

Risk Modeling of Public Private Partnerships for Settlement Infrastructure Development in Jakarta

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Abstract-- Settlements included in national priorities, but has not been included in the projects offered in the PPP Book, although very large housing needs of 5.8 million units. This caused one of them is a low investment value. Given the importance of housing needs in urban development, the PPP can be done in the area with the help of technical assistant by the central government.

This study discusses the problems of any obstacles or things that both encourage rejuvenation of an area that suffered a setback function (decaying urban) in order to be returned to the original function or even enhanced function to be ideal with the main supporting infrastructure such as housing, transportation, energy availability, as well as distribution of clean water which will strengthen the city to operate the function that consists of 5 pillars, namely: community service centers, trade and distribution center, financial center, the center of tourism-related community development. Articulation between the major stakeholders such as: government, private, and community become the main concern in this research, including in determining the appropriate financing schemes.

Index Term-- public private partnerships, settlements, infrastructure, and articulation.

I. INTRODUCTION

Cities community delivers some immediate challenges, from pollution and disease, unemployment and lack of shelter. But the city that presents opportunities to improve energy efficiency, reduce disparities in development and improve living conditions in general. History shows that an integrated

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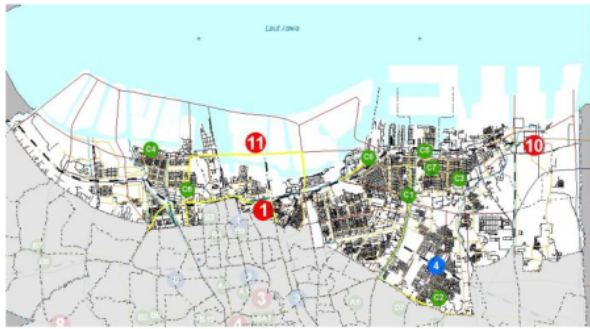
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urban policy can be a path to building a solid (Ban Ki-Moon, 2009).

A policy as a strategy for the future, one with the realignment of an area to achieve optimum utilization of each existing urban land plot in accordance with the functions that have been outlined or urban renewal. Urban renewal is aimed at improving the living conditions of urban society and environmental quality, and sustainability of local communities in various aspects: economic sustainability, environmental sustainability and social sustainability (Lee KL Grace; Edwin HW Chan, 2005). Urban Renewal done when a city experiencing a setback function, so that should be raised again in his new function.

Urban planning should be done prudently and comprehensively. Previously, city planning is not done with the wise and comprehensive, construction / development is causing social and environmental problems, such as clutter environment, traffic congestion and poor environmental quality (Poirot, 1995; Fung, 2001). This will be more severe in the absence of consistency in the implementation of existing plans.

Urban renewal related to four main points in the infrastructure, namely: housing and settlement, transportation, energy security and clean water. To generate a new function of the supporting infrastructure is reliable, it is not solely the responsibility of government, but also the private sector and community involvement. Experience both on policy and practice of France, Britain and the Netherlands in doing urban renewal indicated a need for articulation between public, private, and civil actors (Roelof Verhage, 2005). Development of national infrastructure that have the carrying capacity and maneuverability to economic growth and social justice and the interests of common people in all parts of the archipelago of Indonesia is to encourage community participation. Public housing included in national priorities, but has not yet been included in the projects offered in the PPP Book, although very large housing needs of 5.8 million units. This used one of them is a low investment value. Given the importance of housing needs in urban development, the PPP can be done in the area with the help of technical assistant by the central government. Planning for infrastructure development in North Jakarta as in Fig. 1.



Legend:

- Central of Primer Activity
- Central of Sekunder Activity
- Central of Tersier Activity

Fig. 1. Space Structure Plan Mainland North Jakarta in 2010-2030

City of Jakarta as the capital of the country with an area of approximately 66,152 Ha has a function and role as a service city with 4 (four) pillar activities, namely: financial center, trading and distribution centers, community centers and centers of tourism.

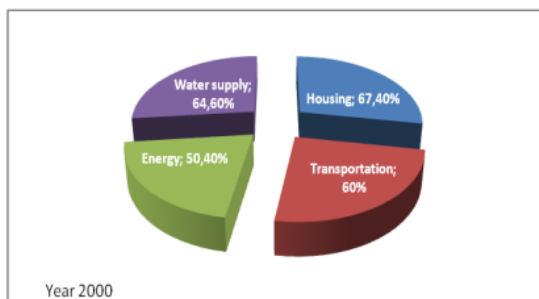


Fig. 2. The proportion of Infrastructure Service Coverage to Total Population in DKI Jakarta Source: processed from various sources

Accordingly development area the function and role, the growth and development are walking with rapid urban development. The population served by reaching more than 10 million people make this city experienced high pressure in the planning of land use, transportation and environment quality as well as attention from the public regarding the effects of urban growth such as sprawl, congestion, housing needs and the loss of green open space.

This study discusses the problems of any obstacles or things that both encourage rejuvenation of an area that suffered a setback function (decaying urban) in order to be returned to the original function or even enhanced function to be ideal with the main supporting infrastructure such as housing, transportation, energy availability, as well as distribution of clean water. The main supporting infrastructure strengthen the city to operate the function that consists of 5 pillars, namely: community service centers, trade and distribution center, financial center, the center of tourism-related community development.

Role of the major stakeholders such as: government, private, and community become the main concern in this research, including in determining the appropriate financing schemes. The results of this study will be recommended to the stakeholders especially the government which will able to make Jakarta as a city that can bring opportunities. It must be backed with the reliability of infrastructure in Jakarta, particularly for infrastructure settlements as the "trigger" its development with the principles of PPP financing schemes to attract local and foreign investor interest and improve its competitiveness in national and global markets.

Problem Identification

Jakarta's rapid population growth reaching 3% per year, potentially causing problems such as inefficient use of urban land, increasing slums, residential areas that are not organized and environmental pollution. City of Jakarta as the capital of a country with a large flow of urbanization has implications for the increasing population and increased need for housing.

As it is, a variety of social problems also arise as a result of the impact of urbanization is almost unstoppable. Starting with the economic problems and social have implications on the complex physical problems such as the arrangement of space that is not effective, traffic congestion and poor transport, flood, slum housing and so forth. The number of people is increasing living on limited land at the root problem of housing. High prices and limited land area in downtown Jakarta, resulting in an alternative to solve the housing needs in urban areas is limited to the developing model of vertical form of residential apartment buildings. The middle of society forced to live in the suburbs because housing prices in the middle of town that is not affordable. This is one of the causes of congestion in the city of Jakarta. Because at the same time, the people of the Greater Jakarta area move toward the outskirts of Jakarta for work. Therefore, a simple development of this plan is one of the strategic program to address the provision of housing in urban areas, decent and affordable to lower-middle income community.

Housing backlog is high, about 5.8 housing units (2004 data), the addition of new housing needs due to the addition of a new family of about 820,000 units per year. In addition, many homes were unfit for human habitation including, technical and ecological, scattered in urban and rural. Slums scattered throughout the urban region, especially Indonesia covering less than 54,000 ha, spread in 10,000 locations. Obstacles faced is the limited urban land so that town government is required to be able to utilize land efficiently by increasing the intensity of their use.

The scope of this study focused on infrastructure development undertaken by a private settlement in cooperation with the government. The study aims to formulate the implementation strategy of rejuvenating the city with some cities precedents in other countries such as France, Britain, Netherlands, Singapore, and Hong Kong (takes about 50

years) who have successfully implementing public private partnerships (PPP).

II. MATERIALS AND METHODS

Development of the application of PPP model in urban renewal builds upon the analysis, while the research area will be done in the case of Regions Cilincing – Marunda. The final conclusion can be drawn from the research and the resulting PPP financing models on urban renewal in Indonesia, especially in Jakarta, with characteristics that specific.

Primary Data

Primary data is existing data and facts relating to the City of Jakarta (especially in northern areas of research case study of Jakarta) and obtained directly from the field through direct survey. Methods for collecting data and facts rejuvenation of existing areas are:

- a. Field survey methods, field survey conducted to see at first hand the condition of the existing regional spatial reclamation is done by observing, feeling and record on camera media. Results recorded images will be used in the analysis process.
- b. The method of mapping the condition of the supporting infrastructure of Jakarta, this method is part of the activities of field survey that aims to record the various conditions of the supporting infrastructure, such as: housing, energy, clean water, and transportation.

Secondary Data

Secondary data is data about the rejuvenation of the area obtained from a collection of books and literature from the library policy. Literature review of various reference sources (journals, text books, website browsing etc.) about good practice in the development of settlements by the application of the PPP in several other countries that has done it (France, Britain, Holland, Hong Kong, India, Singapore etc). The result of these reviews can be used as a reference in Indonesia and particularly its application Jakarta, reinforced with the preparation of road maps from sources that are very relevant and is a secondary data valid / invalid methods for the collection of secondary data about rejuvenating the area conditions through surveys instational such as: data collection development policy and literature review

Research Locations

Location of the study focused on several areas in Jakarta, tailored to the characteristics of the region that has been done by the private and public developers Agency that led to the application of the principles of PPP in development, including Kelapa Gading, Kemayoran, Ancol, and Pondok Indah. This is intended to obtain information about failure, success, or improvements required to be applied to study sites in Cilincing - Marunda. This location was chosen considering not fully activated of settlement infrastructure in this region than in the

surrounding area, but this area has the prospect to be used as investment options. This research requires coordination with various stakeholders such as the Directorate of Joint Government and Private / Bappenas, Local Government of DKI Jakarta, Ministry of Public Housing, and Ministry of Public Works.

Research Procedure

Research steps are as follows:

1. Develop a research questionnaire.
2. Distributing questionnaires to stakeholders both public, private and government, a minimum of 250 respondents
3. Survey research sites to identify and map the environmental conditions in the area of research. Mapping of existing conditions include: Master Plan / National Spatial, Provincial and District, and Network Utilities / Infrastructure.
4. Evaluate / review government policies related to the Rejuvenation of the city of Jakarta in general and North Jakarta in particular.

Data Collection Techniques

The AHP (Analytical Hierarchy Process) conducted in this research is to obtain the Risk Priority of each potential risk in the development of settlements in the area, then significantly affect the prospects for cooperation of government and private model in urban renewal in Jakarta. There are 2 (two) kinds data used in this study, namely:

1. Secondary data; include the study of literature (books, journals, previous studies etc.) to define the variables measured in this study. The data for the theoretical basis of research taken from books, journals, papers etc.
2. Primary data; qualitative data include distributing questionnaires to residents and private sectors with an interest in the concept of rejuvenating the city (urban renewal) are collected. Quantitative data include the expected consequences will arise from doing urban renewal ordinal qualitative data, ie data obtained from the categorization or classification, and there is a relationship between this data but can not do math operations.

Determination of analysis techniques and data processing.

In this research, data analysis techniques determined by using the 5 (five) method are:

1. Analysis of risk level to determine the level of each impact, as input to mathematical analysis as the input level of risk and statistical analysis of risk levels.
2. Analytical Hierarchy Process (AHP) to determine the risk factors or ranking the effects of the implementation of public private partnerships.. The statistical analysis to determine the percentage of large sources of risk on each indicator, to determine the descriptive data (mean, median, mode, std. deviation etc.), to test the normality of data.

Research Analysis

As previously explained that there are various kinds of analysis have been determined in achieving the objectives of this research. Each analysis was performed as shown in the framework of related research. How the analysis is done and what is the purpose of doing will be discussed.

Level Analysis of Risk (Risk Level)

Analysis of the level of risk is influenced by two criteria, namely: the level of impact and influence the frequency of occurrence of impact. Scale effect level is the result of preparations obtained from the impact assessment criteria. Frequency impacts criteria occurring in this study is a combination of qualitative evaluation techniques New Zealand standard on risk management (AS 4360-1995). Analysis of levels of risk or Risk Level conducted to determine the risk level of survey data through a questionnaire. Analysis of risk level can be done qualitatively by making the risk level matrix of criteria influence the level of impact and frequency of occurrence of impact, which after a modification can be seen in table I below:

TABLE I
MATRIX OF RISK LEVEL BASED ON THE DEGREE OF INFLUENCE AND FREQUENCY OF OCCURRENCE (SOURCE: PROCESSED (RISK MANAGEMENT))

Frequency Level of impact	MANAGEMENT				
	(1) Very Low	(2) Low	(3) Middle	(4) High	(5) Very High
1. The prospect of the PPP as planned	L	L	L	M	S
2. The prospect of the PPP as planned, there is a change concept settlements / urban renewal	L	L	M	S	S
3. The prospect of the PPP did not go as planned, there are changes in the system of cooperation	M	M	S	S	H
4. The prospect of the PPP did not go as planned, there are changes in the concept of neighborhood / urban renewal and systems that affect cooperation.	S	S	H	H	H
5. The prospect of the PPP does not exist	S	H	H	H	H

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Analytical Hierarchy Process (AHP)

AHP method was first introduced by Thomas L. Saaty in the period 1971 - 1975 when he was at the Wharton School. AHP method is conducted to process data on the questionnaire to see the ranking of risk factors from the dominant to the non-dominant.

Data Collection

Data obtained in this study is getting from respondents survey according to the objectives of this research. The survey is a

systematic approach to collect data based on samples from the actual population that can be known to a behavior or the main characteristics of the target population at a given time. The object of this research is the human settlement with its supporting infrastructure are generally located in the greater Jakarta area. Settlements used as samples in this study were included in the group of low-income communities and upper middle class society, with a view to give an idea of the condition of settlements and infrastructure. Both quantitative data and qualitative data derived from surveys in Central Jakarta, East Jakarta and North Jakarta. In addition, this survey was also conducted to 10 institutions as stakeholders comprising government and private institutions. The respondents filling the questionnaire are at last equal position with a Director at Ministry level or knowledgeable person in implementation of public-private partnership.

Profile of research data

There are two questionnaires implied:

0 Questionnaires 1, includes data of level impact and frequency in public private partnerships implementation.

0 Questionnaires 2, includes data on public opinion toward the settlement infrastructure

The public opinion data profile can be seen in table 6 which gather opinions of their respective communities in Jakarta and surrounding settlements of existing infrastructure and their expectations of the capacity and reliability of infrastructure (transportation, energy and water) in the future.

The determination of sources of risk

Weights calculating of risk conducted by SPSS program sub analyzing Count. Data information from questionnaire 1 which already tabulated used to input SPSS. From the analysis can be obtained weight source of risk.

Determination of the risk ranking of the impact of the implementation of PPP

From the 32 impacts variable on the implementation of PPP that have been identified, the risk level of each impact and the ranking or priority of these impacts are determined .

Determination of Impact Risk Level

As described in chapter 3 analysis is done in 2 different ways. However, determining the level of risk fixed based on data level impact and frequency of occurrence influence PPP implementation.

Determining the risk level is based on the mode or the value of the most outgoing . Appropriate risk level matrix is known that the impact with a small degree of influence and frequency rarely have this level of risk (L) Low . Thus, from 32 impact variables it can be determined the level of risk impact which voted by a majority of respondents (mode). In principle, how to determine the level of risk that has been described previously, still refers to the matrix level of risk and tabulated into converted numbers, namely: L = 1, M = 2, S = 3 and H = 4 and

then used as input data in mathematical analysis, statistical analysis of the level of risk and risk level.

DISCUSSION

Discussion on Risk Ranking

Analysis of risk ranking as described in the discussion of research on determining the effects ¹ applying the Risk Ranking PPP, obtained by 2 ways of analysis, mathematical and AHP. The mathematical analysis obtained 3 kinds of risk levels that are 1) risk ranking based on the degree of exposure; 2) risk ranking based on the level of frequency; and 3) risk ranking based on risk level. AHP software acquired a range of risk levels. Five top ratings PPP implementation that provides the greatest impact on the development of settlements with questionnaire data 1 are taken and shown in table 2.

TABLE II
RANKING THE TOP 5 FINAL SCORE RISK FACTOR

Variabel	Final Value of Risk Factors	Source of risk
X9	42.019328	Lack of legal empowerment ¹ for the cooperation agreement involving two parties
X13	41.588771	Good Governance
X14	38.735397	Equalization / equating the project vision
X31	38.46979	Unequal benefits for the parties involved
X4	37.842603	Changes in the mandate / authority within the government structure

III. CONCLUSION

Based the analysis and discussion has been described, it can be concluded that:

- 1) Implementation of public private partnerships in the areas of housing including supporting infrastructure, providing investment prospects of the region need to be implemented.
- 2) Sources of potential risk (5 major risk ranking) in the implementation of significant public-private partnerships in infrastructure development of the settlement and lack of law reinforcement on the cooperation agreement involving two parties (X9); good governance (X13); affirmative action / project vision equation (X14); unequal benefits for the parties involved (X31); and change of mandate/ authority within the government structure (X4).
- 3) Based on the analysis of the stakeholders sources of risk (government and private institutions) and public opinion requirement of infrastructure improvements, model of public-private partnership adopted in the development of residential urban renewal based in Jakarta can be formulated.

Based on the findings obtained, suggestion can be proposed as follows:

- 1) Institutional cooperation and coordination that has a direct and / or indirect in settlement and development of the region in the form of legislation and policies have to be set up.
- 2) This study has initiated the application of Public Private Partnerships in the development of residential urban renewal based in Jakarta. Some issues still need to be addressed for better assessment with a focus area: The implementation model of public Private Partnerships in the settlements development focusing on the investment prospects of urban renewal in Jakarta should be done in the next step.

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