Transformation of lots dimension to sustain the pattern of blocks at the city centre of Bandung

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Abstract. The goal of this research is to find how transformation occurs in a residential environments in the city centre of Bandung. At the beginning the area was a habitation for the indigenous people. The semi grid pattern which applied by the Dutch colonial government divided indigenous villages into city blocks. The government also placed a market that made this area become commercial. The commercial function were placed on the outer side of the block, in the form of row shop houses, while the inside of the block is the indigenous people houses or kampong. The difference of function between the allotments is reflected on the difference between the building material, style and ownership status. The economic development pushes some changes. At this moment irregular vertical buildings dominate the outer and inner block, leads to density. With the survey and observation method to several studied object, the present condition could be recognised, whilst to observe the transformation that occurs, past condition studied from literature and similar research in Bandung and other cities with the similar background. The research result shows that the transformation tends to be triggered by merging lots of the shop houses to full fill the needs of residence. Merging lots are the most reasonable thing to expand the house which indirectly maintain the initial block pattern; combination of commercial and residential functions at the city centre. This pattern seems appropriate for a residential area in the city centre as a high value area which has to be used effectively and efficiently. The involvement of the Local Government is expected to regulate the changes so the old area pattern could be sustained.

1. Introduction
Cities are dynamic. The dynamics of city development can be identified from the diversity of architectural styles. In some major cities in Indonesia the dynamics could be identified in the area of old city centres. These areas commonly maintain heritage buildings, developed by the Dutch Colonial. Old buildings that are considered unfitted or unsuitable will be destroyed and then replaced by new buildings with distinguished styles as well as new materials to meet current trends and needs[1].

The city centre in this paper referred to Pasar Baru area, an area located not far from the city centre or Alun-alun. Pasar Baru is a famous trading area in Bandung. This area originated from an indigenous villages which was divided into blocks in line with the determination of the Alun-alun as the centre point of the city of Bandung. The changes or modification of the old buildings in this area are easy to be recognised. Some of the old semi-commercial buildings with various architectural styles such as traditional, Chinese and European were established as conservation buildings (Peraturan Daerah /Local Governmental Rules no.19 years 2009) has been transformed into modern-style buildings.
Currently, the old semi-commercial buildings in the Pasar Baru area are scarce, because most of the old buildings have been transformed into some smaller units or larger buildings as modern multi-storey buildings such as department stores or shopping centres. Both transformations caused by the transformation of the lots either fragmented into smaller units or amalgamated into larger units with different styles.

2. Methods
Some examples of building transformation were typologically chosen. Type is a concept which describes a group of objects characterised by the same formal structure [2]. In this study similarity was emphasised in the type of land lots transformation, fragmentation or amalgamation. The changes in the lots triggered the transformation of the buildings, as stated by Habraken [3] that a site is a subject to transform by human powers. The transformation could happen by additional, removal, or change of the position of the buildings.

Field observations were carried out by photographing, filming, measuring and redrawing of the semi-commercial buildings in Pasar Baru area. This was conducted to determine the typology of building transformation and characterise the building expansion. Interviews with the owners were also conducted to have further information regarding the site and buildings expansions.

3. Discussion and Result

3.1. Historical background of Pasar Baru areas.
As a trading centre, Pasar Baru is located in a convenient area and accessible from the railway station and Alun-alun as the heart of the Bandung city (Fig. 1 left). The cities in Indonesia were originated from residential areas [4]. The city centres were located within the residential settlements by the Dutch Colonial Government. Besides, the cities in Indonesia exhibit relatively similar patterns and structures because of similar culture and political background.

The semi-grid pattern was applied in the city centres where the central point of the grid known as Alun-alun. The semi-grid pattern which was applied in the city centre has caused the kampongs were divided into blocks (Fig.1 right). The division of the blocks has affected the development of the buildings within the blocks. The buildings that were located at the outer blocks (on the side of the streets) were transformed into semi-commercial buildings. On the other hand, those buildings located at the inner blocks remained used as residential, farms and rice fields. As a result, there are dual functions of area pattern: the commercial function of the outer block and residential in the inner block which is considered to be suitable for the city centre area.

![Fig. 1. The city centre (left) (source: Voskuil, 1996) and the block situation circa the 1880s (right) (source: KITLV-Leiden, 2005)](image-url)
3.2. **Land ownership status.**

Since 1906, the government implemented two different government systems for a city: that the Dutch and other foreigners were ruled by a mayor, while the local regents and other officials led the natives under their positions[5]. These two systems have caused residential segregation into the outer and inner blocks. The outer blocks were inhabited by the Dutch and foreign residents who were dominated by Chinese descents. These foreigners controlled the city's economy; thus they got good facilities and services from the government. The indigenous, on the other hand, inhabited the inner blocks and have less access and decent infrastructures. Later, this social inequality has caused dualism in land status.

The lands in the outer blocks were claimed officially by the Government and were referred to as the West lands or formal land. While the lands in the inner blocks were claimed informally because they only had traditional documents and were referred to as the East land or informal land [6]. Therefore, the buildings in the outer blocks were regulated by government regulations. The regulations included the functions, height of buildings and openings of the buildings in order to get a comfortable inner space. In contrast, there were no regulations for the buildings in the inner blocks area or in kampung.

The East land was a customary land owned by the indigenous people and could be inherited through generations. Furthermore, the East land could be divided according to the number of their heirs. Its boundaries could be natural boundaries such as trees, stones, et-cetera, and also vary in size. When there was a trade of the land, it was usually between relatives so that the trade applied the applicable customary law.

Since 1906 the Government of Bandung has established a regulation that all buildings in the outer blocks must be permanent. This regulation triggered the transformation of the traditional building. These traditional buildings, which generally used non-permanent building materials, transformed into stone-walled buildings (Fig.2). Along with the development of the city, the outer blocks were occupied by road-oriented buildings. These buildings obeyed the rules applied and lined neatly around the blocks. Because the perseverance and tenacity of the Chinese traders, so the semi-commercial buildings were predominantly built in Chinese architectural styles. This condition can also be seen in other big cities in Indonesia so that the trading areas are identical to Chinatown [6].

![Fig.2. Building transformation in Pasar Baru area: (left) condition circa the 1880s (source: KITLV-Leiden) and (right) 1900s (source: Voskuil, 1996)](image)

Unlike the outer blocks, the inner blocks did not have any government regulations. As a consequence, the dimensions of the lots and the layouts of the buildings tended to be irregular. The increase of the economy in the city has encouraged more rapid development of the outer blocks compared to the inner blocks. Therefore the land in the outer blocks was more occupied than that in the inner block. Fig. 3 map and illustrates the land use between the inner and outer blocks.
3.3. Transformation of Site

The success of Pasar Baru as a trading area during the Colonial era continued up to the era after Indonesian independence (1945), and even today. The increase of the commercial functions required excessive space requirements that encouraged various transformations. The need for space for commercial activities and the limited space compelled the residential function so that the semi-commercial buildings were fully used for commercial functions.

The tight business competition has forced those who could not keep up to leave the city centre, while those who have survived required additional land space to develop their businesses and residences. The inner blocks were considered potential and thus became a target for the expansion. It can be seen from the large expansion of the semi-commercial buildings towards the inner blocks through the amalgamation of the lots in the inner and outer blocks[1]. From various forms of the building expansion, the site transformation in this area can be divided into two types, namely:

3.3.1 Fragmented Lots.

Chinese architectural style can be identified mainly from the shape and ornament of the roof[7]. There are two types of Chinese semi-commercial buildings that are distinguished from the size of the lots and its development trends. Recently, the original buildings with Chinese roof models are scarcely found. These buildings have been divided into several units. The substitution of the building owner can be identified from the transformation of each unit that resulting from the division. While the original form of the building can be identified from the remaining ornaments, roofs and façades of the building units (Fig.4).

In Bandung, there are two types of Chinese buildings based on the size of the land lots. The small land lot was occupied by one mass of rectangular building only, while the large land lot was occupied...
by several buildings with the inner court as the centre (Fig. 5). The gable roof used in both types of buildings is a characteristic of Chinese architecture style for semi-commercial building typology.

![Diagram showing development tendency of semi-commercial building](image)

**Fig. 5.** Development tendency of semi-commercial building (source: research result, 2013)

The division of the lots tends to be driven by the inheritance distribution. Trading was also inherited through generations. Therefore, the division of the lots into units depends on the number of heirs. In addition, the lots should be divided transversely to enable each unit to have access to the main road.

As previously mentioned, the success of the trading businesses required more spaces. However, due to the limited site available, the horizontal construction was not feasible. Therefore, the vertical construction was considered as the best solution (Fig.5), resulting in the elimination of the Chinese style buildings that characterise the trade area in the big cities in Indonesia.

The distribution of the lots and the development of the buildings which were not conducted simultaneously have generated the irregular shapes of the buildings, as seen in Fig.6.

| Present condition | Present time sketches | Previous time sketch |
|-------------------|-----------------------|---------------------|
| 1. Case on Alkatari Street |
| ![Image 1](image) | ![Image 2](image) | ![Image 3](image) |
| 2. Case on the junction of Suniaraja-Pasar Barat Street |
| ![Image 4](image) | ![Image 5](image) | ![Image 6](image) |
| 3. Case on Oto Iskandardinata Street |
| ![Image 7](image) | ![Image 8](image) | ![Image 9](image) |
| 4. Case on Banceuy Street (1) |
| ![Image 10](image) | ![Image 11](image) | ![Image 12](image) |
5. Case on Banceuy Street (2)

Fig. 6. Some cases in the fragmented lots at Pasar Baru area (source: survey and research result, 2013)

3.3.2 Amalgamated Lots.
The rapid and unequal development in Indonesian cities has led to urbanisation. The migrants from smaller cities commonly lived in the residential at the inner blocks areas because of closer distance to their workplace and economic limitations so the kampong is their chosen one. Therefore the kampong in the inner blocks has transformed into the dense and slummy residential area. This has driven the indigenous residents in the inner blocks moved out. At the same time, the landowners of the outer blocks saw the potential of the lands in the inner blocks for business expansion. They disregard the status issue of the land in the inner blocks.

Some lots of amalgamated have caused an increase in the loss of Kampong. For one building only, for example, amalgamation lots might occur several times depending on the needs and the opportunities of getting a land lot in the inner blocks. This land expansion affected not only the residential environment but also the structure of the area itself. As land was expanded, the owners built their building(s) in accordance with the space of the amalgamated lots with various forms and sizes. This created irregular building shapes. Besides, the irregular buildings were also initiated by the different direction of the amalgamated lots (Fig. 7).

Fig. 7. Some cases in amalgamated lots at Pasar Baru area (source: survey and research result, 2013)
3.4. Building Transformation

As previously discussed, it was found that the variations in the transformation of land lots have influenced the development of the semi-commercial buildings. Based on the data, the transformation was categorised into two types: (1) transformation at fragmented lots; and (2) transformation at amalgamated lots.

3.4.1 Building transformation at fragmented lots.

Based on its original building functions, the semi-commercial buildings had two functions: commercial function, located in the front part; and the residence located in the rear part of the one-storey buildings.

On the multi-storied buildings, the commercial function located on the lower floor, while the residential function was located in the upper.

The buildings, either one story or multi-stories, with no additional lots could not be transformed excessively. The buildings at the fragmented lots, particularly, had small lots that hindered the building expansion. Thus the buildings were only occupied for commercial activities only, diminishing the residential function (Fig. 8).

| Original Pattern | Present Situation | Explanation |
|------------------|------------------|-------------|
| The plan of a horizontal semi-commercial building (one-storey) | | The dominance of commercial function push the occupancy function |
| The plan of a vertical semi-commercial building (multi-stories) | | The rest of the occupancy function used only for dining and restroom not for staying |

Fig. 8. The movement pattern of the semi-commercial building in fragmented lots (source: research result, 2013)

From the outside, there were no significant changes in the building's appearance at the fragmented lots (Fig. 9).

Fig. 9. Development tendency on small lots (source: research result, 2013)
3.4.2 **Building transformation at amalgamated lots.**

Some buildings in the Pasar Baru area got opportunities to expand their lots by buying the adjacent lots from the inner blocks. The amalgamation of lots resulting in the building transformation followed the original form and size of the amalgamated lots. Since there were various forms and sizes, the building transformation was inevitably varied, yielding the irregular building forms and structures in the area (Fig. 10 and 11).

![Amalgamated lots](image1)

![Irregular shapes of the semi-commercial building](image2)

**Fig 10.** Development tendency on the amalgamated lots (source: research result, 2013)

![Some building transformation at amalgamated lots](image3)

**Fig 11.** Some building transformation at amalgamated lots (source: survey result, 2013)

Considering the increasing demand of the commercial function, the buildings were dominantly built for commercial function. If there was enough space to accommodate both functions, the residential function in the one-story buildings was maintained and placed in the rear part. For the multi-storey buildings, the residential function was also placed at the rear part of each floor. Fig. 12.

| Original Pattern | Present Situation | Explanation |
|------------------|-------------------|-------------|
| Horizontal semi-commercial building | | Expansion of lots to backwards Residential function at the rear part |

![Original Pattern](image4)

![Present Situation](image5)
Vertical semi-commercial building

![Diagram of vertical semi-commercial building]

Expansion of lots to backwards
Residential function at the rear part of each floor

**Fig. 12.** The changing pattern according to functions of the semi-commercial building (source: research result, 2013)

The agglomerated lots have caused the land wholly occupied for the buildings, generating denser blocks which have no separators between the outer and inner blocks (Fig. 12).

**Fig. 13.** Present situation of blocks at Pasar Baru area (source: survey and research result, 2013)

4. Conclusion

It can be concluded that the building transformation in the Pasar Baru area was mainly driven by the land transformation, either fragmentation or agglomeration. The transformation at fragmented lots generated vertical semi-commercial buildings. However, the type of semi-commercial building at the agglomerated lots tended to be large buildings because of its development horizontally and vertically. Horizontal developments tend to eliminate kampong as the original residential environment in the inner blocks.

Both types of building transformations generated irregular building shapes and denser blocks. The agglomeration of lots has changed the status of land from informal into formal recognised by the Indonesian Government. The lots transformation did not change the original block structure, that the commercials were placed at the outer block and the residential at the inner block. The physical transformation of buildings in the outer block changed the traditional horizontal buildings into modern vertical buildings. The Kampong at the inner block has transformed into expanded commercial buildings and residential.

Overall, the transformation of buildings and lots did not change the structure of the Pasar Baru area, and the city centre remained occupied as a residence in the downtown area.
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