

# Issues and challenges in the implementation of public housing redevelopment projects due to earthquake

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**Abstract.** The post-earthquake housing redevelopment projects success will be much affected when facing with labor, technical staff and experts who are not competent in their field. Moreover, materials scarce supply can cause poor quality of work. At the same time poor community involvement and other important factors that may hinder the project success. Assessment needs also to be carried out in determining the level of damage, location and community conditions so that successful reconstruction can be achieved. This paper provides an overview of the issues and challenges in the implementation of public housing redevelopment projects due to earthquake. The methodologies adopted were mainly focusing on analyzing the information gathered through review of literature and observations made based on personal experience involving in housing redevelopment projects. It was discovered that the most common problem in post-disaster housing redevelopment is funding. In many instances the government is expected to provide funds earlier. Housing redevelopment project can be an opportunity for corruption which causes loss of project funding, injustice and community rights. Redevelopment projects require top managerial coordination to avoid the ineffectiveness and repetition. Effective policies and strategies are very important to ensure that people's lives are returned to a better condition and are able to withstand future disasters. Identification of ownership and loss of land documents needed to be identified to prevent the redevelopment process from being hampered and delayed. In order to ensure successful implementation of reconstruction projects issues and challenges that influence its success need to be addressed early.

## 1. Introduction

The damage and losses suffered by humans due to the earthquake has put this event into the category of natural disasters which caused the most losses. The damage that occurred normally centered on housing. Post-disaster redevelopment is part of a cycle of post-disaster periods, namely: the emergency phase, the redevelopment phase, the prevention phase, and the preparedness phase. Redevelopment projects are often faced with uncertainty and complexity and are believed to be the most challenging work among the four cycles of the post-disaster period. Although much assistance has come from government institutions, and non-governmental organizations, the number of redevelopment projects that have been completed remains low [1].

Barakat (2003) considered reconstruction of post-disaster homes as a basic need and is a form of human rights [2]. The same view was given by Pribadi et al. (2013) that the biggest impact of disaster is damage to community housing [3]. The rebuilding of housing will certainly provide basic needs for



the community so that it can encourage recovery in other sectors, such as the economy and the source of income affected by the disaster.

Understanding post-disaster recovery process has become a very important subject to be studied for especially those countries in the world that are vulnerable to various types of disasters. Increasing vulnerability factors make disasters often difficult to avoid and may give rise to higher reconstruction costs. Therefore, a comprehensive and sustainable understanding of effective and efficient post-disaster redevelopment is important.

In every event of disaster due to earthquake, the damage to people's homes is very large. This has a very bad impact on the community. Every post-disaster situation has its own uniqueness that is different in each disaster event. Disaster damage varies greatly from conventional construction to modern construction. Thus, post-disaster redevelopment process is complex, dynamic and uncertain and has many challenges. Redevelopment projects require planned and coordinated efforts from all parties for successful recovery for the affected population [4]. Each redevelopment project carries special challenges and must be handled based on case by case basis [5].

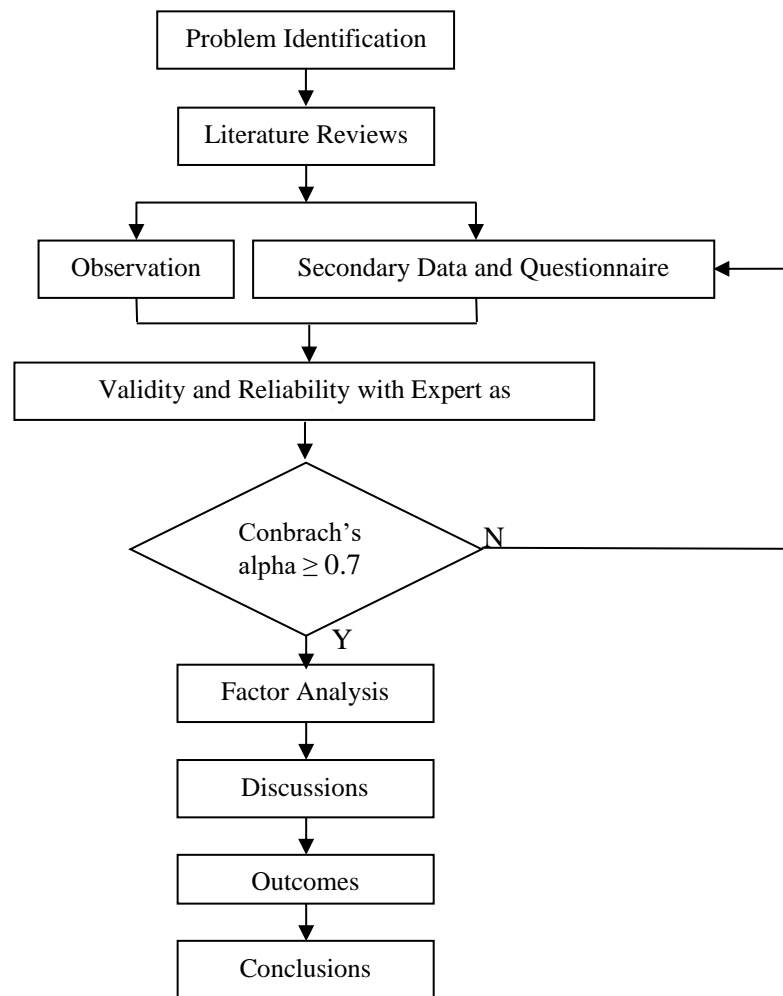
Recognizing that redevelopment projects are challenging and facing with many problems requiring these problems to be known in advance. Several previous studies have shown that when a redevelopment project is underway, several central issues need to be addressed to achieve the success of the redevelopment projects [6]. Shiozaki et al. (2013) reiterated that redevelopment cannot continue unless complex issues within the project are resolved [7].

Another main challenge in post-disaster redevelopment is how to efficiently carry out the redevelopment projects [8]. The transition from the emergency response phase to the redevelopment phase is the most critical stage in any disaster situation [9]. Haigh & Amaratunga (2010) describe that the ability to effectively overcome interdisciplinary challenges generated by disasters will significantly improve project efficiency [10].

## **2. Methodology**

To understand the implementation of reconstruction of houses damaged after earthquake, a macro approach was adopted. This method involves collecting information from the relevant literature as case studies. The author's involvement as a consultant for the Technical Support Team (TST) after the earthquake provided a very valuable source of information needed in this study.

The methodology of this research involved reviewing the literature, collecting data from secondary sources, observing and analyzing the information from personal involvement in redevelopment projects and discussing the main findings as shown in the Figure 1 below.



**Figure 1.** Methodology.

**3. Issues and Challenges in RedevelopmentProjects**

It cannot be denied that the issues and challenges in redevelopmentprojects will differ between project locations [5].Common issues and challenges are:

1. Build back better

The ongoing process of redevelopment and recovery has significant opportunities to ensure that communities are "build back better" than they were before the disaster [11]. As stated by Ophiyandri et al. (2013) "build back better" refers to superior development than before and is able to withstand future disasters. "build back better" leads to improvements in the implementation of structural design to achieve efficiency and effectiveness in the redevelopmentprocess [12].

2. Policy and strategy

Policies and strategies are very important for long-term redevelopmentefforts [13]. The responsibility for creating and practicing redevelopmentpolicy depends solely on authority [14].

3. Coordination

The redevelopmentproject demands a high level of coordination and careful management of the managerial approach as stated by the [15]. Poor coordination will result in repetition of actions and ineffective use of funds [16].

#### 4. Corruption

Redevelopment projects are also opportunities for fraud and corruption which have resulted in huge losses in project funding that have affected the overall reconstruction activities [17]. Perera-Mubarak (2012) concluded in his study that corruption after the tsunami had a bad impression, lack of rights to use resources, injustice in the allocation of aid and damaged system support [18].

#### 5. Resource challenges

Generally, redevelopment project resources are not well organized in a short time [19]. Redevelopment party will be burdened when faced with sudden increases in labor, and scarce material supplies [11]. The challenges of this resource also cause difficulties in following the work schedule according to the time of implementation [20]. Therefore, to ensure effective reconstruction performance, the parties involved must understand the importance of factors that interfere with the availability of resources [21].

#### 6. Lack of technical staff

For the management of large redevelopment projects and demanding complexity, reconstruction implementers need competent and experienced staff, inadequate technical staff often results in the failure of reconstruction projects [22]. The shortage of technical staff and competent experts is the main problem that must be addressed in redevelopment projects [5].

#### 7. Challenges in community participation

Community involvement in each activity is an important element in achieving the success of post-disaster redevelopment projects [19]. Communities have a very special role in all stages of post-disaster redevelopment which ultimately determines the success of the project [23].

#### 8. Initial assessment

Immediately after a disaster struck, the initial assessment was carried out to obtain the level of damage, the number of damaged houses, category of houses, location and condition of the people affected by the disaster [24].

#### 9. Funding for redevelopment

After the disaster struck it is often faced with large numbers of refugees. Therefore, it is expected that the government will provide redevelopment funds for permanent housing [25]. According to [26], the most common problem found at the beginning of the reconstruction was funding for redevelopment. A case study conducted by [27] in Ghana for post-disaster redevelopment activities revealed that inadequate funding was a major challenge and the same situation faced by the redevelopment project.

#### 10. Quality of work

Problems with material shortages [28], poor quality of materials [29], and poor workmanship [30] resulted in poor quality implementation of redevelopment projects. Poor quality of work is a major cause of many casualties in developing countries [22].

#### 11. Land Ownership

Property protection rights are a high priority after a disaster [16]. Land-use changes caused by disasters to identify properties is highly complex related to land ownership. Loss of land documents causes delays in the redevelopment process [31]. Some beneficiary want to build their homes quickly, but the house documents have been destroyed by the disaster, thus becoming a barrier in restoring land properties [5].

### **4. Redevelopment Projects in West Sumatra - Indonesia**

After the West Sumatra earthquake in 2009, the Supporting Team for Technical Reconstruction Rehabilitation (TPT RR) was formed based on the Decree of the Head of BNPB No SK. 109/BNPB/XI/2009 November 20, 2009, which was directly responsible to the Head of BNPB and supported by the Governor of West Sumatra in the implementation of rehabilitation and reconstruction.

The Technical Support Team consists of elements from the National Disaster Relief Agency (BNPB), related elements of the Regional Work Unit (SKPD) and elements of higher education. Technical Support Team (TPT RR) BNPB functions to strengthen local government in data collection, planning, funding including foreign aid, facilitation and coordination, reporting/information/media relations, supervision, monitoring and evaluation.

TPT-RRT duties include:

1. Formulate strategies and operational policies for the rehabilitation and reconstruction of the region after the earthquake in West Sumatra Province.
2. Arrange in detail the steps to accelerate the rehabilitation and reconstruction of the region after the earthquake in West Sumatra Province.
3. Assisting in coordinate the implementation of rehabilitation and reconstruction in accordance with the general policy of the rehabilitation and reconstruction of the region after the earthquake in West Sumatra Province.
4. Monitoring and evaluating the implementation of rehabilitation and reconstruction.

The implementation of redevelopment projects still faces with many problems and challenges. The agency that responsible for the West Sumatra housing reconstruction program which began in 2010 and handled 114,000 house reconstructions reported that the TPT RR struggled to meet the project schedule. The main source of delays comes from coordination issues and funding sources. In addition, late work completion had caused cost overruns and vice versa. Also reported a lot cases of implementation failures as a result of insufficient funding. In general, the common issues and challenges in redevelopment projects can be summarized as follow:

#### *4.1. Cost overrun*

The increase of construction materials price was caused by an increase in construction activities. As a result, the price of building materials in places like West Sumatra surged by almost 50%. The shortage of skilled labor also contributes to the escalation of costs [30, 32]. Another factor is the problem of transportation where many roads have not been able to be accessed smoothly. As a result, transportation costs are high [13]. In addition, poor workmanship also contributes to cost overruns and is exacerbated by low supervision during the construction process.

#### *4.2. Poor quality*

Along with the late housing completion in the reconstruction project, other complaints are related to quality and design issues, poor coordination and communication between contractor and beneficiaries. Difficulties are also faced in building houses having quality standard that satisfy all beneficiaries. Due to the lack of standards, the housing development program is not balanced both at the level of completion or in the level of quality. In general, low contractor capacity and poor supervision have caused poor construction quality.

#### *4.3. Dissatisfaction*

The majority of beneficiaries were not satisfied with the provided housing. Delays and low-quality construction contribute to this. Satisfaction is closely related to the beneficiaries' feelings. Good quality housing to the developer may sometimes do not meet their expectations and needs of the potential house owner. A simple example is that one recipient of the completed house might expect his house to be painted, whereas, the house is not painted. Because expectations do not meet the needs of the recipient there will be a significant level of dissatisfaction. This indicates that housing reconstruction project must be managed carefully and understanding how to meet the expectations and needs of the potential house owners is very important. Without communication with the beneficiaries, expectations cannot be identified. To avoid this problem, the community must be actively involved in the reconstruction process. Therefore, community participation is important, and by involving disaster-affected communities in the reconstruction process, the level of satisfaction is more likely to be fulfilled.

## 5. Overcoming Issues and Challenges

With the emergence of various issues and challenges, comprehensive steps are needed in housing reconstruction projects. Efforts that can be made in overcoming these obstacles include increasing coordination in the context of integration of planning and synchronization of programs and budgets, including evaluating progress in the implementation of reconstruction, drafting various regulations needed to accelerate reconstruction, while prioritizing aspects of justice, good governance, and increasing institutional capacity and human resources.

After taking into account the conditions and situations in the proposed reconstruction project, then the reconstruction strategy is determined as follows: identifying, mapping and certifying land, preparing spatial planning at the environmental, city / district, and regional or provincial levels, and provide assistance and build housing for affected communities.

To implement the above strategy, policies on handling land issues are needed, especially those related to spatial planning. At the same time the resolution of legal issues including land, the implementation of certainty in the supply of building materials, especially timber, including other alternative materials, and the smooth distribution of building materials and other logistics must be addressed properly.

### 5.1. Society participation

Communities have an important role in ensuring the success of post-disaster reconstruction project, because their input is critical for the successful implementation of reconstruction project. The community has special role in all stages of post-disaster reconstruction which serve as an indirect reconstruction project management team.

### 5.2. Assessment

The initial assessment is carried out to obtain an initial figures of the amount of damage, the number of damaged houses, the category of housing, location and condition of the people affected by the disaster. The failure in making initial assessment can increase the chances of other hazards. Assessment is carried out not only to provide the data needed, but also to help others determine whether to provide assistance or find various other countries that can assist with the project funding.

### 5.3. Funding

Funding is one of the main problems that must be solved to achieve the success of reconstruction project. The most common problem found at the beginning of the reconstruction project is lack of funding which resulted in many project failures.

### 5.4. Quality of work

There are many demands from affected people with regard to the level of quality of housing provided. Common problems encountered are poor quality of material and poor workmanship. Therefore, workmanship and quality of finished work are two important issues that must be resolved.

## 6. Conclusion

The implementation of redevelopment projects especially in developing countries are still facing many issues and challenges. Low government capacity can influence the policies and strategies of housing redevelopment programs. Thus, in reducing the likelihood of this occurrence, increasing government capacity is needed. This can be done by creating a post-disaster housing redevelopment project training program. In this training, the basics of a general post-disaster reconstruction program need to be taught and explained. Providing lessons learned from selected case studies will also be useful. The problem of lack of technical staff can also be reduced by providing training for them. Similarly, to increase labor capacity, regular training for workers must be carried out systematically.

Policies / strategies for implementing post disaster redevelopment set by the government must be comprehensive. Problems with communication and coordination, the processes carried out in damage assessment, methods of valuing housing that are not standardized occur because of poor reconstruction

policies / strategies. The government must clarify the roles and responsibilities of each stakeholder involved in the reconstruction program, establish clear and simple methods for coordination and communication, and prepare standard assessment methods. Strong policy is needed as having strong policies will enable the government to encourage other organizations that come to affected areas to follow standard assessment methods.

Funding procedures for redevelopment programs must clear and transparent. To attract donors who will provide assistance for redevelopment programs, the government must convince donors that these funds will be spent with clear transparency and accountability. The problem of rising material prices is an event that usually occurs after a disaster. This is because the demand for materials is higher than the existing supply. Thus, the government is urged to control material prices and ensure that demand and supply are balanced. For housing materials that can be produced by the home industry, such as bricks, providing equipment and training to the community about how to produce it will be profitable. It is understandable that the procedure for disbursing government budgets is a complicated problem and must go through a long process. However, an exception must be made for the redevelopment programs. Thus, the government must create a clear and simple mechanism for channeling funds especially for post-disaster housing redevelopment.

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