Community base development at the implementation of rehabilitation and reconstruction project after earthquake in West Sumatera

Indra Farni1,a, Rosli Mohamad Zin2,b and Alzahri3

1, 3Students Faculty of Civil Engineering, UniversityTeknologi Malaysia, Johor Bahru, Malaysia.
2Lecturer Faculty of Civil Engineering, UniversityTeknologi Malaysia, Johor Bahru, Malaysia.
a indrafarni@yahoo.com
b roslizin@utm.my

Abstract. This study aim to assessing and investigate the construction process of damaged houses during the rehabilitation and reconstruction phases due to the 2009 West Sumatran Earthquake. Community empowerment approach is adopted considering its sustainability to strengthen the capacity of community in order to reduce disaster risk. The community empowerment concept will run effectively if it is designed properly. Through self-help scheme, the social solidarity, voluntary, and self-reliance, the community is expected to be prepared to forge synergic partnership based on equality and interdependency. Community orientation not only mobilizes the potentials of internal resources but also takes the move to mobilize and utilize all parties involved such as outside community, local government, interested groups, and others. The partnership is very much needed to strengthen the community capacity and to expand its development efforts. People oriented development is formed based on community approach. The community approach is determined by individuals who are expected to build critical awareness and positive behavioral changes, self-reliance, and independence towards the rehabilitation and construction process. The individual behavior change that becomes the pillar for collective community behavioral change, resulting the capability of the community to build up and develop the social resilience of the community, housing and human settlements infrastructure and basic service independency, and economic reliance. The community implementation at community level, in principle, is adjusted to local priority needs of respective area by taking into account the three pillars of the balanced community. This study finds that the rehabilitation and reconstruction process in the aftermath of the 2009 West Sumatran Earthquake had not actively empowered the society. Therefore, development reorientation approach has to be done as a new paradigm and the development concept has to be started with community empowerment.

1. Introduction

According to Post-Earthquake Rehabilitation and Reconstruction Action Plan following the 30 September 2009 earthquake in West Sumatera Indonesia, the rehabilitation and reconstruction program was implemented for 2 (two) years from 2010 to 2011. Based on the damage data, 181,995 buildings, which were heavily and moderately damaged, would be repaired or rebuilt. Generally, rehabilitation and reconstruction activities consist of 2 (two) methods. First, by engaging in a third-party contractors for the construction of buildings and infrastructures; and second, through a community empowerment program. The first option is typically having short duration and process. In addition, the method is usually easy to
be monitored and to be evaluated based on its planning documents. This third party contractor method was adopted during rehabilitation and reconstruction period following the West Sumatran earthquake in 2009. However, many problems were found in the implementation process. (Ophiyandri, T et. all, 2010). National reconstruction authority (2016) stated that these problems were contributed by lack of owner supervision, lack of law enforcement, political and social situation during the emergency, rehabilitation and reconstruction periods.

The second method, community empowerment program enables communities to be involved in planning and construction process. This approach tends to take longer time in implementation and also requires high commitment from the government. In addition, this community based approach needs the government to be actively involved in the project including to motivate the community, to disseminate the knowledge of good practice in earthquake resistant buildings as well as how to manage construction work. This approach has to be done carefully to consider sociological and psychological aspects of community. However, this approach is a good and sustainable way to strengthen the capacity of community; thus, reducing disaster risk. (Pemukiman dan Prasarana Wilayah., 2002).

2. Aims and scope of study
The aims of this study are to assess and investigate the construction process of damaged houses during the rehabilitation and reconstruction phases due to the 2009 West Sumatra Earthquake.

The scopes of work are:

- To focuses on the implementation process during rehabilitation and reconstruction of damaged houses due to the 2009 West Sumatran Earthquake. The process involves Technical Supporting Team (TPT), Indonesian National Disaster Mitigation Management Agency (BNPB) as well as the affected communities. The communities were accompanied with technical facilitators to provide assistance in the construction process.
- To take West Sumatra region as a case study.

3. Methodology
To understand the rehabilitation and reconstruction of damaged houses after the 2009 West Sumatran earthquake, a macro approach is adopted. The method involves gathering relevant information, resources, and literatures in West Sumatra as a case study. The author is really fortunate to be selected as a consultant for Technical Supporting Team (TPT) in the aftermath of the disaster; thus, this experience is highly valuable in this study.

The methodology of this study involves many stages. The main steps include identifying the problem, literature reviews, collecting data from many resources and observation, analyzing the outcomes and discuss the main finding as shown in Fig. 1 below.

4. Implementation Of Rehabilitation and Reconstruction
The implementation of rehabilitation and reconstruction which covers the housing sector, will be carried out through community-based development with the main reason that the culture of mutual help to individuals or groups of people is decreasing through generations. Examples of mutual help: building houses, restoring houses, help its citizens who has difficulties, help its citizens who are hit by disaster and so on. These kinds of activity are called gotong-royong activities. Society also have organized their own groups for activities such as: repairing rural roads, taking care of village roads regularly or monthly, building religious facilities and infrastructure.

Another reason is that in many countries, the failure of government in managing natural resources, providing basic infrastructure and ensuring social services has spurred research to look for alternative options. In recent years, a change has taken place from a supply-driven approach to demand-driven, and from central command and control to local management or co-management of resources and services. This change is intended to improve efficiency, equity, empowerment, and effectiveness. One of the option is to undertake community-based development (group-based development). Experience in community-based development is substantial, both about what can be done and what cannot be done. From this
experience, it is realized that no model is suitable for all places and times. Supporting large-scale community-based development requires a new, supportive institution: Adoption of objectives and processes that strengthen the capacity of a community, networks or groups, to organize and maintain the sustainability of development and its benefits.

Experience also shows that community-based development does not automatically include marginalized groups, the poor, women or minority groups, unless specifically explained, both at the level of the helpers and the community. Community-based development is associated with local stakeholders in decision-making. If the people in the community will are willing to take the initiative, be creative, learn, and take responsibility for their development, they should be encouraged to participate actively. This requires the formulation of policies and project characteristics that enable community participation. (Baez, Javier E, and Santos, Indhira V, 2008)

5. Community-Based Development Strategy
To encourage community-based development on a large scale, it is important to first understand the group or community itself. Based on this understanding, what is needed to support community actions can be defined successfully at a higher level. Community-based development requires the transfer of control and accountability from central authority to individuals, groups, and communities. Success depends on meeting the needs and creating local ownership of management (rules, controls, authorities, and responsibilities), and organizational capacity. The challenge is to reinvent community trust so that they can support community engagement, participation, and capacity building for continuous improvement. Large-scale community-based management requires fundamental changes in the policies, incentives, and structures. This all costs money, but if all of that is done well, then the benefits will be significant.
Adopting a clear strategy to community-based development is important. Success can be achieved by creating incentives for organizations to interact with each other to achieve desired results. While experience showed that in large-scale community-based development projects the results are very limited. There are four strategies used by the project manager to encourage support for community-based approaches and project effectiveness. This strategy consists of stakeholder engagement, consultation with different stakeholder, pioneering activities, and structured learning. (Sumodiningrat. G, 1996)

5.1. Stakeholder Engagement

Many projects use participatory workshops to include representatives of government officials, LSM, colleges and communities. Rehabilitation of community reconstruction by using participatory methods where participants formulate their own vision of community management. The workshop uses a series of interactive methods to develop agreements on decisions / authorities to be delegated to different levels of the government, to make community management systems possible. The workshop involved district, provincial government and central government officials along with LSM and project consultants.

5.2. Consultation

Not everyone is involved in decision making. To that end, the project uses several survey methods, benefit assessments and consultation meetings with potential clients. This is almost always done by local leaders and facilitators. Women's facilitators from the local area are usually required to ensure successful consultation with women.

5.3. Pioneering Activities

The project leader typically uses one of two approaches in the pilot project to begin the learning process. The pilot project can be used to test several different approaches and building capacity along with project preparation. Monitoring and evaluation is an essential component of pioneering activities. If the link between the prepared project and the pilot project is unclear, the pilot project becomes irrelevant. Alternatively, the first year of a project can be formulated as a pilot, with flexible, structured funding to enable trials of some of the strategies and staff training of aid agencies. The scale of the project can then be expanded gradually.

5.4. Learning

The fourth strategy is done by applying the whole project as a structured learning process. Thus, the focus is on learning by doing, modeling, and monitoring, evaluating, and refining systems with experience. The first phase of the reconstruction phase (pioneering) rehabilitation project has used a structured learning approach. During project preparation, on the preparation of a technical plan, the focus is on applying a responsive, demand-driven community-based approach. A limited number of technical designs are prepared for different technological options from one region to another. Through this process, consent to community plans has been reduced to a lesser extent.

6. Implementation Steps

6.1. Preparation Program

Preparation program includes socialization of concept and mechanism about implementation of rehabilitation and reconstruction to the parties involved from central to local level so that there are similarities of vision, mission and program strategy, also coordination and alignment in the implementation of rehabilitation and reconstruction of housing sector after West Sumatra earthquake at 30 September 2009. (Pranoto, S. et al, 2011)

Activities in the preparation of this program includes:

- Preparation of Technical Guidelines for Rehabilitation of Reconstruction and socialization materials.
- Program socialization and coordination at the district / city
- Provision of Provincial Management Consultant (KMP) and District / City Management Consultant
• Recruiting Technical Facilitators and Non-Technical Facilitators
• The formation of Community Assistance Team (TPM) is facilitated by the Head of Sub-District.
• Validation of damaged house data by TPM and Facilitator.
• The formation of community groups (Pokmas) consisting of 20-25 families per group.

The preparation phase of rehabilitation and reconstruction activities begins with a meeting between the Governor of West Sumatra with the Regents / Mayors, all SKPD of West Sumatra and TPR RR. The governor is very concerned about this activity and encourages this activity to run smoothly as planned.

6.2. Determining Targets
• Regent / Mayor determines the recipient areas of assistance, the priority of receiving communities and the allocation of the number of potential beneficiaries.
• Regent / Mayor shall issue the decree of beneficiary based on damaged housing data from the Building Assessment Team based on the criteria established by BNPB as well as the damaged house data of re-verification conducted by the Community Facilitation Team and the Facilitator.
• The Community Group holds meetings with the Pokmas members to determine the recipients of the assistance in turns or each individually by using of workers.

6.3. Community Preparation
Community preparation about training and understanding of the implementation of rehabilitation and rehabilitation programs is an activity that should not be ignored, because the community themselves will be able to utilize BLM funds and make improvements to their homes. In the preparation of community activities, it envolves: (Pranoto S. et al 2011)

6.3.1. Preparation of Non-Technical Activities
• Community meetings for the formation of Pokmas and its administrators
• Establishment of aid approval priority agreements at the Pokmas level.
• Account opening of POKMAS with 2 (two) specimen Pokmas administrators.

6.3.2. Preparation of Technical Documents
• Preparing for Technical Drawing.
• Preparation of the Budget Plan (RAB).
• Plans and stages of house construction.

6.4. Preparation of Administration
• Record of Group Formation, Pokmas Management and Establishment Priority of Proposed Activities (BA-PKPM & PPUK).
• Letter of Assistance Distribution Agreement (SPPB)
• Record of Withdrawal / Use of Funds (BAPPD)
• Request for Payment of Assistance (PPB)
• Receipts signed by the Pokmas coordinator
• Job Progress Report (LKP)
• Letter of Expenditure Responsibility (SPTB)
• Recapitulation of Fund Disbursement
• Letter of Direct Payment Request (SPP-LS)
• Letter of Direct Payment Order (SPM-LS)
• Employment Contract Form between KPA and Facilitator
6.5. Implementation Activities

According to the Technical Guidance of Rehabilitation and Reconstruction after an Earthquake in West Sumatra, the activities of the housing sector are preparation phase (preparation of Juklak Juknis, facilitator recruitment, facilitator training, public education), home improvement implementation, fund distribution, assistance / technical assistance and supervision. An approach to the implementation of home improvement is done through the empowerment of affected communities. The implementation of rehabilitation and reconstruction in detail as follows (Badan Nasional Penanggulangan Bencana, 2007):

- Dissemination and policy exposure, strategies and rehabilitation also reconstruction programs to the related government agencies.
- Recruitment of Technical Facilitators and Non-Technical Facilitators.
- A training for implementers and facilitators.
- Rehabilitation counselling programs of housing reconstruction to the affected communities.
- Validation of registered houses for reconstruction.
- The formation of community groups.
- Open a bank account for community groups.
- Preparing the shop drawings and cost budget plans.
- Distribution of Direct Community Assistance Fund (BLM).
- Implementation of rehabilitation and reconstruction.

Housing reconstruction based on shop drawings and cost budget plans that have been assisted by the government. Relief funds were transferred in 2 stages. Phase I consist of 50% of BLM funds and Phase II is transferred after they spend it at least for 30%. This is done to maintain accountability of BLM funds utilization. On their house reconstruction, they were accompanied by facilitators and TPM. While the process is executed by the services of masons and carpenters.

The community group members have been equipped with knowledge and the guidance of earthquake safe construction techniques. Utilization of government relief funds is preferred to work on the structure of the house (foundation, column / pole, roof frame and roof cover). As for the completion of housing rehabilitation will be completed by the owner.

BLM funds are just a stimulant support, so for a large sized house, it will not be able to complete the housing construction. However, for some of the community members who are capable or may have relatives to provide assistance, they can complete home improvements well and cost more than 3-4 times greater from the regular allocation of government relief fund.

There are hindrance to carrying out community housing reconstruction: First, a shortage of skilled workers who can actively and steadily working until it’s done. This happens because they have to working on stage IIA for 22,309 houses and stage IIB for 122,140 houses simultaneously in a budget year. Workers are forced to take turns working on house reconstruction.

Furthermore, we faced with an increase in the cost of manpower, which was originally Rp. 50,000 per day to a minimum of Rp.100.000 per day. Also, facilitator supervisors and TPM are not doing well so we can found so many results of unstandardized housing reconstruction based on earthquake safe building techniques and it need to be refined at many places. (Kementerian Bappenas, 2009)

7. Community Group as Local Wisdom

The community groups referred here are those relating to the organizational structure of the rehabilitation and reconstruction of community houses after the earthquake in West Sumatra 30 September 2009. We hoped that with this community group that consist of potential beneficiaries of funds from BNPB can be realized smoothly and produce optimal repairment under the guidance of TPM and the designated facilitators.

Actually, the community group that is abbreviated as Pokmas is another name of the form of mutual cooperation or togetherness as the identity of Minangkabau society. Because in Minangkabau they lived in groups that are part of identity in implementing their life philosophy.
Therefore, the natural existence of Pokmas in the utilization of rehabilitation and reconstruction assistance after the earthquake of 30 September 2009 is the realization of togetherness that is bonded by mutual teamwork spirit. So, the Minangkabau personal identity "saiyosakato" can accelerate the process of community housing construction in efficient and effective way in each district or city that affected by the disaster until it is done.

Therefore, we hope to feel the togetherness as the characteristic of Minangkabau. It has been proven; How the spirit of our elders used to build a gadang or adat house, build a mosque, build a hall, open agricultural fields, create a field to play football, conventional bath ledges and expressway system. It seems impossible, because at that time there is no convenient equipment like now, but the hard work and brilliant work that can produce extraordinary outcome. (Pranoto, S. 2007)

In Minangkabau, we know several terms related to mutual teamwork to realize something like; Mandatakan Parumahan (Flattening the ground for the construction of the house before installing the foundation), Batagak Kudo-kudo (Installing the roof frame, when the construction of the house is ready to install the roof), Baka wah Mambarasihsan Kapalo Banda (cleaning the irrigation while deliberation agreed begin to descend into the rice fields), Barodi (contributing to make new roads or emergency bridges), Badoncek (dues and compete to provide money assistance to build something an object or the implementation of an event in the family of a tribe). (Pranoto S, et al., 2011)

A power that born from the result of various potential synergies usually can be a mega tremendous power. There is no longer a high hill that cannot be climbed and there is no longer a deep chasm that cannot be descended, because something far can be close and the weight can be light. Everything solved with togetherness and mutual teamwork that grew out of a sincere initiative, because it is bound by a sense of destiny to rebuild a decent house for shelter by the rain and heat. A shelter for the living descendants that have been stricken by the natural disasters, an earthquake at 30 September 2009. If everything are united and earnest, it will solve various problems, because behind the distress, there must be a will and togetherness.

8. Results and Discussions
In recent year, the role of community becomes more important, especially for Indonesia that adopts centralistic government system. Consequently, many customary norms that were once effective in organizing and coordinating the behaviour of communal community members have been largely under-empowered. There are connections between customary norms in the regulation of communal community behaviour and its access to conservation efforts and the use of common property resources or in a narrower sense, to provide super effective local public goods, such as in forest management, grazing, fishing and irrigation systems, These are referred as "local common" or information delivery media, since in this local common characterized by the difficulty of members doing user cost-price charge, due to their inseparable technique (technological non-excludability) from Resources.

The role of local communities in managing local commons is certainly not to be overstated. But for enhancing the capacity of local communities to achieve their better role, it is an important issue to be solved in the current development review agenda. In popular view, we usually found the previous opinion states that the penetration of economic market activities into the subsystem-oriented community is expected to undermine traditional norms that contain institutions of mutual teamwork and mutual assistance also guarantee the subsistence needs caused by the state of poverty and the suffering because of impoverished rural communities.

Aside from a trusted model by enlighten mento philosopher such as Montesquieu, who reckon that traditional customs and community norms are oppressors of human thought and work, as of advocating the alternatives for market development to be viewed as a liberator effort. But these two opposing models share the same view from a normative perspective that communities and markets as mutually exclusive institutions.

On the other hand, the repeated inter-community member interaction are demonstrating about creating regulation endogenously (for social norms and community order) to coordinate the activities of the members, and the establishment of self-enforcement mechanisms, with no interference from the third
parties - and will become more efficient. In other words, community norms are informal institutions that can guide community members towards volunteer-cooperation output or alternatives, in fulfilling the objectives of empowerment in the broader sense.

In every effort of empowerment done by the government, global government or other parties, the effort must remain as a trigger to mobilize people's economic activity.

Efforts of community empowerment should be divided into five main points:

- Assistance of funds as venture capital,
- Development of infrastructure as a development of socio-economic activities of the people,
- Provision of facilities to facilitate the marketing of social activities,
- Training for officials and communities,
- Strengthening socio-economic institutions of society

The development process relies on the community more efficiently, effectively and sustainably because:

- Community group members can be more dynamic in developing activities, humanity values and social values, for example; honesty, sincerity, trustworthiness, sacrifice, togetherness, unity, mutual teamwork, solidarity between peers, and so on.
- Empowerment process runs more effectively and efficiently.
- There is a process of mutual care between fellow members.
- There is consolidation of joint forces between weak and strong in a community.
- Groups can develop and institutionalize joint responsibility, building character assurances between members, learning process / interaction between members, and developing member businesses.
- Reorientation of the bureaucracy to support community empowerment and investment in social capital through the participation of users in decision-making including rule formulation.
- Achieving a conformity between what people want and their ability to pay and manage, and what the aid agencies provide.

9. Conclusion

Indonesian government represented by the National Disaster Mitigation Management Agency (BNPB) has a central role in providing stimulant for disaster relief (BLM program). The disaster relief is specified for rehabilitating and reconstructing the damaged houses of communities. Besides, the BNPB also provides guideline/technical instructions, facilitates many parties involved in the project, and encourages rehabilitation and reconstruction activities. In addition, community rights are also protected.

However, the rehabilitation and reconstruction process had not actively empowered the society. Therefore, development reorientation approach has to be done as a new paradigm. The community oriented development gives opportunity for every community to participate in development process with equal opportunity. To obtain entire community involvement, many requirements have to be fulfilled such as equal opportunity and access as well as the ability of community to participate. As a consequence, the community has to be enthusiastic to take a role in rehabilitation and reconstruction process. In conclusion, the development concept has to be started with community empowerment.

10. Acknowledgement

The Authors acknowledge the financial support provided by the Universiti Teknologi Malaysia under International Doctorate Fellowship.

11. References

[1] Department of Settlement and Regional Infrastructure. Self-Reliance in Community Development Towards Sustainable Housing and Continuation. Indonesia Goverment Publishing Service; 2002.

[2] Direktorat Jenderal Perumahan dan Perumkiran. Proyek Penanggulangan Kemiskinan di Perkotaan. Bersama Membangun Kemandirian. Indonesia Goverment Publishing Service; 2003.
[3] G. Sumodiningrat, *Regional Development and Community Empowerment* (1st Edition, PT. Bina Rena Pariwara, Jakarta, 1996).

[4] J. E. Baez, and I. V. Santos, *On Shaky ground: The Effects of Earthquakes on Household income and poverty* (Research for Public Policy. MDGs and Poverty, UNDP, 2008).

[5] The State Ministry of National Development Planning / National Development Planning Agency. The Rehabilitation and Reconstruction of the Post Earthquake Territory in West Sumatra Province: Indonesia Government Publishing Service; 2009.

[6] Pemerintah Republik Indonesia. Undang-Undang Republik Indonesia No.24 tahun 2007, tentang Penanggulangan Bencana (Government Publishing Service; 2007).

[7] *Post Disaster Recovery Framework* (National Reconstruction Authority Government of Nepal, Kathmandu, 2016).

[8] S. Pranoto, *History of Rural Development in Indonesia* (Alfabeta, Bandung, 2007).

[9] S. Pranoto, Fauzan and S. Karimi, *Pembelajaran Rehab Rekon Gempa Sumatera Barat 30 September 2009* (PT. Gramedia Printing Group Palmerah Selatan St 22-28 Jakarta, ISBN 978-602-19476-0-9. 2011)

[10] T. Ophiyandri, D. Amaratunga, and C. Pathirage, “Advantages and Limitations of Community-based Post Disaster Housing Reconstruction Project,” UNISDR, (2010).

[11] The Project on Building Administration and Enforcement, *Capacity Development for Seismic Resilience*, 2010.