

# ***Social Disaster Risk Vulnerability Analysis as A Result of Rural Urban Transformation Process (Case Study at Sawangan Depok West Java Province Indonesia)***

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**Abstract**—Social disaster at research area caused by human factors, include social conflicts between groups of communities and terror. The structure of society in Sawangan has high interactions of rural-urban and process transforming the rural town can be a trigger of social disaster. The transformation of rural town that related with the risk is an important thing to explored and understood as a part of social phenomenon. The purpose of this study is to analyze the risks of social disaster and determine the level of danger or the magnitude of potential danger (hazard). The risk identification level of disaster can define the number and frequency of potential conflicts. Magnitude of conflict can be seen from the history of conflict or events in past that have occurred with the possible potential to occur repeatedly. The method used descriptive quantitative and map correlation with approach of the conflict based on the structural-functional theory. The results showed that areas with high social disaster vulnerability index was produced by the spatial characteristic namely high of population density and low of social capital and the institutional of society. Distribution of areas with high social disaster index occur in area Pengasinan and Pasir Putih, while the distribution of areas with low social disaster index occur in Sawangan, Bedahan, Kedaung, and Cinangka.

**Keywords**—*Social disaster, rural urban transformation, risk index, conflicts, Sawangan*

## I. INTRODUCTION

Depok City was originally a city district that is included in the district of Bogor, then got the administrative city status in 1982 and 1999, on April 20, 1999 officially became a municipality Depok (now: the city). Based on District Regulation No.8 Year 2008 on the Establishment of Regional District in the city of Depok, Depok City Government which was composed of six sub-districts divided into 11 districts. The districts consist of Cimanggis, Sukmajaya, Tapos, Sawangan, Pancoran Mas, Limo, Beji, Cinere, Bojongsari,

Cipayung and Cilodong. Depok city has an area of 200.29 km<sup>2</sup> or 0.58% of the area of West Java Province, directly adjacent to the three districts / cities (Bogor Regency, Tangerang and Bekasi City), and also two provinces (Banten and DKI Jakarta). Depok City already to either change the structure of space and the structure of society. The changes structure of the space, referred to persistence of land use changes from land that utilized as fields, gardens, and vacant land to be settlements.

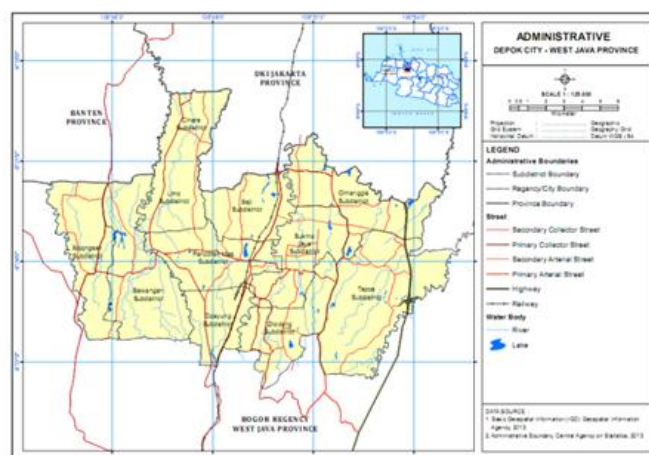


Fig 1. Map of Administration of Depok City

The development of Depok city either in change the structure of space and society, have impact to the structure of the space referred to persistence of land use changes that initially there's no wake up land (fields, gardens, vacant land) into settlements. Based on BPS data, in 2005 recorded an open green land area 10106.14 ha or 50.23% and the settlement reached more than 44.31% of the area of Depok. However, based on data from the 2012 comprehensive residential and industrial area increased to 80% from the area of Depok.

Referring to Janthy T. Hidayat (2012), the land-use change of rural into urban land in Depok, causing spread of pattern that called sprawl. Population growth in the city of Jakarta to be one of the factors causing the increasing demand for space, while the quantity of space still the same, then there is a development to the suburbs of the city that aims to provide a space for the fulfillment of increasing population numbers.

The dynamic conditions development of Depok City both in the structure of space and the structure of society, the District Sawangan is an area most extensive, that has not woken up land, and the population density is lowest than the other regions. Additionally in District Sawangan land used for agriculture is still extensive such as gardens and fields.

Sawangan region still has a rural typical although it is located in urban areas. Characteristics of rural areas, among others: (1) comparison of land with a man (man-land ratio) is large enough land in rural areas is relatively larger than the number of population so that the population density is low (2) the dominant employment agrarian (3) the relationship between the villagers are very familiar (4) the old tradition is still valid (Daljoeni, 1987).

However, with an area and geographical position that owned, District Sawangan potential to become the region linking the city Depok with Parung, Leuwiliang (Bogor) and Serpong (Tangerang). The interaction between the District Sawangan with Bogor and Tangerang trigger the development of the region, both in the structure of space and society. In the last 5 years, the settlements regularly increasing in the Sawangan District, so has the number of migrants.

In connection with the interaction of the Sawangan District with other regions this could potentially lead to social conflict. According to Fisher (2001), the conflict can become a social reality that is negative or positive depending on perspective, analysis, and management that conducted in case of the conflict. Fisher (2001) also mentions that the conflict is an expression of interest in the phenomenon of social heterogeneity. conflict can become a social reality that is negative or positive depending on perspective, analysis, and management is done in the case of the conflict.

Conflict is one indicator that can be categorized as a social disaster. A conflict would be disastrous, if already violent form, and lead to loss of life (Fisher, 2001). Social disaster can be identified from the vulnerabilities that arise. This vulnerability can be measured from the characteristics of the social, cultural, economic and political in a society that has a negative response and more easily ignited by a conflict.

Based on the background already outlined problems, can be formulated in the form of research questions such as following:

- What the risk identified from index of social disasters potential conflict in the District Sawangan?
- How can the risk of social catastrophe which correlated with the structure of space and the demographic structure of the region so that it can be identified products space-forming potential social disaster in the Sawangan District?

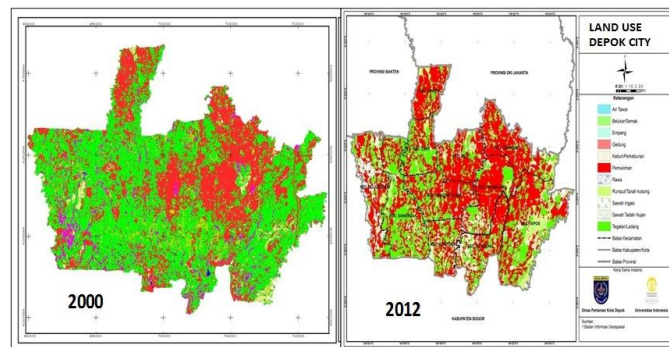


Fig. 2. Map of Landuse of Depok City

## II. METHOD

The research with approach to index social disaster risk using descriptive quantitative approach, as well as the approach of conflict by using map correlation. A quantitative approach is used in the calculation of the index, while the approach of conflict used to conduct an analysis of social relations that occur in society. Social relations are identified from social structures and processes that occur.

The framework for this study can be explained by linking community structures in the area of research with the potential conflicts that might occur and have occurred. Relationships between variables used in this research can be explained from research schemes (attached).

The data in this study were obtained through observation, interviews with informants, secondary data from publications related to the area of research, and statistical data from government agencies. After the data is collected, processing is conducted to determine the level of danger (hazard), vulnerability (vulnerability) and adaptation capacity (capacity).

Identification of The risk of disaster is always proportional to the level of hazard (H) and vulnerability (V), as well as inverseley proportional to capacity (C). Its can be formulated like this.

$$R = \frac{H \times V}{C}$$

Source: IIRR and Cordaid (2007) on Wianti, F.K et al (2009)

Where R is the risk of a social disaster in the form of violent conflict, H is a hazard, these types of potential conflicts, and V is the vulnerability or vulnerabilities identified from social capital owned by the community.

TABLE I. DATA PROCESSING

Indicator	Description	Categorize
Hazard	Identification type of conflicts potential and also conflict probability at all of region at Sawangan	<b>Low Hazard</b> if the conflict never happened or had been happening but could potentially happen again <b>Middle Hazard:</b> if the conflict never happened but potentially happen again <b>High Hazard</b>

Indicator	Description	Categorize
		if the conflict never happened and could potentially happen again
Vulnerability	identification of social system that developed in the community	<b>Not Vulnerable</b> high cooperation <b>Vulnerable</b> the high competition <b>Very vulnerable</b> their disagreement high
Capacity	identification social capital of community	<b>Weak</b> <b>Strong</b> <b>Very strong</b>

Source: Wianti, F.K et al (2009)

The data analysis is to make the distribution results calculation of social disaster risk index has been achieved into the spatial structure of the unit of analysis. The structure of space is determined by the population density and landuse of each region. This analysis also linked with demographic aspects such as education and livelihood. Results of analysis are shown in the risk map of social disaster based on the structure of space and the demographic structure of the research areas.

### III. FINDING AND DISCUSSION

#### A. Structure of Space and Demography

Geographically, Sawangan has area around 29.25 Km<sup>2</sup> or 14.6% of the total areas of Depok City. Sawangan located in the southern of Depok to borders in the north is town of Tangerang Selatan, east to the district of Limo, Pancoran Mas, and Cipayung. The south by the district of Bogor, and in the west by Bojongsari.

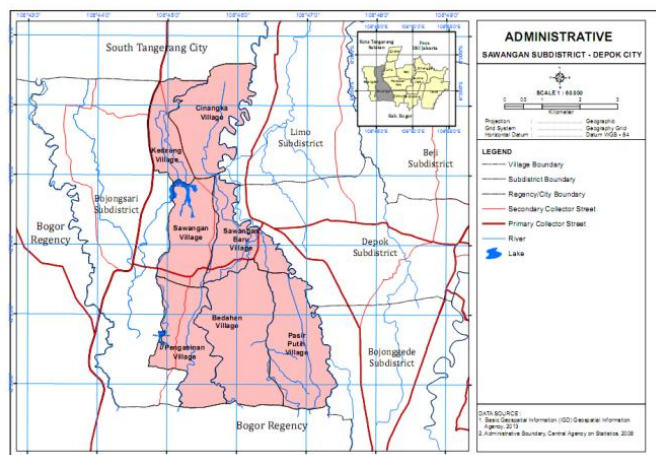


Fig. 3. Map of Administratif of Sawangan

The impacts of Sawangan that directly adjacent to other districts and cities is the increasing population in the district Sawangan. Shown in table II.

As the continuing impact of the increasing population, so the number of land for settlements increase too. This can be significant with changes of land use at Sawangan. In 2008, the

area of land designated for residential as much as 46% of the area, in 2012 changed to 56%.

TABEL II. DEMOGRAPHY INDICATOR AT SAWANGAN

Description	2012	2013	2014	2015
Population	128.905	139.473	144.528	153.832
Density of Population	4.409	4.770	4.943	5.252

Source: Statistic of Sawangan Subdistrict

Based on statistical data processing and satellite images, obtained by the fact that most of the settlement in Sawangan is regularly form settlements. Regular settlements that inhabited by migrants (figure 4). It is an indicator that the sub district locations Sawangan driving the changes in the structure of society and the local area.

The other demographic indicators in Sawangan that studied relation on potential conflict is the level of education and the quantity of underemployment. This is calculation results for 7 villages in District Sawangan (Table III).

Overlay analysis performed to obtain the distribution structure and demographic profiles, in order to obtain an overview of the types of settlements, levels of education, and underemployment level. The results showed that on a regular settlements have high education level and the underemployment level is low, while the condition its different to unregular settlements that have low education level and the high of underemployment level. The sub-district of Pengasinan and Pasir Putih as a region with low education level and high underemployment level condition, related with the high of significant level in social capacity concept, so the region will be significant with low social capital and potential to making a trigger of social conflicts.

TABLE III. LEVEL OF EDUCATION AND UNDEREMPLOYMENT AT SAWANGAN

No	Sub District	Education Level	Underemployment Level
1	Pengasinan	Low	High
2	Bedahan	Middle	High
3	Pasir Putih	Low	High
4	Sawangan Baru	High	Middle
5	Sawangan	Middle	High
6	Kedaung	Middle	High
7	Cinangka	High	High

Source : Analysis Data, 2016

#### B. Identification of Social Conflicts

Based on interview with key informant of community leaders and local government institution, the obtainable of data related type of conflicts at Sawangan. There is two indicator



identification of conflicts. The first indicator is magnitude of conflicts, and the second is events probability of conflicts.

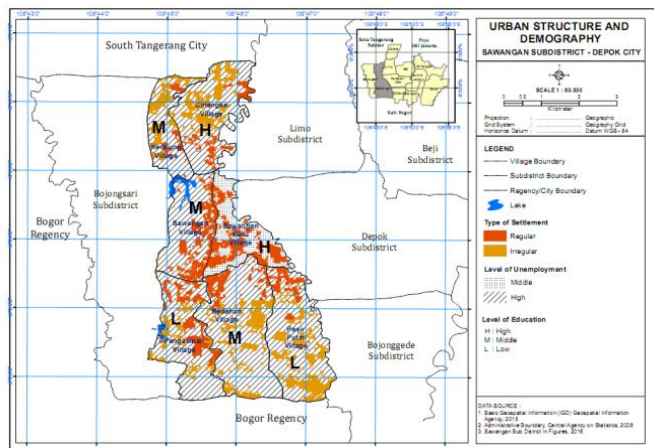


Fig. 4. Map of The Structure of Space and Demography of Sawangan

Magnitude of conflicts based on the types of conflict was proposed by Fisher (2001). Fisher found the 3 types of conflict as follow :

- Laten Conflict is the type of conflict that are hidden and need to be lifted to the surface, so it can be handled effectively.
- Open Conflict is a conflict that has roots problems very real, so requires a variety of measure to resolve the root causes and effect of it.
- Surface Conflict is a conflict that very shallow and arise because of misconceptions about target that can be addressed by improving communication.

The Type of social conflict events that have occurred in the district of Sawangan at the last five years ago, can be seen complete in Table 4.

TABLE IV. IDENTIFICATION OF SOCIAL CONFLICT EVENTS

No	Sub District	Type of Social Conflict
1	Pengasinan	Friction ahead of election, Friction between communities, Rejection of government policy
2	Bedahan	Friction between communities, Friction ahead of election
3	Pasir Putih	Construction of places of worship, Friction ahead of election, Rejection of government policy
4	Sawangan Baru	Ahmadiyah attack, Friction ahead of election
5	Sawangan	Teen brawl
6	Kedaung	Friction between communities
7	Cinangka	Friction between communities

Source : Data Analysis, 2016

Probability of social conflict event have categorized into low level, middle, and also high probability level. Condition of low level probability is never happened or ever happened of

social conflict, but not potential happened again. As a middle probability level is never happened, but its have potential to happened and high level of condition the social conflict, if it can happened and will be potential happened again.

Based on the calculation to magnitude and probability of social conflict at Sawangan, have a result that the high conflict potential is located in sub district of Pengasinan, Pasir Putih, and Sawangan Baru. The region characteristic with high conflict potential include into the type of laten and open conflict. Both of the types will be happened again for next time.

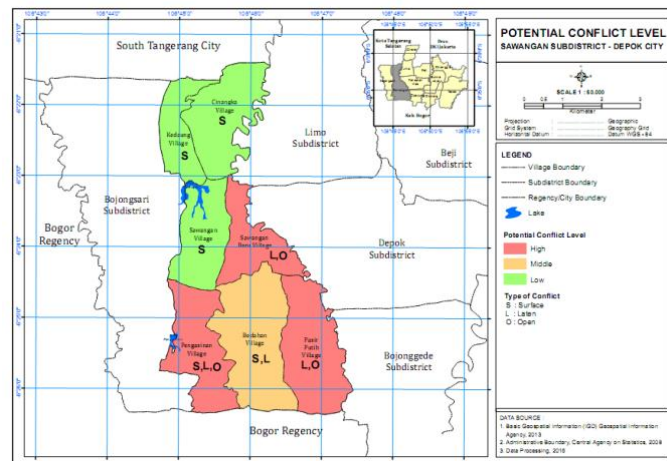


Fig. 5. Map of Conflict Potential at Sawangan

### C. Index of the Social Disaster Risk

The social disaster is the disaster that caused by the event or the several events by human activity, including social conflict of intergroup or between others community and terrors (UU RI No.24 year 2007).

The risk of social disaster can be interpreted as the potential disaster that will be a vulnerability into community, which can make the conflict events compared to the capacity or the resilience of community in the mitigation for the solution of conflict.

In this reasearch H (hazard) collected from magnitute and probability of conflict. V (vulnerability) identified from the social system condition in the community. While C is capacity, identified from social community modals. The result came from the criteria and indicator like shown on the table 5.

TABLE V. ANALYSIS OF SOCIAL DISASTER RISK INDEX AT SAWANGyN

Component of Risk	Indicator	Score	Description
H	M	1	Surface Conflict Potential
		2	Latent Conflict Potential
		3	Open Conflict Potential
	P	1	Never happened or happened of social conflict, but not potential happened again
		2	never happened, but it have potential to happened

Component of Risk	Indicator	Score	Description
		3	It was happened and will be happened potential again.
V	Social System	1 2 3	Cooperation Competitive Contradiction
C	Social Capacity (Education level)	1 2 3	Low of social modal High of social modal Very high of Social Modal

Source: Wianti, F.K et al (2009)

Information: R = Risk, H = Hazard, V = Vulnerability, C = Capacity, M = Magnitude, P = Probability  
Based on the instrument of analysis below ,achieved the score index of social disaster risk:

Minimum score R = 0.33

Maksimum score R = 6

Score interval Maksimum – Minimum R = 5.67

TABLE 6. INDEX OF SOCIAL DISASTER RISK AT SAWANGAN

No	Sub District	Risk Index
1	Pengasinan	6
2	Bedahan	1
3	Pasir Putih	6
4	Sawangan Baru	2
5	Sawangan	0.5
6	Kedaung	0.5
7	Cinangka	0.33

Source : Data Analysis, 2016

The index of social disaster risk classified into 3 levels . It was done for every indicator. Risk value categorized:

High Risk =  $3.7 \leq R < 6$

Midle Risk =  $2 \leq R < 3.7$

Low Risk =  $0.33 \leq R < 2$

High social disaster risk is located at Pengasinan and Pasir Putih (Figure 6). The index distribution of the social disaster risk was indicated on the region with the structure condition which dominated by the irregularly settlements, with the characteristic structure of demography that low in education level and still high the level of unemployment.

As for the region with the middle social disaster risk is at the Sawangan Baru. The characteristic of social disaster risk are mirrored with the demography structure region with the high level of education and the middle level of unemployment.

Sub district of Bedahan, Sawahan, Kedaung and Cinangka have low social disaster risk index. The structure all of these region indicated by regular settlements form, and also the demography structure which indicated in low level until high level of the education and unemployment.

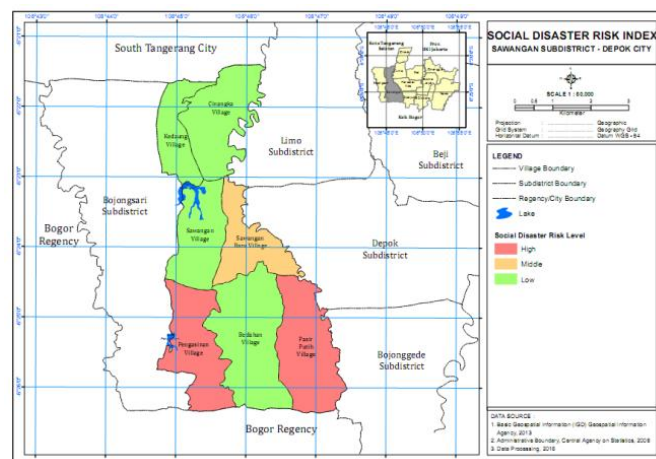


Fig. 6. Social Disaster Risk Index Index at Sawangan

#### IV. CONCLUSIONS AND SUGGESTIONS

The sosial disaster risk potential can affectthe urban rural transformation region. District of Sawangan as a rural urban transformation region have characteristic rural at five years ago, but now Sawangan have urban characteristic, that including the administrative of depok City. Determination of social disaster risk index based on structure of region and demography at Sawangan indicated that, the areas with the structure of region dominated by the irregular settlements are more have a high social disaster risk.

The community empowerment is a means increasing of adaptive capacity as a increasing of social modal including education level, skills, and also creating employment, these are the solution can be decrease potential of social disaster risk at Sawangan.

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