PROCEEDING
INTERNATIONAL CONFERENCE

Land Consolidation
as an Instrument to Support
Sustainable Spatial Planning

National Land College
Yogyakarta, November 16th, 2017

Supported by

university of groningen

Proceeding International Conference:
Land Consolidation as an Instrument to Support Sustainable Spatial Planning

First published
(November, 2017)
by:
National Land College
Jl. Tata Bumi No. 5 Banyuraden, Gamping,
Sleman, Yogyakarta, 55293
Tlp. (0274) 587239
Faxs: (0274) 587138

In collaboration with

STPN Press
Jl. Tata Bumi No. 5 Banyuraden, Gamping, Sleman
Yogyakarta, 55293
Tlp. (0274) 587239 (ect. 115)

Author: Oloan Sitorus, Sukmo Pinuji, Westi Utami,
Arif Suhattanto, Ferdy Nugraha, et al.
Editors: STPN Press Team
Layout & Cover: nazir slm

National Library: Catalog in Publication
Proceeding International Seminar:
Land Consolidation as an Instrument to Support Sustainable Spatial Planning
National Land College, 2017
vii + 240 page.: 20.5 x 29 cm
ISBN: 978-602-7894-37-7

LAND CONSOLIDATION AS A SOLUTION FOR DENSELY POPULATED AREA (CASE STUDY IN KOTAGEDE YOGYAKARTA)

Westi Utami[1]
National Land College, Tata Bumi 5 Yogyakarta 55293, Indonesia

Abstract

The growth of natural settlements, in the absence of land planning and arrangement often creates problems with space utilization in densely populated areas. The high building density without regard to road accessibility, the availability of open space and the availability of shared space not only affects the low level of environmental health but also affects the level of community vulnerability in the event of a disaster. The research was conducted in densely populated area of Kotagede. The research method is done by spatial approach using Geo Eye Image and conducting field survey. The results showed that the growth of settlements without land control caused high levels of vulnerability where 41% of households are in a very vulnerable condition. Narrow road conditions and poor road accessibility also make it difficult for residents to evacuate in the event of a disaster. Control of land through land consolidation can certainly be used as a solution to organize residential areas and reduce the impact of risk in the event of a disaster.
Keywords: land control, land consolidation, Disaster risk reduction

A. Background

The natural growth of settlement without any rules of the land utilization for street access, public facility, and social facility causes densely populated settlement and the decreasing of the environment quality. This condition is mostly found in urban and sub urban areas where they become the center of economy and settlement.

The regulation and the control of land utilization must be applied. The solution of this problem is zoning or the policy of land consolidation toward the densely populated settlement or the region that is predicted to be densely populated settlement.

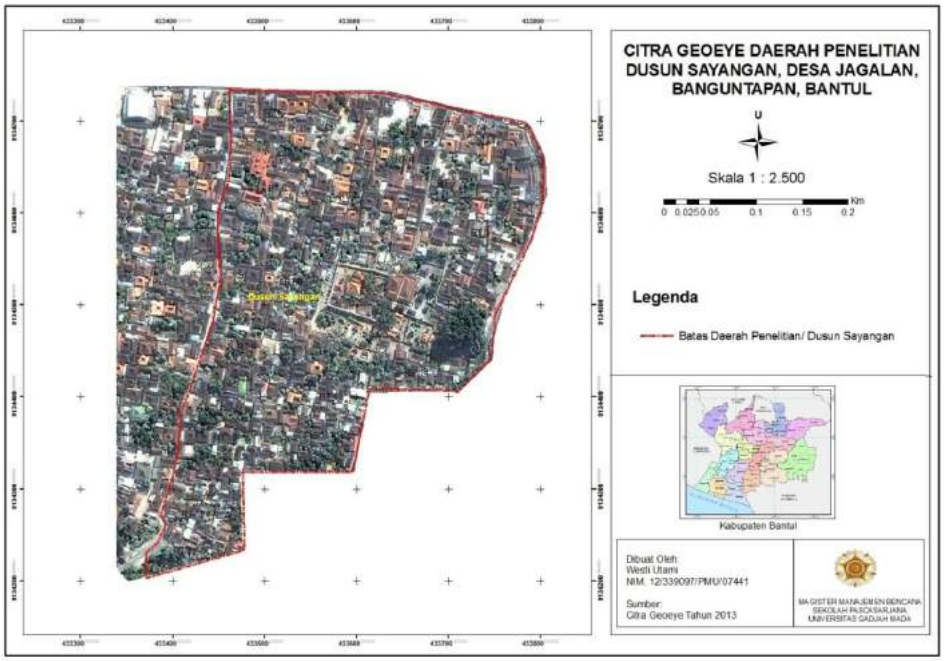
A study toward the settlement that grows naturally is done at *Sayangan Hamlet*, *Jagalan, Banguntapan Bantul* because this area was densely populated settlement in 2006 when the earthquake occured at *Sayangan Hamlet*. The level of population density reaches 11.941 people/Km^2 (Population Census, 2010) with close distance (around 1-2 meter), the narrow road (0,5 m -2 m) and the street is curvaceous. Because of the earthquake that occured on May 27th 2006, this region suffered from destruction. There were 150 traditional houses (*joglo*) and 88 houses that were destructed by the earthquake. The consolidation of land policy can be a solution for overcoming the densely populated settlement. This solution is expected to create qualified and sustainable settlement. But, this is a challenging solution to be applied.

B. Densely Populated Settlement in Kotagede

Sayangan Hamlet is one of the parts from the old Mataram Kingdom. This area is a center for economy and trading activity especially silver craft. In the past, *Sayangan Hamlet*

[1] Coresponding Author: westiutami@gmail.com

was inhabited by rich merchant. Because there were so many thieves at that time, the high wall was built to protect the kingdom. Nowadays, the high wall is fragile and this endangers citizen. This area is densely populated settlement with 3364 residents, 912 heads of family (The Monography of *Desa Jagalan*, 2013). The high densely populated settlement, the narrow street, the dense settlement pattern are the causes that this area is susceptive toward the earthquake. The houses that are located together, the minimum of opening space to avoid the remain of earthquake, the narrow aisle (0.5 - 2 m) and the high wall that is easily cracked will make the citizen difficult to evacuate themselves from the earthquake. This is the condition of *Sayangan Hamlet* from Geo eye Image that is depicted in picture 1.



Picture 1. Condition of Sayangan Hamlet from Geo Eye Image (Geo Eye, 2013)

C. The Problem of Dense Settlement

Based on the research that was done in 2014, it stated that From the opening space ownership census shows that 38,7% of households do not have open space and only 18% from 365 households have opening space for more than 100 m^2. The households who do not have opening space will find difficulty in evacuating themselves if earthquake occurs. The unavailable of opening space causes some hoeseholds are rather vulnerable in facing earthquake. From the census that is done, there are 127 houses (34,6%) that have wide access with road length for 1,5 meter. Only 8,2% and 6,5% of households who have road width of 3 meter. The households who are in narrow street are in the center of dense village. In order to reach this area, people usually walk, ride bicycle or motorcycle. The narrow street is impossible for two motorcycles can pass. Some wide streets (more than 3m) and the good condition of streets are owned by several houses that are in Modokoro street, the

west side street of market, the road to mataram mosque, and the road of border Sayangan and Bodon village. Based on cross tabulation result, the level of vulnerability in environment and physical vulnerability shows that most residents (154 households) are vulnerable in physical and environment aspect. They are in level 2 of vulnerability level. There are 13 households who are extremely vulnerable physical and environment. These 13 households should be very careful if there is an earthquake. They must be very careful if they evacuate themselves because they are in the vulnerable house and there is not opening space around their house. The narrow street and the unavailable of opening space will make them difficult to evacuate if there is an earthquake (Utami, 2014).

From the previous research shows that many densely populated settlement experiences environment degradation and the high susceptive health environment. So, if the earthquake or wildfire occurs, this region has a higher risk compared to other regions. The picture of densely populated settlement and citizen is presented at picture 2.

- densely populated settlement very hight
- do not have open space

road length only 1 - 1,5 meter

Picture 2. Condition in Sayangan Hamlet from Geo Eye Sattelit

Narrow road (1 – 1.5 m)

Densely populated and unavalaible open space

Picture 2. Densely populated settlement in Sayangan Hamlet

D. Land Consolidation as the Solution for Densely Populated Settlement

The densely populated settlement problem in *Sayangan Hamlet* can overcome by zoning solution and also land consolidation. The land consolidation can be done toward the cluster area that still has open area by removing the barrier wall so the street access is wider, having sufficient light, and having environment that can be maintained. While, for the house that has limited and narrow land, the consolidation of horizontal land will be hard to do. In order to overcome densely populated and old settlement, the vertical land consolidation can be done.

Picture 3. Land Consolidation In Sayangan to support avaibility open space and road save

The horizontal land consolidation can be done through: cutting, shifting, breaking, exchanging, combining, and eliminating. The easier way to do is by unpacking the barrier wall and it can be used to broaden the land and open a new land. The arrangement of the land ownership, mastery, use and utilization and also the magnitude of land consolidation, can be done from the funding of government (*APBN /APBD)* or from the society itself such as: land contribution for development /Sumbangan Tanah Untuk Pembangunan (STUP) and land replacement cost of development/Tanah Pengganti Biaya Pembangunan (TPBP) scheme. For *Land Consolidation* participants who do not have land for *STUP* and *TPBP* can replace with the money based on agreement. Condition Sayangan Hamlet with fragile walls and narrow road is presented at picture 3.

The land consolidation must involve the local government, land office, and community. The local governmnet has authority to organize the layout and zoning area and it also has role in infrastructure such as road development, the water tunnel, and others.

The land office has an authority in managing the land ownership, authorization, use and utilization. The division of authority and organization in applying LC follows the LC implementation that consists of control team (province level), coordination level (regency/city level) and the task force of unit.

The process that must be done in land consolidation must be through socialization, agreement of community/*Land consolidation* participant, the measurement and mapping, the location establishment, object and subject identification, the topography measurement and land use mapping, block plan making or pra design spatial, discussion about new settlement arrengement, the release of the claim of land from the participant, the land affirmation as land consolidation object, relocation/stacking out/the design movement to field, the construction/formation of road body, the redistibution/publication of land right and certification decree.

While for the densely populated settlement in *Sayangan Hamlet* with the size of building area is around 40 m^2 and the building condition that is not good, the settlement arrangement can be done through vertical land consolidation.

E. Conclusion

1. The uncontrolled settlement that is not maintained well causes the emerge of settlement and the crowded amount of citizen. This condition can cause the degradation of environment and health.
2. The crowded settlement with narrow accessbility and also the limitation of opening space has a high correlation toward the physical vulnerability and the environment so if there is disaster (earthquake/fire), this region has a higher risk.
3. The settlement in *Sayangan Hamlet* is unique for this region was established since the Mataram kingdom with traditional joglo building and old wall that surrounds house and citizen's garden, so it forms labyrinth with narrow street.
4. The policy that can be done for the settlement that has room but it is closed by the wall can be done through land consolidation by demolishing the wall so it can be used for dilating the street and creating the opening space for public.
5. The land consolidation for densely populated settlement and the settlement that is predicted will be dense is necessary to be done for creating a better quality ennvironment. The optimum use of the land utilization will also create a sustainable environment.
6. For the dense population that has size of land/house 40 m^2 and does not have open space with the unoroper house condition can be applied through vertical land consolidation.

Bibliography

Bappenas, 2006, *Preliminary Damage and Loss Assessment*, *Yogyakarta and Central Java Natural Disaster*, The Consultatif Group on Indonesia, Jakarta.

Knoblauch, R. L., 1996, *Field Studies of pedestrian Walking Speed and Star Up Time*, Transportation Reasearch Record, vol. 1538, hal. 27-38.

The Monography of *Jagalan village*, 2013

Pusaka Jogja Bangkit, 2006, Rapid Assessment of Damage Heritage in Jogja And Central Java Post Earthquake May 27, 2006, Report.

Rouben Goldblatt, 2003, "Evacuation Planning, A Key Part of Emergency Planning", for Presentation 83rd Annual Planning Transportation Research Board, January pp. 11-15.

Sensus Penduduk, 2010, *http://www.bps.go.id*, online Acces : November 26, 2013.

Stevanov, A. & Smith, J. 2009. Multi Objective Evacuation Routing in Transportation Networks. *European Journal of Operational Research*, 1498, 435-446.

UNOSAT. 2006, Preliminary Damage Assessment: Java Eartquake. Access: December 12 2013 from *http://un.or.id_yogya_maps.asp*.

Utami Westi, 2014, Vulnerability Mapping and Evacuation Maping In Sayangan Village Baguntapan Bantul DIY, Thesis.

Xu, Okada, Takeuch and Kajitani, 2007, *A Diagnosis Model for Disaster Shelter Planning from Viewpoint of Local People, Case Study of Nagata Ward in Kobe City Hyogo Prefecture, Japan*, Annual of Disaster Prevention Research of Kyoto University No 50.

Legislation:

Government Regulation No. 24/1997 on Land Registration

Regulation of Head of National Land Agency Number 4 Year 1991 concerning Land Consolidation.

Decree of Head of National Land Agency Number 2 Year 2003 regarding Norm and Standard of Mechanism of Government Authority in Land Affairs Implemented by Regency/City Government.