BUILDING RESILIENCE OF LIVELIHOOD SYSTEMS TO DISASTER: LESSONS LEARNED FROM THE TSUNAMI DISASTER RECOVERY PROCESS

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ABSTRACT

This research aimed to assess the contribution of livelihood recovery efforts, including communities’ own initiatives and external support, to people’s livelihoods in the tsunami-affected areas in Aceh Province, Indonesia. Using a mixed-methods approach and covering fourteen tsunami-affected villages located in Pidie and Aceh Besar district, the study adopts the concept of Sustainable Livelihoods and modifies the Sustainable Livelihoods Framework (SLF) for its critical analysis. The findings show that people’s strategies were influenced by local values, practices and institutions, previous hardships, and contributions from different livelihoods recovery programmes implemented by relief and development agencies. In dealing with the impacts of the tsunami, men and women in the affected communities showed various short-term responses or coping strategies. For longer term recovery, communities developed adaptation and transformation strategies for their livelihood activities. In many cases, people adjusted existing livelihood activities to the changes as well as developing new livelihood strategies. This led to different outcomes for households, either being more resilient or more vulnerable, as well as influencing their future access to assets.

Keywords: Disaster, Livelihoods, Resilience, and Sustainable Livelihoods.

Introduction

The tsunami disaster in 2004 affected a huge number of people and their livelihoods in Aceh Province, Indonesia. The World Bank reported that the livelihoods of people in the agriculture and fisheries sectors were the hardest hit, with damage to productive assets and loss of income estimated at over one-third of the total losses due to the disaster. This led relief and development agencies to invest major support in livelihoods recovery post-tsunami.

A disaster can change people’s access to livelihoods assets, which in turn influence the mechanisms of livelihoods recovery. Among the significant factors that affect the ability of individuals and households to cope with and recover from disasters is their level of ‘resilience’, which is influenced by access to five livelihoods assets or capitals: natural, social, physical, financial and human. In a development context, the term ‘livelihood’ comprises the capabilities, assets and activities required for a means of living. A livelihood is sustainable when it can cope with and recover from stresses and shocks and maintain or enhance its capabilities and assets both now and in the future without undermining the natural resource base (DFID, 1999). Meanwhile, the term has also been used widely in a humanitarian context, referring to external assistance aimed at recovering and supporting people’s livelihoods, also
known as livelihood programming. In this regard, relief and development agencies adopted different approaches.

Scoones (1998) asserts that livelihood adaptation, vulnerability and resilience are central to the definition of sustainable livelihoods. Davies (1996) considers that such resilience in facing stresses and shocks is a key to both coping and livelihood adaptation. According to Scoones (1998), assessing resilience and the ability to positively adapt or successfully cope requires analysis of a range of factors, including an evaluation of historical experiences of responses to various shocks and stress adaptation strategies. The aim of this paper is to present how livelihood recovery efforts, both through communities’ own initiatives and external support, contributed to rebuilding people’s livelihoods after the tsunami.

Study area and Methods

Research was conducted in four villages in Pidie district, located in Kembang Tanjong and Bate sub-district, and 10 villages in Aceh Besar, located in Lhoknga, Leupung and Lhoong sub-district. Villages were selected according to three main criteria - the type of livelihoods programme intervention, the presence and intensity of conflict and physical accessibility. The study adopted a mixed-methods approach, combining quantitative and qualitative research. Qualitative techniques included key informant interviews (KIIs), mixed-group and gender-disaggregated focus group discussions (FGDs), case studies and participant observation. Quantitative data was obtained through household surveys.

Results and Discussion

Pre-event vulnerability and people’s coping strategies

The major livelihood activities prior to the tsunami are listed in Table 1.

Table 1. Men’s and women’s livelihoods activities in the study areas prior to the tsunami

<table>
<thead>
<tr>
<th></th>
<th>Men’s livelihoods</th>
<th>Women’s livelihoods</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Pidie district</strong></td>
<td>Fishing (sea and river), fish farming, small-market trading, raising livestock (goat)</td>
<td>Making mats, producing salt, collecting oysters, raising small livestock (duck and chicken) and small trading</td>
</tr>
<tr>
<td><strong>Aceh Besar district</strong></td>
<td>Farming (rice, seasonal crops and perennial trees), fishing (sea and river), fish farming, raising livestock (buffalo, cow and goat), collecting rock, daily paid labour, small trading and carpentry</td>
<td>Farming (rice, seasonal crops and perennial trees), collecting oyster, collecting sand, producing salt, raising small livestock (duck and chicken), small scale home based business (making cake, traditional spices and tailoring), small trading and daily paid labour</td>
</tr>
</tbody>
</table>

Sources: Summaries from FGDs and KIIs.

In Pidie district, people had experienced exposure to conflict over a longer time period and suffered more devastating impacts than those who lived in Aceh Besar district. The communities in Pidie district considered the conflict to be the worst hardship in their lives; in some respects worse than the impacts of the tsunami. This hardship tested the resilience of livelihoods system in the area before the tsunami. In dealing with this hardship, the communities coped in various ways, as summarised in Table 2.
Table 2. Summary of coping strategies in dealing with the impacts of conflict

<table>
<thead>
<tr>
<th>Impacts</th>
<th>Coping Strategies</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Pidie district</strong></td>
<td></td>
</tr>
<tr>
<td>- Insecurity</td>
<td>- Collective temporary local migration (exodus)</td>
</tr>
<tr>
<td>- Enforcement of the regulations attached to the state of civil</td>
<td>- Male migration.</td>
</tr>
<tr>
<td>emergency and martial law such as: curfew, procedures set up by the</td>
<td>- Temporary or long term neglecting of resources (ponds)</td>
</tr>
<tr>
<td>army for travelling, fishing and community social activities.</td>
<td>- Women worked longer hours and avoided involvement in public sphere</td>
</tr>
<tr>
<td>- Loss of revenue led to food security issues</td>
<td>- Women utilised more support from extended families</td>
</tr>
<tr>
<td>- Degradation of local values, trust, social support, leadership,</td>
<td>- Women utilised more services from money lenders (muge).</td>
</tr>
<tr>
<td>participation etc.</td>
<td>- drawing upon household’s liquid assets (sold jewellery, livestock or farmland)</td>
</tr>
<tr>
<td>- Lack of access to external support</td>
<td>- Many children left their schools; boys were sent to Islamic boarding schools</td>
</tr>
<tr>
<td>- Women had to bear multiple burdens (domestic and economic</td>
<td>and girls provided support for the families.</td>
</tr>
<tr>
<td>responsibilities)</td>
<td>- Some community members became beggars in urban centres.</td>
</tr>
<tr>
<td>- The conflict hindered service delivery of government programs</td>
<td></td>
</tr>
<tr>
<td><strong>Aceh Besar district</strong></td>
<td></td>
</tr>
<tr>
<td>- Insecurity</td>
<td>- Community neglected hillside farms.</td>
</tr>
<tr>
<td>- Banned access to hillside, affecting farmers, rock collectors</td>
<td>- Men stopped fish farming activities</td>
</tr>
<tr>
<td>and labourers of swifts’ nest (sarang walet) business.</td>
<td>- Households diversified their livelihoods activities, including: cultivating</td>
</tr>
<tr>
<td>- Curfew, affected men’s engagement in fishing and fish farming.</td>
<td>various commodities in lower farm lands, small trading, home based small</td>
</tr>
<tr>
<td>- Loss of revenue</td>
<td>business or taking part in daily paid labour</td>
</tr>
<tr>
<td></td>
<td>- Borrowed money from neighbours, sold livestock and jewellery, and peugala</td>
</tr>
<tr>
<td></td>
<td>(lease out) of productive land</td>
</tr>
</tbody>
</table>

Sources: KIIs and FGDs across the villages

The impacts of the tsunami on men’s and women’s livelihoods and coping strategy

The disaster affected people’s livelihoods capitals directly and indirectly. The impacts of the tsunami, including loss of life, severe damage to natural resources and infrastructure, as well as loss of households’ assets, affected men’s and women’s livelihoods in various ways. Across the villages, key informants and FGD participants argued that the most significant impacts were derived from high casualties and damage to natural resources. This, however, does not belittle the impacts of damage to other capitals due to the disaster, i.e. damage to infrastructure, market places and households’ physical assets. The impacts of mortality and damage to natural capital were less reversible in comparison to other damage, such as lost physical assets or infrastructure.
Table 3. Summary of coping strategies in dealing with the impacts of the tsunami

<table>
<thead>
<tr>
<th>Direct impacts of the tsunami</th>
<th>Men</th>
<th>Women</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Mortality</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>- Loss of family members</td>
<td>- Re-forming families (through re-marriage)</td>
<td>- Women spending more time for domestic work</td>
</tr>
<tr>
<td>- Changes in family structure</td>
<td>- Changing existing local practice of matrilocality</td>
<td>- Women pursuing home based livelihood activities (limited options)</td>
</tr>
<tr>
<td>- Loss of support from extended families</td>
<td>- Living in nuclear families</td>
<td>- Married young women to have more children</td>
</tr>
<tr>
<td><strong>Severe damages to natural resources</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>- Some villages were totally washed away, forced the community to leave the areas.</td>
<td>- Migrating collectively (men and women)</td>
<td>- Women share domestic roles during their time in temporary camp</td>
</tr>
<tr>
<td>- Rice field, lower farm, pond land and rivers were severely damaged</td>
<td>- Seeking local informal social support</td>
<td>- Calling for local informal social support</td>
</tr>
<tr>
<td></td>
<td>- Drawing upon common resources</td>
<td>- Sharing valuable physical assets with other community members</td>
</tr>
<tr>
<td></td>
<td>- Men and women share responsibilities in managing <em>dapur umum</em> (<em>common kitchen</em>)</td>
<td>- Developing temporary livelihoods activities: small trading, participating in CFW.</td>
</tr>
<tr>
<td></td>
<td>- Sharing valuable physical assets with other community members.</td>
<td>- Drawing upon common resources (hillside land)</td>
</tr>
<tr>
<td></td>
<td>- Engagements in temporary livelihoods activities: collecting recyclable materials, participating in cash for work (CFW) and carpentry work during reconstruction period</td>
<td>- Relying on external support</td>
</tr>
<tr>
<td></td>
<td>- Cultivating seasonal crops in other people’s undamaged land (in temporary locations)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>- Relying on external support</td>
<td></td>
</tr>
</tbody>
</table>

Sources: KIs and FGDs across the villages

Communities, households and individuals developed coping mechanisms to deal with this hardship. This did not entirely rely on their access to assets, but was also influenced by local social values and perceptions that contributed to their motivation and strength. The community commonly perceived the disaster as a *test from God* and therefore felt they had to be sincere in facing the loss of family members and assets. Togetherness, willingness to share and commitment to maintain their identity as a community in such difficult circumstances reflected a strong social characteristic and understanding by the affected communities. Their belief that the disaster was sent by God and would be followed by *Hikmah* (*means: every cloud has silver lining*) as part of their internalisation of Islamic values and practices was a
valuable source of motivation. This helped the community members to keep hope for their future. A sense of responsibility and hard work, sincerity and their experiences in facing previous hardship played an important role in gaining motivation for recovery.

However, as the impact of the tsunami disaster on people’s livelihoods was overwhelming and unprecedented, especially the severe damage to physical capital and loss of households’ assets, it was beyond the ability of the affected community to cope by using only their own resources. Therefore, the role of external support was extremely important. The delivery of external aid and recovery process were positively influenced by significant improvement in security, since a peace agreement between the Indonesian government and The Aceh Free Movement (rebels) was signed within the first year after the disaster. The livelihood recovery process and outcome after the tsunami in the study area can be explained through the following conceptual framework:

![Conceptual framework of livelihood recovery process and outcomes](image)

**Figure 1. Conceptual framework of livelihood recovery process and outcomes**

Figure 1 shows that access to various livelihood capitals in a post disaster situation is influenced by the degree of shocks (vulnerability context), policies, institutions and processes as well as external aid. This access determines their immediate responses (coping mechanisms) and their further adaptation and transformation strategy, which in turn will result in different outcomes for households, either being more resilient or more vulnerable, as well as influencing their future access to assets. Each livelihood capital contributes to the system’s resilience in various ways, as presented in Table 4.
Table 4. The relationship between livelihood capitals and community resilience

<table>
<thead>
<tr>
<th>Forms of capital</th>
<th>Contributions to people’s resilience</th>
</tr>
</thead>
<tbody>
<tr>
<td>Social capital: Trust and shared norms, networks and affiliation, information flow and market chains</td>
<td>Facilitates coordination, facilitates access to resources and provides informal safety nets</td>
</tr>
<tr>
<td>Natural capital: Resource stocks, land, water, vegetation and ecosystems</td>
<td>Increases protection to natural disasters (storm and floods) and protects the environment</td>
</tr>
<tr>
<td>Physical capital: Housing and buildings, public facilities, vehicles, tools and equipments</td>
<td>Facilitates communication and transportation, facilitates evacuation and increases safety</td>
</tr>
<tr>
<td>Financial Capital: Income, saving and investment</td>
<td>Maintains purchasing power, increases wellbeing and speeds recovery process.</td>
</tr>
<tr>
<td>Human Capital: Education, health, skills and knowledge, innovation and motivation</td>
<td>Increases ability to develop and implement risk reduction and coping strategy</td>
</tr>
</tbody>
</table>

Modified from: Mayunga (2007)

The role of external aid in livelihoods recovery

Massive destruction of livelihoods capitals and loss of income was the main reason why relief and development agencies invested major support in livelihoods recovery after the tsunami. Four livelihoods programmes in the area were selected for the study and their contributions to people’s livelihoods were assessed based on the beneficiaries’ perspectives. The programmes were: (1) Cash transfer, implemented by the Asian Development Bank, (2) Community revolving funds, implemented by PASKA, (3) Women’s livelihoods support, implemented by PASKA, and (4) In-kind assets transfer, which includes the rice field rehabilitation programme implemented by the Department of Agriculture, and an agro input programme for ginger cultivation complemented by skill training delivered by the Lam Reneu Foundation.

This external aid, which enhanced household access to livelihoods capitals, and interplayed with people’s own motivation and social values, has contributed to the process of livelihoods recovery. In many cases it was the foundation for each household to develop their livelihood strategies after the tsunami, which could be: (a) similar to their pre-tsunami livelihood activities, (b) improving existing activities (adaptation strategy), or (c) developing new livelihood activities (transformation strategy). The household survey provided evidence of the changes in people’s livelihood activities.

Figure 2 shows the proportions of the pre-tsunami livelihood activities being maintained at the time of the research. From 261 households participating in the survey, 7% of them have completely changed their livelihood activities. However, about 56% had not changed their livelihood activities at all, and at least 37% of households were maintaining some of their pre-tsunami livelihood activities. A further investigation through qualitative techniques provides a better explanation of the changes in the livelihoods system. Table 5 shows various adaptations that have been made to existing livelihoods activities.
Figure 2. Number of households maintaining pre-tsunami livelihood activities

Table 5. Adoption of new practices into existing livelihoods activities

<table>
<thead>
<tr>
<th>Previous status of livelihoods activities</th>
<th>New adaptations</th>
<th>Drivers</th>
<th>Outcomes</th>
</tr>
</thead>
</table>
| Rain-fed subsistence rice farming (in Lam Senia, Mon Cut, Meunasah Mesjid, Meunasah Lambaro and Mon Ikeun village) | Adopting new agriculture mechanization, such as tractor and thresher, using highly-yielding variety and applying more artificial fertilizers. | The promotion of agriculture intensification introduced by the Department of Agriculture. The institution assisted the communities with land rehabilitation programme which was combined with distribution of free agro-inputs. | - In rain-fed farming system, the use of highly-yielding seed, with shorter life span but more susceptible to drought and flood, resulting in uncertainty of outcomes.  
- A shorter life span, has made multiple cultivation in a year possible. This has been the main reason for the sparrow (Lonchura leucogastra) outbreak in the area. This was also a result of the fact that some farming areas were neglected and reverted to bushland after the tsunami. This provides secure nesting areas for the birds  
- The sparrow outbreak, as a new form of environmental stress has forced women to invest more time on the farm in dealing with invasions of sparrows. |
<p>| Women’s activities in collecting | Adopting new oyster cultivation techniques and a PASKA’s Women support programme | - Sustainable use of resources with a better quality of oysters produced in a more predictable |</p>
<table>
<thead>
<tr>
<th>Activities</th>
<th>Institutions and Programs</th>
<th>Benefits</th>
</tr>
</thead>
<tbody>
<tr>
<td>Oysters (in Pasie Lhok and Pasie Ie liebeu village)</td>
<td>New institution in accessing the river as a common resource.</td>
<td>- A new institution adopted in regulating households access to common resource (river)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- A more sustainable, predictable and better households’ (women’s) income</td>
</tr>
<tr>
<td></td>
<td></td>
<td>quantity.</td>
</tr>
<tr>
<td>Women’s activities in producing sea salt (in Pasie Ie Luebue village)</td>
<td>Using a modified model of stove that facilitates a quicker boiling process.</td>
<td>A quicker process reduces women’s working hours and increases productivity.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>A more efficient use of resources (firewood) implies less capital required for production.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>This does not always guarantee for a better income. Women in this village claimed that this activity is heavily affected by seasonality and they still have salt price issue in the same time. The productivity is lower during the raining season than the dried season, yet the price is fluctuated in opposite way; it has higher value during the raining season.</td>
</tr>
<tr>
<td>Men’s activities in cultivating ginger (in Nusa and Lampaya, and Naga Umbang village)</td>
<td>Adopting new cultivation techniques, e.g. mulching system, spacing arrangement, using highly yield seeds and fertilizers.</td>
<td>A better quality and a higher quantity of harvest contribute to a better income for the households.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Many young men from landless families cultivate ginger in other people’s land by following mawah (share cropping) system. This does not only reduce unemployment but also increases households’ income and improves the use of lower farm land.</td>
</tr>
<tr>
<td>Being dependent on Muge’s small loan assistance for women only, using mats production as collateral (in Pusong and</td>
<td>Forming a village cooperative which is run by the community members (men and women) and offers microfinance services.</td>
<td>Women participation in managing the cooperative has improved their role in the public sphere. The trainings provided to support their roles boosted their self-confidence, gained more respect and being trusted for other roles in the community. Women’s involvement and confidence in public sphere were considered to be the most significant</td>
</tr>
</tbody>
</table>
Conclusions

Livelihoods recovery processes and outcomes have been influenced by a number of factors. People’s own capability to cope with the impacts of disaster was influenced by their motivations and social values and practices, and was complemented by external aid and a conducive political environment. These influence people access to assets, which in turn determined their short term responses and long term adaptation and transformation strategy. This leads to both possibilities of their being more resilient or more vulnerable, as well as influences their future access to assets.

The findings show that a resilient livelihoods system does not mean that the system has the ability to bounce back to its previous status in a linear process. In actual fact, this involved changes in people’s access to different levels and combinations of assets, which led to a new livelihoods transformation or adaption of existing livelihoods to changes. Therefore, in this context, being resilient should be looked as the ability to respond, manage and mobilise the assets, and use the opportunity to move on.

Practical lessons and policy implications

The findings of this study offer some practical lessons and policy implications as follows:

1. In delivering livelihoods recovery programmes, it is important for relief and development agencies as well as government institutions, to take into account any pre-event status (previous hardships and sources of resilience) of the affected community. This will allow recovery efforts to be used as a window for opportunity to build a better and more resilient and sustainable livelihoods systems, instead of rebuilding pre-event risk and vulnerabilities or investing in a greater future risk and vulnerabilities.

2. The Sustainable Livelihood concept suggests that people’s livelihoods strategy and outcomes are influenced by the vulnerability context, their access to livelihood capitals and policies, institutions and processes. Adopting this concept into a programme consequently requires an integrated approach instead of single sector approach.

3. In a disaster-prone country like Indonesia, people’s livelihoods are always at risk. Therefore, it is important for decision makers and service providers at various levels to develop a clearer conceptual framework for supporting communities in building a more resilient livelihoods system. For this purpose, I would like to recommend relevant
agencies to adopt the concept of Sustainable Livelihoods in their programmes. This is a people-centred approach which enables parties to comprehensively assess people’s needs. It is goes beyond a conventional single-sector approach and potentially offers a more effective and efficient outcomes of livelihood programmes in a development and post-disaster setting.

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