ditempat –tempat yang programnya berjalan dengan bagus seperti Bireuen dan Bener Meriah bisa di cek kok, tanggapannya positif terus kemudian program kami akan selesai maret 2014, tapi banyak masyarakat minta program tersebut diperpanjang atau di beberapa desa di Bener Meriah yang tempat kami tidak menjalankan program, mengapa di tempat mereka tidak di jalankan program serupa. Keberhasilan program itu beragam, kalau di Aceh Tamiang memang tidak begitu berjalan programnya karena jaraknya, letak kantor PMI dengan tempat dilaksanakan program harus di tempuh selama 2 jam (ketamiang hulu) dengan kondisinya yang cukup berat. Mungkin tingkat kedekatannya beda tidak seperti didaerah-daerah lain.

On places where the programs went successfully like in Bireuen and Bener Meriah; you might want to check; they gave us positive response. Although we had to end our program on March 2014, many of them asked for a program extension. However, in some villages in Bener Meriah, outside of the villages where we ran these programs, we had people protesting and demanding for the same programs to be applied also in their villages. The success of the programs would be different in each site. In Aceh Tamiang, indeed, the programs were not that successful due to the distance between facilities. For example, from the *PMI* office to the site of the program we need to take a 2-hours-long trip (to Tamiang Hulu), not to mention the very bad condition of the road. Thus, the distance may be varied, and the problem is not always the same with the other villages.

Umumnya saya lihat programnya di masyarakat diterima dengan baik. Sampai titik tertentu kita juga di anggap bagian dari mereka, ketika ada anak atau keluarganya yang menikah di undang, jika ada yang meninggal kita ikut takziah. Di awal program kita buat pertemuan dengan BPBA di Banda Aceh dan menjelaskan strategi yang akan kita lakukan, begitu juga di kabupaten atau kota lainnya, kita berkoordinasi dengan BPBD dan pemerintah setempat. PMI kabupaten dengan provinsi punya kerjasama dengan BPBD untuk menjalankan program-program ini, termasuk beberapa kabupaten mereka membuat laporan tahunan untuk diserahkan ke BPBD Kabupaten kota di daerah mereka. Yang menjadi pertanyaan adalah beberapa staf disitu jika ditanya open gak open.

Generally, I could see how the programs were well accepted by community. To certain extent, we were even counted as part of them. We were invited to wedding events of their families or relatives, and if there was a family lost we would be asked to join them praying together (*takziah*). At the beginning of the programs, we set a meeting with the *BPBA* in Banda Aceh to explain about our strategies and plans. The same procedure we did in other municipalities and regency, where we coordinate with BPBD and the local government. The PMI in both local and provincial levels also had cooperation with BPBD to work together in running our programs as well as preparing annual report to be submitted to the BPBD. The only problem was that the staffs there did not really care when we came to ask some questions related to the program.

Seharusnya itu harus berjalan dalam forum pengurangan resiko bencana di Aceh, tapi forum pengurangan resiko bencana di Aceh saat ini tidak begitu aktif, namun kita mencoba dan mendorong mereka untuk membuat program setelah gempa 11 April 2012 itu kesempatan yang bagus untuk semua pihak berefleksi, apa benar yang kita lakukan selama ini sudah ada dampaknya karena saat itu tes yang sebenarnya. Jadi kami menghadirkan referensi-referensi seperti itu maunya kami bulanan tapi agak sulit untuk hal itu.

These programs were supposed to be run within the Disaster Risk Reduction multi-stakeholder's forum. But at the same time, the forum was not working properly. Nevertheless, we kept trying and encouraging them to create another program after the 11th April 2012 earthquake, because that was the perfect moment for all of us to get reflection whether what we have done so far have given good impact or not. That's the real evaluation for the strategies and approaches we have applied. So, we hoped that we could provide such references every month, but apparently, it was rather hard to do so.

Diantaranya kami lihat Forum PRB Aceh hanya sebagian kecil yang aktif, sementara yang lainnya lagi tidak aktif. Kemudian lembaga-lembaga seperti ini sudah menjadi ajang untuk perebutan kepentingan pribadi, ada pihak A, pihak B. jika pihak A yang menang, pihak B narik diri, begitu juga sebaliknya, jadi ya tidak begitu jalan. Itu pihak A atau B mewakili organisasi dan uniknya ini jika di forum PRB Aceh ini dulunya dia merasa penggagas forum (pendirinya) setelah mempersiapkan semuanya untuk calon kandidat ketua, namun yang terpilih malah orang baru, orang yang mereka anggap tidak terlalu berkecimpung dalam pendirian sehingga komunikasi tidak bagus.

Among those in Aceh PRB [Disaster Risks Reduction multi-stakeholder forum], a few people actively participated, while others were rather passive. Institution/organization like this has always been an arena where personal interests were put in competition; A, B, and so on. If A for example wins, B will withdraw, and vice versa. So, you can say that the organization has never been functioned properly. The A and B here were the representatives of organization members in this forum, and they thought that they had contributed in the establishment of the PBR forum (as the founders). So, after preparing everything for the candidate election of new leader of the forum, the moment the seat was eventually taken by someone new [a new member] who they considered never contributed ever since the beginning, and as the consequence it caused the uncondusive working atmosphere within the forum members.

2. **Apa yang membedakan pendekatan ini dengan strategi yang dilakukan sebelum tsunami 2004?**

How do these approaches differ from concepts and strategies conducted before the Tsunami 2004?

Yang membedakan adalah, pendekatan strategi setelah recoveri yaitu, kita pada masa setelah tsunami dulu kita punya dana yang besar US\$ 300 juta untuk Aceh saja, jadi komponen kerjanya lebih luas dan kita sebut nama programnya Integrated Risk Based Community. Cuma dulu AR tidak pernah bekerja sendiri tapi bekerja melalui PMI dan kami berpikir dengan komponen yang banyak dan butuh biaya yang banyak dan butuh biaya besar, maka program akan sulit di replikasi atau dilanjutkan oleh PMI, jadi kemudian sejak tahun 2012 kita ada pengurangan dari program itu, namun juga ada penambahan. Kalau dulu kita selalu lihat program AR itu di bawah goalnya. Goalnya biasa untuk mengurangi tingkat kematian orang, mengurangi kerusakan harta benda.

The difference between the strategy before tsunami 2004 and the approach we used in the post-recovery program, is that we had a huge amount of funding after tsunami, which was around 300 million USD for Aceh alone. Thus, the scope of the program was larger, and we named the program as the Integrated Risk Based Community. But anyway, the AR [the American Red Cross] had never worked alone. They worked with *PMI*. And we thought that with the huge amount of component and budget, the programs would be hard to be replicated or continued by PMI, considering their limited capacity. Thus, after 2012 we modified the programs. Usually, we run assessment to the AR programs based on the goals. Generally, the goal is to increase the survival rate of the disaster event, and to reduce any kind of property damage.

Itu pada masa tsunami dibagi tiga untuk peningkatan kapasitas masyarakat, menguatkan kapasitas sekolah dan PMI. PMI harus kuat karena mereka implementing agency. Di samping itu, belakangan ini menjadi refleksi kita kalau sekolah dan masyarakat tidak bisa dipisahkan, seharusnya menjadi satu komponen. Ada sekolah, masyarakat dan peningkatan kapasitas PMI dan juga hubungan dengan stakeholder. Misalnya kita di sini menjadi pemain yang aktif juga dalam pengurangan resiko bencana dengan melakukan kegiatan dengan BPBA, setelah itu kita juga melibatkan perguruan tinggi dan untuk tahun lalu kita ada kerjasama dengan 4 kampus yang ada di Aceh yakni, Universitas Teuku Umar, Sekolah Kesehatan di Bener Meuriah, Al-Muslim Bireuen dan kampus di Tamiang untuk membuat peta tematik untuk pengurangan resiko bencana pada kegiatan KKN mereka.

During the tsunami relief, we divided our approach into three programs: first is to increase the community capacity; second is to strengthen school capacity; and third is to develop the *PMI* capacity. The *PMI* should have a good capacity because *PMI* has a main role in implementation of the programs. Besides, recently we found that schools and community cannot be separated in the program, as they are supposed to be targeted as one component. In these programs, we involved schools, community, and capacity enhancement for *PMI*, as well as connections with the stakeholders. For example, we took an active role in disaster risk reduction by cooperating with the *BPBA*, and we also involved several universities. Last year we involved 4 universities based in Aceh – Universitas Teuku Umar in Meulaboh, Bener Meriah Medical School, Al-Muslim University in Bireuen and a university in Tamiang – to create a thematic map for risk reduction program as part of the students' community service program (*KKN*).

Yah itu kontribusinya, evaluasi programnya, walaupun saya lihat sekarang juga. Dulukan konsep seperti Community Resilience, implisit di program, hari ini saya lihat trendnya termasuk di AR, kita juga melihat eksplisit Community Resilience, terus bagaimana kita mengidentifikasi komponen-komponen Community Resilience itu yang berbeda-beda antara peneliti dan konseptor tapi secara umum hampir mirip-mirip, tapi itu belum dimulai. Kedepan kita akan gagas dengan cara itu.

These all are our contributions and the evaluation of the programs. And we keep giving contribution until today. Back then, the concept of Community Resilience was very implicit in the programs. But today, we can see the trend, including in AR, we can identify several explicit Community Resilience in the programs. Furthermore, the way we identify the components of the Community Resilience are different among researchers and contributors, though generally they are rather similar. It has not started yet, but we are going to introduce the explicit Community Resilience component in the future.

3. **Tantangan dan masalah apa yang masih dihadapi organisasi anda untuk melakukannya setelah tsunami 2004?**

What are the remaining challenges and problems faced by the government and the community in building tsunami resilience after the 2004 Indians Ocean tsunami in Aceh Province?

Tantangan malah bukan bekerja dengan masyarakat, justru saya tidak melihat ada yang signifikan bekerja dengan masyarakat. Tantangannya justru dengan tim pelaksana karena kita bekerjanya itu dengan volunteer, relawan kemudian terus standart management programnya. Ada *take over* relawan yang dibentuk yang nantinya akan sangat berpengaruh ke masyarakat. Jika volunteer kerja di lapangan dengan masyarakat baik, aktif, maka mereka akan terus berusaha saat pelaksanaan program ke depannya di masyarakat.

Surprisingly, our main challenge in this program was not when we worked with local people.

I could not see any significant challenge during our work with the people. The real challenge was within *PMI* team, since we were working on a voluntary basis, it thus sometimes affected the work productivity and the program management. We had volunteers who later would take over the programs and play significant role to the community. If volunteers work together with the community in cooperative way, they

will keep doing their best on the next program implementation in the future within community.

Namun kendalanya dalam bekerja berkaitan pemerintah lokal seperti BPBA atau BPBD. Kapasitasnya terbatas, dan kendalanya lagi di negeri ini saat orang mejadi PNS semangat untuk bekerja, semangat untuk melayani tipis, ya itu, kadang-kadang juga tidak bisa disalahkan orang karena sistemnya. Kami saat ke BPBD-BPBD, sering ketemu dengan satu, dua anak muda yang mau bekerja lebih tapi tidak survive juga, karena kalau kata orang sini, ujung-ujung mentok juga jadi itu sih tantangannya. Kalau dengan masyarakat cukup baiklah dan cukup lancar.

But the problem then also occurred when we worked with the local government institution like BPBA or BPBD. They have a very limited capacity, and the problem in this country is that when someone became a civil servant (*PNS*), the spirit to work and to serve community is very weak. But, well, you cannot blame the government officer when it is the fault within the system. When we came to *BPBD*, we often met one or two young officers who would like to perform better but unfortunately, they do not receive enough appreciation. This is because the Acehnese community believe that the extra effort will be useless at the end. So, that's the real challenge in working with our government. On the other hand, I think everything was fine and went smoothly with the community.

Kadang memang ada masalah dan masyarakat kita, pasca tsunami dengan menyebutnya entitlement mentality, penghayatan keberhakan, orang merasa berhak. Jadi kalau ada bencana masyarakat secara otomatis mereka berpikir akan dibantu seperti materi. Ada pengalaman-pengalaman, misalnya teman-teman mendampingi masyarakat dampingan. Dalam progress jika terjadi banjir teman-teman sudah datang ke desa tersebut jam 2 pagi, tapi tidak bawa sekardus Indomie, masyarakatnya langsung bilang ngapain kemari? Ya secara mentality juga berpengaruh tergantung bagaimana kita membawa diri kemasyarakatnya.

Indeed, we could have some problems. After tsunami, we identified a problem within the local community that was called 'entitlement mentality'. It means the sense of having certain rights, where people feel entitled to certain rights. So, when a disaster happens, the people would immediately think that they will soon receive aid in form of goods or money. We have some experiences, for example when the volunteers visited the affected community. During a flood event, our volunteers had been in the village since around 2 AM in the morning. They did not have a box of instant noodle [a common food supply in emergency] to give. The people then asked, "What are you doing here?" Well, this statement discouraged us badly, but then it depends on how we deal with the local people during our mission.

4. **Dengan siapa saja atau organisasi apa saja, anda bekerja sama dan berkoordinasi?**

What are key stakeholders and networks that deal with disaster risk reduction and resilience building at the local level (municipalities) in the province of Aceh?

Saat ini partner bekerja utama kami PMI dengan cara menyediakan dana dan teknis, kemudian PMI yang bekerja di lapangan. Kita juga bekerjasama dengan BPBA di beberapa daerah dan Kabupaten/Kota di Aceh juga dengan forum pengurangan bencana

di Provinsi Aceh. pernah juga melakukan koordinasi dengan IOM yang masih bekerja di bidang ini

Our main partner now is the PMI. We support PMI by providing them funds and technical supports, while they will work on the program implementation. We also cooperate with *BPBA* in some regions in Aceh and with the Disaster Risk Reduction forum in Aceh Province. Once we also coordinated with IOM who still work in the same field.

Capacities to manage resilience

5. **Apakah menurut anda, saat ini, jika terjadi peringatan sirene akan terjadi tsunami masyarakat akan aman atau mampu menyelamatkan diri jika anda berada di rumah, di kantor atau sedang berada dimanapun di kota ini?**

What do you think, today, if the tsunami early warning system rings and tell people that tsunami will approach, do the community members know how to save their life, if they are in their houses, at their offices or anywhere in this city?

Kalau sebagian besar bisa menyelamatkan diri sebagian lagi tidak (ya fifty-fifty lah) kenapa tidak bisa menyelamatkan diri? Karena perilaku untuk menyelamatkan diri masyarakat masih belum jelas, sebenarnya belum clear bagaimana menyelamatkan diri secara efektif.

I think some people could survive (50-50 possibility). Why could not they survive during tsunami event? Because they do not have a good evacuation plan. They do not have sufficient knowledge related to the effective evacuation procedure.

Pada gempa 11 april 2012 lalu saya berada di desa alue dayah teungeh kecamatan meuraxa saya melihat sendiri, bahwasannya diantara masyarakat ada gedung evakuasi namun sedikit sekali masyarakat yang mau menggunakan gedung itu. mereka mau lebih memilih pergi dengan motor kedaerah yang mereka anggap tinggi, kemudian jalanan jadi macet, kalau terjadi tsunami wasalam semuanya akan jadi korban dan meninggal.

On the 11th April 2012 earthquake, I was in *Alue Dayah Teungeh* village in Meuraxa district. I saw that there was an evacuation building available, but very few people were willing to evacuate to that building. They preferred fleeing with motorcycle to the higher places, which then led to the serious traffic jams everywhere. In that situation, if something like tsunami happened, no one could survive.

Kenapa ini bisa terjadi: pertama, fasilitas evakuasi masih tidak cukup, kedua jika fasilitas cukup belum digunakan secara maksimal karena tidak cukup ada evaluasi. Ketika setelah ada gempa itu saya melakukan FGD ke 3 desa, Banda Aceh, Aceh Besar dan Aceh Jaya, saya tanyakan ke masyarakat kenapa mereka mengapa mereka tidak menggunakan gedung evakuasi, kemudian mereka mengatakan tidak yakin dengan kontruksi bangunan tersebut karena ini kontruksi Indonesia dan Pemerintah yang mengawasinya. Dan mereka juga tidak dapat sosialisasi yang cukup tentang berapa ketinggian gedung tersebut dan berapa kekuatan gedung tersebut, untuk kekuatan gempa berapa SR.

How could this happen? First, the evacuation facility is not sufficient. Even if the facility was sufficient, people would not use it to the optimum utility due to the lack of appropriateness study for the facility as the vertical tsunami evacuation shelter. After

the earthquake, I conducted some FGDs in Banda Aceh, Aceh Besar, and Aceh Jaya. I asked them why they did not evacuate to the evacuation building, and they said that they were unsure with the construction quality of the building since it was built by Indonesian engineers under supervision of Indonesian government. They also did not get enough sensitization in terms of the height and the strength of the building, and what is the maximum earthquake magnitude in Richter Scales it could resist.

Yang kedua mereka yang di Banda Aceh tidak mau menggunakan gedung tersebut, bukan karena hanya ingin menyelamatkan diri tapi harta mereka juga. Dan Informasi harus mengungsi kemana, bagaimana kondisinya seperti itu belum menjadi auto kritik bagi lembaga-lembaga kami yang pernah bekerja di Banda Aceh. Salah satu yang menjadi tantangan adalah program-program ini desainnya di perdesaan yang orang-orangnya ingin berkumpul bersama ingin membicarakan hal-hal bersama, ada kunjungan dari rumah ke rumah atau buat kelompok-kelompok kecil untuk pertemuan. Dan hal ini sulit diterapkan di perkotaan dan menjadi PR kedepannya menjalankan program dalam kontek urban. Program sudah berjalan dulu, tapi kita masih pukul rata pendekatannya, sekarang kita coba mereview kembali program yang sudah pernah kita jalani.

And then, people in Banda Aceh prefer not to evacuate to the building because they wanted to save not only their lives, but also their valuable personal belongings. And information about where to evacuate and about building capacity have never been the main concern to the relevant organizations in Banda Aceh. One of the challenges in Banda Aceh as an urban area is that these programs previously were designed for rural communities, where the people like to gather around and talk about issues together, visit door-to-door, or have small groups meeting. Next, this program will be implemented in urban context and thus it is harder. It then becomes another task for us to be able to implement this program in urban context in the future. The programs have been managed well, and we are still generalizing the approach that we use. Now we are trying to review the programs we have implemented before.

6. **Menurut anda, apa yang masih dibutuhkan agar jika terjadi tsunami masyarakat dapat selamat dari bencana tersebut?**

What community members still need so they can safe from the future tsunami?

Fasilitas penyelamatan diri, rambu evakuasi, kemudian juga jalur evakuasi perlu ditambah. Yang kedua pendidikan masyarakat apa yang perlu dibawa saat menyelamatkan diri, dimana mereka bisa berkumpul dengan keluarga, bagaimana warga bisa punya rencana tanggap darurat dan yang sangat penting kesiap siagaan di pemerintah. Pemerintah punya rencana kontegensi yang dibuat betul-betul kemudian ada dishare di masyarakat. Namun yang saya lihat tidak begitu dan saya yakin banda Aceh punya S.O.P peringatan tsunami dini, namun sejauh mana disosialisasikan, itu saya juga tidak tau atau jangankan untuk disosialisasikan untuk dipahami saja susah oleh aparat pemerintah. Karena yang paling besar di negeri ini, mutasinya sering. Karena yang buat dokumen siapa yang mengurus siapa. Saya melihat publik service paling kurang, pemimpinnya berlatar politik sehingga tanggungjawabnya kurang.

Survival facilities, evacuation signs, and evacuation routes still need improvement. Next is how to educate community, for example about things they truly need to bring with them while saving their own lives, about where they should be heading to in case of they want to gather with their whole family, how their emergency plan would be and then the most important is the government's disaster emergency plan. The government has also created a contingency plan that has been sensitized to the community. But, unfortunately that was not what I saw on field. As far as I am concerned, Banda Aceh has its own S.O.P. for tsunami warning, but I am not sure about how far it has been sensitized. It is difficult to be implemented, because the government do not have sufficient knowledge and understanding about the plan. One of the reason is because the government were frequently transferred to different job position. The ones who created the documents are different with the ones who will take care of the next procedures. I think that the government officials are controlled by a strong political agenda and have a very little sense of responsibility in public service.

7. **Apakah menurut anda pemerintah, LSM, atau organisasi anda mampu menyediakan semua kebutuhan tersebut?**

Do you consider, the government, non-government organizations or the community can provide it?

8. **Menurut anda, apakah semua rencana, fasilitas, dan usaha pemerintah dan masyarakat untuk meningkatkan kemandirian dan ketahanan masyarakat dalam menghadapi risiko bencana sudah sesuai dengan kebutuhan masyarakat?**

Do you reckon, all the plans, infrastructures, and efforts that government and community provide for tsunami resilience building are fit with the community members need?

Sudah ada tapi apakah sesuai atau belum, perlu di cek lagi sepertinya. Tapi yang menjadi tantangan adalah dokumen-dokumen itu sudah selesai, disimpan di lemari dan jika ada pameran pembangunan baru di keluarkan lagi untuk di pajang. Saat orang Jakarta datang tinggal d tunjukkan namun apakah sudah di sosialisasi. Itu yang jadi pertanyaan besar apakah masyarakat tau?

We do have plans, facilities, and efforts, but whether it is fit or not, we still need to review our approaches. But the next challenge is when all the paperwork (related to the plans, facilities, and efforts) are done, the documents are kept in the drawer. These documents are used only for the government expo, and as the evidence to show when people from Jakarta (the central government officers) came to monitor the program. But has it ever been sensitized to our community? Have the community ever get the information? These are the big questions.

9. **Darimanakah masyarakat mendapatkan pengetahuan tentang apa yang harus dilakukan ketika suatu saat terjadi tsunami untuk menyelamatkan diri (evacuation plans and route, evacuation building?)**

How community members gain the knowledge about the evacuation plans and routes, evacuation building and where they have to run to save their life in future tsunami event?

Masyarakat tau selama ini dari pengalaman mereka di gempa tsunami 2004, itu pengetahuan yang paling banyak masyarakat dapat dan yang kedua dari media massa, yang ke tiga pastilah dari lembaga-lembaga yang dulunya bekerja di aceh saat bencana meninggalkan sesuatu ke masyarakat adalah informasi dan tantangannya informasi-informasi tersebut kita bisa mendukung untuk memilah mana yang paling penting dan mengemasnya untuk mudah di ingat.

People learned a lot from the experience in the 2004 earthquake and tsunami. That was the experience where they gained most of their knowledge from. Secondly, from the mass media, and third is from institutions/organizations that used to work in Aceh during disaster reliefs. They left lots of things or information for the community to learn from, which makes the only challenge left is how to classify things that are more important and easier to be remembered from all the information.

Resilience

Self-organization

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10. **Perubahan-perubahan apa saja yang terjadi untuk meningkatkan kemandirian dan ketahanan masyarakat dalam menghadapi risiko bencana setelah tsunami 2004?**

What evidence is there of change in the community after the 2004 Indian Ocean Tsunami in Aceh province in term of building tsunami resilience?

Masyarakat yang pasti tahu apa itu tsunami, yaitu gempa besar yang disertakan naiknya air laut ke daratan, kemudian kalau mereka menyelamatkan diri dengan motor maka jalanan akan macet, itu masih harus lama ditingkatkan untuk perbaiki perubahan-perubahan dari masyarakat pasca tsunami. Ada perubahan positif di masyarakat aanya peningkatan pengetahuan, peningkatan keterampilan sedangkan perubahan negatifnya kehidupan sosial masyarakat lebih menurun, karena mereka dulu bersaing untuk mendapatkan bantuan. Dan ini akan jadi sulit bagi masyarakat saat pemerintah, LSM, tidak bisa diharapkan untuk berbuat sepenuhnya.

The community have certainly become more aware of tsunami. They have known tsunami as a tremendously strong earthquake followed by the big wave. And they have learned that if they try to evacuate with motorbike, it would cause serious traffic jam. We still need a long-term improvement and transformation within the society after tsunami. There are however some positive changes like the improvement of knowledge and skills. One negative social change is the declining of social lives quality, because they used to compete to get the aid, and it will be challenging for the community once the government, NGOs, cannot be expected to perform excellently.

Learning

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11. **Apa saja yang telah organisasi anda pelajari dari pengalaman tsunami 2004? What do you learn or what can be learned from the 2004 Indian Ocean Tsunami in Aceh province experience?**

Kesiapsiagaan dalam masyarakat itu penting, kesiapsiagaan di keluarga juga penting, dulu kita sering melihat hal ini dalam konteks terpisah tapi sekarang kita malah berpikir ketangguhan masyarakat saat ini tidak akan terkotak-kotak lagi. Kemudian pengetahuan yang penting jika terjadi bencana bantuan dari luar bisa datang paling

cepat 6 jam dan itu tidak efektif, yang efektif itu biasanya setelah 24 jam sehingga kapasitas masyarakat harus ditingkatkan dan meningkatkan dalam menghadapi bencana.

The emergency response of the community is important. The emergency response of families is also important. In the past, we often saw these things in separate contexts. But now, we would like to think that the community resilience should no longer in a comprehensive concept. Another important thing to know is when a disaster happens, the aid will be coming only after 6 hours at the fastest, and it is not even sufficient during the time. The capacity of community should be improved to be able to self-respond the disasters while waiting for the additional aid that would come after 24 hours.

12. **Apakah proses belajar ini masih berlangsung?**
Do you still learn now?

13. **Apa yang membatasi proses belajar ini?**
What limits it?

Evaluation of the disaster resilience building strategies

14. **Menurut anda, bagaimana perkembangan dari proses meningkatkan kemandirian dan ketahanan masyarakat dalam menghadapi risiko bencana setelah tsunami 2004 di masa yang akan datang?**

What do you think, the progress of tsunami resilience building in Aceh province after the 2004 Indian Ocean tsunami in Aceh province?

15. **Bagaimana komitmen organisasi anda untuk terus melakukannya?**

How strong is your commitment to involve in tsunami resilience building in Aceh province?

10.5 Sample of transcript interview from community-based organization

Code: 20-NGO-BNA

Governance and collaboration

1. **Apa kontribusi dari organisasi ini untuk meningkatkan kemandirian dan ketahanan masyarakat dalam menghadapi risiko bencana?**

What strategies and approaches are employed and preferred by the government and the community to build tsunami resilience after the Indian Ocean Tsunami in 2004 in Aceh Province?

Karena gini, kita memang di RAPI ini terdidik care sekali dengan penanganan bencana, makanya ketika kita menghadapi pihak-pihak yang seharusnya menghadapi bencana, mereka melempem dan kita ini dongkol, emosi dong. Kita gak punya gaji, RAPI itu relawan murni lo mbak, gak punya gaji seperak pun, tapi kita berani berbuat habis-habisan, sementara ada instansi pemerintah yang punya dana luar biasa, kok mereka adem-adem ayem, pergi pagi apel segala macam pulang sore selesai. RAPI 24 jam stand by, itu realita selama ini di lapangan, terlepas dari ada satu dua yang belum maksimal mungkin, tapi secara umum untuk RAPI saya berani bilang luar biasa untuk carenya terhadap bencana.

Because, here is the thing. We, [members of] RAPI, are very well educated in disaster management. That is why, when dealing with parties who are supposed to take care of this issue instead of being sluggish/passive, we get very annoyed and upset. We do not get paid as in RAPI all of us are pure volunteers. We do not get paid at all though we go all out in our work, and meanwhile a government institution with a huge funding out there is doing nothing; their staffs are coming in the morning, doing all routines, and then going home in the afternoon just like nothing happened. RAPI would stand-by for 24 hours per day; that is what happened on site for real. Apart from maybe one or two more unfinished work, just yet, generally I dare to say that RAPI exceptionally care about disaster.

Masuk RAPI itu kita ngurus izin dari pemerintah, izin kepemilikan perangkat juga izin frekuensi itu kita bayar lo mbak. Setelah itu, alatnya, radionya, alat komunikasi kita beli sendiri dengan uang sendiri. Bergabunglah di RAPI, menjadi relawan RAPI. Begitu ada bencana, orang lain belum datang, kita harus sudah datang, itulah yang kita terapkan di RAPI. Mulanya adalah sedikit mula-mula berfikir ini uang sendiri, semua sendiri, bantu-bantu orang sendiri, tapi lama-kelamaan anggota RAPI ini caranya tumbuh sendiri, kita larangpun ketika ada bencana jangan datang, marah sama kita. Jadi kalau ada bencana sudah overload jumlah anggota kita, keseringan seperti itu, mungkin artinya efektifnya hanya 8 orang untuk satu kegiatan. Tiba-tiba yang datang karena rasa solidaritas sama sodara-sodaranya bisa puluhan, berhari-hari, berminggu-minggu, kita di lampuuk tempo hari yang baru-baru ini agak sering intensitasnya tinggi kemarin ada yang tenggelam di lampuuk, sampai dua minggu kita masih siaga di sana. Saat orang lain sudah bubar, pihak-pihak terkait sudah bubarkan pencarian, rekan-rekan kita masih ngetime juga, tapi kadang-kadang kita juga harus memberikan apresiasi yang luar biasa kepada rekan-rekan ini. Wajar kita sempat emosi kalo mendengar ceramah-ceramah dari pemerintah, dari orang-orang yang selama ini seakan-akan bajunya berlabel “sayalah pejuang kebencanaan”, sementara kerjanya pagi pergi apel pulangnye sore,

wajar saya sedikit emosi, tapi intinya mari kita bergandengan tangan, siapapun itu, mari kita sama-sama peduli terhadap bencana ini.

To join RAPI, we must get permission from the government - the devices ownership permit, the frequency licenses - and we must pay for all of it. We paid for everything. Moreover, the tools - radio and other communication devices - it is all in our personal expenses. Joining RAPI means becoming vounteer for RAPI. When a disaster happens, everybody else may not be there yet but we have got to be there and be ready. That is what we always do in RAPI. At the beginning, they might have been thingking through everything, that they would use their own money, do all work on their own, and help people on their own will. But in the long run, RAPI members somehow are growing together. If they are told not to come/help in a disaster situation, they will feel disappoint. So, every time a disaster is ocured, most of the times we got team members more than we need. Normally, eight people should be enough for an incident. However, dozens would come for solidarity, and are willing to stay helping for days, for weeks. In *Lampuuk* [a beach area name in Aceh], not long ago, someone was drowned. We were there stand-by for two weeks. Everyone else had gone home and another team had stopped searching, but our team continued to stand-by. We should give a great appreciation to them. It is just normal to get mad hearing the speeches of the government officers, who only wear uniforms that seemed to be labeled/saying like "I'm a great rescuer", while all they do are just signing in every morning and going home in the afternoon. It is normal to get a little upset, but anyway the most important thing here is to work hand in hand, whoever you are, let us work together and show that we care.

Saat air sedang naik. Saat sebahagian diluluh-lantakan, ini ada rekan kita si julidar yang bawa lari perangkat dan langsung melaporkan. "kami baru diguncang gempa yang sangat kuat" dan kita belum tau berapa kekuatannya, pokoknya sudah mirip-mirip kiamat, sambil lari langsung melaporkan bahwa air laut sudah naik, kita tidak tau bahwa massa itu tsunami, Karena masyarakat kita pengetahuannya rendah tentang tsunami bisa kita kategorikan masa itu nol, kecuali orang-orang yang memang pendidikannya di bidang kebencanaan pernah ke luar negeri, dia tau tsunami apa, kalau kita disini orang lokal tidak tau, kacuali ada beberapa daerah seperti simeulu.

When the water was rising high [Sunday morning, 26.12.2004, right after the earthquake], and some parts [of area] could have been destroyed, we had our partner, Julidar, who took the radio communication device right away and reported to us, "We're just hit by a strong earthquake! ", while we had not known yet how strong it was, but anyway it was felt like the end of the world already. While kept running, he reported that the water was rising very high. We did not know at that time that it was tsunami, because the people had no knowledge about tsunami at the time. Except for those who studied disaster related subject, or who ever went abroad, they might have known about what tsunami is. However, the local people here had no clue, except for those who lived in a village like Simeulu.

Di Simeulu bukan tsunami juga katanya mereka lebih mengenal 'smong', itu cerita turun-temurun, sehingga mereka jugaantisipasi. Begitu gempa sudah kencang dan dilihat air sudah surut, memilih untuk naik ke puncak gunung, sebelumnya mereka belum pernah melihat tsunami, tapi karena cerita turun-temurun itu, itu sebenarnya warisan lokal yang memang sangat baik untuk dikembangkan untuk dijaga

kelestariannya. Jadi kita juga dari RAPI, kearifan lokal yang seperti itu juga kita cari. Setiap kita tugas kelokasi-lokasi bencana, kita juga tetap mengutamakan kearifan lokalnya, kita juga harus tau kebiasaan masyarakat setempat bagaimana, kita juga harus bisa beradaptasi dengan itu, sehingga apa yang kita berikan bantuan tidak salah kaprah. Karena berbicara tentang informasi, ini saya kira sensitif. Orang korban, datang kita tanya, “pak, berapa orang korbannya, apa yang butuh, berapa orang yang kakinya patah?” begitu kita Tanya ini, sebelum kita mungkin sudah puluhan orang yang tanya juga, alhasil nanti mereka tanya kembali, “bantuan yang kalian bawa apa?”, ini sensitif kalau kita tidak mengerti kearifan lokal, kalo kita untuk mencari informasi yang akurat, sementara penanggulangan itu tanpa informasi data yang akurat, nol jadinya.

The people in Simeulu [an island name in Aceh which has a history of tsunami in 1907] don't call it tsunami anyway as it is rather known as 'smong'. They have traditional story from generation to generation, thus it was anticipated by them very well. When an earthquake comes very strong and somehow the sea level ran farther low, the people would immediately run up to the hill. They might have not seen an actual tsunami before, but it was from the traditional stories they could understand the situation very well. It is a good local wisdom that should always be preserved. Within RAPI, we also try to find out about that kind of local wisdom. Everytime we are on site where the disaster is happened, we will put the local wisdom first - finding out and adapting to the local traditions - so that when it's time to give them aid/support, there will be no misunderstanding between us and the local people. Because when you're talking about an information, I think it's a sensitive matter. When we come [to the affected area] and ask “How many victims are there? What do you need? How many people got leg fracture? “; there might have been dozens of people coming and asking the same questions before us, that the people would most likely ask back, “What kind of aid do you provide? “. This is a sensitive issue if we don't understand the local wisdom. So, we'll have to seek for that information accurately, because mitigation without the accurate data and information will result to nothing.

Kita buat kegiatan lain seperti, pelatihan dasar untuk SAR, kita tetap melibatkan basarnas, untuk p3k kita bekerjasama dengan PMI, jadi satgas yang terjun kelokasi minimal dia mampu memprotek diri sendiri, jangan sampai dilapangan, kita tidak tau dia bisa berenang atau tidak, life jacket tidak pakai, sampai ketengah rakit terbalik. Mudah-mudahan tidak. Itulah yang selalu kita ingatkan kepada rekan-rekan agar itu menjadi suatu perhatian, jangan sangking semangatnya menolong orang sampai lupa bahwa kita tidak bisa berenang. Dalam setiap pertemuan, sharing-sharing kita selalu mengingatkan.

We also created other activities such as SAR basic training, where we involved the BASARNAS [Indonesian National Association for Search and Rescue], and for the first training, where we cooperated with the PMI [Indonesian Red Cross]. Therefore, the team that will be sent on the field at the very least will be able to protect themselves. We do not want a situation where they are being deployed while we're still unsure in whether he can swim or not, they don't know how to use a life jacket or even flip the boat in the middle of the water. We hope not. That's what we always remind the crew, to also pay attention to such a thing. Don't be too eager on helping people, that you even carelessly forget you can't swim. We remind them this through the sharings on every meetings/gathering.

Mulai dari proses evakuasi kita sudah terlibat, menyampaikan kondisi yang aktual, yang sebenarnya, yang paling efektifnya menjadi pusat informasi masyarakat. Misalnya ada masyarakat yang bertanya, kita akan sebar berita ini kepada semua melalui radio, mungkin ada rekan kita yang sedang bertugas di pos yang dibutuhkan. Kita disini ada Asosiasi Keuchik Kuta Alam, 11 desa keuchik dan ketua pemudanya sudah kita bekali pengetahuan komunikasi radio, termasuk pengetahuan komunikasi bencana, seperti penanggulangan bencana, seperti golden time. Setelah masyarakat sudah tidak panik, tidak bertabrakan di jalan, golden time kami sudah habis, kita gak ikut APBA, gak ikut punya pemerintah. Pemerintah golden timenya dihitung ke rupiah, kalo kita gak. Jadi misalnya masyarakat setelah kami tanya sudah aman, nyaman, saat itulah goldentimanya berakhir, jadi ketika ditanya sampai berapa lama, ya tidak terbatas. Kami selalu menjaga goldentime, jangan selamat dari air, malah meninggal karena kecelakaan.

We've been involved in phases started from the evacuation, delivering the actual condition, and becoming the most effective source of information for the people. For example, when someone asks, we will spread the news to everyone through radio, where we might have someone that could help at the [emergency] post/location in need. We have the *Keuchik* [the village's leader] of *Kuta Alam* Association: 11 villages respectively with leaders both of village community and of the young people who have been trained with radio communication procedures, including disaster communication, like disaster management, golden time, etc.

[Then they are explaining about how they set the golden time] When panics have gone and no more crashing on the road, it means the golden time is up. Our work is not limited to the APBA [Aceh Provincial Government Budget], nor to the government rule [they criticize the local government staffs' practice for being too money-oriented]. Their golden time is converted to rupiahs [they tend to be irresponsible or have less consideration in helping evacuation process, would ask for extra payment for extra work outside of their regular job, for instance to assist people during evacuation after a strong earthquake happens]. It's different from our golden time. For example, when we have confirmed that the people have felt safe and comfortable/relieved, that's when the golden time ends. So, if we are asked, "How long is your golden time?" we would say that it depends on disaster characteristic. We always consider golden time is crucial, we don't want them to survive from the tsunami wave but then get killed by a traffic accident.

2. **Apa yang membedakan pendekatan ini dengan strategi yang dilakukan sebelum tsunami 2004?**

How do these approaches differ from concepts and strategies conducted before the Tsunami 2004?

Sudah[...], jadi RAPI itu dari dulu sudah seperti itu, cuma waktu tsunami kita masih kondisi konflik. Pada saat konflik hampir semua unit radio disita oleh Negara, baik disita secara baik-baik maupun dengan paksaan, dan sebagian besar memang menyembunyikan perangkat komunikasi, sehingga komunikasi di RAPI itu tidak sedikit kelihatan, begitu tsunami terjadi, jumlah anggota RAPI tidak banyak yang aktif, karena itu masa konflik, siapapun yang pegang radio sembarangan salah-salah putus kita di aceh ni, termasuk yang mengabarkan tsunami ke Jakarta, bahwa air tsunami

sudah naik ke aceh itu adalah anggota RAPI, namanya Julidar itu, di radionya JudetJZ01PKO,

It has been... So, RAPI has been professional ever since the beginning. It's just that at the time of tsunami, we were at the state of conflict. During conflict, almost all of radio units were confiscated by the center government, properly or forcefully, and most of us did hid our communication devices at that time. So, back then, communication within RAPI were done collusively. At the time of tsunami, the active members of RAPI were only a few people. And since we were in the time of conflict, whoever holding a radio device suspiciously could end up bad in Aceh. The person who sent the information about tsunami to Jakarta, that the water of tsunami was rising super high at the time, was one of our members in RAPI; His name is Julidar, and his radio channel was JudetJZ01PKO.

beliau dengan perangkat seadanya gantung di badan bawa baterai mobil untuk komunikasi tembak jauh ke Jakarta, bahwasanya kami di aceh baru saja diguncang gempa yang sangat kuat, sekarang air sudah naik, kita tidak tau masa itu bahwa itu tsunami karena kita saat itu di SD, kita gak tau bahwa itu adalah tsunami, jadi yang kita tau melaporkan bahwa air laut naik. Berita itu sampai ketelinga presiden, presiden langsung memerintahkan pihak-pihak terkait, memerintahkan menteri untuk melihat ke aceh dan pertama yang dilihat adalah meulaboh. Jusuf kala langsung memerintahkan dan lngsung menyiapkan heli untuk ke aceh.

He, with a very limited equipment, hanged and carried car batteries on his body, managed to communicate all the way to Jakarta and sent information that Aceh was just struck by a tremendously strong earthquake, and that the water was rising very high. We did not know back then that it was tsunami - we were still in primary school. We did not know it was tsunami, so we could only say on our report that the sea water was rising super high. That news reached the president, and the president immediately ordered the relevant parties and the Minister to look at the condition in Aceh, and the first place they checked was Meulaboh. Jusuf Kalla then directly ordered and prepared a helicopter unit for Aceh.

3. **Tantangan dan masalah apa yang masih dihadapi organisasi anda untuk melakukannya setelah tsunami 2004?**

What are the remaining challenges and problems faced by the government and the community in building tsunami resilience after the 2004 Indians Ocean tsunami in Aceh Province?

Kendala yang sangat berarti diharapkan tidak ada, memobilisasi untuk anggota yang akan kita ajak kesana itu saja tidak ada pengertian dari pemerintah, sementara disana masih butuh jalur komunikasi belum ada. Tingkat kepedulian pemerintah belum ada, BPBA hanya menjaga gengsi, rupiah tinggal management yang bagus untuk RAPI. Staf BPBA sebagai pemegang amanat program, 2 tahun kemudian akan dimutasi, pindah dan program di mulai lagi dari nol, membuat hubungan emosional mulai dari nol lagi, begitu seterusnya, Bagaimana mau maksimal.

Such significant challenges hopefully never exist, because even to mobilize our crews to the field, we receive no support from the government. Moreover, the communication

path on location is another problem. The government pays no attention to this issue [the government needs RAPI but do not care for their needs and do not listen to their ideas or requests]. BPBA [Disaster Management Agency of Aceh] staffs, who are primarily in charge of the disaster management program, will be on position transfer in the next 2 years; moving. It means we will be restarting the whole program and rebuilding the emotional bonds from zero. How can it be possible to work on the program to the maximum?

Itu adalah kendala kecil, masalahnya sekarang carenya mereka terhadap relawan RAPI tidak ada. Kita tidak minta mereka gaji kita, karena kita adalah relawan bagian dari TRC. Dilapangan kami yang pegang kendali, mereka hanya ketika datang bantuan logistik dibagikan. Mereka koordinator semua aliansi yang bergerak dalam kebencanaan, mereka tidak bisa merekrut, tidak bisa memmanage aliansi lain.

That't just a small challenge. The problem now is there is no attention given to the volunteers of RAPI. We never asked them to pay us, since we are volunteers, part of the TRC [Emergency Responder team]. On the sites, we have the main control, they only come when it's time for logistic distribution. They are the coordinators of all organizations' members responsible in disaster response, yet they are unable to recruit and manage them all.

Misalnya ketika sampai di lapangan kami tidak tau harus tidur dimana, buat tenda dimana, buat posko dimana, saat kita datang kesana seperti orang mau minta sedekah aja, bingung. Kami tidak bisa bilang mereka gak punya ilmu, mereka punya ilmu, tapi aplikasinya masih tidak paham dan mereka selalu buat anggaran, tapi kenapa di anggaran itu tidak ada anggaran untuk kegiatan kita. Saat kejadian di takengon, kami berangkatnya uangnya kumpul bersama, Ketika sampai di sana kita tidak disediakan apa-apa, tempat tinggal tak ada, asuransi tak ada untuk kita kalau terjadi kecelakaan.

For example, when we get there on site, we don't know where to sleep, where to set up tents, and where to build [emergency] posts. We come as if we were asking for charities, getting flustered. We cannot say that those people don't have the knowledge; they do. They just don't know how to apply them. They also have made their budget allocation, yet why aren't any of the budget allocated for our activities? On the Takengon incident [an earthquake], we went there by collecting our own donation. We arrived there with nothing provided, no shelter, and not even insurance if anything were to happen to us.

Bencana ini kami bagi dalam tiga periode, yang pertama emergency periode, transisi periode dan long time periode. Jadi pada masa emergency dan periode memang RAPI yang dilapangan, sedangkan mereka menjadi pahlawan ketika long time periode, pada saat membangun rumah kembali orang kegiatan-kegiatan sosial, sedangkan meminimaliskan korban yang di emergency itu adalah RAPI dan mereka tidak ada, mereka sibuk dengan surat-menyurat, sibuk dengan kepanikannya sendiri.

We divided disaster relief into 3 periods: the first one is emergency period, then transitional period, and 'long time' period [rehabilitation and reconstruction phases]. So, on the emergency and transitional periods, indeed RAPI were on site, while they [from the government] came as heroes in the 'long time period'; that was during the houses reconstruction, the social projects. The ones who helped the victims in the emergency were RAPI members. Meanwhile, they were nowhere to be seen, being busy with their paper work, busy by their own panics.

Kita hanya makan pujian, dan itu sudah cukup mengenyangkan kita selama ini, sedangkan mereka hanya butuh informasi aja dari kami, kita gak tau kemampuan mereka apa selain membuat program, dan mereka adalah coordinator, SAR, TNI, RAPI, dan parpol-parpol lain, ini memang tugas BPBA, awal kejadian mereka entah dimana, kami kesana seperti pengemis, mereka hanya lapor kepusat, dibutuhkan rumah sekian unit.

All we got are just compliments which have always been enough for us all these times. While they only need to get information from us. We never know what they could do beside making programs, not to mention that they are the coordinators of SAR, TNI [Indonesian Military Force], RAPI, and political parties. This is the job of BPBA. At the beginning of the incident, they were nowhere to be found. While we went there like beggars, they only made a report to the central [government] about how many house units they might need.

Jadi bagaimana mau menangani bencana tanpa komunikasi, komunikasi adalah yang terpenting. Kami membantu masyarakat, mereka tidak ada perhatiannya sedikitpun, kami tidak minta diperhatikan, tetapi salah satu bidang mereka yang harus mereka tangani itu adalah logistik, transportasi, mobiler, dan komunikasi, hanya itu sebenarnya yang mereka harus kerjakan saat terjadi bencana dan ini adalah kelemahannya dari sisi pemerintah. Yang di lapangan kita yang pegang kendali, kalo untuk bagi-bagi sembako, ya mereka yang pegang kendali. Kita hanya mau pada saat emergency itu kita diperhatikan, misal, kita butuh tenda, butuh mobil untuk berangkat kelokasi, karena kita beranjak dari relawan murni, karena kita dari organisasi tidak ada biaya-biaya operasional yang seperti itu, semuanya dari pribadi,

So how do you expect us to handle disasters without proper communication? Communication is crucial. We help the people, while they [the government] don't care at all. We never asked to be cared for, but however they should participate to handle some parts such as logistics, transportation, mobility, and communication. Those are the only things they should take care every time disaster happens. But then again, this is the flaw of the government. On the site, we take control. When it comes to logistic distribution, they take over the control. We only ask for their attention during the emergency period, things like tents when we need them, cars to reach the site, etc. Because we started as pure volunteers, we came from organizations without such operational budget, and thus everything is on our personal expenses.

RAPI ini sebenarnya organisasi hobi. RAPI ini hobinya bukan di kebencanaan, tapi hobby komunikasi sesama anggota RAPI, tetapi karena ada jiwa kemanusiaannya kami, kami bantu kebencanaan, tapi kenyataannya sekarang, RAPI ini adalah salah satu nyawa pemerintah dalam bidang komunikasi, dan pemerintah Aceh tidak bisa mengatur bidang komunikasi

RAPI was just a 'hobby' [they established the organization to facilitate their interest in radio communication]. Our hobby was not the disaster related issues, but the radio broadcasting. It's only due to our spirit of humanity that we help those in the disasters. RAPI is one of the government's lives in term of communication, because unfortunately the government of Aceh cannot manage the matter of communication in emergency.

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4. **Dengan siapa saja atau organisasi apa saja, anda bekerja sama dan berkoordinasi?**

What are key stakeholders and networks that deal with disaster risk reduction and resilience building at the local level (municipalities) in the province of Aceh?

Kita bekerjasama dengan semua stakeholder, semua ormas, pemerintah dan semua yang berhubungan dengan kebencanaan, dalam artian kita mensupport komunikasi, kita juga punya tenaga-tenaga skill komunikasi, satgas komunikasi yang juga harus mengerti radio, kita bekali juga mereka dengan hal-hal yang seperti itu.

We cooperate with all the stakeholders, community organizations, government, and anyone who are related to disasters. In a sense that we support the communication, we also have staffs with good communication skills, the communication units who are obliged to understand radio. We also prepared them with such matters in their hands.

Capacities to manage resilience

5. **Apakah menurut anda, saat ini, jika terjadi peringatan sirene akan terjadi tsunami masyarakat akan aman atau mampu menyelamatkan diri jika anda berada di rumah, di kantor atau sedang berada dimanapun di kota ini?**

What do you think, today, if the tsunami early warning system rings and tell people that tsunami will approach, do the community members know how to save their life, if they are in their houses, at their offices or anywhere in this city?

Mengobati trauma sangatlah sulit, apalagi mendidik aparaturnegara yang kurang care, ketika misalnya gempa mengguncang (misal 6 keatas) mereka yang lari terlebih dahulu, bukannya mengevakuasi masyarakat. Pada tanggal 11 april jika memang air naik, jumlah korban lebih banyak dari tsunami 2004, karena semua jalan dibanda aceh macet total, apalagi ada yang meninggalkan mobil ditengah jalan dan orangnya keluar.

Healing a trauma is very difficult, while we lose hope in such uncaring government officers. When, for example, an earthquake strikes (on 6 SR or more), they would flee first instead of evacuating the people. On April 11th if the sea level were rising, the number of victims would be much higher compared to the tsunami 2004, because all road in Banda Aceh was in total traffic jam, especially where the people abandoned their cars just in the middle of the road.

Karena aparat pemerintah tidak berada pada tempatnya, tapi seandainya mereka ada di semua simpang, pasti tidak ada masalah yang terjadi, awalnya kita yang jadi polisi, trus saat polisi datang kita yang mundur. Kalau kita bandingkan dengan organisasi lain, saya berani bilang kalo RAPI ini adalah organisasi paling bodoh, radio beli sendiri, ijin urus sendiri, bayar lagi ke pemerintah, kerja dikemanusiaan membantu operasional pemerintah, pemerintah bergaji dengan bidangnya masing-masing, RAPI 5 tahun ijin perangkat bayar ke pemerintah 450.000. pernah datang tim Nasional Geogaphy untuk wawancara RAPI, karena mereka mendengar kehebatan RAPI, setelah mereka mendengar cerita kami, mereka heran. Mereka pikir kita dibina dengan baik oleh pemerintah, padahal tidak. Kami tidak peduli apakah pemerintah tidak care, tapi

kemanusiaan kami tetap kami jalankan, sejauh kami bisa membantu, kami akan bantu, itulah kepuasan kami.

It was because none of the government officers was present in the evacuation process. If only they were there on each cross road, I'm sure no such problems would happen. At first, we were the ones who took the police role, and then when the actual police were coming, we went back off. If we compare it to other organizations, I'm quite sure that RAPI is the naivest of all organizations. We buy our own radio devices, apply for our own license, even pay the government and work for humanity to help the government operational unit, while they are paid well based on each working field. RAPI have paid the government 450.000 for a 5-years-long equipment license. There once came a National Geographic team to interview RAPI, because they said that they heard about the excellence of RAPI. After knowing the truth from our story, they were surprised. They thought that we were intensively trained by the government, while in fact we're not. We don't care whether the government care about us or not, and we will always fight for our spirit of humanity. As long as we can help, we will help; That's where our satisfaction comes from.

6. **Menurut anda, apa yang masih dibutuhkan agar jika terjadi tsunami masyarakat dapat selamat dari bencana tersebut?**

What community members still need so they can safe from the future tsunami?

Kalau kita lihat di pemerintah yang menangani kebencanaan ada dinsos, ada dapur umum yang bertugas untuk penyaluran bantuan masa panik, ada BPBA dan BPBD, ada basarnas, PMI, komunitas-komunitas radio, sekarang yang diperlukan pemerintah untuk mengaturnya saja, misal masyarakat butuh perban, bisa minta ke PMI atau dinkes, yang mengatur BPBD, sekarang yang dilihat apakah tepat waktu dan sasaran kepada masyarakat. Untuk kelengkapan di Aceh, pelatihan dan penelitian dibutuhkan, aplikasinya di balik. Pada saat emergency, kenapa tidak salurkan dulu, baru laporkan bisa menyusul, kita selalu menunggu LPJ (laporan pertanggung jawaban). Pemerintah tidak bisa mengatur itu, jangankan mengatur, skill sendiri aja mereka tidak ada. Seharusnya mereka sudah paham kelemahan mereka itu dimana, mereka tau, tapi tidak mau mempertajam lagi kelemahan mereka itu. Seperti berangkat ke takengon, mereka tidak memfasilitasi kendaraan, padahal itukan memang tugas pemerintah untuk masyarakat, lagipula uang mereka kan dari masyarakat. Skill pemerintah belum cukup untuk penanganan, perlu adanya pelatihan untuk aparatur dan masyarakat.

When we take a look at the government that handle disasters; we have the social service, we have the public kitchen that was created for the aid distribution in panic situation, we have BPBA and BPBD, we have BASARNAS, PMI, and radio group-communities. Now what the government need to do is just to manage them properly. Like when people need bandages, you could ask for such an item to the PMI or the Health Ministry department, and then BPBD would take control. And what we need to watch is whether it is or not given at the right time and to the right people. As for Aceh, training and research are needed. We need to do the other way around. In times of emergency, why don't we distribute [the aid] first, then do the report afterwards. All these times, we always need to wait for the report paper (LPJ). The government cannot regulate that. They don't even have the skill set, let alone to regulate. They should have known their own weaknesses. Or they might have known, but they just don't have the initiative to

narrow down those flaws they have. Like when we went to Takengon, they didn't facilitate the transportation, while that's definitely the responsibility of the government to their society, especially that their money all came from the community. Those skills to become a proper government are not there yet. Therefore, the government and community still need to be trained.

Aparatur pemerintah punya fasilitas, yang mereka butuhkan hanya pelatihan karena bencana kita tidak tau kapan datang, pembinaan untuk stakeholder yang harus diperhatikan. Jika tidak ada bencana mereka tidak tahu telepon RAPI, tapi ketika ada bencana mereka tahu telpon RAPI.

The government staffs have all emergency response facilities. What they need is a training, because we'll never know when the next disaster will come. Guidance for all stakeholders must have our attention. If nothing happens (in a normal situation), they will never call (forget about us); but when a disaster strike, they will call us. [They only come to us when they need RAPI's help for a disaster and seem to forget us when nothing happens].

Kadang-kadang kita ada sanksi moral, begitu kita terjun kelapangan, masyarakat mengadu apa yang dibutuhkan, kemudian humas sampaikan ke BPBA atau BPBD, tapi mereka tidak datang-datang memberikan bantuan, mereka sibuk dengan birokrasinya. Disaat kita ingin membantu mereka dan masyarakat juga sangat ingin dibantu, kita seakan-akan tak mampu berbuat apa-apa, gara-gara kepedulian pemerintah kurang. Mereka bilang tidak mudah mengeluarkan barang-barang, tapi tidak mungkin seterusnya tidak mudah. Mereka tidak mau belajar dari pengalaman, makanya mereka tidak punya ilmu.

Sometimes we get a social sanction. The moment we jumped on the field, the people started giving requests or complained to us, and then our Public Relation section received and passed them to the BPBD and BPBA, but no response/no aid coming, because they were too busy with their own bureaucracy. In times when we really want to help the people, and the people truly need help, we seem helpless and unable to do anything, simply because the lack of caring/support by the government. They said that it was hard to take out some stuffs, but are you sure it's possible that that's happening everytime? They don't want to learn from experience, that's why they have no knowledge [-improvement].

Paradigma masyarakat bahwa RAPI ini ada gaji sangking aktifnya, jadi ketika ada bencana, masyarakat langsung mencari pos RAPI maupun kerumahnya untuk mendengarkan informasi, karena masyarakat kita juga sudah terdidik yang seperti itu, tidak terlalu panik lagi mendengarkan informasi, sekarang masalahnya ketika kita tidak memberikan informasi atau kita juga harus maninggalkan lokasi atau mengbackup informasi ditempat lain yang lebih penting, masyarakat marah.

Social paradigm, where they believe that RAPI are paid by the government, as they are active [in helping people in disasters], that whenever a disaster comes, people would immediately go and find RAPI posts, or even to the houses of RAPI members? to get information. Since they have been educated that way, not to be too panic when they received such an information. So now the problem is when we don't give them the information, or in cases we have to leave the site, or when we have to backup the

information on other places that are more important [more affected/more emergency], they will get mad.

Masyarakat yang di dengar bukan RAPI, tapi kepala desa mereka, karena inilah kami berfikir untuk mendidik dan bina kadesnya agar kita bisa mengarahkan masyarakat, seharusnya ini kebijakan pemerintah, bukan kami. Kami pernah buat pelatihan, semua menggunakan biaya sendiri, Mereka ada cara bagaimana harus membawa masyarakat, tapi kenyataan di lapangannya, disitukan ada posko induk yang didalamnya terdapat berbagai instansi pemerintah, kita bantu untuk komunikasi, tapi kadang-kadang kita tidak hanya dikomunikasi, kita juga duduk di meja PMI karena anggota PMI tidak datang.

The one who the people listen to is not RAPI, but their village 's leader. This is why we thought that it's necessary to also teach and train the village 's leader, so we can guide the people [effectively]. This is supposed to be the initiative by the government, not us. We have done some training in the past though, and it's all on our personal fund. They should have some ways to direct and guide the community, but the reality on site is poor. They have a central post that includes some government agencies in it that sometimes need our help in communication. And then, we do not only help them on the communication matter, but also on the [information-] table in the PMI post, as the members are sometimes not coming.

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7. **Apakah menurutandapemerintah, LSM, atau organisasianda mampu menyediakan semua kebutuhan tersebut?**

Do you consider, the government, non-government organizations or the community can provide it?

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8. **Menurut anda, apakah semua rencana, fasilitas, dan usaha pemerintah dan masyarakat untuk meningkatkan kemandirian dan ketahanan masyarakat dalam menghadapi risiko bencana sudah sesuai dengan kebutuhan masyarakat?**

Do you reckon, all the plans, infrastructures, and efforts that government and community provide for tsunami resilience building are fit with the community members need?

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9. **Darimanakah masyarakat mendapatkan pengetahuan tentang apa yang harus dilakukan ketika suatu saat terjadi tsunami untuk menyelamatkan diri (evacuation plans and route, evacuation building?)**

How community members gain the knowledge about the evacuation plans and routes, evacuation building and where they have to run to save their life in future tsunami event?

Resilience

Self-organization

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10. **Perubahan-perubahan apa saja yang terjadi untuk meningkatkan kemandirian dan ketahanan masyarakat dalam menghadapi risiko bencana setelah tsunami 2004?**
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What evidence is there of change in the community after the 2004 Indian Ocean Tsunami in Aceh province in term of building tsunami resilience?

Learning

11. **Apa saja yang telah organisasi anda pelajari dari pengalaman tsunami 2004?**

What do you learn or what can be learned from the 2004 Indian Ocean Tsunami in Aceh province experience?

Kami selalu ingin meningkatkan diri, kami selalu merasa kurang untuk menangani bencana, jadi walaupun kami sudah terbiasa, tapi kita tidak pernah merasa jenuh atau merasa lebih, kita tetap seperti keseharian dan tetap ingin menambah ilmu untuk kebencanaan. Contohnya BMKG ingin menyampaikan informasi gempa > 6 SR, BTS operator seluler padam, BTS overflow, PLN padam, sistem komunikasi terputus, satu-satunya cara untuk menyampaikan informasi adalah dengan radio, jika RAPI jahat, saat emergency gempa kita matikan semua perangkat, BPBA dan BPBD mencuri informasi dari kami, karena ketika bencana terjadi mereka membuka jalur RAPI. RAPI langsung mendekati laut untuk memantau keadaan, meski hilang satu anggota RAPI tapi bisa menyelamatkan seribu nyawa itu sebuah kebanggaan.

We always want to improve ourselves; we always feel that we are never enough to manage disasters. So eventhough on daily basis we've got used to it, we never feel exhausted or like it's too much. So, we stick to the daily basis while keep improving our knowledge about disaster [management]. For example, when BMKG wants to broadcast the information of an earthquake that is bigger than 6 [SR], while BTS cellular operator off, BTS overflow and PLN black out, communication system is cut/failed, and the only way to communicate is through radio. If we wanted to be evil, we can just shut down all of our equipments during the emergency, preventing BPBA and BPBD from stealing information from us. Because when crisis happens, they always open the RAPI's radio communication, while RAPI would directly go to the coastal area to check the live situation, even when it 's at the cost of one life of RAPI members, if that could save a thousand of lives, that would be an honor to us.

Itu terbentuk secara alami, ada kepuasam. Kami punya kode etik, saat kami menyampaikan informasi apa yang kami lihat, apa kenyataan dilokasi. Memang kami masih ada kekurangan, tapi sudah 90% efektivitas laporan itu sudahbaik

It is formed naturally, through some sort of satisfactions. We have our ethic codes: We only deliver the information of what we see live on the site. We do have weaknesses, but we think that if the report effectivity has reached the 90% level, this should be good enough.

12. **Apakah proses belajar ini masih berlangsung?**

Do you still learn now?

13. **Apa yang membatasi proses belajar ini?**

What limits it?

Evaluation of the disaster resilience building strategies

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14. **Menurut anda, bagaimana perkembangan dari proses meningkatkan kemandirian dan ketahanan masyarakat dalam menghadapi risiko bencana setelah tsunami 2004 di masa yang akan datang?**

What do you think, the progress of tsunami resilience building in Aceh province after the 2004 Indian Ocean tsunami in Aceh province?

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15. **Bagaimana komitmen organisasi anda untuk terus melakukannya?**

How strong is your commitment to involve in tsunami resilience building in Aceh province?

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