Decision Making Application for Housing Development Investment

by Harun Immanuel

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Harun Immanuel*, Wati Asriningsih Pranoto, Mark Setiadi
Civil Engineering Department, Faculty of Engineering
Universitas Tarumanagara

*harun.327181015@stu.untar.ac.id

Abstract. The need for housing in Garut is increased from time to time, besides of that the form of the houses was abstract and spread organically therefore to maximize the amount of housing construction and improves the quality of Garut residence those houses expected to be arranged systematically. Those organic spread houses established without valid permits become a polemic to build a neat and clean housing development. The dispute problems are expected to be answered by the Vroom Yetton Group Based Type 2 method to prevent disputes between developers and local inhabitants. Unit configuration affects the saleable area and expected to gain maximal value due to the limitations and existing landforms. Neat Housing Development intends educating people who are accustomed to living in organic housing into systematical housing and to improve the quality of life for the community and the value of the houses units. Therefore there are 3 alternatives to choose; skip the disputes area and build housing on the available area, spend amount of money to the disputes area for compensation, or build the whole area and give some of the houses to the existing local inhabitants. Those alternatives might be answered by analyze each of their net present value, payback period, and internal rate of return.

1. Introduction

This study aims to develop housing at Garut according to their needs nowadays. Their life quality also needs to be improved granting to their life style. Facilities like school, shopping centre, sports, etc are needed following those issues [1]. To fulfill those needs, amounts of investment are needed to develop housing, but before doing investment feasibility study urge to be done in advance. Disputes among villagers and land investor become a problem because of the organic spread illegal houses without valid permits within the land owned by the owner. Afterwards doing the feasibility study could be done to aims breakeven value for the investor or owner in a span of time. Therefore instead of doing only feasibility studies, decision making tool is needed to decide things through the dispute.

2. Method and materials

2.1. Object Sample

The sample was located at Garut, West Java Province, Indonesia. **Figure 1** shows the dispute area within the land owned by the Investor. Area A indicates the dispute area, meanwhile area B express free area. Disputes area covers 9869 sqm and free area only covers 4305 sqm, it shows that dispute area dominates 68,67% of the total 14174 sqm area owned by the investor. Legally (*de jure*) the investor owned the whole area based on land certificate, disputes happened while residents build their house referring to their lack of knowledge about legal. This occasion engaged random residents to establish their houses on the land they don't own.

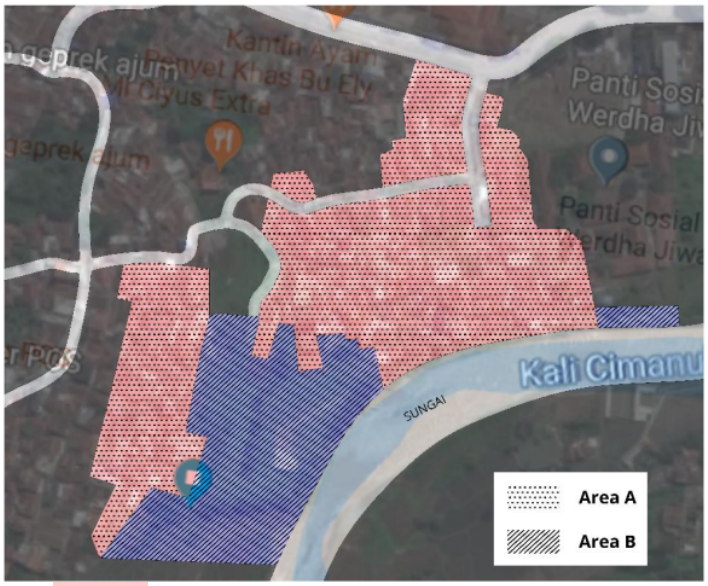

Figure 1. Dispute area within land owned by the investor

2. Method

The Vroom-Yetton Decision Model is a situational leadership theory from industrial and organizational psychology developed by Victor Vroom, in collaboration with Phillip Yetton and then developed by Arthur Jago. This theory is designed in such a way as to make decisions quickly and situational conditions that have been undetermined [2], [3]. Vroom Yetton Decision Tree consist of five type decision leads; Autocratic 1, Autocratic 2, Consultative 1, Consultative 2, Group-Based 2. Those decision were made by seven questions as indicator. Dispute problems would likely using Group Based Type 2 to gain better succeed chance among other leadership type as shown below on **Table 1**. [4].

Table 1. Decision making choice

Problem Type	Vroom Yetton Elements	Frequency	%
1	A1, A11, C1, C11, G11	42	20 %
	G11	16	7,61%
3	A1, A11, C1, C11, G11	56	26,66%
4	A1, A11, C1, C11	9	4,28%
5	G11	35	16,66%
6	C11	5	2,38%
7	A11, C1, C11	3	1,42%
8	A11, C1, C11, G11	19	9,04%
9	C11	2	0,95%
10	C11, G11	13	6,19%
11	G11	8	3,81%
12	C11	2	0,95%

3. Results and discussion

3.1. Vroom Yetton Decision Tree

Based on Vroom Yetton Decision Tree using Group Based Type 2 will works according to **Figure 2** [2]. Bold line indicates every possibilities leads decision using Group Based Type 2 Decision, therefore there are 3 possibilites among them that leads to different acts for the land execution. Those alternatives will be later analyzed by calculate the net present value and payback period of each decision.

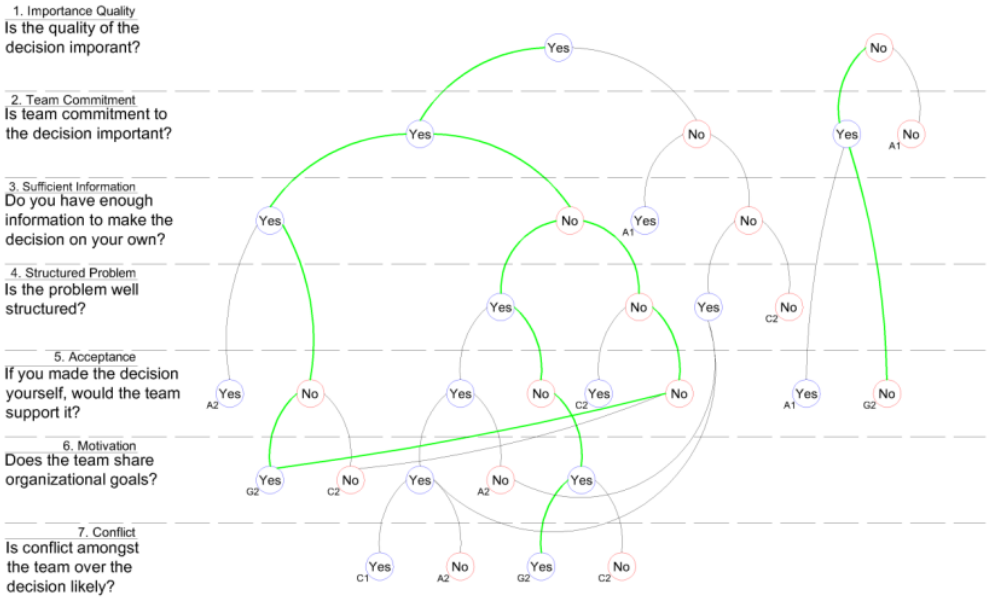

Figure 2. Vroom Yetton Decision Model for Group Based Type 2

As shown at **Figure 2**, there are five Vroom Yetton elements, which each of those decision will lead to various acts. Autocratic Type decision will leads the project assuming everything the land owner decides is absolute as the ideal choice, but actually this kind of decision making most likely conflict with the local resident will be inevitable. Simultaneously, Consultative Type decision will give options to local resident, but not sure going to be accepted by them. In the other hands Group Based Type 2, decision eventually will avoid problems since it will be accepted by all of the stakeholder by using open discussion method. Green line at **Figure 2**, indicates how problems should be solved using Vroom Yetton Group Based Type 2 solution. Each decision will produce their own acts, in this case Group Based type 2 will lead the investor to three alternatives: let the dispute area and continue the project on free area; construct houses for residents as a compensation for residents; or delivering amount of cash as compensation for them to leave the dispute area.

3.2. Result of Siteplan Alternatives from Decision Making

As described from **Figure 3**, the first alternative is to develop housing on the unoccupied area and let the dispute area as it is. In the figure, Area A indicates dispute area, Area B is free area. Specifically squares inside the free area are housing with 36 sqm building with 60 sqm land area for each unit.

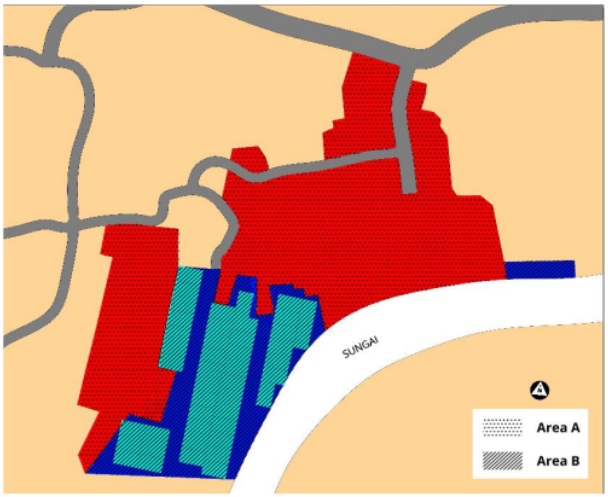

Figure 3. Siteplan build only on free area

For second and third alternatives are described at **Figure 4**. All area are assumed as free area. Area A are type 36/60 housing and Area B are housing with 27 sqm building with 40 sqm land area for each unit. Second alternative offering compensation to the resident in a form of substitution houses (157 units) meanwhile third alternative offering compensation to the resident with amount of cash.

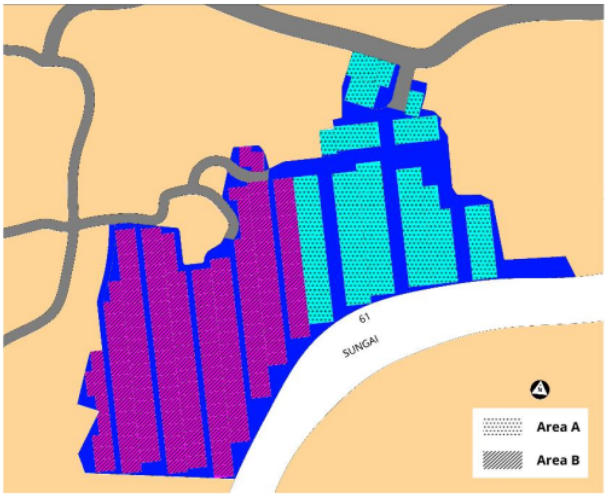

Figure 4. Siteplan build by overcome the dispute area

Below at **Table 2**, show how much the dispute area in comparison with the free and total area. Disputes area covers most of the area (more than 50%). Afterwards at **Table 3**, show how do those three alternatives giving different sellable ratios. Therefore disputes area most likely need to consider to be reoccupied. According to the site plan in **Figure 4**, 27/40 houses (Area B) could be built earlier in existing free area (see **Figure 3**) to relocate the local resident before displace and demolish the existing houses.

Table 2. Dispute Area Comparison

Gross Free Area	Gross Dispute Area	Total Area	Dispute %
4305 sqm	9869 sqm	**14174 sqm**	68,67%

Table 3. Sellable area comparison

45 units	60 sqm	**2700 sqm**	Sellable ratio 2700/4305 = 0,60
157 units	40 sqm	**6280 sqm**	
61 units	60 sqm	**3660 sqm**	Sellable ratio
	Total	**9940sqm**	9940/14174 = 0,69

Each alternative might be chosen according to feasibility study by looking up to their net present value, payback period and internal rate of return.

4. Conclusion

Decision making tools are made to help investor to decide what to perform for his investment idea, especially at this case represent a land with dispute area (approximately 68,67% of the area). Group Based Type 2 decision making from Vroom Yetton is expected to overcome problems and satisfy each stake holder from the dispute. This decision is expected to gain chance rate to succeed the project. Better sellable ratios are a huge consideration to reoccupy the dispute area, therefore study such as net present value, payback period and internal rate of return can be made to analyze the project feasibility.

5. References

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