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Do Disasters Create Opportunities for Change towards Sustainability? Initial evidence from Aceh, Indonesia

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Abstract

Practitioners and scholars increasingly view disasters as an opportunity not only to mitigate future disaster risk, but also to actively pursue change towards sustainability, i.e., making progress on poverty, environmental pollution, climate change, and social injustice. While the rhetoric of using windows of opportunity for building back better proliferates, the accounts of these achievements are mixed. Furthermore, few studies exist that research how people and organizations—in the midst of post-disaster devastation and loss—were able to see and seize opportunities for change towards sustainability. The post-disaster recovery process from the 2004 Indian Ocean tsunami devastating Aceh, Indonesia is one of the cases with mixed accounts that framed their recovery around the goals of building back better. Thus, this study looks at this case to shed light on how opportunities were seen and seized over the last 10 years. The initial research findings suggest that major achievements towards sustainability were made, in particular negotiating a peace-agreement that resulted in ongoing peace. However, progress towards sustainability is more dominant in some daily activity fields (e.g., educating, caring, engaging recreating, communicating) than in others (e.g., working, housing) and more work still needs to be done even in the domains where progress towards sustainability is manifest (e.g., difficulty for well educated youth to find local employment). Nevertheless, there is lots that people and organizations—as part of their disaster preparedness efforts—can learn from the leaders of the Acehese sustainability change initiatives. In particular because the leaders of these sustainability change initiatives are very diverse, including women and men, young and old, laypersons and experts, as well as local, national, and international teams. Moreover, most of these leaders were “first-timers” in seeing and seizing opportunities for change towards sustainability despite the trauma, loss and devastation that surrounded them.

Keywords:

Disaster, recovery, opportunity, sustainability, change

1. Introduction

Scholars and practitioners increasingly view disasters as an opportunity to pursue change towards sustainability, i.e., making progress on poverty, environmental pollution, climate change, and social injustice (Birkmann et al., 2010; Folke et al., 2010). This perspective becomes more and more relevant as unsustainable pathways persist (Rockstroem et al., 2009, Wise et al., 2014), and more extreme weather events in higher frequencies are to be expected in the future (IPCC, 2010).ⁱ Utilizing post-disaster recovery to advance sustainable development means not only to shift from risk-based disaster management approaches to vulnerability reducing approaches (Sarewitz et al., 2003), but also to actively enhance pathways that allow people and places to thrive. Yet, while the rhetoric is widely used—e.g., “never let a crisis go to waste” or “building back better”—more evidence is necessary to explore *how* these promises can actually be met (Brundiers, 2014; Christoplos 2006; Fan, 2013; Fruehling, 2002; Gelcich et al. 2010; Mannakkara, 2014).ⁱⁱ

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This paper presents initial evidence on this issue from a study on the ten-year post-disaster recovery processes in Aceh, Indonesia, after the 2004 Indian Ocean earthquake (December 26, 2004) and earthquake in Nias (May, 28, 2005). This case was selected because it is a contested case; yet a case, which provides rich learning opportunities for post-disaster recovery. International, national, and community leaders proclaimed early in the process the intention to recover sustainably and ‘building back better’ (MDFa, 2012; Shah & Lopez Cardozo, 2014). In contrast, studies have shed some doubt that the process delivered on this promise (e.g., Kennedy et al., 2008). Now, after the tenth anniversary, sufficient time seems to have passed for appraising the recovery processes against the ‘opportunity-for-sustainability’ claim.

Based on this case, the study explores three questions in order to *contribute evidence on how people and organizations were able to pursue opportunities for change towards sustainability* created by the disaster and post-disaster recovery processes:

- (1) What are the main changes that result from post-disaster recovery efforts?
- (2) In how far do these changes constitute achievements towards sustainability?
- (3) Who is seeing opportunities for change towards sustainability; and how do these actor groups seize these opportunities, i.e., begin work towards sustainability; and how do they sustain the changes induced?

The study results can be used by actor groups interested in leveraging disasters for sustainability.

2. Research Design

Selection of interviewees started in summer 2014 and was based on the criterion that people were involved in post-disaster recovery processes that pursued sustainability goals. Using the ‘snowball approach’ additional interviewees were identified over the course of the study. To determine how actor groups were able to see, seize, and sustain opportunities-for-sustainability, I collected data through 80 semi-structured interviews and supporting document analysis from October to December 2014 in Jakarta, Bandung, Yogyakarta (interviewing international and national actors) and Aceh (interviewing local and regional actors). In addition to interviews, several sites across the Aceh province were visited—as referenced in the interviews—and data collected through observations and informal conversations. Results from interviews are presented as follows: RI_A_16_LNGO. Legend: RI: Republic of Indonesia, A: Aceh [Location of interview]; 16: number of interviewee; LNGO: Local NGO [actor type].

In step 1 (Question 1), changes were inventoried for daily-activity domains—like housing, educating, working, being mobile, and worshipping (Forrest & Wiek, 2014). People’s actions in the daily-activity domains draw on the infrastructures that support the daily-activity domains, such as buildings, roads, electricity grid, sewage, and so forth. Furthermore, actions in daily-activity domains are shaped by the formal and informal rules and values that organize each domain. For instance, a formal rule in ‘educating’ is that education is free and accessible; informally, people perceive that the value of education increased compared to pre-disaster/conflict times. In step 2 (Question 2), the inventoried changes were then appraised against Gibson’s (2006) integrated set of sustainability principles, including: integrity of natural environment; sufficient livelihood and public finances, social well-being and democratic governance; resource maintenance and efficiency; as well as the cross cutting principles of intra- and inter-generational justice, as well as precaution and adaption. In step 3 (Question 3), the questions of what actor groups saw opportunities and how they seized opportunities for change toward sustainability and how they sustained the introduced changes, was addressed by interviewing participants about key elements of the action learning cycle. The elements included: actors’ role in the post-disaster recovery process, their actions, the resources and skill used as well as the barriers encountered and tactics used to address them (Park et al., 2012).

The data collected from interviews posed some well-known challenges, as 10 years after the disaster many organizations had moved on and were unavailable for interviews, and interviewees worked hard to reconstruct their memories as they reflected—often for the first time in years—on past activities.

Sometimes it became clear only during the interview that interviewees had a different understanding of sustainability than what is the subject of this study. This is why complementary data was collected through document analysis and site visits. The study compiled a robust set of data that should suffice for an accurate analysis and balanced appraisal of the recovery process under the given perspective.

Please note that at the time of writing this article (August 2015), I am in the midst of the data analysis and the article summarizes the initial insights that are emerging.

3. Case Study Background

There are three main reference points for post-disaster recovery in general, and for progress towards sustainability in particular: first, the situation prior to the disaster, second, the actual disaster situation, with immediate responses, and third, the enfolding post-disaster recovery process (Fig. 1). Seeing, seizing, and sustaining opportunities-for-sustainability need to be analyzed and appraised against this background (c.f., Gelcich et al., 2010).

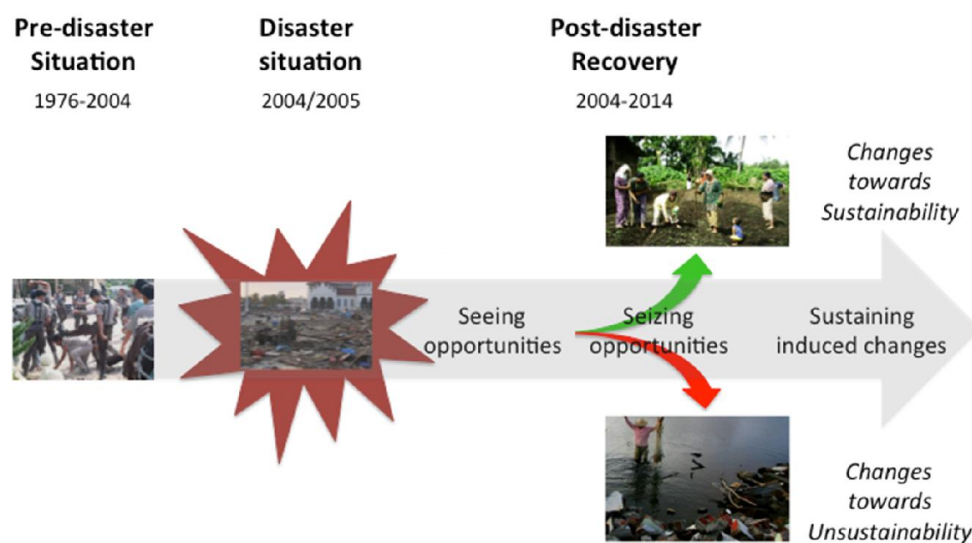


Figure 1: Process model of post-disaster recovery, with main reference points in the pre-disaster situation and post disaster situations.

3.1 Pre-disaster Situation

Aceh province had experienced more than 30 years of civil conflict, which eroded the economy and the social fabric, creating inequalities and fuelling corruption. At the time of the tsunami, Aceh was lacking functioning administrations, markets and a trained workforce, civil society groups, and ethical standards for public life (Glavovic, 2008). A large number of the population lived along the coast often lacking of disaster awareness and preparation, while other villages were very remote, and thousands of people were internally displaced due to the conflict. There was increasing recognition among the leaders of the Free Aceh Movement (*Gerakan Aceh Merdeka* (GAM)) that conflict must end. Select INGOs were allowed to work in the province during conflict times to support internally displace people and to help protect the highly vulnerable environment. These INGOs had functioning institutions and connections to outside organizations as well as an understanding of the diverse local contexts and cultures.

3.2 Disaster Situation

Aceh province was the area hardest hit from the Indian Ocean tsunami, as it was closest to the epicenter. The tip of Aceh province, with Banda Aceh as its capital, was the highest populated area. Nearly 200,000 people were killed and more than 533,000 missing; survivors lost their livelihoods and circa 25% of the labor force became unemployed. Homes, infrastructure, and ecosystems were severely damaged, with losses equivalent to the gross provincial income for a year (Glavovic, 2008).

To manage the post-disaster recovery, two processes were launched: the specially designed disaster management authority (*Badan Rehabilitasi dan Rekonstruksi* NAD-Nias; BRR) took charge on leading the recovery effort. Accelerated peace-negotiations enabled the signing of the peace agreement between GAM and the Government of Indonesia on August 15, 2015 (Helsinki Memorandum of Understanding) and contributed to establishing the Aceh Reintegration Agency (*Badan Reintegrasi Aceh*, BRA), in charge of the economic and social reintegration of former combatants (Fan, 2013).

The influx of resources—totaling more than 7 billion dollars (GFDRR, 2013)—into the province became the “second tsunami” (Phelps et al., 2011). While the disaster experience had deeply traumatizing effects on people (Meilianda, 2014), the experience of perceived unjust aid distribution was even more traumatizing, especially among victims of the conflict (RI_A_22_INGO).

At times there were up to 900 NGOs reported to be active in Aceh, in addition to foreign governments and multilateral organizations, in particular the Multi-Donor Fund (MDF), as well as the national government agencies, including BRR, BRA, provincial and local governments, village committees, and community-groups (MDFb, 2012). Organizations often had more money than they could spend and were perceived as focusing more on meeting their spending rates than on communities’ needs (RI_J_56_IO).

4. Results

4.1 Main Changes in Daily-Activity Domains through Post-disaster Recovery

In the *domain of mobility and transportation* national, provincial, district and village roads and trails were reconstructed or rehabilitated, including bridges and river crossings. Ports and airports were rebuilt (MDFc, 2012). Interviewees emphasized the increased connectivity along the West Coast and with Indonesia and Asia, as there are now several flights a day departing from Aceh. Public transportation was not a priority during the post-disaster recovery. However, the city of Banda Aceh is now planning a public (bus) transportation system (RI_A_48_LGov).

In the *housing domain*, houses were quickly rebuilt in situ and in relocation sites; the housing sector was the most affected with more than 127,000 houses destroyed. Houses were rebuilt by various actor groups, applying different standards in terms of community-participation, building materials, and construction quality (Pribadi et al., 2014; Roseberry, 2008). Housing related infrastructures were put in place, including drinking and sewage water systems, drainage and flood control, and landfills for solid-waste management (MDFc, 2012). The WWF issued “The Green Reconstruction Policy Guidelines” to address emerging environmental problems, which accelerated with the intense sourcing of construction materials in Aceh. However, only a few organizations accounted for them in their housing reconstruction programs. The World Bank developed the “REKOMPAK” program, which pursues an owner-driven and community-based approach to housing construction. That model has since been applied across Indonesia and continuously improved (MDFb, 2012). As part of clarifying issues around land titles, BRR facilitated a new law, granting women property rights; and community groups started to advocate for cultural heritage preservation.

In the *domain of working*, Aceh still experiences high levels of unemployment (9.10%; 2012), insufficient livelihoods, in particular in the agricultural and natural resource management sectors, and poverty (18.5%; 2014) (Phelps et al., 2008; Nazamuddin, 2014). Some recovery initiatives succeeded in sustaining local livelihoods in areas such as coffee, cocoa, fisheries, and brick-making. Their models developed livelihood approaches that are community-controlled, skill-based, and environmentally friendly. While an abundance of products are available in Aceh, including franchising products, a strong local economy is missing. Even the eggs are imported from Medan, because imports, exports and processing are mostly organized from Medan (Phelps et al., 2011).

In the *domain of educating*, schools have been rebuilt and public education until college-level is available for free and enrollment is high (almost 100% of children aged 7-12; more than 95% of youth aged 13-15; 75% of the youth aged 16-18) (Nazamuddin, 2014). New curricula related to disaster risk

reduction have been initiated. Two international research centers were established. They engage in collaboration with local partners, such as the local disaster management agencies, city management, and local communities and share knowledge and experiences internationally. While people see a transformative potential in the educational sector, there are challenges related to unequal distribution of educational opportunities across Aceh, lack of employment options for graduates, and new funding models are needed to ensure continued funding when the existing funding streams, defined in the Law of Governing Aceh, will end (Shah & Cardozo Lopez, 2014).

In the *domain of caring*, major hospitals and clinics have been rebuilt and public health care is available for free. There are challenges, including ensuring access to good health care across the province and caring for the large parts of the population who are still suffering from mental health issues due to tsunami- or conflict traumata. Gaining custodial guardianship rights for their children remains a legal and societal battle for many women (Fatimahsyam et al., 2014). Unequal treatment of post-tsunami and post-conflict victims during the recovery continues to present challenges for the social and economic reintegration of post-conflict victims; in particular of ex-combatants and their families. Relevant for the domain of caring are also changes made to address environmental issues as a way to promote well-being, healthy livelihoods, and changes to managing disaster risk.

The Government of Aceh launched a variety of environmental policies including a moratorium on logging, a sustainable palm oil policy, livelihood-based carbon conservation projects, and green development policies, including disaster risk reduction. Thereby, implementing these policies involves a wide range of—sometimes disparate—stakeholders (Lassa, 2010). The Aceh disaster experience accelerated the development of a new law for disaster management (24/2007) and forth following regulations in Indonesia. The new law implements two major shifts: it now tasks disaster management authorities from local to national level and a wide range of non-governmental actors with a pro-active approach to disaster management, focusing on disaster risk reduction instead of the previous reactive approach in emergency management (Lassa, 2013).

In the domains of *engaging and communicating*, interviewees emphasize the role of the peace agreement in allowing public life and civil society organizations to come back and enable the first elections in 2006. Civil society organizations are promoting positive peace, intercultural tolerance, leadership skills for youth and women, as well as sustainability mainstreaming across the Acehese caucus. Interviewees also recognize the participation of women and girls in public life as a major change. Changes in the domain of *communication* stem from a recovery project called “ICT for Aceh”, bringing Internet access, including wireless, to Aceh and from a local journalists association that advocates by for ethical reporting in post-conflict and post-disaster contexts.

In the domain of *recreating*, Aceh promoted itself as a tourist region and has experienced increasing numbers of Indonesian (almost 100,000 in 2011) and international visitors (more than 26,000 in 2011) (Mota, 2014). Tourists visit Aceh’s national parks and beaches, the religious heritages and the tsunami memorials and monuments, and come for the cultural and gastronomic experiences. Recreational places frequently visited by locals are in particular the coffee shops, parks, and beaches.

In the domain of *worshipping*, changes include the granting of religious autonomy through the Helsinki Peace agreement (Renner & Chafe, 2007). Aceh is now one of two provinces in Indonesia allowed to implement Islamic law (*Shari’a*) in its entirety, “with significant implications for tourism, foreign direct investments and gender politics” (Phelps et al., 2011:424). Additional changes include the efforts of other religious groups to promote cultural and religious tolerance and diversity.

4.2. Accomplishments towards Sustainability

This section looks at the identified changes above from the perspective of select sustainability principles (Gibson 2006) and discusses how the changes fare in general against these sustainability principles:

Integrity of natural environment: Experts in Aceh see the integrity of coupled socio-ecological systems as severely threatened, because development is encroaching in forest areas and illegal logging continues. Both put strains on the habitats of species (including some endangered species) and put people living in and nearby the mountains at periodic risk of floods, landslides, and losing their

livelihoods (Singleton, 2014). Local and international NGOs collaborate on political campaigns. Together, they call for enforcing existing environmental protection laws and implementing disaster risk reduction measures that account for upstream issues such as deforestation and vulnerability issues such as lack of livelihood opportunities in remote areas (Press-release, Banda Aceh).

Sufficient livelihood and public finances: Current numbers show that Aceh continues to have some of the lowest economic growth and highest poverty rates across the Indonesian provinces. In contrast, Aceh ranks 7th in Indonesia in terms of its GRDP and 5th in the amount of educational spending. This indicates that Aceh would have the resources to spur economic growth and to fight poverty. Yet, public spending is not well targeted to combine education with sufficient livelihood opportunities (Nazamuddin, 2014). Private sector investment, especially in natural resource sectors (coffee, rubber, palm oil, fisheries, minerals, geothermal energy) does not stimulate a local economy, because much of its value-added activities happen outside of Aceh (Phelps et al., 2008). Nevertheless, efforts by the Acehese Government are under way to enhance e.g., vocational training to promote entrepreneurship across the province. Similarly, efforts by local NGOs aim at training youth in social entrepreneurship in agricultural sectors; while these efforts are small, they are serving as good role models.

Social well-being and democratic governance: Building on the peace agreement, the recovery process invested in capacity building programs related to decision-making and governance targeting individuals on the village level as well as district and provincial government entities. On the level of formal village governance, women are retreating from ‘equal participation’ in decision-making, although gender mainstreaming was a key concern in these post-disaster recovery efforts (Thorburn & Rochelle, 2014). On the level of the province, the peace agreement granted Aceh autonomy in having its own political parties. However, interviewees state that many political leaders fail to utilize this opportunity, lacking political skills and being oriented toward their own networks instead of the public good. Nevertheless, efforts such as the “Sustainability Caucus” exist. It aims to build capacity for sustainability thinking and decision-making among Acehese legislators by promoting dialogue with local sustainability experts and scholars. Furthermore, various local NGOs continue to build capacity among their members for an active civil society. Nevertheless, social wellbeing—in terms of societal cohesion—is experiencing tensions. The post-disaster recovery process created a “split Aceh”, because it failed to integrate post-disaster recovery of *tsunami victims* with the social reintegration of *conflict-victims and ex-combatants*. The latter two groups continue to feel neglected by their government representatives, some of them having been their former leaders. Furthermore, medical professionals identified that tensions might increase as some groups are still suffering from tsunami- and/or conflict related traumata. While clinical expressions of mental and physical health issues are decreasing across society, the survey identified a new socio-cultural expression of trauma; the decrease in morale and spirits among the young generation. Even the request for improved mental health programming could address these intergenerational issues to a certain extent; strengthening local wisdom and redefining customary institutions is equally relevant (Direzka et al. 2014).

4.3 Seeing, Seizing, and Sustaining Opportunities-for-Sustainability

While not successful on *all* accounts, *some* progress towards sustainability has been made, and thus, the disaster was seized as an opportunity for change towards sustainability, to some extent. For instance, progress has been made in the daily activity field of education (high enrollment rate, good funding), even though challenges remain (e.g., opportunities for graduates, pedagogical reforms). Yet, such changes did not happen automatically. While opportunities for change towards sustainability might exist during post-disaster recovery processes (Fan, 2013; IOM, 2014), somebody actually needs to be able to see and seize them so that they become real (these opportunities exist like fallow land that somebody needs to make arable). The research shows that the actor groups that were able to see and seize opportunities for change to sustainability and sustain introduced changes over time are not constraint to a specific actor group. Table 1 offers an overview of select initiatives and the initiating actor group indicates the *wide and diverse range* of actor groups able to see and seize opportunities.

Table 1: Overview of actor groups and of selected initiatives aiming for change to sustainability

Actor Group	#	Exemplary Initiatives	Relevant Daily-Activity Domains
National Government	15	BRR approaches, e.g., Let's critique BRR; Legislating heritage rights for women	Engaging, Housing
Provincial Government	10	Aceh Scholarship of Excellence Program Providing free access to public health care and education	Educating, Working Caring
Local Government	5	Waste Management Sustainability pilots across Banda Aceh Municipality	Housing Working, recreating
International Organization	7	Rekompak – Community-driven housing reconstruction Multi-Donor Fund	Housing, engaging
International NGO	16	Sustainable Coffee Production Program Mobile Training Units for vocational education in Aceh	Working, caring Educating, working
Domestic NGO	6	Providing municipalities with professional risk assessment of housing safety Facilitating multi-stakeholder collaboration for DRR	Housing Various
Local NGO	9	Documenting & looking after community heritage places Educating youth in peace and entrepreneurship in AG Facilitating planning procedures and access to local gov.	Housing, recreating Engaging, working Communicating
Domestic research institutions / universities	7	Tsunami Disaster Mitigation Research Center; TDMRC International Center for Asian & Oceanic Studies; ICAIOS Aceh Climate Change Initiative / Sustainability Caucus	Educating Educating Educating / Communicating
Private sector	6		

Some actor groups—e.g., INGOs concerned with environmental protection—worked in Aceh on sustainability issues already pre-disaster. They were poised, waiting in the wings for their opportunity to push their causes. One reason for effectively promoting environmental protection of the forest was that they were ready to demonstrate to tsunami- and conflict-affected people how a healthy forest contributes to the safety and livelihood of people (RI_J_63_IO).

Other actor groups emerged post-disaster, such as senior officials of the city of Banda Aceh and within the first government of Aceh province; or local NGOs developing disaster risk reduction programs. For instance, the city's leaders' vision was to create a livable and green city and to combine natural resource management with livelihood development (Bahagia, 2013). Various aspects contributed to the city leaders' ability to work towards their vision in adverse circumstances, e.g., they partnered with international sustainability experts, recruited and mentored local staff, and fearlessly and openly confront key institutional shortcomings such as lack of performance and controlling.

Some organizations were active already during conflict times and continue to exist to this day, albeit struggling. This demonstrates their high levels of adaptive capacity over the past decades and their ongoing fight for their cause.ⁱⁱⁱ These organizations are mostly local actors groups. They are working to strengthen civil society e.g., through transparent communication and information campaigns or empowerment of women. They were able to persevere partly because they received support through their Indonesian parent-organization and partly because they were very apt in developing relationships with local and emerging organizations, willing to contribute to their efforts.

Regardless of the actor group, the people championing the opportunity for change to sustainability shared some common attitudes and personality strengths. They were visionary people, thinking beyond the formal scope and timeframe of the post-disaster recovery process. Their visions were built around diverse aspects of sustainability values. These could relate e.g., to people's abilities to flourish, to live in healthy, safe and socially secure environments, or to pursue sufficient livelihoods without doing harm to the ecological life-support systems. Although they were regarded as crazy because of their bold ideas, they remained undeterred, finding ways to connect their initiative with community groups, village and government officials, and external organizations' support.

4.4 Actions for seizing opportunities and sustaining introduced changes over time

Interviewees argued that seizing opportunities and sustaining introduced changes *requires* relationships between the initiating actor group and other actor groups with decision-making power. Good relationships between the villages, cooperating with NGOs on a development project, and the district and provincial government were especially important to successfully facilitate the hand-over of communal facilities, transfer of ownership, and embedding facilities and their functions within existing institutions that provide financial and planning support in the future. Interviewees also explained their activities in facilitating access of individual project participants to resources in the private and public sector in the long-term. Such activities include negotiating conditions for micro-credits with banks, building up visibility of producers and their products (e.g., locally made seismic bricks) in markets and among relevant government departments, and developing capacity building programs that help project participants to increase their individual and collective self-efficacy in order to take on decision-making roles in supply chains of e.g., coffee or cocoa production.

Relationships and cooperation among civil society groups, self-identified as “drivers of change”, are few, but starting to increase. Civil society groups are reluctant to cooperate fearing loss of funding in an already scarce and competitive funding situation (Siswani, 2014). Nevertheless, some of the interviewees belong to newly developed umbrella organizations, which try to coordinate their efforts around their similar goals, especially around strengthening civil society activities, positive peace-building among youth, and disaster risk reduction activities.

4.5 Resources and skills for seizing and sustaining opportunities

Resources and skills that actors used in their efforts to push for change toward sustainability include working with local resources, such as local wisdom about locally available resources (e.g., for food production) and human resources (e.g. drawing on networks in order to bring people together, who share the same commitment). Additionally, interviewees emphasized the role of using pilot projects to convince decision-makers, funders, and the public about their projects. They argued that pilot projects are convincing because they are happening in real-time; people can see and participate in them. Pilot projects—if successful—render the proof of concept. Another resource that interviewees used include educational opportunities for themselves by bringing local, scientific, and professional knowledge to bear in the process. Interviewees found it beneficial to learn from international counterparts (e.g., city-to-city exchanges), from young professionals, who graduated abroad thanks to the Aceh Scholarship of Excellence; and from senior leaders, who role-modeled new behaviors related to learning from mistakes, and increasing performance, accountability and transparency. Receiving awards and international recognition for their sustainability efforts helped sustainability initiatives to become eligible for funding through the Government of Indonesia’s projects, e.g., on recycling.

4.6 Barriers and tactics for seizing and sustaining opportunities

Interviewees identified specific barriers to work towards change for sustainability.

First, sustainability—defined as striving to provide decent livelihoods for all, today and in the long-term, without wrecking the planet (Gibson, 2006)—is not a broadly known concept. Sustainability is commonly understood as the longevity of a project over time. Nevertheless, various groups, including the “sustainability caucus” and environmental NGOs, continue to raise awareness on sustainability as a concept to inform policy making and decision-making in matters of everyday life.

Other barriers relate to expanding successful pilots to larger scales. For instance, while the city of Banda Aceh offers recycling and composting services to reduce the amount of trash going to (the first sanitary) landfill, residents are unwilling to provide their own bins and pay for the service. Some argue that this attitude is a legacy of the “second tsunami” where INGOs covered such expenses. In other projects barriers relate to insufficient funding for implementing proposed renewable energy production projects; to lack of political will of the provincial leadership; and to a lack of operational capacities, e.g., related to prevent illegal logging. Other projects are stagnating because of human resources issues. These can include the lack of a trained workforce (e.g., to maintain solar powered systems); or a workforce that lost its motivation to care for maintaining instruments and procedures (e.g., in health care); or because young professionals are leaving Aceh, frustrated by the glass-ceiling

presented by the customary law of seniority. Coping strategies applied to address these barriers include providing good service that justifies the service fee; trying to bring the topic of renewable energy back on the agenda of policy makers; and individual mentorship for talented youth.

5. Discussion

5.1. *Changes indicating progress toward sustainability?*

Opportunities for change towards sustainability were seen and seized in various fields; including e.g., educating, engaging/communicating, and caring. Yet, it was the peace agreement, which provided an important fundament for the sustainability initiatives (and other initiatives) to succeed.

The sustainability change initiatives focused primarily on the social dimensions of these daily activity domains as the physical infrastructures were provided at great speed. While the intentions and efforts to seize perceived opportunities for sustainability were strong, their realization often failed or did not yet produce sweeping changes; implementing these changes requires that many other related things would need to be addressed as well. For instance, the Aceh Scholarship of Excellence trained a large number of young people. Yet, the young's ability to contribute to Aceh depends on changes in the customary interactions between senior and junior people, on sufficient job opportunities, which themselves depend on economic development of the province, and on public funding mechanisms or public direct investment in proposed new technologies for renewable energy or other sustainability practices.

Progress toward sustainability could be enhanced through collaboration among local government entities, researchers and students, as well as social entrepreneurs by implementing real-time sustainability pilot projects with public participation (e.g., Peterson, 2011; Dean, 2013). Thereby, local partners, e.g., municipalities and NGOs, have a responsibility to negotiate what is helpful for them or not (RI_Y_75_DUni). International partners' responsibility is to share sustainability innovations and support explorations how these approaches could be adapted to the specific situation and maintained over time (RI_J_66_NGov_USA).

Furthermore, this study concurs with Christoplos (2006) that—while opportunities were missed during the post-disaster recovery—new opportunities open along the recovery process in later phases of the post-disaster recovery process. Examples include the successful renegotiation of spending-agreements between Indonesian NGOs and their international donor organization as well as the recent launch of the “sustainability caucus” in Aceh, building renewed momentum for sustainability. Interviewees acknowledge that the funnel for introducing change to sustainability might be narrower once houses and infrastructures are built, but they urge to keep looking and working towards emerging opportunities. Instead of mourning missed opportunities, they recommended to at least develop actions to remedy the damage created by the missed opportunities.

5.2. *Strategies used to seize opportunities for change towards sustainability*

The study found that working in the opportunity space is a “first timer” for many and not everyone leading such an initiative was poised to seize the opportunity. Access to a network of peers for exchange, reflection, and peer-learning seemed to have been an important element for seizing perceived opportunities and for continuing to find ways to sustain these induced opportunities.

Participating in such a network might have helped to develop “linking” and “bridging” capital, which are aspects of social capital (Vallance, 2013). Bridging capital allowed interviewees to connect their change initiatives with other change initiatives to pool resources and work together towards shared overarching ideas (e.g., Aceh Civil Society Task Force). Linking capital allowed interviewees to facilitate relationships between project participants and decision-makers in district and regional governments, relevant supply chains, and funders. Bridging and linking capitals translate the increased capacity of individuals into increases in collective capacities and structural changes (Eakin, 2014).

In order to support “first-timer” and “seasoned” actor groups alike in their efforts to pursue change towards sustainability, the role of the “sustainability liaison” could be helpful. The sustainability liaison is the go-to-person/unit and connector in all things sustainability, including sustainable peace. This role proved to be valuable in other post-disaster recovery situations (IOM, 2015). In Greensburg, KS, USA, the post-disaster recovery process designated such a role. In Christchurch, NZ, the sustainability officer of the city of Christchurch informally became this role. While not tied to sustainability, the experience of the Multi-Donor Fund in Aceh and Yogyakarta indicates that its role as liaison greatly facilitated relationships and coordination between donors, the city, and its residents.

6. Conclusions

This study set out to understand how actor groups are able to see and seize opportunities for change to sustainability and how they sustained introduced changes over time. The study identified that many sustainability initiatives were unable to generate sweeping changes, considering the challenges presented by persisting adverse realities of development and the negative and often unintended consequences created by the complex, multi-agent post-disaster recovery process itself (Wiek et al., 2010). One sweeping change, however, is peace: the recovery processes accelerated the opportunity for peace and the Acehnese sustained it now for 10 years. Additionally, the focus of this study is less on the outcomes than on the process of these initiatives. Sharing the stories of people who committed themselves—despite the odds—to sustainability change processes in highly adverse post-disaster contexts might inspire actor groups elsewhere to pursue opportunities for change towards sustainability also as part of their disaster preparedness efforts in case that a hazard strikes their place.

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Endnotes

ⁱ This research looks at disasters as resulting from a natural hazard impacting on social systems, the built environment, and the natural environment. Thereby, the social and natural systems are differently vulnerable to hazards, given their exposure and sensitivity to the hazard and their adaptive capacity to cope with the impact. Viewing disasters through the vulnerability lens helps explain why disasters are ‘man-made’ even when a natural hazard, such as an extreme weather event, earthquake, or volcanic eruption, triggered it. It is the systemic complex of historically grown human decisions that create the progression of vulnerability, including unsafe conditions (e.g., low housing standards, high levels of poverty), dynamic pressures (e.g., rapid migrations, epidemics, war/conflicts) and root causes (e.g., colonialism, capitalism, neoliberal reforms) (Wisner et al. 2004). While this research looks at disasters resulting from a natural hazard, the thesis of disasters creating opportunities for change towards sustainability could also be applied to social or technical hazards such as terrorist attacks and wars as well as oil spills and breakdown of nuclear reactors, respectively (c.f., Adenrele & Donlan, 2008; Perrow, 2007).

ⁱⁱ For instance, a review conducted by Brundiers (2014) on studies claiming to research disaster as opportunity for change towards sustainability found that few of these studies actually empirically studied what people did; the majority of studies confined the topic to conceptual discussions. Gelcich et al. (2010) confirm that seizing the disaster as opportunity to pursue change towards sustainability occurs in three phases—preparing for the window of opportunity, navigating the transition, and institutionalizing the changes. However, their research looks at crisis, not disaster, and they conclude that more research is needed to shed light on the specific steps in each phase. Christoplos (2006) provides hypotheses why non-profit and non-governmental organizations often fail to seize the window of opportunity for change towards social justice. Fruehling (2002) and Mannakkara (2014) offer some of the few evaluative analyses focusing mostly on *what* was achieved. Fruehling looks at the international effort post hurricane Mitch to transform and reconstruct Central America; Mannakkara looks at ‘building back better’ after the 2004 Indian Ocean Tsunami in Sri Lanka and the 2009 Victorian Bushfires Recovery in Australia.

ⁱⁱⁱ Adaptive capacity means to be able to mobilize existing resources necessary for adapting to change (Marshall et al., 2012).