

Grassroots Perceptions of Land Administration to support Disaster Risk Reduction in Hazard-Prone Informal Settlements in Jakarta Province, Indonesia: Lessons for Land Policy

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Keywords: informal settlement, land tenure security, land administration, disaster risk reduction, Indonesia

SUMMARY

Risk drivers from urbanization, urban poverty, and natural hazards may be compounded by insecure urban land tenure. There is a debate on how improved Land Administration System (LAS) can contribute to reduced urban vulnerability and improved urban Disaster Risk Reduction (DRR). The aim of the research is to investigate household perceptions of land administration and to identify the land administration factors that were perceived as needing improvement in support of DRR in four informal settlements that are very exposed to flooding in Jakarta Province, Indonesia. This is part of a larger study that seeks to draw out policy lessons for Land Administration System to support Disaster Risk Reduction. The research employs a multi-method approach with a case study strategy to investigate the household perceptions in Jakarta Province. Important factors in the perception of tenure security were land registration, government recognition of land rights, the government providing advice on spatial planning and zoning regulation, and the government providing advice on the land registration process. Many respondents stated there are structural projects for DRR in their area that led to an overall reduction in disaster risk. However, those households without land records lack formal identity and are more affected by relocation plans.

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1. INTRODUCTION

A regional report on urbanisation in Asia highlighted that it is communities of poor and marginalized that are most vulnerable to a natural disaster (UN Habitat 2012). They are vulnerable due to often living and working in hazardous environments. Many also face the threat of eviction due as a result of the government's desire to reduce the disaster risk of these people and the environmental risks to them and others. Poor land tenure security and high disaster vulnerability also hinder the progress of the global sustainable development agenda (UN 2015). Risk drivers such as urbanization, urban poverty, and natural hazards increase the exposure and sensitivity of people who live in vulnerable areas (Baker 2012). Furthermore, the scale of the growth of informal settlements has also become a challenge, with unplanned land development increasing vulnerability (Baker 2012). This was consistent with a study of land tenure in Asia and the Pacific which stated that the predominant form of growth is in slums and informal settlements, often on unsuitable and unsafe land, without adequate building quality, infrastructure, and services. These issues are compounded by tenure insecurity and limitations in land administration and management (Mitchell, 2010). In Indonesia, similar problems related to informal land tenure exist (e.g. there are still many unregistered land parcels, as well as the rise of land occupation without land documents) and this is recognized by the government in Indonesia (Srinivas et al. 2014).

Steinberg (2007) stated that Jakarta faces challenges related to weak enforcement of land use planning. Jakarta has a spatial plan since its enactment as the capital of Indonesia in the 1960s (Gunawan 2010), and hazard risk mapping has been included in the spatial plan and its implementation is carried out through zoning regulations (Birkmann et al., 2014). However, the spatial plan was not fully implemented by the local government (Srinivas et al. 2014), and high levels of urbanization occur that is not in accordance with spatial planning and zoning regulations (Silver 2007). Implementation is ineffective because of overlapping jurisdiction across agencies and lack of coordination (Birkmann et al. 2014). In addition, weak law enforcement, as well as low public awareness, are blamed as factors that exacerbate disaster vulnerability (BPBD 2013). In Jakarta, many informal settlements built on the green line zone, which are located around the railway line, the median road, around the electricity network and under the toll road (GOJ 2014). Many settlers also occupy the blue open zone, the water zone over public water bodies that aims to reduce disaster risk in these areas and which functions as a conservation area in the vicinity of river basins, riverbanks, lakes/reservoirs/ dams (GOJ 2014).

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The importance of land tenure security has been discussed in various studies (Feder & Feeny 1991; Payne, Piaskowy & Kuritz 2014; Van Gelder 2010). But there are still different views on how land tenure security is defined and how it can be measured (Payne 2001). Land documents are often seen as the most reliable evidence of secure tenure (FAO 2002). Some argue that the perception of settlers of their land tenure security depends on evidence they hold (Orcherton et al, 2016; Payne 2001; Usamah et al, 2012; Van Gelder 2010). However, unless the owner tries to use the land as collateral (Soto 2000), or can prove there is no threat of forced eviction (Orcherton, Mitchell & McEvoy 2016), this remains a perception. Others argue that land tenure security is linked to legal tenure security by recognizing the legality of land in the form of land titles (Srinivas et al. 2014; UNECE 1996). According to Place, Roth and Hazell (1994) in their study in rural Africa, duration, assurance of the protection of property right and robustness of property right are components that can be used to measure land tenure security. An element of duration is the length of occupation of that land or housing, with long-term occupation in urban areas also being seen as one form of evidence of recognition of rights by neighbors and government (ADB 2012; UN Habitat 2003). Another dimension that has been considered as evidence of the occupant's perception of tenure security is the level of investment they have made in the land or buildings (Dale & Mclaughlin 1999).

A key aim of Land Administration Systems (LAS) is to improve tenure security. Research of Indonesia Land Administration System by Srinivas et al. (2014) described limitations in LAS and lack of coordination with Disaster Risk Reduction (DRR). Landowners consider the cost of land registration in BPN office is expensive, there are problems with the transparency of procedures and it is difficult for marginalized and poor people to access land registration (Srinivas et al. 2014). High transaction costs during the land registration process may also hinder government programs to transform from informal to formal land administration (Srinivas et al. 2014). In response, BPN has made improvements in the land registration services including issuing a Ministerial Regulation on Non-Tax State Revenue within BPN (GOI 2015a) and publishing the Standard Operational Procedures (SOP) services in the land offices through its website (BPN 2018). According to GOJ (2016b), the Jakarta local government's developed a One Stop Integrated Service (*Pelayanan Terpadu Satu Pintu* or PTSP). This service has been established at the local government offices (*kelurahan*, sub-district, municipality and province office) since 2013 (GOJ 2016b). As a result, recent reports from ombudsmen in 2016 and 2017 (ORI 2016, 2017) show improvements in the quality of public services in Jakarta, especially in the field of permit/licensing, land use and tax services.

The implementation of disaster risk management in Indonesia tends to focus on emergency or post-disaster responses (BNPB 2015a). Non-structural DRR programs including dissemination of information as well as disaster education to increase disaster awareness are also actively carried out by Regional Disaster Management Agency of Jakarta (BPBD) in collaboration with NGOs, academia and disaster volunteers (BNPB 2015b). Structural development to support DRR is also carried out in the form of normalization of rivers/reservoirs, construction of sea dikes, dredging of rivers/reservoirs and plans for constructing underground canals (BNPB 2015b). The government of Jakarta carried out land acquisition as well as relocating settlers whose houses were affected by the projects to rental dwellings. However, problems related to

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the form and size of compensation caused social conflicts between the local government and the central government and settlers (LBH Jakarta 2015).

This paper presents the results of questionnaires and focus group discussions with residents living in disaster-prone areas in four settlements in North and East Jakarta. Households were randomly selected based on their availability and equal distribution of geographic representation. Four focus group discussions were conducted in three *kelurahan* and data collection was conducted in Bahasa Indonesian. The questionnaires and focus group discussions were designed to investigate household perceptions of land administration and to identify the land administration factors that were perceived as needing improvement in support of DRR in each of the settlements.

This paper is part of Ph.D. research that explores the relationship between land administration and DRR in Jakarta Province, Indonesia. Although this paper is focused more on land administration, a few aspects of the relationship between land administration and DRR are also discussed. A question that arises is what are the unique land administration requirements of residents who are vulnerable to disaster and also have poor tenure security?

2. METHODS

A multi-method and case study approach was used in the study. As described below, the case study area was chosen to cover four informal settlement areas in North and East Jakarta. These four settlements were selected based on the following criteria (i) the complexity of land tenure arrangements that include informal tenures, (ii) categorized as slum areas, and (iii) medium and high level of disaster risk. Data collection included questionnaires and focus group discussions.

2.1. Questionnaire sampling

Quantitative data collection involved household questionnaires in four settlements in North and East Jakarta that are very exposed to flooding. Households were randomly selected based on their availability and equal distribution of geographic representation, taking gender balance and age group diversity into consideration.

For quantitative data collection, questionnaires were delivered to the landowner, tenants, and squatters in hazard-prone informal settlements in the case study areas. 4 *kelurahan* or "urban village" were selected as the case study location: (*Kelurahan Kampung Melayu* and *Kelurahan Bidaracina*) in East Jakarta and *Kelurahan Penjaringan* and *Kelurahan Ancol* in North Jakarta Municipality. Out of the 200 questionnaires, 164 questionnaires were completed and returned by respondents. The quantitative data analysis software SPSS Version 25 was used for the quantitative and statistical analysis.

2.2. The Focus Group Discussion (FGD)

The range of qualitative data collection methods included focus group discussions, collection of written documents, and historical information and these were used to triangulate and validate

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the conclusions drawn from the questionnaire responses. A key source of data was focus group discussions to elicit local narratives including individuals' and groups' accounts of personal and community experiences and life stories.

The FGD were conducted in 3 *kelurahan* (*Kelurahan Ancol* and *Kelurahan Penjaringan* in North Jakarta; and *Kelurahan Bidaracina* in East Jakarta). The aim of the FGDs was to explore perceptions of land administration of the informal settlers very exposed to flooding. Invitations to the FGD were sent to randomly selected households by the head of neighborhood (“*Rukun Tetangga*” or RT) and the head of community (“*Rukun Warga*” or RW). Participation in the FGD was voluntary and of the 45 participants, there were 36 males and 9 females, including community leaders and household representatives.

The qualitative data analysis software NVivo Version 12 was used to manage the data and to assist in the qualitative analysis. Ethics approval was provided by RMIT University, and to protect participants' privacy, pseudonyms are used throughout this paper.

The NVivo software was used for qualitative data analysis that consists of data entry; coding; identifying relationships; constructing diagrams, tables, matrices, and graphs; corroborating and validating results

2.3. Case study areas

One of the megacities that experience the LAS and disaster problems is the Special Capital Region (DKI) Jakarta (hereinafter called Jakarta). As the capital of Indonesia, Jakarta has 10.1 million inhabitants with a population growth rate of 1.02% (BPS 2015). Geographically, Jakarta has a long coastal area of about 35 Kilometers and 13 major rivers pass through it. Jakarta faces challenges because of the high disaster risk. Since the 16th century, Jakarta has often experienced flooding which has caused economic losses, damage to infrastructure and loss of human life (Gunawan 2010). In addition to the threat of flooding, data from deformation measurements indicate the existence of land subsidence. Deformation research shows that 40% of Jakarta's area, especially in North Jakarta, is located below mean sea level (Abidin et al., 2011).

The case study selection criteria for Jakarta were based on the consultation with LAS and DRR experts in Jakarta.

2.3.1. East Jakarta - *Kelurahan Kampung Melayu* and *Kelurahan Bidaracina*

As shown in Figure 1a, these two case study *kelurahan* are located in Jatinegara Sub-district, East Jakarta Municipality. They are located on the edge of the Ciliwung River and prone to river flooding. The structural DRR project named Ciliwung River Normalization Project was being undertaken by the local government of Jakarta and the Ministry of Public Work in *Kelurahan Kampung Melayu* in 2015 (LBH Jakarta 2015). In addition to the Ciliwung River normalization project, the government also plans to undertake a major project in the form of the underground canal that will connect the Ciliwung River with the East Flood Canal in *Kelurahan Bidaracina* (LBH Jakarta 2015). Both of the projects received opposition from the settlers because they considered that the compensation provided was inadequate despite having occupied the areas for years (LBH Jakarta 2015).

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2.3.2. North Jakarta - *Kelurahan* Penjaringan and *Kelurahan* Ancol

As shown in Figure 1b, Penjaringan and Ancol are located in North Jakarta Municipality. They are situated along the coast and river, therefore exposed to coastal and riverine floods. In *Kelurahan* Penjaringan, structural DRR projects have been implemented by the rehabilitation and upgrading of Pluit dam and several rivers in 2014. In general, this area is often exposed to floods due to rising sea water, especially at spring tide (UPC 2017). Moreover, this condition is exacerbated by the existence of land subsidence that threatens the residential areas (Abidin et al., 2011). The government also built sea dikes in the villages on the north coast of Jakarta in 2016 (LBH Jakarta 2015).

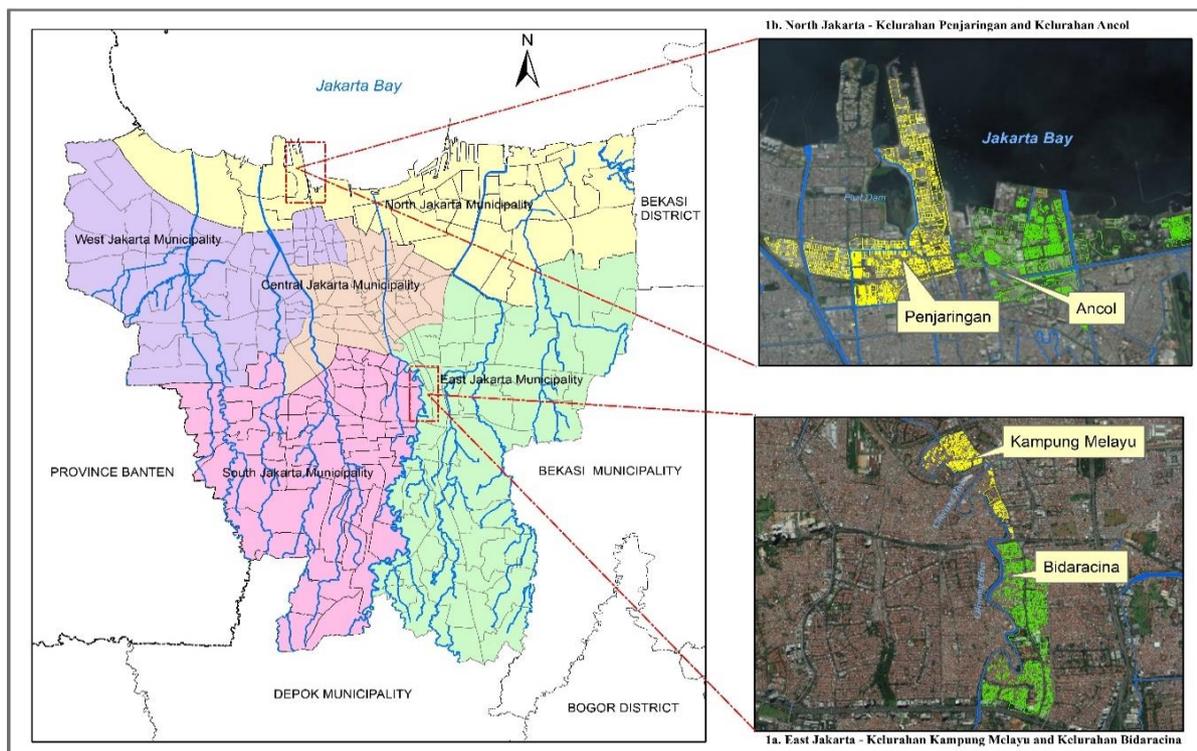


Figure 1. The overall map of the 4 case study areas (Adopted from BPN 2017; Google 2016a, 2016b). The green and yellow color show the distribution of land parcels in the 4 *kelurahan*.

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3. HOUSEHOLD PERCEPTIONS OF VULNERABILITY AND TENURE SECURITY

The section below describes the result of the households' perception of vulnerability, tenure security and land administration.

3.1. Households Perception of Disaster Vulnerability

Most of the surveyed households considered that they were vulnerable to disaster (115 respondents or 70.1%). In this context, the vulnerability can be considered to include the components of exposure and sensitivity. The case study settlements were chosen because they were very exposed to floods. The perception of vulnerability was highest in Penjaringan (77.3%) which is adjacent to the sea, as well as having a land surface lower than sea level. This means settlers in Penjaringan are the most exposed to flood disasters and from the inundation of seawater. However, all settlements have high levels of exposure to floods and this is reflected in high vulnerability responses also in Bidaracina (70.3%), located in the lowlands and right on the Ciliwung riverbank. Residents in Kampung Melayu also feel vulnerable (69%) despite the river normalization program having been implemented (UPC 2015). Our research also included questions on elements of sensitivity and responses indicated that building materials were of sub-standard quality and many houses were not connected to formal electricity, water, and sanitation services.

3.2. Households perception of the Relative Level of Tenure Security

As shown in table 1, while most respondents claimed to have records or the testimony of a witness to support their right of occupation, many felt vulnerable to eviction (89% or 146 respondents).

When asked "*What are the reason you are vulnerable to eviction?*", most respondents thought their perceived threat of eviction was related to a nearby government DRR project (90%). This is a critical finding as it means that the cause of the risk is seen to not just come from the informality of the tenure, it is perceived to come from DRR projects. Many also thought that the threat of eviction was related to living in a disaster-prone area (66%), or living in a 'no-build' planning (65%), or living on State-owned land (55%). A smaller number considered the threat of eviction was related to living on the land of others (22%).

Table 1 Perception of the current threat of eviction

Number of sample = 164 respondents	Which community do you live in now?									
	Penjaringan		Ancol		Bidaracina		Kp. Melayu		Total	
	n	%	n	%	n	%	n	%	n	%
Q1. Do you think you are vulnerable to eviction?										
- No	7	4.27	6	3.66	2	1.22	3	1.83	18	10.98
- Yes	37	22.56	35	21.34	35	21.34	39	23.78	146	89.02

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Q2. What is the reason you are vulnerable to eviction?										
- The dwelling is located in the disaster-prone area	23	15.75	25	17.12	28	19.18	20	13.70	96	65.75
- The dwelling is not in accordance with the spatial detail plan and zoning regulation	31	21.23	23	15.75	19	13.01	22	15.07	95	65.07
- The dwelling is located in state land	31	21.23	21	14.38	17	11.64	11	7.53	80	54.79
- The dwelling is located on the land of others	8	5.48	5	3.42	13	8.90	6	4.11	32	21.92
- The dwelling will be used for government project	30	20.55	33	22.60	30	20.55	39	26.71	132	90.41
Q3. Do you think you are vulnerable to disaster?										
- No	10	6.1	15	9.1	11	6.7	13	7.9	49	29.9
- Yes	34	20.7	26	15.9	26	15.9	29	17.7	115	70.1

Many respondents felt vulnerable to eviction and had low levels of perceived security of tenure. As most are very exposed to natural hazards then this supports the theory that hazard-prone households have more insecure tenure.

3.3. The existence of structural projects for Disaster Risk Reduction

The results of households' questionnaires responses to the questions regarding the existence of structural project for DRR, 134 out of 164 respondents (81.7%) said that there are structural projects for DRR in the areas, while only 30 (18.3%) respondents answered there is no DRR project near their areas.

When asked if the river normalization projects reduced their disaster risk, most of the houses affected by projects (73%) said that the projects did reduce their disaster risk. This indicates that the project had an overall positive result with regard to disaster risk. However, there were potentially unintended consequences with 70.1% of respondents considering themselves still vulnerable to disaster and 89% at risk of eviction.

The questionnaire result also shows that respondents considered the following community responses are important to reduce their disaster risk:

- Reforestation in upstream areas – 83.5% (137 important or very important).
- Building a house in the safe area - 76.2% (125 important or very important)
- Knowledge dissemination to build disaster resilience in the community – 76.8% (126 important or very important).
- Building a house based on government planning regulation (city planning permit, land use planning permit, building permit) – 72% (118 important or very important).
- Reduce litter on riverbanks – 68.3% (112 important or very important)
- Community information on land tenure rights – 63.4% (104 important or very important)

4. HOUSEHOLDS PERCEPTIONS OF THE LAND ADMINISTRATION SYSTEM PROCESSES

Household questionnaire responses to questions about land administration processes in the four settlements are presented in Table 2 below. The results provide information on perceptions at the household level of the land registration, land use planning, land valuation, and taxation and

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land development elements of the LAS. Each of these are discussed in the sub-sections that follow.

Table 2. Household perceptions of land administration in the case study area

Number of sample = 164 respondents	<i>What are land administration issues in your areas?</i>					
	Agree		Uncertain/unsure		Disagree	
	n	%	n	%	n	%
<i>Household perception of land registration procedures</i>						
Q1. The land registration fees are too high	96	59	13	7	55	34
Q2. The standard operating procedures of land registration in BPN is untransparent and unclear	109	67	22	13	33	20
Q3. Procedure at the neighborhood level, village, and sub-district level untransparent	131	80	3	2	30	18
Q4. The documents as evidence required for land registration is difficult to obtain	122	74.4	15	9	27	16.6
Q5. Land registration process is time consuming	129	79	10	6	25	15
Q6. The location belongs to the state, a private or state company or other parties	138	84	5	3	21	13
<i>Households perception of land use planning</i>						
Q7. The location noncompliant with spatial planning and zoning regulation	118	72	18	11	28	17
<i>Households perception of land valuation and taxation</i>						
Q8. Tittle deed duty and stamp duty are high during land transfer	70	43	25	15	69	42
<i>Households perception of the land development approval process</i>						
Q9. Obtaining the permit documents is difficult (Town planning letter, land use permit letter, building permit letter etc)	47	28.7	12	7.3	105	64

4.1. Land registration

4.1.1. Affordability of land registration fees

As presented in Table 2, more than half (59%) of the questionnaire respondents agree and considered land registration fees are high. While this may be an expected response, the FGD confirmed that some landowners can't afford the fees for land registration because of their poverty. Also of interest is the relative responses from each settlement. More people in Penjarangan (66%) agreed or strongly agreed that registration fees are too high. Although its environmental conditions are prone to both river floods and floods due to rising seas (MoCEA et al. 2014), Penjarangan has a high population density and poorer households (BPS 2016).

During the FGD session the settlers advised that, as they could occupy the area for years without any claims and restrictions from other parties, and because they have administrative received services as residents, they felt no need to apply for a land certificate. Another reason they did not immediately register the land is that they felt it was expensive.

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“People may think that without a land certificate they feel safe for years. They can build houses, get ID-Card (KTP) and Family Card (KK), and get access to electricity etc. Why just now trying to register a land certificate (apply for land registration)? Why not register long ago? Because the societies feel that the land registration fee was expensive. Some of the settlers who live here work in the informal sector and are included as the poor (Mr. Badi, 33 years old).

4.1.2. Transparency of registration procedures at the municipal land office (BPN)

When supporting documents for first land registration or land transfer (e.g. *girik*/letter C, land and building tax, receipt of land purchase, notarial deed of sale) are complete, the landowner can make a formal payment and will be issued a receipt. A file number can be used to check the progress of the certificate request. In addition to the information counter, the public can also read the information at BPN's official website (BPN 2016). However, more than two-thirds of respondents (67%) agreed that land registration procedure was untransparent and unclear. The rate of agreement and strong agreement for this question in Penjaringan was even higher (78%). Respondents on two *kelurahan* in the eastern region (Bidaracina and Kampung Melayu) have percentages of 68 % and 66% respectively while Ancol in the Northern region has 63% agreement.

The land registration process has adopted integrated land office computerization (BPN 2016) in each land office, and the landowner can also have the opportunity to check the status of their land registration application (BPN 2016). But the online services still require a lot of improvement as stated by Mr. Sukri:

“When I came to the land office, information on land services was also lacking. The process flow from the service counter is hard to know. People usually believe in land brokers. Land mafia occurs initially due to the trust factor. This is because landowners are not supported by clear land information (Sukri, 33 years old).

One of the things discussed in the FGD is the difficulty of obtaining land information, for example, the land status. This caused the residents to feel confused because when they come to the *kelurahan* office, the officers there do not know these details either. The officers usually ask landowners to come to the land office (BPN). However, resident felt it is difficult to obtain land information as stated by Mr. Ujang:

“It becomes even more complicated because BPN can't release the land information because it is considered as a state document. Such information can only be issued by court order” (Mr. Ujang, 45 years old).

4.1.3. Transparency of registration procedures at neighborhood, village and sub-district level

Most respondents (80%) agreed that the procedure at a local government office lacked transparency. During the FGD, participants also discussed the transparency of procedures at the local government (neighborhood level, village and sub-district level). Landowners need to request supporting documents from some government agencies. For example, the landowner must obtain proof of land occupation, letter of recommendation that the land is not disputed,

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and a statement letter saying that the land is not pledged to the bank as collateral (GOI 1997). To register land, landowners must come to several government offices to get signatures to support statements of control over land as stated by Mr. Gabriel:

“The bureaucracy is convoluted. We have to come back and forth to the kelurahan/village office, the sub-district office, the tax revenue department, each with its own terms. To obtain documents and signatures requires energy, cost and time”
(Mr. Gabriel, 38 years old).

4.1.4. Supporting documents required for registration

Moreover, 74.4% of respondents agree that it is difficult to obtain documents as evident for land registration. In FGD, it was revealed that the problem above is related to the informality of their land records.

“We are like blind people for not knowing the land information. We only rely on information from word of mouth. When we ask the village or kelurahan office, ... we are told to come directly to the land office (BPN). But when we came to BPN, the officer explained that we had to get letters of recommendation signed by the head of the neighborhood (RT), the head of the community (RW), the urban village office and the sub-district office. The fact is that the urban village office and subdistrict office are reluctant to give a recommendation letter because the status of the land here is considered a lack of clarity (Mr. Dany, 64 years old)”.

According to Harsono (2003), there is a community perception that the land and building tax (PBB), title deed duty (BHTB) and stamp duty (PPH) and some old land tax documents (for example Girik, Letter C, Ippeda, Ireda) are government recognition of land ownership. However, the receipt of the PBB clearly states that the PBB is not proof of land ownership (GOJ 2016a). The PBB is only a proof of tax liability for landowners who benefit from the land and buildings (GOI 1997; Harsono 2003). So far, society's perception has not changed (GOI 2015b). Even some NGOs still refer to the payment of PBB taxes (Ciliwung Merdeka 2016; LBH Jakarta 2016; UPC 2015) and the length of duration of occupancy (LBH Jakarta 2016) as evidence of land ownership.

During the land registration process, settlers are required to provide legal land documents or evidence of support. The landowner is requested to submit the Identity Card, Family Card, receipt of Title Deed Duty (BPHTB) payment, receipt of Land and Building Tax (PBB) (GOI 1997). In addition, landowners are also asked to explain the history of the land, such as whether it is customary land or vacant state land.

“Bureaucracy, we must come to the village office. We need a letter of introduction, a letter containing a statement of land ownership etc. ID cards and family cards can be obtained at the kelurahan office but when we will ask for land documents, the staff of the kelurahan ... do not believe that we are the landowners here (Mr. Yasirwan, 55 years old).

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However, the landowners have difficulty obtaining signatures and approvals from the *Lurah* (head of the village), *Camat* (head of sub-district), Mayor and Governor. So they do not have land documents even though they may have occupied these lands for many years, even more than 20 years.

Perception regarding evident for land registration as shown in Table 2 shows most respondents (74%) either agree or strongly agree that it is difficult to provide the evidence required for land registration. In Penjarangan, almost all (88%) agree or strongly agree. It is followed by Kampung Melayu and Ancol at 76% and 71%. Poor households' situation in Penjarangan makes people feel vulnerable to both disaster and eviction. These concerns are further exacerbated by the absence of documents to prove their ownership. While much less (60%) of respondents in Bidaracina had difficulties in obtaining supporting document.

"We are in fact already tens of years living here, but it is not easy to register land to BPN. We have difficulty obtaining supporting documents (Mr. Arifin, 65 years old)".

During the FGD session, the respondents said that the *kelurahan* officers are reluctant to give recommendation/supporting letters. The common reason is that the land is considered as state land and citizens can't show the basis of their land possession: whether through the process of selling/buying, inheritance, or perhaps by occupying the vacant land. The *kelurahan* officers also advised that it is difficult for them to undertake document verification because their land information is not up to date and because of the absence of a land parcel map.

To complete the necessary documents, the landowner must come to the *kelurahan* office to get a letter of recommendation. Then they should also get approval from the sub-district office. This process is not easy to do within 1 day. In addition, landowners must also obtain proof of tax payment as well as possess residence documents.

"After several documents were signed by the village head, the documents were taken to the subdistrict office for signature. What other files/documents should be prepared? We had to go to many government offices before submitting all the documents to the land office.Landowners sometimes feel sad and frustrated because the documents that have been submitted to the BPN returned back because it is considered there are other supporting documents that are still not complete (Mr. Arifin, 44 years old)".

4.1.5. Time for land registration

In regard to a problem related to processing time in BPN, 79% respondents agree that the land registration process is time-consuming. During the FGD session, Mr. Yunadi revealed his concern:

"With the slow process (of land registration), people become wondering. The government needs to explain the time limit for completion of the (land) certificate (Mr. Yunadi, 55 years old)"

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4.1.6. The house is located on belonging to the state or private parties

Applying for a land certificate requires proof that the land is not owned by others. However, many households in the case study area settled on unused land many years ago without formal agreements. This is confirmed by most households (84%) responding that other people had claim over the land they are occupying. In the FGD it was highlighted that there can also be overlapping claims to land. For example, Mr. Wahyu stated in the FGD:

“We also just informed that there are freehold certificates (Hak Milik) in the location, but the location already occupied by settlers and there are hundreds of houses. The parties claim to each other ... Not only the government and individuals are in dispute, but there are also disputes between residents and some private companies claiming to own Building Rights ('Hak Guna Bangunan' or HGB) certificates (Mr. Wahyu, 45 years old)”.

4.2. Land use planning

As discussed earlier, enforcement of land use planning zones is a challenge. Many houses were settled in the areas before it was zoned as the blue and green (no-build) zones. Current spatial planning in Jakarta was enacted in 2012 followed by detailed spatial planning and zoning regulation in 2014 (GOJ 2014). If the existing use right is not in accordance with the current detailed spatial planning and zoning regulations set in 2014, landowners are given the opportunity to make the transition for 2 years until 2017 (GOJ 2014). More than two-thirds (72%) of respondents stated that their land use was not compliant with spatial planning and zoning regulations. Several efforts are being made by the Jakarta government to enforce these zones. Mr. Andi revealed his experience:

“The local government has already implemented Detailed Spatial Planning (RDTR) and zoning regulations (enacted in 2014)....Local governments say that this region is not in line with the RDTR and zoning regulations. So far, we feel we are not getting enough information and less involved during the arrangement of spatial planning. (Local Government think that) land use in this area is considered to violate the spatial planning. Informal settlements in this area already exist before the RDTR and zoning regulations (Mr. Andi, 55 years old)”.

Penjaringan has the highest percentage of agreement (80%) compared to other *kelurahan*. The location of an informal settlement in Penjaringan that is mostly in zones that are not in accordance with the spatial plan is suspected to be the cause of the delay of their land registration process.

The respondents also were asked whether they were consulted during the drafting of the spatial planning and zoning regulation. A very small number (4%) of respondents said that they were consulted during the drafting of spatial planning, detailed spatial planning, and zoning regulations.

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“We also hope that the government will explain why our area is a green area in RDTR. When this area becomes a green area, it is almost impossible for us to have a land certificate because it is a forbidden zone. Then how our fate? We feel we have the right because we've lived for decades here (Mr. Rizal, 55 years old)“.

4.3. Land valuation and taxation

While many settlers considered that they knew the official government valuation for their land (57%), only 17% thought this was correct. Of the 72 who did not believe the valuation was correct, most of these (74%) considered the valuation to be below market value. This land valuation can be used to calculate the land registration fees, including title deed duty and stamp duty. The valuation of land is also significant for the calculation of compensation related to resettlement and land acquisition which are both a real possibility for hazard-prone houses.

Almost half (42%) of the respondents agree or strongly agree that title deed duty and stamp duty are high during land transfer. One of the participants in FGD stated information regarding land valuation:

“Some local government policies also seek to assist landowners. DKI Jakarta Provincial Government issued a tax policy on Title Deed Duty Tax (BPHTB) and Stamp Duty (PPH) of 0% for transactions under 2 billion (rupiahs)...The reason why people are reluctant to certify the land is the amount of tax, namely PPH and BPHTB. If the tax is zero percent, then it is expected that the community will be helped (Mr. Sukri, 33 years old)“.

4.4. Land development approval process.

Households perceived it is easy gaining approval for land development in local government offices. More than half (64%) stated that it is easy to obtain permit documents such as building permit letter (*“Ijin Mendirikan Bangunan”* or IMB). More than half (64%) stated that it was easy to obtain permit documents such as building permits (*“Building Permit”* or IMB). In accordance with regulations, the locations must be in accordance with spatial planning. During FGD, respondents stated that Jakarta province has implemented One Stop Integrated Service (*“Pelayanan Terpadu Satu Pintu”* or PTSP). The respondents admitted the benefits of PTSP for public service:

“Actually, we feel now that the bureaucratic affairs have undergone a positive change. The officials in the kelurahan offices now actively explain the problems of land and the local government has also provided One Stop Integrated Service (PTSP) in each kelurahan. But land affairs are still a big problem (Mr. Amirudin, 34 years old)“.

During FGD, it is also revealed that in the present, the regional government of Jakarta are more strict in giving development permits to citizens. One of the bases for granting development permits is the suitability of land use with spatial planning and zoning regulation (GOJ 2014).

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4.5. Households perception of existing disputes and dispute resolution

Urban poverty in each of the case study areas creates land tenure problems triggering land conflicts and disputes that hinder social and community cooperation. A very high level of disputes exists over these settlements. Most households state their land is claimed by others and 89% say there is a current dispute over their land.

Furthermore, the respondents were asked, “*How is land conflict resolved?*”. The most common method used for conflict resolution was litigation (52.9%) which is slow and expensive. The other 47% are resolved through alternative disputes resolution mechanisms. Almost one-quarter (23.4%) said that community meetings could be used to help resolve the land dispute. In addition, some land cases are also considered to be mediated with the help of BPN (21.92% or 32 respondents). While 17.81% or 26 respondents argued that land issues could be resolved through a family meeting. Mr. Suherman stated in FGD:

“...to resolve the land dispute, the role of the head of the neighborhood (Rukun Tetangga or RT) and head of community (Rukun Warga or RW) is very important. Sometimes religious leaders are also involved in giving advice and consideration (Suherman, 57 years old)”.

5. LESSONS FOR LAND POLICY

Urban growth, informal settlements, and land tenure challenges are stress factors that will contribute to risk drivers in urban areas. The growth of informal settlements along hazard-prone areas and fragile ecosystems contribute to the increase of urban disaster vulnerability. This is evident in the results of the households’ survey in Table 1 showing that 70.1% of respondents felt vulnerable to disaster. A question that arises is – are the land administration needs of highly exposed informal settlements different to the needs elsewhere?

The section below draws out lessons for land policy related to land tenure security, land administration system and DRR for these highly exposed households. This section based on the household's response to their experience with the land administration system and provide lessons for the design and implementation of land administration in order to meet the needs of these hazard-prone informal settlers. For this discussion, we discuss these lessons under each of the following land administration functions: (i) land registration processes, (ii) land use planning, (iii) land development approval processes, (iv) valuation of land, and (v) dispute resolution.

Table 3. Summary of lessons for land policy in the case study area

Policy Lessons	Policy implication
<i>Addressing insecurity of tenure</i>	
Those without formal and legitimate land documents are unlikely to get compensation or disaster relief funding.	Ensuring all affected households are included in DRR disaster relief and DRR programs.
As raised in FGD session, settlement upgrading is not integrated with land registration	Provision of infrastructure and service to all stakeholders.

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<p>Providing these very exposed and vulnerable households with land documents could reduce their threat of eviction related to land acquisition for DRR and infrastructure projects, increase their likelihood of access to formal electricity and WASH services and may provide an incentive to use improved building materials.</p> <p>Improved protection of the tenure security of houses resettled under structural projects.</p>	<p>Protection against the negative impacts of evictions on tenure security.</p>
<p>Land registration processes</p>	
<p>Need to improve access to the historical land tenure and land development records.</p> <p>Improve transparency in land registration by allowing additional forms of supporting documents and addressing the bottleneck of needing the signature of the head of the village (<i>kelurahan</i>) or <i>lurah</i>.</p> <p>The time for processing registration applications could be improved by (i) changing the regulations to allow other types of land-related documents to be used as evidence and; (ii) ensuring that the Standard Operation Procedures of land registration is consistent across municipalities in Jakarta.</p>	<p>The proposed One Stop Integrated Service (PTSP) in regional offices.</p> <p>Transparency could be improved by connecting the PTSP to the land database in BPN.</p>
<p>Land use planning and land development approval processes</p>	
<p>Improved enforcement of Regional Spatial Planning (RTRW), Detail Spatial Planning (RDTR) and Zone Regulation will contribute to fewer households being exposed to flooding, and reduce vulnerability.</p> <p>Mainstreaming knowledge of hazard-risk into spatial planning is important.</p> <p>Improved enforcement of the no-build zones, supported by issuing land documents to households in less exposed areas will increase tenure security, and reduce vulnerability</p>	<p>Enforcement of “no-build” zones in a way that protects tenure security. Mainstreaming knowledge of hazard risk into spatial planning.</p>
<p>Valuation of land</p>	
<p>Most settlers considered the official valuation was below market value. Improved land valuation, along with the provision of land records, will support the more equitable land acquisition and compensation decisions.</p>	<p>Addressing the challenges by increasing land valuation accuracy, transparency, and availability of land valuation records.</p>
<p>Dispute resolution</p>	
<p>Most households state their land is claimed by others and 89% say there is a current dispute over their land, with 53% resolved through courts – a process which is slow and expensive. Dispute resolution could be improved through the involvement of community leaders, for example through deliberations between parties in dispute.</p>	<p>Participatory land mapping and the placement of boundary marks also considered as a mechanism to reduce land disputes due to lack of land information in village level</p>

5.1. Addressing insecurity of land tenure in the study area

The absence of formal land documents is experienced by households in the informal settlement where only 3% of respondents have formal documents, 20% have informal documents (but legitimate), while the remainder has no legitimate documents. Participants in the FGD claimed that those without formal documents and informal land documents (legitimate ones) are unlikely to get compensation or disaster relief funding. This is one key area where a lack of land documents impacts exposed households differently to those less exposed.

While one of the proposed responses to disaster risk is settlement upgrading, as raised in FGD, the settlement upgrading is not integrated with land registration. It is suggested that after reducing vulnerability through settlement upgrading etc, the government should consider ways to provide infrastructure to all houses to increase resilience. In addition, the land agency can help by providing a land document that Water, Sanitation, and Hygiene (WASH) and electricity

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agencies accept.

Settlers in the green and blue zones in the case study areas are vulnerable to eviction whether they have formal land records or not. As shown in table 1, most (70%) respondents fear of eviction, especially from government projects. Improved tenure security can support the options for reducing vulnerability: (i) Reducing exposure through resettlements upgrading; (ii) structural works to reduce sensitivity; (iii) strengthening the community resilience; (iv) and recognition of existing use rights if they were there before the zones were defined. The land agency could consider increasing tenure security as a mechanism for strengthening the community. In addition, the government could enforce the green line zone blue zone in the hazard-prone areas to reduce exposure. Without addressing the exposure, providing these very exposed and vulnerable households with land documents could act as an incentive to stay and increase their threat of eviction related to land acquisition for DRR and infrastructure projects. However, where exposure is addressed through structural projects or sensitivity addressed through settlement upgrading, improved tenure security can increase their likelihood of access to formal electricity and WASH services and may provide an incentive to use improved building materials.

There are DRR projects over hazard-prone State land, despite hundreds of settlers occupy those locations for many years. DRR Agencies needs to work with the land agency to reduce the impact of DRR structural project on tenure security.

5.2. Land registration in the study area

Regarding land registration processes, the assumption that the settlers are more likely to lack formal land records was true in each of the four case study settlements. The questionnaire result showed that only 9.6% of dwellers had land documents that would be considered legally legitimate by the land agency. Households without land documents had a high perceived threat of eviction related to land acquisition for DRR and infrastructure projects and were more likely to use inadequate building materials, lack access to electricity and water services.

As shown in table 2, in general, 64% considered that it is not difficult to search for land permit documents, while 28% say it is difficult. As raised in FGD, this difficulty arises because of a lack of access to historical land tenure and land development records. The FGD attendances suggested that the proposed One Stop Integrated Service (PTSP) will be important in addressing this issue.

Many of the households' occupied land claimed by others can be improved with land information disclosure. Information disclosure should be implemented by land offices by providing convenience to parties who want to obtain land information, especially land status.

As raised in FGD, transparency in land registration at *kelurahan* (urban village) and sub-district level can be improved through allowing other forms of supporting documents and addressing the bottleneck of needing the signature of the head of *kelurahan* or *lurah*.

The existence of existing PTSP at the *kelurahan* level is expected to accelerate the process of verifying the application of land service recommendation at the *kelurahan* level. There needs to be integration and data sharing between the PTSP database in the *kelurahan* and the land

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database owned by BPN. At a minimum, every *kelurahan* office should have a land status map and up to date land records.

The time for processing registration applications could be improved by (i) changing the regulations to allow other types of land-related documents to be used as evidence and; (ii) ensuring that the Standard Operation Procedures of land registration is consistent across municipalities in Jakarta. Moreover, the cooperation between BPN and regional government in the form of data sharing using PTSP will shorten the time needed by the citizens. It will make it easier for BPN and *kelurahan* and sub-district office to perform verification process of supporting documents. As suggested in the FGD, the integration of PTSP services can even be upgraded to facilitate the process of payment of land and building tax (PBB), deed transfer tax (BHTB) and stamp duty (PPH).

5.3. Land use planning and land development approval in the study area

In the case study areas, most of the households within the Green line zone and the Blue open zone were built before these zones were established. Also, the assumption that most informal settlers are very exposed to disasters was valid in these settlements with 70.1% responding that they were vulnerable to disasters. These informal settlements were established in an unplanned manner, with most of the houses (72%) were in locations that don't comply with the current zoning. Improved enforcement of Regional Spatial Planning (RTRW), Detail Spatial Planning (RDTR) and Zone Regulation will require relocation and potentially contribute to fewer households being exposed to flooding, and reduce vulnerability. There should be a mechanism to recognize existing use rights if they were there before the spatial planning and zones regulation were defined. One lesson for land administration is that mainstreaming knowledge of hazard-risk into spatial planning is important.

Settlement in these zones makes the settlers more vulnerable to eviction as 146 respondents (89%) in the same settlements felt vulnerable to forced eviction. When the settlers were asked for the reason they are vulnerable to eviction, 65% answered that the dwelling is not in accordance with the detailed spatial planning and zoning regulation. This affects their tenure security and ability to get land certificates. Their informality and high levels of exposure, as well as being within these no-build zones make them a priority for resettlement. The lesson for land administration is that improved enforcement of the no-build zones, supported by issuing land documents to households in less exposed areas will increase tenure security, and reduce vulnerability.

5.4. Land Valuation

A lesson for land policy is that addressing the issues in the accuracy, transparency, and availability of land valuation records can support improved decisions related to eviction of highly exposed households. Improved land valuation, along with the provision of land records (or other forms of improved tenure security), will support more equitable relocation, land acquisition, and compensation decisions. The valuation of land is significant for the payment of stamp duties, and for the calculation of compensation related to resettlement and land acquisition which are both a real possibility for hazard-prone houses. Land administration can

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be improved by addressing the issues in the accuracy, transparency, and availability of land valuation records. Improved land valuation, along with the provision of land records, will support the more equitable land acquisition and compensation decisions. However, the accuracy of land valuation can be undermined by uncertainty over zoning or land tenure.

5.5. Dispute resolution

A very high level of disputes exists over these settlements. Most households state their land is claimed by others and 89% say there is a current dispute over their land. Most disputes are resolved through courts (53%) which are slow and expensive. The other 47% are resolved through alternative disputes resolution mechanisms.

As discussed in the FGD, dispute resolution could be improved through the involvement of community leaders, for example through deliberations between parties in dispute. The role of head of neighborhood, head of hamlet and religious figures are also felt important to resolve disputes. In addition, NGOs should support community resolution and mediation. Participatory mapping activities and the placement of boundary markers as initiated by NGO are also considered as measures that can reduce land disputes due to lack of land information.

5.6. How Land Administration can support DRR in the study area

Land administration can support DRR through providing evidence of tenure security for all affected households, which may include new land records. This will help ensure all affected households are included in DRR disaster relief and DRR programs. In addition, ensuring DRR and other public projects do not reduce tenure security or increase land disputes. An implementation challenge is to get land and DRR agencies working together to be tenure-responsive. DRR agencies need to work with the land agency to reduce the impact of DRR structural project on tenure security. The legal process for implementing resettlement requires better planning and coordination between government agencies and involves community participation

6. DISCUSSION AND CONCLUSION

This paper investigated the perceptions of tenure security of households located on hazard-prone land, and the effect of DRR projects on tenure security. While 115 respondents (70.1%) stated that they were vulnerable to disasters, most (89%) also stated they were vulnerable to eviction. This illustrates that for households in these settlements, both disaster risk and the threat of eviction are key concerns. A key element of this perceived threat of eviction impacting tenure security was the existence, or otherwise, of DRR infrastructure projects. These results are consistent with the existing literature, which has found that informal settlers are more likely to have poor tenure security and a higher level of hazard risk.

Most respondents lacked formally recognised land records, relying on other documents or the testimony of a witness to support their right of occupation. Many felt vulnerable to eviction and had low levels of perceived security of tenure. Most believed that the lack of a transparent

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procedure at the neighborhood level (*kelurahan*) and sub-district level was the main land administration issue.

Most also believed that their homes had been affected by development projects in the context of involving disaster risk reduction, such as river normalization, access road near river construction, flood retention levels and the construction of underground canals. Many respondents also felt vulnerable to eviction because their land and their houses are in a disaster-prone area or were not located in accordance with the detailed spatial planning and zoning regulation map, or they were occupying state land. A key issue for land policy is to ensure that resettlement designed to reduce vulnerability and hazard risk do not also reduce tenure security.

Most of the households responded that they are vulnerable to disasters and the threat of eviction, whether they hold a land record or not. However, those with land records have a formal identity and are recognised in post-disaster financial support schemes and in plans for compensation related to relocation for DRR purposes. Their perception of the high threat of eviction means the tenure is insecure and is supported by other factors (especially land documents, zoning and lack of infrastructure). The main reason for this high level of perceived threat of eviction is no land document, wrong zoning, and government projects. Where these highly exposed households have unique demands for land administration is that the threat of eviction is localized and often related to projects that involve resettlement. Where this threat is not perceived then other elements (such as housing materials) suggest that there are low to medium levels of perception of tenure security.

The case study settlements are located in hazard-prone areas. Almost every year there are floods due to overflowing river flow and the overflow of seawater during spring tide. Infrastructure projects that aim to reduce disasters face challenges during the land acquisition and relocation processes. In the framework of development, the government has the right to acquire land for public purposes. However, in practice, only people with the formally recorded land certificates are recognised in the resettlement process. Households respond that they are being evicted because the government considers that households' rights are illegitimate. Our key message is that this approach affects tenure security and is not reducing hazard risk as expected as many households have moved back to their hazard-prone land. For improved DRR these issues need to be addressed.

Based on household perceptions of vulnerability and tenure security, the lessons for land policy include the need to ensure that (i) all affected households are included in disaster relief, (ii) all legitimate tenures are eligible for the provision of infrastructure to all vulnerable households, (iii) protection is provided against the negative impacts of eviction on tenure security, (iv) when the "no-build" zones are enforced tenure security is protected, and (v) ensure that DRR and other public projects do not reduce tenure security or increase vulnerability. These recommendations have the potential to greatly improve the resilience of vulnerable households. However, further consultation would be needed to validate these recommendations across the wider Jakarta area.

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BIOGRAPHICAL NOTES

Mulyadi commenced his PhD study on LAS to support DRR at Mathematical and Geospatial Sciences, School of Science of RMIT University in July 2016 as Australian Award Scholarship (AAS) awardee. The research investigates the development of Land Administration System and aims to develop and implement a policy framework for LAS to support Disaster Risk Reduction in Indonesia. Mulyadi has been working for Ministry of Agrarian Affairs and Spatial Planning/National Land Agency Indonesia since 2002. He holds a BSc in Geodesy and M.App.Sc in Geographical Information System.

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Donald Grant was the New Zealand Surveyor General until February 2014 when he took up the position of Associate Professor in Geospatial Science at RMIT University. He holds a BSc Honours in Physics from Canterbury University, a Diploma in Surveying from Otago University and a PhD in Surveying from the University of New South Wales. He registered as a surveyor in 1979 and is currently registered as a Licensed Cadastral Surveyor in Victoria.

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