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[Sunarharum, Tri Mulyani, Sloan, Mellini, & Susilawati, Connie](#)  
(2014)

Community engagement for disaster resilience : flood risk management in Jakarta, Indonesia. In

*ANDROID Residential Doctoral School and the 4th International Conference on Building Resilience*, 8-11 September 2014, MediaCityUK, Salford Quays, United Kingdom.

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# Community Engagement for Disaster Resilience: Flood Risk Management in Jakarta, Indonesia

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## ABSTRACT

Understanding dynamics of interactions between community groups and government agencies is crucial to improve community resilience for flood risk reduction through effective community engagement strategies. Overall, a variety of approaches are available, however they are limited in their application. Based on research of a case study in Kampung Melayu Village in Jakarta, further complexity in engaging community emerges in planning policy which requires the relocation of households living in floodplains. This complexity arises in decision-making processes due to barriers to communication. This obstacle highlights the need for a simplified approach for an effective flood risk management which will be further explored in this paper.

Qualitative analyses will be undertaken following semi-structured interviews conducted with key actors within government agencies, non-governmental organisations (NGOs), and representatives of communities. The analyses involve investigation of barriers and constraints on community engagement in flood risk management, particularly relevant to collaboration mechanism, perception of risk, and technical literacy to flood risk. These analyses result in potential redirection of community consultation strategies to lead to a more effective collaboration among stakeholders in the decision-making processes. As a result, greater effectiveness in plan implementation of flood risk management potentially improves disaster resilience in the future.

**Keywords:** community resilience, decision-making processes, flood risk management, relocation, community engagement.

## INTRODUCTION

There is an increasing intensity of disasters globally, particularly in East Asia-Pacific region (Jha and Stanton-Geddes, 2013). Cities in the region, which are growing rapidly, are becoming increasingly vulnerable to disasters, one example is Jakarta. Urbanisation in Jakarta increases the demand for land use while the land availability is limited. This obstacle led to the emergence of informal development in flood-prone areas with high exposure of flood risk, for instance, residential area in the Ciliwung River banks, inhabited by low-income or poor people.

Consequently, adaptation strategies to cope with flooding plays a crucial role in managing flood risk, such as relocation. Relocation is perceived and considered to be the best option to reduce vulnerability to the risk of disaster, especially relevant to the vulnerability of informal settlements in areas with high exposure to flood risk (World Bank, 2004; World Bank, 2010). However, this strategy poses enormous challenge in decision-making of the design process and implementation. Community engagement in decision-making of this strategy is complicated by barriers to communication, including: characteristics inherent to top down governance; technical literacy of affected populations relative to flood risk (Faulkner, et al., 2007; World Bank, 2011c;

Dickson et al., 2012); and potential disconnects between perceptions and desires within government institutions and the communities (World Bank, 2011b; EMQ, 2012). Consultations with communities living in flood-plains occurs primarily top-down, from government to the communities. In the absence of effective consultation, communities may not cooperate in the relocation, or may end up with reduced resilience as a consequence of severing of social networks necessary especially during disasters.

Communication and coordination between government institutions and communities is crucial to ensure the effectiveness of flood risk management policies and programs and increase community resilience (Faulkner, et al., 2007; Katsuhama and Grigg, 2010; Jha and Stanton-Geddes, 2013). Unidirectional consultation strategies, with information flowing only from government and NGOs to the community, exclude local knowledge of conditions and community needs, and inadvertently decrease the effectiveness of design and implementation of flood risk management. This research empirically investigates barriers and constraints to increasing the effectiveness and efficiency of flood risk management by engaging in dialogues with government and NGOs as well as community groups. This research has practical relevance to improve the community resilience relevant to Jakarta flood risk management. It will also contribute to collaborative planning theory, expanding on understandings of power sharing in plan development and implementation.

### **The Case Study**

Administratively, Jakarta exists not as a city but as a province with special status as the capital of Indonesia, named as Daerah Khusus Ibukota (DKI) which means a Special Capital Region. Jakarta is located in a deltaic plain of thirteen natural rivers and more than 1,400 km of man-made waterways (BPBD DKI Jakarta, 2013). As mentioned before, Jakarta is challenged by urbanisation and is increasingly vulnerable to disaster, especially flooding. This dilemma is exemplified by flooding in 2013 and flooding in 2014 which lasts longer than the previous year (BPBD DKI Jakarta, 2014).

Jakarta's chronic housing shortage poses multiple challenges for contemporary policy-makers (Sunarharum et al., 2013) and leads to the occurrence of informal settlements along Ciliwung River bank. Kampung Melayu Village, as a case study, is one of the villages located in flood-prone area in Ciliwung River bank. In 2014 flooding, Kampung Melayu Village is one of the most affected areas in which the water level reached two to five meters high and there are 10,000 affected, which is 15% of the total affected people in Jakarta people (BPBD DKI Jakarta, 2014). This significant flooding event is frequently forcing evacuation of portions of the community. Bambang Surya Putra, Informatics Section Head of Jakarta Province Disaster Management Agency (personal communication, 13 January 2014) confirmed that Jakarta flooding is as a result of accumulation of water run-off from upstream region. The accumulated water run-off has complicated the capacity of the drainage channels and the rivers, including Ciliwung River as the main river.

In response to flooding events, Ciliwung–Cisadane River Basin Agency (BBWS-CC), under Ministry of Public Works Indonesia, proposed and designed the normalisation of Ciliwung River to optimize the Ciliwung River's function in managing flooding based on the river capacity for is an extreme flow event with a hundred year return period, called  $Q_{100}$  (BBWS-CC, 2013). This normalisation plan requires river widening, including 50 meters of river's wide and 7.5 meters of inspection pathways' wide in both sides of the river (BBWS-CC, 2013). Also, Government of DKI Jakarta would strictly implement regulation of Indonesian Government Number 38 year 2011, stating that 15 meters delineation from both sides of the river is served as buffer areas between the river ecosystems with mainland, which does not allow any development on it.

Increasingly, the implementation of Ciliwung River normalisation plan and clearance of 15 meters radius from both sides of the river is followed by relocation of communities living in the Ciliwung river banks, including communities living in the Kampung Melayu Village.

The normalisation plan affects 4,000 families (Suryanis, 2014) living in Kampung Melayu Village. The affected populations will be relocated into low strata title housing called *Rusun* Komarudin, in Penggilingan Village, East Jakarta - 15 kilometres far from Kampung Melayu Village as their origin. The condition and environment of *Rusun* Komarudin are very different from Kampung Melayu Village. *Rusun* Komarudin is a complex of six towers simple apartment - each of towers consists of 100 units, whereas Kampung Melayu Village is a 0.48 km<sup>2</sup> residential area with 30,181 populations (BPS-Jakarta, 2012). Comparing to *Rusun* Komarudin, Kampung Melayu Village is much closer to the centre of Jakarta as well as to public services, including Kampung Melayu Market and Kampung Melayu Terminal, which give job opportunities for many of Kampung Melayu residents. Bambang Surya Putra, Informatics Section Head of Jakarta Province Disaster Management Agency (personal communication, 13 January 2014) confirmed that the value of this area has made Kampung Melayu residents difficult to move, considering the proximity to their job.

In brief, rehabilitating infrastructure amongst informal settlements with histories of controversial evictions and resettlement practices highlight the challenges to engage the powerless communities, poor people who are impacted by the Ciliwung River normalisation plan, in the decision-making processes.

### **Conceptual Framework of Collaborative Planning and Community Engagement for Disaster Resilience**

A collaborative approach to planning was earlier introduced by Godschalk and Mills then was evolved by some other authors. Godschalk and Mills (1966) are suggesting planning process to involve collaborative process, to focus on land use and human activities, and to stress on two way communications between community and planners. To further clarity, collaborative planning is an interactive process of consensus building, plan development, and implementation (Margerum, 2002) as a way to build networks and to improve the knowledge transfer among stakeholders (Innes and Booher, 2000). Wherein, Healey (2006) expands the involvement of not only process of consensus building, but also the inclusion of mechanisms of governance in collaborative planning.

Community engagement is the critical element of a collaborative approach to decision-making process (Innes and Booher, 1999), to know the extent to the power sharing will happen (Arnstein, 1969), to accommodate the desires of the stakeholders and the decision-makers. In the collaborative planning, community engagement might be viewed as an authentic dialogue between stakeholders which leads to reciprocity, relationship building, mutual learning (Innes and Booher, 1999), and consensus building (Healey, 2006; Margerum, 2002). In the context of Indonesia, collaborative planning conceptualizes participation from local government's perspectives as well as local communities' perspectives (Beard, 2002). The urban political-administrative structure determines the collaborative interaction involving local people and establishing governing mechanism in planning at the community level.

Decision-making in many infrastructure settings relevant to flooding is often a long and complicated process. This process will likely include political trade-offs and stakeholder consultations (Herder, et al., 2011). Conflicts may arise as flood risk management involves multiple stakeholders and multiple objectives (World Bank,

2006; Faulkner, et al., 2007; Kubal, et al., 2009). In this case, integrating information about risk into decision-making processes might increase the visibility of options for flood risk management. Integrating risk and uncertainty into planning decisions is an approach to reduce this obstacle, by believing two factors need to be taken into account, including: (1) describing the decision-making environment where uncertainties are involved; and (2) examining constraints in the implementation of planning decisions (Herder, et al., 2011).

On one hand, stakeholder engagement is fundamental throughout the disaster management planning process. Perceptions of stakeholders about risk may vary because of differences in values, needs, assumptions, concepts and concerns (EMQ, 2012). These perceptions might influence the decision so that it is important to involve all stakeholders to establish the same understanding about the problem. While governments need to identify whether their investments are suitable to achieve their goals, at-risk populations need to understand whether living in flood plain is unfavourable for them (World Bank, 2004; World Bank, 2010; Dickson, et al., 2012). Flood risk management requires a consideration of the community context to achieve a clear understanding of the relevant specific area. This requirement highlights that engaging the community in flood planning is crucial, enabling communities to directly contribute to the production and dissemination of risk information (Heywood, 2011; EMQ, 2012).

In summary, effective community engagement is complex and requires a long-term commitment to build and maintain relationships with the community and stakeholders at different levels. At a practical level, community engagement means maintaining dialogue while collaboration means working in partnership with the community. Collaborative planning identifies and supports the development of local community and empowering them to exercise choice and take responsibility. This concept requires decision makers to recognize the fundamental philosophy of power sharing in building community resilience in planning.

## **METHODS**

Case study method enables this research to explore and explain the relationship between government institution's and communities' understanding of flood risk management. The detailed case study involves semi-structured interviews as a primary data collection to address research questions and lead to develop the analysis. This semi-structured interviews help to shape a better understanding of barriers and constraints to effective flood risk management decision-making, and to potentially offer advice to improve the processes.

Interviews were conducted with representatives from governmental agencies, based on their key roles in developing planning flood risk reduction and disaster mitigation and response programs in the province of Jakarta, Indonesia. There are three governmental agencies involved, they are National Development Agency (BAPPENAS), Jakarta Province Disaster Management Agency (BPBD DKI Jakarta), and Ciliwung – Cisadane River Basin Agency (BBWS-CC).

Interviews were limited to individuals working at national and provincial levels of governance and aid. Interviews were conducted with a single individual or with a group of individuals from the same agency depending on scheduling availability. Also, interviews were conducted with representatives of NGOs working more directly with communities (generally below the province level) as well as local leaders of Kampung Melayu Village and subsequent sub-villages. The researcher has identified initial

contacts to begin the snowballing technique by drawing on an extensive network of industry and NGO contacts.

## RESULTS AND DISCUSSIONS

### Collaboration Mechanism for Disaster Risk Management in Jakarta

Achieving urban resilience requires engaging the capacities of social agents to understand and act upon the urban systems through interactive cycles of understanding vulnerability and building resilience (Katsuhama and Grigg, 2010; Jha and Stanton-Geddes, 2013). Engaging with community groups and NGOs to provide necessary inputs to disaster risk management efforts has importance in identifying and acting on risk and vulnerability (Jha, et al., 2012). The law Number 24 Year 2007 of Indonesia, on Disaster Management, provides an opportunity for various stakeholders to actively participate in disaster management including the international organizations and foreign NGOs (Center for Excellence, 2011).

With regard to disaster risk management, DKI Jakarta involves collaboration between communities, governments and governmental agencies. A direct mandatory occurs from the highest level governance to the lower level. Coordination occurs within each level of governance's departments/agencies, led at the national level by the National Disaster Management Agency, and by disaster management boards provincial and district levels. Jha and Stanton-Geddes (2013) emphasize that it is crucial to strengthen coordination across different level of authority and the communities to use and develop risk information. The collaboration mechanism of Jakarta disaster risk reduction, shown by Figure 1, involves combination of top-down and bottom-up coordination which allows government agencies and the disaster management board on each level to coordinate with the lower level of authorities, while feed-back and information from community level goes up into the higher level of governance. Communication exists between the communities of DKI Jakarta and various levels of governance, but power is not shared in a bottom-up manner.

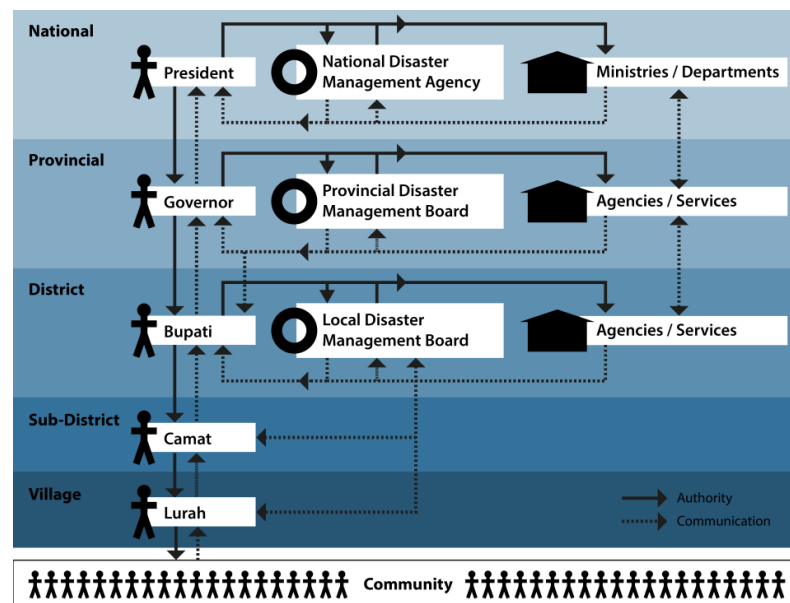


Figure 2 Collaboration Mechanism of Jakarta Disaster Risk Reduction (Sunarharum, et al., in Press)

In brief, strengthening institutional coordination and capacity building on disaster risk management across sectors and decision-makers in all levels of government is a

priority for the region. Jha and colleagues (2012) emphasized that building on existing community-based interventions and social protection systems provides an opportunity for countries to achieve significant outreach of disaster risk management programs at the community and household levels and to reduce the socioeconomic impacts of disasters that disproportionately affect the most vulnerable segments of society.

### **Different Perception of Flood Risk Challenges the Collaborative Approach**

There are reasons why people with marginal incomes live in disaster-prone sites, including: because they cannot afford to live elsewhere, because they prefer affordable housing in close proximity to livelihood opportunities (World Bank, 2004; World Bank, 2010; Dickson, et al., 2012). Bambang Surya Putra, Informatics Section Head of Jakarta Province Disaster Management Agency (personal communication, 13 January 2014) confirmed that communities living in Kampung Melayu Village are classified as poor that they can only afford to live very close to the river and also close to the traditional market as their workplace.

In the case of Jakarta Flooding, communities perceive flooding as a normal reality and a part of their daily life while the governments perceive it as a crucial disaster that has to be resolved as soon as possible. Flooding is such a common phenomenon for communities living in flood-prone areas. They have been living in at-risk areas, very close to the river, for decades. They already build their own resilience, by implementing adaptation strategies that has made them resistance to (or able to better live with) flooding, for example by raising their house into two storage house and put the electricity power in the second level of their house. From the previous flooding events, they learnt that flooding only occurs for about five days out of 365 days in a year. They prefer to live with flooding.

On the other hand, government of DKI Jakarta perceive relocation of vulnerable populations is a best way to reduce the risk. However, relocation is complicated by several factors, such as: distance from livelihoods and social networks, socio-culturally very different settlement layouts, lack of community participation, and under-budgeting of relocation costs (World Bank, 2004; World Bank, 2010). As a result, even if strategies exist, government of DKI Jakarta faces challenges in developing, implementing, and maintaining risk management. The difference in perceiving risk between government and community is a critical barrier in flood risk management of Jakarta. Oswar Mungkasa, Director of Land Use and Spatial Planning, National Development Agency/BAPPENAS (personal communication, 27 January 2014) was able to confirm that this barrier is as a result of limited knowledge and understanding of risk of flooding, limited institutional capacity and limited standard procedures for incorporating disaster risk management in city planning.

### **Technical Literacy Related to Flood Risk**

Sharing information of disaster hazard and risk amongst decision-makers, includes government institutions and communities, is crucial in risk management efforts (Jha, et al., 2013). Jha and Stanton-Geddes (2013) further clarify that communicating risk and uncertainty in flood risk management, including mitigation and adaptation efforts, is also important to achieve an informed decision. Increasing technical literacy, in tandem with efforts to translate technically complex information into clear and accessible language can aid and enhance a community's capability to undertake activities for minimizing risk and recover from the impacts of flooding (Faulkner, et al., 2007; World Bank, 2011c; Dickson et al., 2012). However, sharing information relevant to flood risk has been complicated by barriers to communication, especially given possible limited technical literacy of affected populations.

In the case of Jakarta, Jakarta government has been using open street map (Gunawan, et al., 2012), and participatory early warning system (BPBD DKI Jakarta, 2013) to enable communities to access and sharing information. Also, Bambang Surya Putra, Informatics Section Head of Jakarta Province Disaster Management Agency (personal communication, 13 January 2014) confirmed that *Twitter* has been used to share information relevant to flood locations and water level. This social media not only allows communities to participate, but also other governmental agencies, for instance Transport Management Centre agency. By using *Twitter* as one of informational tools, Jakarta Province Disaster management Agency gets more knowledge about the flooding conditions so that some actions could be undertaken. However, the use of *Twitter* does not fully address the information clarity to transfer knowledge and to facilitate coordination amongst decision makers because not many people living at flood-prone areas know or are able to access information on *Twitter*.

On one hand, Jakarta Province Disaster management Agency has been using open street map to engage the local communities in flood risk management. Open street map produces flood maps encourages a community-driven approach, allowing participation of the local leader at the community level, students from Jakarta universities, government officials, the Humanitarian OpenStreetMap Team, donors and partner organisations (BPBD DKI Jakarta, 2013; Gunawan, et al., 2012). However, limited knowledge of populations at risk about how to access the maps becomes another barrier to achieve the goal of information sharing about flooding.

Another strategy that Jakarta governments use to inform communities about flooding is by participatory early warning systems. Bambang Surya Putra, Informatics Section Head of Jakarta Province Disaster Management Agency (personal communication, 13 January 2014) confirmed that Jakarta Province Disaster Management Agency gives warning and information about water level and status of each flood gates from upper areas through direct calls to the community leaders as well as through text messages to the communities. Then, community leaders are able to take action to deliver this information and announce it to the local communities through loud speaker of the mosque.

When the water level is increasing, Jakarta Province Disaster Management Agency advices people to evacuate themselves to the closest shelter and local emergency centre. However, people living in the flooded areas, in Kampung Melayu Village for instance, do not take this advice seriously and prefer to stay until the water level is reaching the second level of their house. This dilemma becomes a great challenge for the evacuation team due to the difficulties to access flooded areas to evacuate people when the water level is high. Although Jakarta governments have implemented some strategies to reduce the risk of flooding by engaging local communities in sharing information, limited knowledge and low level of awareness of at risk populations have become crucial constraints.

### **Community Engagement for Jakarta Flood Risk Management**

The major challenges for flood management are socio-technical, such as strengthening coordination and cooperation among all stakeholders to support preparedness of institutions and communities (Wilby and Keenan, 2012). Community participation is an essential element to address local needs, engage public in flood disaster preparedness and build a capacity to cope with flooding (World Bank, 2011). Without support from communities, flood risk management is far from success.

Ciliwung-Cisadane River basin Agency has conducted socialisation to at risk populations relevant to conditions of the existing Ciliwung River and the normalisation



plan. Head of villages, local leaders, as well as the key persons were involved in the socialisation program so that they are able to transfer the knowledge about the normalisation plan to the communities. Based on interviews with some of community leader in Kampung Melayu Village, people are able to understand that normalisation plan will be undertaken as one of the solutions for Jakarta's flood. However, they confirmed that there is no consultation and active involvement regarding relocation plan.

Halirik, Head of Community Empowerment in Kampung Melayu Village (personal communication, 20 February 2014), confirmed that relocation plan is very sensitive for at-risk populations in that area and it requires a huge consideration because it will be a big decision for them. So far, information about relocation of people living in Kampung Melayu Village comes one way from top to down, from Jakarta provincial government to the local authorities. Based on the interviews with representatives of community in Kampung Melayu Village, moving into *Rusun* Komarudin is a tough decision since there is uncertainty about compensation of their recent house, the ownership status of the new house, and the livelihood opportunities. Government of DKI Jakarta provides *Rusun* Komarudin as a new place to live in but there is no guarantee about job opportunities to survive from poor economic condition.

In brief, there is a significant communication gap between policy makers and community in Kampung Melayu Village because there is no community consultation to build a consensus regarding Ciliwung River relocation plan. This gap is a significant barrier to the success of the relocation plan. Without having meaningful dialogue, at-risk populations are not motivated to be engaged and face confusedness so that these obstacles will hinder the goal of enhanced community resilience in flood risk management.

## **CONCLUSIONS**

In summary, Jakarta government initiated some large scale infrastructural plans with regard to reduce the risk of flooding. Also, plans are underway to relocate residents away from flood risk areas. However, in the crisis situation, consultation with the communities occurs primarily in one direction – from the government to the community – and excludes local knowledge of conditions and community needs. Additionally, community participation in management planning and flood risk reduction is hampered by several factors, such as: lack of co-ordination and lack of two-way communication between the government and society; limited knowledge in flood affected communities about the risks of flooding; and the differences between the perceptions and desires of the community and the government. These things are obstacles in realizing community resilience and in improving the effectiveness of disaster planning. These challenges can be anticipated by strengthening coordination among all stakeholders at all levels of government (Wilby and Keenan, 2012).

Therefore, it is crucial to conduct a dialogue or community engagement process involving communities and governments. Application of this collaborative forum potentially improves the information and knowledge transfer regarding flood risk in the planning processes. On one hand, the presence of collaboration between government entities and communities could improve community resilience to face and reduce the risk of future disasters. In addition, the significant contribution of this approach allows the emergence of decision-support tools or a model of collaborative planning and participatory mechanism.

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## **ACKNOWLEDGMENTS**

The authors acknowledge the Queensland University of Technology's Science and Engineering Faculty and the Directorate of Higher Degree Education, Ministry of Education, Indonesia for providing funding to support the author's postgraduate studies in Australia. The author would like to recognise Dr. Deden Rukmana, Associate Professor and Coordinator of Urban Studies and Planning Program at Savannah State University; International River Foundation; Dr. Oswar Mungkasa, Director of Land Use and Spatial Planning, National Development Planning Agency (BAPPENAS) of Indonesia; DKI Jakarta Provincial Government Disaster Management Agency; Ciliwung-Cisadane River Basin Agency, Ministry of Public Works; Ciliwung Care Community (KPC); and Ciliwung Institute for their role in helping to shape the current research.