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RECONSTRUCTING POST-EARTHQUAKE SETTLEMENT USING COMMUNITY DELIBERATION PARTICIPATION APPROACH IN YOGYAKARTA-INDONESIA

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Abstract

An earthquake occurred in 2006 at Yogyakarta which damaged 209,494 buildings and caused the death of 4,143 people. A post-disaster settlement reconstruction covering all settlement facilities and infrastructure was initiated using a participatory approach which involved the targeted residents in the process of mapping the conditions, potentials, and resources of the region. It is, however, important to evaluate the effectiveness of this reconstruction method to reduce the impacts of such disaster in the future. Therefore, this research was conducted to focus on the forms, levels, and driving factors of citizen participation at each reconstruction stage. A qualitative descriptive method was employed through the use of observation and the findings showed that citizens were involved in the process by attending and participating in *rembug warga* forums, suggesting ideas, donating funds, and serving as personnel at the socialization, planning, and implementation stages. The reconstruction led to the construction of quality residential infrastructure and facilities due to the systematic and integrated coordination of the *rembug warga* forums.

Keywords: Post-disaster, Settlement, Reconstruction, Infrastructure, Community, Participation

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INTRODUCTION

Natural disasters are difficult to predict but several efforts are usually implemented to minimize their risk and impact. One of the methods to sustain a community after these disasters is through reconstruction and this has been reported to be hindered by the use of conventional top-down policy-making approach which is not understood or trusted by local residents. Therefore, a more cooperative and trustful approach involving the participation of residents in the decision-making and planning process of reconstruction is required to be intensified (Zhang, 2015). Moreover, one of the principles of the United Nations Development Programme is to “identify the need and priorities of affected populations by creating participatory processes that involve communities themselves in decision-making, service delivery, and recovery” (UNDP, 2016). Cartes showed the possibility of minimizing the impact of disaster by planning a risk map which involves people at risk in order to create resilient residents with the understanding and awareness of future disasters (Cartes, 2018). The planning process was also reported by Yu & Gao (Yu, 2013) to include effective steps towards reducing risks while the natural disaster risk assessment was observed by Yin (Yin, 2011) not to have specified general procedures and programs. However, the involvement of citizens is useful in identifying risks to be used as input in post-disaster settlement zone planning (Nasrollahi, 2018). This, therefore, means a community-based disaster preparedness approach is an important element in designing a management strategy, especially to reduce vulnerability (Allen, 2006).

Disaster mitigation strategies, both on a macro and micro scale, are used in improving the quality and quantity of post-disaster settlement infrastructure (Behnam, 2014). Moreover, the rehabilitation and reconstruction processes designed with consideration for risk-minimizing factors require quality control which is very important to the successful implementation of a community-based approach (Huda, 2007). Citizen participation is an important element in comprehensive planning (Ling, 2006) and also a driving force for residents’ resilience to develop their residential areas, increase regional independence, overcome local crises (Song, 2018). It empowers and promotes behavioral changes in citizens (Murota, 2014), and also ensures successful management of the risks associated with disasters (Samaddar, 2017). Furthermore, the involvement of the community in planning housing reconstruction was emphasized and this led to the establishment of a zone for reconstruction. The linking of disaster risk awareness and preparedness activities to local cultural events has also been reported to be extremely effective in maintaining preparedness culture (Ishiwatari, 2014). This shows that people have a significant role and influence at different stages of disaster management using a community-based approach. Organizational development and strengthening of crisis-coping

skills are, however, two key components to improve their participation during crises (Valibeigi, 2019).

Citizens with high physical, human, and social capital are better prepared and more responsive to disasters (Buckland, 1999) while communities with substantial cohesion and a good sense of identity have the ability to spontaneously organize post-disaster reconstruction through collective action in the absence of government resources and support (Li, 2019). Their involvement is considered effective due to the possibility of an increase in income, acquisition of construction skills, and improvement in awareness of natural disasters through the working processes (Abe, 2018). Community participation, generally, refers to the involvement of people in setting goals, preparing, implementing, and evaluating plans and programs on any project implemented to solve problems or develop their socio-economic conditions. They derive motivation to work together based on the sense of community and recognition of the benefits attached to their involvement (Hossain, 2012).

The concept also requires the significant impact of non-profit organizations as partners in every disaster risk reduction activity (Bajek, 2008) and this means collaboration or partnerships among stakeholders is required for effective improvement of disaster risk management process (Prashar S., 2018). Several measures have been adopted by the governments to encourage better communication between policymakers and local residents as observed in the funds provided to NGOs to participate in post-disaster reconstruction but these efforts have been primarily concentrated on enhancing community cohesion (Cho, 2014). Meanwhile, it is possible to understand the vulnerability, danger, and resilience associated with disasters through the involvement of affected parties in the process (Van Niekerk, 2018). This means participatory planning is important to the provision of the data needed to improve the existing conditions of a particular place (Hendricks, 2018). Furthermore, people-centered housing recovery was defined as a concept requiring residents to play a central role in making reconstruction decisions. It also supports owner-driven and/or self-built reconstruction and broadly involves policy, process, and housing design. The concept which is often used interchangeably with terms such as “owner-driven” and “self-built” is closely connected with the participation of local people in the planning and design process (Maly, 2012) (Maly & Shiozaki, 2012). Meanwhile, the post-earthquake rehabilitation and reconstruction process implemented in Yogyakarta used a settlement arrangement based on citizen participation as the planning approach.

Aisyah Abu Bakar proves that community movement is a significant personal empowerment outcome (Aisyah Abu Bakar M. M., 2019). According to Aisyah Abu Bakar, appropriate design strategies can improve and sustain well-being through instilling a sense of empowerment, leading to positive relationships

among space occupants (Aisyah Abu Bakar M. M., 2019). Noralfishah Sulaiman stated that those who could not prevent disasters entirely but their impacts and severity could be lessened by applying specific frameworks (Noralfishah Sulaiman, 2019). Rahsidi focuses on the inclusiveness of Disaster Risk Management. The study assesses proactive adaptation of the Early Warning System (EWS) for Disaster Risk Reduction Program in Bertam Valley. The study aims to identify community preferences as an initiative to improve the effectiveness of the EWS system. To sustain the awareness and preparedness of EWS, continuous involvement by the community is necessary to make them resilient (Rahsidi Sabri Muda, 2018). Disaster is a significant threat that could jeopardize the development of economic, social, and physical elements of a nation and its people's well-being. The damage and loss of property and life caused by disasters are overwhelming and least desired by any country. Noraini Omar Chong identified three major issues and challenges in DRM in Malaysia, particularly from agencies' perspectives. These issues and challenges include (Noraini Omar Chong, 2018): a) Disaster management planning imbalanced between top-down and bottom-up approaches, b) Lack of coordination in disaster management cycle, with greater focus only on the disaster emergency response stage, c) Lack of planning of long-term recovery (post-disaster) resulted in low-level community low-level holders' resilience to disasters.

DESCRIPTION OF LOCATION AND PROBLEM

Panjangrejo Village is located in Pundong sub-District, Bantul Regency, Yogyakarta, Indonesia. This sub-district was, however, the epicenter of the tectonic earthquake experienced on May 27, 2006, where 4,143 people died, 26,299 seriously injured, 71,763 houses destroyed, 71,372 houses severely damaged, and 66,359 houses slightly damaged (Bantul District Government, 2011). This led to the need to acquire knowledge on risks associated with disasters and their handling process. Meanwhile, the settlements in Panjangrejo Village have been rehabilitated and reconstructed for over 10 years since the Settlement Arrangement Plan document was established in 2010. This study was conducted to answer the question “what are the forms, levels, and factors driving citizen participation from the preparation to the reconstruction evaluation stages of post-disaster reconstruction of settlements?”

RESEARCH METHODS

The descriptive qualitative method was used in this research with the data collected by interviewing community leaders and villagers from September to October 2019 and analyzed based on the level of citizen participation identified in the Preparation, Planning, Implementation, and Evaluation Phases. The Citizen Participation variable was measured using eight levels of participation according

to Sherry Arnstein which are Manipulation, Therapy, Informing, Consultation, Placation, Partnership, Delegated Power, and Citizen Control. These were further divided into three groups which are (1) Non-participation, (2) Degree of tokenism and (3) Degree of Citizen Power (Arnstein, 1969). The non-participation group is a level which is not in the true sense and it consists of manipulation and therapy, the Degree of Tokenism group is the level considered not serious which consists of informing, consultation, and placation while the Degree of Citizen Power group consists of Partnership, Delegated power, and Citizen control. The measurement scale for the eight levels of citizen participation was adjusted to the number of indicators at each stage (see Table 1).

Table 1: Citizen Participation Measurement Scale

No	Level of Participation	Score 1 indicator Interval	Score 2 indicators Interval	Score 3 indicators Interval	Score 4 indicators Interval
(1)	(2)	(3)	(4)	(5)	(6)
8	Citizen Control	571 – 640	1.401 – 1.280	1.711 – 1.920	2.281 – 2.560
7	Delegated Power	501 – 570	1.001– 1.140	1.501 – 1.710	2.001 – 2.280
6	Partnership	431 – 500	861– 1.000	1.291 – 1.500	1.721 – 2.000
5	Placation	361 – 430	721– 860	1.081 – 1.290	1.441 – 1.720
4	Consultation	291 – 360	581– 720	871 –1.080	1.161 –1.440
3	Informing	221 – 290	441– 580	661 – 870	881 – 1.160
2	Therapy	151 – 220	301– 440	451– 660	601 – 880
1	Manipulation	80 – 150	160 – 300	240 – 450	320 – 600

Source: Studio, 2020

RESULT AND ANALYSIS

Panjangrejo villagers have the habit of holding *Rembug warga* to discuss common problems and the activities usually include deliberations, conveying aspirations, and making decisions. The level of citizen participation in this meeting was measured by interviewing 80 people used as respondents. The interview includes several stages such as Preparation with 2 indicators, Planning with 4 indicators, Implementation with 4 indicators, and Evaluation with 3 indicators and the results obtained concerning the level of citizen participation in *Rembug warga* at the Preparation Stage is presented in Table 2:

Table 2: Level of Citizen Participation in the Preparation Stage

No.	Indicator	N	Average Score	N x Score
(1)	(2)	(4)	(6)	(7)
1.	Attendance in <i>rembug warga</i> activities.	80	5.7	456
2.	The level of activeness in discussing and conveying ideas during <i>rembug warga</i> activities.	80	5.6	448
Total N x Score				904

Source: Studio, 2020

The total score of citizen participation level based on attendance at the *rembug warga* activity was 456 and this is included in the Partnership level using Table 1 Column 3 which is for 1 indicator. This means the residents at the *rembug warga* activities during the preparation stage negotiated effectively with the facilitators or partners and this made it possible for them to influence every decision. Moreover, the total score based on activeness while discussing and conveying ideas was 448 and this is also in the range of Partnership level. It shows the residents have a good direction and development ideas, are accountable, and have an influence on the activities at the preparation and later stages. The total score for both indicators at the preparation stage was 904 and this was also found to be at the Partnership level based on Table 1 Column 4 for 2 indicators and observed to be at the Citizen Power group. The results of the interviews obtained from the respondents at the planning stage with the scoring scale are presented in Table 3.

Table 3: Level of Citizen Participation in Planning Stage

No.	Indicator	N	Average Score	N x Score
(1)	(2)	(4)	(6)	(7)
1.	Attendance in <i>rembug warga</i> activities.	80	5.91	473
2.	The level of activeness in discussing and conveying ideas during <i>rembug warga</i> activities.	80	6.08	487
3.	The level of willingness to donate funds.	80	6.47	518
4.	The level of willingness to contribute energy.	80	6.16	493
Total N x Score				1971

Source: Studio, 2020

The total score of citizen participation level based on the attendance indicator at the *rembug warga* activity for the Planning Stage was 473 and this was also included in the Partnership level using Table 1 Column 3 for 1 indicator. This means attendance at *rembug warga* activities made the residents have good

working relationships with government and partners and this allowed them to influence the planning process. Moreover, the total score for the activeness level in discussing and conveying ideas was 487 and this is also included in the Partnership level using Table 1 column 3 for 1 indicator while citizen's willingness level to contribute funds is 518 and included in the Delegated Power level. This shows the citizens have full authority in managing finances, have the ability to establish direct relationships with sources of funds without going through third-party intermediaries, and participated significantly in ensuring accountability for the activities. Furthermore, the total indicator score for the level of citizens' willingness to contribute energy was 493 and this is included in the Partnership level using the same standard with previous indicators. This means the energy contributed aided the planning process. The total score for the four indicators at the planning stage was, however, recorded to be 1,971 and also included in the Partnership level with full authority according to Table 1 column 6 for 4 indicators. Therefore, the program was produced using the suggestions and decisions from residents during the *rembug warga* activities while the partnership level was observed to be the Citizen Power group. The results of the interviews obtained from the respondents at the implementation stage with the scoring scale are presented in Table 4.

Table 4: Level of Citizen Participation in the Implementation Stage

No.	Indicator	N	Average Score	N x Score
(1)	(2)	(4)	(6)	(7)
1.	The level of willingness to allow land use for development	80	5.60	448
2.	Level of willingness to contribute funds	80	6.11	489
3.	The level of willingness to contribute energy.	80	6.58	527
4.	The level of willingness to contribute materials/ goods.	80	6.33	507
Total N x Score				2011

Source: Studio, 2020

The total score for the level of citizen participation based on the people's willingness to allow the use of their land as a development location was 488 and included in the *Partnership* level according to Table 1 Column 3 for 1 indicator while the contribution of funds was recorded to be 489 and included in the same *Partnership* level. Moreover, citizens' willingness to contribute energy was found to be 527 and included in the *Delegated Power* level based on the same table used for the other indicators. These results showed the residents played an active role in controlling the course of development effectively and were able to overcome

problems during the process of implementation through labor contributions. Meanwhile, the total score of citizens' willingness to contribute materials/goods was 507 and included in the *Delegated Power* level using the same table. This score exceeds the initial estimate considering the social status of the residents which are majorly farmers but with a high willingness to donate goods to support the development. The total score of all indicators in the implementation stage was 2,011 and this was observed to be at the level of *Delegated Power* based on Table 1 column 6 for 4 indicators. This level is, however, part of the *Citizen Power* group and shows the citizen participation was active with full authority. The results of the interviews obtained from the respondents at the evaluation stage with the scoring scale are presented in Table 5.

Table 5: Citizen Participation Level in Evaluation Stage

No.	Indicator	N	Average Score	N x Score
(1)	(2)	(4)	(6)	(7)
1.	Attendance level in <i>rembug warga</i> activities	80	6	480
2.	The level of activity in discussing and conveying ideas.	80	6.03	483
3.	Level of willingness to donate funds.	80	6.47	518
Total N x Score				1481

Source: Studio, 2020

The total score for the level of citizen participation based on attendance at each *rembug warga* activity was 480 and included in the *Partnership* level according to Table 1 Column 3 for 1 indicator which means the residents participated actively. The total score through active discussion was recorded to be 483 and also included in the *Partnership* level while the willingness to contribute funds was found to be 518 and included in the level of *Delegated Power*. This level indicates the residents maybe have limited funds but tried their best to participate in the development program. Moreover, the total score for all indicators at the evaluation stage was 1,481 and included in the level of *Partnership* and the *Degree of Citizen Power* group according to Table 1 column 5 for 3 indicators. Therefore, the residents have a big concern and responsibility in the development process and participated actively and voluntarily.

CONCLUSION

The participation of citizens during the preparation stage was discovered to be between attendance at *rembug warga* activities and conveying ideas, the planning stage varied between attendance at *rembug warga* activities, conveying ideas, voluntary funding, and labor contributions while the implementation stage had voluntary labor and fund donations and the evaluation stage involved a sense of

responsibility and respect for the development process. The preparation stage was found to be at the *Partnership* level and included in the *Citizen Power* group while the same level was observed for the planning stage but the donation of funds was included in the *Delegated Power* level. Moreover, the implementation stage, especially permission to use land and fund donations, was included in the *Partnership* level while land use, labor, and goods donations indicators were categorized as the *Delegated Power* level and this belongs to the *Citizen Power* group. Meanwhile, the participation at the evaluation stage, especially in the form of attendance at community consultation activities and discussions and conveyance of ideas, was included in the *Partnership* level while the willingness to donate funds was included in the *Delegated Power* level. The overall participation at the evaluation stage was in the *Partnership* level and classified as the *Citizen Power* group as shown in Table 6.

Table 6: Conclusion of Citizen Participation

No.	Development stage	Indicator	Score	Participation Rate
1.	Preparation Stage	Level of attendance in <i>rembug warga</i> activities.	456	Partnership
		Level of activity in discussing and conveying ideas in <i>rembug warga</i> activities.	448	Partnership
Total			904	Partnership
2.	Planning Stage	Level of attendance in <i>rembug warga</i> activities.	473	Partnership
		Level of activity in discussing and conveying ideas in <i>rembug warga</i> activities.	487	Partnership
		Level of willingness to donate funds.	518	Delegated Power
		Level of willingness to contribute energy.	493	Partnership
Total			1.971	Partnership
3.	Implementation Stage	Level of willingness to allow land use.	488	Partnership
		Level of willingness to donate funds.	489	Partnership
		Level of willingness to contribute energy.	527	Delegated Power
		Level of willingness to donate materials/goods.	507	Delegated Power
Total			2.011	Delegated Power

	Level of attendance in <i>rembug warga</i> activities.	480	Partnership
4.	Evaluation Stage	The level of activity in discussing and conveying ideas in <i>rembug warga</i> activities.	483 Partnership
		Level of willingness to donate funds.	518 Delegated Power
Total		1.481	Partnership

Source: Studio, 2020

The activities of the *rembug warga* were found to be the driving factor determining the level at which the citizens participated at every stage of the post-earthquake settlement reconstruction process. The activities supported citizen participation in the preparation, planning, implementation, and evaluation stages, and their effectiveness was reflected in the activeness of the respondents.

SUGGESTION

Rembug warga activities are important to the successful post-earthquake reconstruction in Yogyakarta and considered a habit conducted "by the residents and for residents" to become an element of local wisdom in building a synergy of cooperation between government, partners, and residents. These activities are, however, expected to be the model for the post-disaster reconstruction activities in other areas.

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