

The Typologies of Unit Plans in Indonesian New Town**

인도네시아 신도시의 단위주호 평면유형에 관한 연구

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Abstract Recently, the cosmopolitan cities of Indonesia have started to attract global interest due to the rapid economic development and urbanization process of the country based on this great potential of the population and natural resources. The development of new towns has emerged as one solution to reduce urbanization problems in Indonesia and the concept of new town planning originated from E. Howard's Garden City. But new towns in Asian countries constituted unique regional characteristics because they were modified in accordance with their climatic conditions and housing cultures. Kenneth Frampton (1998) and others discussed Asian regionalism and described this phenomenon in terms of "contextual modernization" (Ju et al, 2012). Under the ultimate goal of this study, to identify the uniqueness of Indonesian contemporary houses, this study analyzed the 63 unit plans collected from the representative six new towns supplied by major housing development companies in Jakarta and Surabaya. As a result, this study extracts the representative unit typologies of landed properties and discuss about the regional characteristic of unit designs in Indonesian new towns.

Keywords 뉴타운, 유닛계획, 공간구성, 인도네시아, 자카르타, 수라바야
New Town; Unit Plan, Typology, Spatial Organization, New Town, Indonesia, Jakarta, Surabaya

1. Introduction

1.1. Background and Aim of Study

In Indonesia, the active working age group is the biggest population as of 67.3 % among the total. And the middle income group is growing rapidly into 241 million people in 2020 (Boston Consulting Group). Recently, the cosmopolitan cities of Indonesia have started to attract global interest due to the rapid economic development and urbanization process of the country based on this great potential of the population and natural resources. The development of new towns has emerged as one solution to reduce the urbanization in Indonesia.

The concept of new towns originated from E. Howard's Garden City, but new towns in Asian countries constituted unique regional characteristics because they were modified in accordance with their climatic conditions and housing cultures. Kenneth Frampton (1998) and others discussed Asian regionalism and described this phenomenon in terms of "contextual modernization" (Ju et al, 2012).

This study aims to explore the contemporary housing unit designs associated with the development of new towns supplied by major housing development companies in Indonesia. This study is expected to identify the unique characteristics of housing unit design in new town development of Indonesia.

This study has the following detailed objectives;

First, to understand the basic principles of layout of a house in a lot.

Second, to classify the units according to plot size

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and unit size and analyze their trend.

Third, to analyze the basic components of a house in the term of rooms and spaces and extract representative typologies of unit plans in terms of space organization.

Finally, to identify unique and regional characteristics of unit design in new towns supplied by the private housing developers in Indonesia.

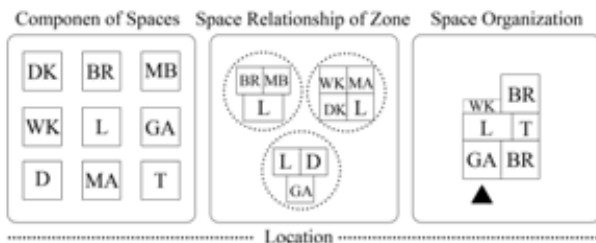
1.2. Scope and Methodology of Study

This study selects six representative new towns; Citra Raya, Sentul City and Bumi Serpong Damai from Jakarta which is the capital city, and Citra Land, Graha Famili and Pakuwon from Surabaya, which is the second largest city. They are developed by major developers in Indonesia.

The methodology in this study is mainly based on field surveys. Field surveys of six new towns have been carried out two times at the end of August 2013 and February 2014. To confirm our understanding, we also conducted interviews with project managers and local housing expertise.

Through the supports from companies who participated with above projects, we finally collected and analyzed 63 housing unit plans from the 24 clusters in six new towns.

A house can be perceived as groups of relationship between spaces and the inhabitants, which contain certain pattern. Space organization is useful tool for finding the patterns underlying housing form (Rapoport, 1977; Ju et al, 2012).



<Fig 1> Framework of Analysis

2. Case Analysis

2.1. Overview of Objects

Among six new towns, BSD is the largest new

town, as of 6000 ha future development in total. Whereas the new towns (Citra Raya, BSD, Sentul City) in Jakarta Metropolitan Area (JMA)¹⁾ are located in suburban area, the new towns in Surabaya (Citra Land, Pakuwon Indah, GrahaFamili) are located inside the city.

The new towns around JMA are as huge as above 1,000 ha (Firman, 2009) while the new town in Surabaya are smaller than those of Jakarta as around 200 ha. The developers started their projects in JMA first then they expanded their residential and property business in Surabaya since the economic boom which followed by the policy which shifts the non-oil export industry by launching the deregulation package in 1986 (Dick, 2002).

Most of the new towns have started their construction since 1993-1995 but they are still under the development. Although the new towns had developed on the basis of the master plan of urban planning at the beginning, marketing and selling were actually processed step by step in small groups of 100-200 houses. As a result, it proposes a variety of housing community patterns that have been customized according to economic and social changes by the times. This can be understood as a strategy to reduce groups of housing for successful sales.

The Citra Raya has developed approximately 675 ha (24.5%) from the total 2760 ha. BSD is in the second phase of project development already constructing 1,960 ha (32.67%) of total 6000 ha projected land. There is approximately 2210 ha (73.67%) established land from 3000 ha total Sentul Area.

Citra Land Surabaya built 740 ha (37%) from 2,000 hectares land banks. Pakuwon Indah developed area is 187 ha (46.75%) from the 400 ha future development. On the other hand, Graha Famili finished all 360 ha land development.<Table 1>

We picked the representative four clusters from each six new towns for unit analysis. Then, from each cluster, we collected 2-3 housing unit drawings. Excluding 3 floor type units, we analyzed the total 63 units for space organization.

Analyzing units by size, there are 20 units below 100 sqm in size, 11 units in the range of 100-149

1) Jakarta Metropolitan Area is the agglomeration of Jakarta as main city and the other surrounding area: Bogor, Depok, Tangerang, Bekasi

sqm, 11 units in 150–199 sqm, 10 units in 200–249 sqm, 7 units in 250–299 sqm and only 4 units over 300 sqm. Most of the units are under 200 sqm in size.

<Table 1> The Overview of New Towns Surveyed

City	Jakarta			Surabaya		
Theme	Citra Raya	BSD	Sentul City	Citra Land	Graha Famili	
Location	Cikupa	South Tangerang	Sentul	Lakarsantri	Pradah Kendal	
Developer	Ciputra	Sinar Mas Land	Sentul City Tbk	Ciputra	Intiland Tbk	
Starting Year	1994	1994	1995	1992	1993	
Population (people)	85,000	50,000	88,881	16,080		
Household (units)	23,812	13,86	7,089	4,020	186	
Future Development Land Size(ha)	2,760	6,000	3,000	2,000	360	
Present Land Size(ha)	675	1,960	2,210	740	360	
Land Use ha(%)	R	273(40.44)	1,120(57.14)	1,030(46.40)	380(51.35)	230(64.76)
	C	59 (8.74)	40 (2.04)	450(20.43)	50 (6.76)	30 (7.74)
	MF	130(19.26)	160 (8.16)	50 (2.27)	10 (1.35)	30 (8.89)
	G	213(31.56)	640(32.65)	550(24.95)	130(17.57)	70(18.62)
	I	-	-	130(5.95)	170(22.97)	-

*The Pakuwon Project is no included in the table

The size of one story units (15 units) ranges from 30 to 92.4 sqm, while the size of two story units (47 units) has a wider range between 54 and 349 sqm. Among the two story units (47 units), 4 bedrooms unit is the most popular type (25 units). Among one story units (15 units), two bed rooms unit is the most popular type (13 units).<Table 2>

2.2. The Typologies of Unit Plans

Among the 63 cases of this study, 47 cases are designed as two story buildings. Therefore it is not easy to classify the types of unit design as a total.

First of all, we analyzed the space organization of ground floor and first floor separately. Then we will perform the mutual correlation analysis between two floor types: ground floor and first floor.

The ground floor units are classified into four groups based on how many bedroom they comprise with; (1) G0: the unit without general bedroom, (2) G1: 1 bedroom unit, (3) G2: 2 bedroom unit and (4) G3: 3 bedroom unit.

G0 is a rare case which comprised only L, K and MA. G2 has two variations; G2-A and G2-B, with and without guest area (GA). Among all the components, GA is a unique feature in Indonesian Javanese housing for receiving guest and it could be an extra space for important festivals that the family is hosting.

<Table 2> The Overview of Units Analyzed

NO	Code	Year	Building Size	Lot Size	Storey	BR	MA	WK	DK
1	CR-C1-1	2010	54	120	2	4	0	1	0
2	CR-C1-2	2010	93	160	1	1	1	0	1
3	CR-C1-3	2010	170	200	2	3	1	0	1
4	CR-C2-1	2012	73	140	2	2	1	1	0
5	CR-C2-2	2012	132.08	160	2	4	2	0	1
6	CR-C2-3	2012	220	240	2	4	1	0	1
7	CR-C3-1	1995	30	90	1	2	0	1	0
8	CR-C3-2	1995	107	160	2	3	1	1	0
9	CR-C3-3	1995	138	200	2	3	1	1	0
10	CR-C4-1	1995	211.58	300	2	3	2	1	0
11	CR-C4-2	1995	266	406	2	3	2	1	1
12	BS-C1-1	1986-2006	99	144	2	3	1	0	1
13	BS-C1-2	1986-2006	128	180	2	3	1	0	1
14	BS-C2-1	1986-2006	151	225	2	3	1	1	1
15	BS-C2-2	1986-2006	180	200	2	3	1	1	1
16	BS-C3-1	2007-2020	230	230	2	4	1	1	0
17	BS-C3-2	2007-2020	260	300	2	4	1	1	0
18	BS-C3-3	2007-2020	310	300	2	4	1	1	0
19	BS-C3-4	2007-2020	348	630	2	4	1	1	1
20	S-C1-1	1993	28.5	90	1	1	0	1	0
21	S-C1-2	1993	108.93	200	2	4	1	1	0
22	S-C2-1	2000	62	216	1	2	0	1	0
23	S-C2-2	2000	77	270	1	2	1	1	0
24	S-C2-3	2000	31	90	1	1	0	1	0
25	S-C2-9	2000	50	162	1	2	0	1	0
26	S-C3-1	2004	48	81	1	2	0	1	0
27	S-C3-2	2004	67.46	108	2	2	1	1	0
28	S-C4-1	2009	52.93	90	1	2	0	1	0
29	S-C4-2	2009	76.4	135	1	3	1	1	0
30	S-C4-3	2009	102.74	135	2	3	1	1	0
31	S-C5-1	2000	89.64	217.0125	1	2	1	1	0
32	S-C5-2	2000	91.2	224	1	2	1	1	0
33	S-C5-3	2000	122.52	252	2	4	1	1	0
34	S-C6-1	2007	217.12	286	2	4	1	1	0
35	S-C6-2	2007	193.83	300	2	4	1	1	0
36	CL-C1-1	2005-2009	85.05	143.1	1	2	1	1	0
37	CL-C1-2	2005-2009	80.22	139.34	2	3	1	1	1
38	CL-C2-1	2010-2014	187.63	190.84	2	4	1	1	1
39	CL-C2-2	2010-2014	274.1299	3657.1	2	4	1	1	1
40	CL-C2-3	2010-2014	170.21	180	2	4	1	0	1
41	CL-C2-3	2010-2014	237.48	264	2	4	1	1	0
42	CL-C3-1	1996	140.78	160	2	3	1	1	0
43	CL-C3-2	1996	92.4	182.36	1	2	0	0	1
44	CL-C3-3	1996	54	120	1	2	0	0	1
45	CL-C4-1	1996	228.25	264	2	4	1	0	1
46	CL-C4-2	1996	117.84	87.2	2	3	1	1	0
47	CL-C4-3	1996	202	238.7	2	4	1	0	1
48	GF-C1-3	2004	254.99	576	2	4	2	1	1
49	GF-C4-1	2003	226.25	342	2	4	1	1	1
50	GF-C4-2	2003	307.66	405.88	2	4	1	1	0
51	P-C1-1	2009	112	112	2	3	1	0	1
52	P-C1-2	2009	125	128	2	3	1	1	0
53	P-C1-3	2009	176	216	2	3	1	1	0
54	P-C1-4	2009	160	180	2	3	1	1	1
55	P-C2-1	2010	281	300	2	4	1	1	0
56	P-C2-2	2010	341	450	2	4	1	1	0
57	P-C2-3	2010	268	375	2	3	1	1	0
58	P-C3-1	2012	170	200	2	3	1	0	1
59	P-C3-2	2012	206	250	2	4	1	1	0
60	P-C3-3	2012	281	300	2	4	1	1	0
61	P-C4-1	2012	170	200	2	3	1	0	1
62	P-C4-2	2012	206	250	2	4	1	1	0

CR: Citra Raya, CR-C1: Park View, CR-C2: The Leaf, CR-C3: Taman Puspita, CR-C4: Kusuma Dwipa
 BS: Bumi Serpong Damai, BS-C1: Costarica, BS-C2: La Vintage, BS-C3: The Maja
 S: Sentul City, S-C1: Bukit Golf Hijau, S-C2: Pasadena, S-C3: Taman Besakih, S-C4: Pine Forest, S-C5: Yunani, S-C6: Hilltop
 CL: Citra Land, CL-C1: Eastwood, CL-C2: Waterfront, CL-C3: Alam hijau, CL-C4: Vila Sentra Raya
 GF: Graha Famili, GF-C1: Emerald Place, GF-C4: Mutiara Golf
 P: Pakuwon, P-C1: The Mansion, P-C2: Ritz Golf, P-C3: VBR2, P-C4: VBR3

However, there are only 8 cases which a variation of G1 (G1-2A and G1-2B) designed with GA but only living room. Typically, guest could approach to living room (L) via GA (55 cases).

Living room (L) is a core of all units as it is used as family gathering. Each space components are typically connected with L either directly or indirectly via semi open space or corridor. One of interesting space is an open air kitchen. There are 12 cases equipped with open air kitchen, most of them (11 cases) are located at facing back yard. Most of the units with open air kitchen are the design of Sentul New Town in Jakarta. The most preferred floor design are G1 (42 units) and G2 (18 units). Each category has its sub variations due to location of each main component. [table 3]

The first floor units are classified into two groups based on how many bedroom they comprise with; F2 (2 bedroom unit, 16 units), F3 (3 bedroom unit, 25 units) and F4 (on the first floor, there are maid area only, 6 units).

F2 can be sub-classified as F2-A, F2-B, F2-C, F2-D, F2-E, F2-F and F2-G based on the relationship between master bedroom, bedroom and living room. F3 also can be sub-classified as F3-A, F3-B, F3-C, F3-D, F3E, F3F, and F3G.

F4 is a special type that all major rooms are located on the ground floor and there is only maid space on the first floor, showing clear division between family and servants.

2.3. The Findings

Below are the results of examining the characteristics of space organization in the major zones of a house.

(1) Layout of a House in a Lot

Among 62 units, only 15 units are semi-detached house type, which are two houses sharing one bearing wall, with each having a part of the garden, found mostly at Sentul new town. The others are terrace houses. The terrace houses were constructed linearly linked in rows, sharing common bearing walls and can be single or multiple stories. It is the most prevalent housing typology in Malaysia and Indonesia (Ju et al, 2010). It is sometimes named as a 'link-house or row-house' There are differences between Malaysian

terrace house and Indonesian. In Malaysia, the terrace houses are built mostly in small size lot, there are no open spaces in the middle of a unit. But in Indonesia, even in the huge size lot where a detached house can be built, the house is built from wall to wall, even though they can have open space in the middle of a house. As a result, High walls surround the house, showing the strong protectiveness to neighbors. According to local housing experts, these protective walls appeared in the new housing style of Indonesia due to the process of housing construction. Housing construction in the new town cannot be finished in short periods of time, but the construction itself occurs in small scales and takes many phases. This is why protection walls were needed to protect the territory along the building process.

The Building Coverage Ratio (KDB) of cases in this study ranges from 19.8% to 66.93%. The 34 units among the total case, building ratio ranges from 40% to 60%. Units whose KDB is under 40 % are 25 units. While there are three cases exceeding 60% building coverage ratio. Based on the Law No. 28/2002 article 20 of the building regulation, KDB is decided based on the lot size, land use planning and land support capacity. The KDB varies according to the city's planning guideline where the cases are located. In Tangerang (Citra Raya and BSD), maximum KDB for low density is 50%, for the middle density, 60 % and for the high density, 70 %.

(2) Guest Area for Reception

Among the total cases, there are only 8 units which don't have guest areas (GA). As mentioned above, GA is the reception space for guests. This area has direct access from main entrance to the living area. The absence of GA in a house can be explained by that the first is limit of a space and the second is the change of culture that only close-related group can enter the house, compared with the past. The units without GA space are the houses built after 2000, newly built houses. Majority (55 cases) of the houses has GA attached to living area (L).

(3) Utility Space

Besides the floor plan, the design of the kitchen is also unique in this kind of housing. A kitchen is divided into two areas: the wet kitchen and the dry kitchen. The dry kitchen is used to prepare simple food. The wet kitchen is for more arduous jobs

<Table 3> Typologies of Unit Plans

Level	Unit type									
Ground Floor	G0-1	G0-1'	G1-A				G1-B	G1-C	G1-D	
	S-C6-2, P-C3-2, P-C1-1, P-C4-2, GF-C4-2, CR-C1-2, P-C1-4, CR-C4-1, S-C1-1, CL-C4-2, CR-C2-2, P-C3-3, CL-C2-2, CL-C4-3, P-C2-2, BS-C3-2, CL-C4-1, BS-C3-1, S-C6-1, S-C1-2, CL-C2-3, CL-C2-1, CR-C2-3, GF-C4-1, P-C2-1, BS-C1-2, CR-C1-3, BS-C2-2									
	G2-A	G2-A-1	G2-A-2	G2-B	G2-B-2	G3-A	G3-A'	G3-A-1		
	CR-C3-3, OL-C1-1, CR-C1-1, CL-C3-1, CR-C3-2, S-C4-1, S-C3-1, CR-C3-1, S-C3-2									
The First Floor	F2-A	F2-A'	F2-B	F2-B-1	F2-B-2	F2-C	F2-C-1	F2-C-1'		
	P-C1-3, P-C2-3									
	P-C1-4									
	P-C3-1, P-C4-1									
	CR-C1-3									
	BS-C2-2									
	BS-C1-2									
	CR-C1-2									
	CR-C4-1									
	F2-C	F2-C-1	F2-C-1'	F2-C-2	F2-D	F2-D-1	F2-E		F2-E-1	
	BS-C1-2									
	CR-C1-2									
	CR-C4-1									
	BS-C1-1									
	P-C1-1									
	CR-C4-2									
	F2-E-1'	F2-F	F2-F-1	F3-A	F3-A-1	F3-A-1	F3-B	F3-B'		
	CR-C4-2									
	CL-C4-2									
	BS-C3-3, S-C6-1									
	P-C1-2, P-C3-2, CL-C2-1, GF-C4-2, P-C4-2									
	CR-C2-1, CR-C2-3									
	P-C3-3, P-C2-1									
	BS-C3-2									
	F3-B-1	F3-C	F3-C'	F3-C-1'	F3-D		P-C2-2			
	S-C6-2									
	P-C2-2									
	GF-C1-3									
	BS-C3-1									
	C-C2-3, CL-C2-2									
	F3-E	F3-E-1		F3-F		F3-F-1		F3-G	F3-G-1	
	CL-C2-3, CL-C4-1, CL-C4-3									
	CL-C2-3									
	S-C1-2									
	BS-C3-4									
	GF-C4-1									

F4 is comprised of maid area only, S-C3-2, CL-C3-1, C4-C2-2, S-C4-2, CR-C3-3, CL-C1-2

Note: Ga = guest area. MB = master bedroom. BR = Bedroom. L = living room. MA = maid area. T = toilet.

including laundry. The better ventilation in the wet kitchen is possible to bring fresh air from the outside. Occasionally, the wet kitchen is directly connected to the garden so that it can act as a utility space. There is also a private room and a separate bathroom for the housemaids in the wet kitchen. There can be two maid rooms in large wet kitchen area.

Among all the units, the units with only dry kitchen and without wet kitchen are 14 units in total.

These units range from 54 sqm to 228 sqm. There are 38 units which has only wet kitchen and 10 units have both.

Maid space is a unique feature of Indonesian housing. It is common to have a maid space. These building sizes of the units which do not have maid area are diverse between 30-92.4 sqm and all are the cases of Citra Raya and Sentul City project. Clear division between main family activity space and maid

space could be designed by vertically, horizontally, or totally in different building mass.

3. Conclusion

As part of on-going research about Indonesian new town housing, this study explores the typologies of unit plans.

The identity of Indonesian unit design in new towns found in this study can be summarized as follows.

There is significant division between the main family living area with the service area and maid area. The ways of separation are diverse. On the other hand, the separation between the guest area and family area can be more flexible depend on the lot size and the household preference to serve the guest.

The design of the kitchen and utility space is unique, where kitchen is divided into two areas; the wet kitchen and the dry kitchen. The large size units normally have both of dry and wet kitchen. Whereas, the small size units have only open space kitchen located at back terrace.

Housing typologies such as bungalows, semi-detached houses and terrace houses are imported western housing typologies which were prevalent worldwide in new towns and were part of what is known as the international style. Our findings indicate that these western prototypes were customized and developed to suit the unique social, ethnic and climatic environment of Indonesia.

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