Spatial negotiations in domestic space of the home-based garment industry in Kampung Tambora, Jakarta

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Abstract. With a population of around 260,100 and covering an area of 5.4 km², Kampung Tambora is one of the densest urban areas in Jakarta. The area is well known for its home-based garment industry, which supports the livelihood of the community. Typically, several houses in one alley run the garment industry business, where both men and women work and live under the same roof. The study aims to understand how all actors in the home-based garment industry negotiate with the limited space to fulfill domestic and working needs. Three houses were selected for observation to understand how all involved actors maximize the use of the limited space through spatial interruption in domestic space. The study found that the actors define the activities through the utilization of space, the allocation of spatial functions, and symbolizing objects. Multi-story houses were built to expand space and enable the owners to work without disrupting the privacy of domestic activities. Although the actors of the home-based enterprises found ways to cope with the issues of crowding, alternative ideas are needed to increase their well-being and improve the environmental quality of similar high-density urban settlements in many parts of Jakarta.

1. Introduction

High-density informal settlements are usually found in developing countries to accommodate the need to settle in big cities. These settlements are typically spread around the formal economic centers, with informal economic activities carried out by several members of the community [1]. Informal sector activities are the manifestation of the problem of rapid urbanization and underdevelopment. These problems are characterized by the growth of informal economic activities, such as the emergence of home-based enterprises (HBEs) in the urban settlement [2]. It also emerged as a result of a reciprocal relationship with the formal sectors to fulfill the needs and livelihood of the city in a sustainable way [1]. Therefore, in similar high-density settlements, the community’s survival strategies can differ based on the context. The strategies can lead to different attempts to sustain their settlement and living characteristics.

However, there is an absence of specific spatial regulations that govern the utilization of domestic space and public space in informal settlements for other functions. This leads to the flexibility of the community for using and negotiating their domestic space to accommodate for informal economic activities. Previous studies have looked at the sustainability potential of informal economic activities in informal settlements found in the cities of developing countries in Asia and Africa, such as Dharavi, Ikirike, Laweyan, Ga-Mashie, and Kebon Kacang, [2, 3, 4]. For example, in Delhi [1], HBEs are
sustained by occupying domestic space (50%) and public space (12.5%). In the case of high-density settlements, the challenge of limited space means alternative strategies are needed to negotiate space flexibly without destroying spatial and social networks [4]. Every settlement has a different approach to spatial negotiations depending on the types of HBEs in the area [1]. Understanding the context and types of HBEs will help improve settlement quality while considering its spatial characteristics and networks and being beneficial to the city. This paper specifically discusses and analyses the process of domestic spatial negotiation of the home-based garment industry in the Tambora settlement. The emphasis on spatial flexibility and informality will help increase the sustainability of urban informal settlements.

Two scopes of spatial negotiation are identified for the Tambora settlement, namely between working and domestic activities in the living space and around common areas in the settlement. In the former case, the owners of the home-based industry highly influence the patterns of spatial arrangements. They negotiated the position of private space so it would not intersect with working activities. The workers negotiated their space by placing personal objects to mark their occupancy and territory in the working areas. The spatial negotiations in the home-based garment industry can be analyzed using the Spatial Triad by Lefevbre [5]. The negotiation inside the living area together with human behavioral adaptations [6] is viewed as a coping response towards the limited space of home-based enterprises in high-density settlements [2].

2. Literature review

2.1. Home-based enterprises as part of informal economic activities
Informal sector activities are essential to maintain the sustainability of areas. They emerge simultaneously with the increasing density of these settlements. Informal sector activities are characterized by low capital and skill, minimal use of technology, and the use of informal space or interference with other spatial functions [1]. They emerge as a reciprocal response to the existence of a critical formal sector in the city core, which is a mechanism to maintain the sustainability of economic life for all communities. Informal sectors are commonly found along the public streets, pedestrian roads, and on the drainage covers as public space appropriation. Rogerson [7] classified informal economic activities into two types: 1) survivalist enterprises as informal economic activities done by individuals; and 2) growth enterprises that include roles differentiation in running the business by several actors. The re-emergence of informal sector activities boosts the growth of informal economic activities, which include home-based enterprises (HBEs) [2]. The problems of informal economic activities in developing countries vary from issues of cost, resources, and the limitation of space. Home-based enterprise is a strategy to generate income and reduce poverty at the neighborhood scale [3]. Home-based enterprises help create flexibility in controlling the use of electricity, water, and other resources in one given space by one or more families [3]. HBEs also maintain the privacy of activities within the home due to limitations to access public space. Therefore, home-based enterprises mostly occur in informal urban settlements [2].

2.2. Space formed by home-based enterprises
The house as a domestic space has specific distributions of space allocation that are consistent with the inhabitants' living needs. The use of the house as a place for economic activities will affect the morphology of the house, starting from internal space adjustments up to public space intervention as a form of negotiation [3]. The process of negotiation due to work activities is seen as a domestic interruption because it changes the characteristics of the house as initially only a living space[3]. The process of negotiation starts with separating the need to work as resistance space and rest as respite space [8]. Both spaces occur within the same space at different times. The actors need to apply physical separation to differentiate between working and living activities.

Therefore, the existence of home-based enterprises will transform the home and become part of it. The transformation happens due to the flexibility potential because the same person owns the house
and the enterprise; sufficient resources such as electricity and water; and lastly privacy is ensured because activities are protected from public reach [3]. In the context of HBEs, the formed space is characterized by a high degree of improvisation. There are three ways in which the residents negotiate the house’s physical space to accommodate work activities: 1) separating the context of working and non-working activities; 2) creating several types of physical boundaries (tangible or intangible boundaries) based on residents’ needs and; 3) permeability and flexibility of activities in spatial usage based on time allocation [5]. Spatial negotiation is performed to achieve flexible space, which allows the residents to fulfill domestic and economic needs [4].

2.3. Spatial negotiation with home-based enterprises in the domestic area

Lefebvre [5] mentioned that there are two characteristics of space, i.e., absolute and abstract space. Both characteristics create different ways of perceiving space. Wapshott and Mallet [5] reviewed the Spatial Triad by Lefebvre in the context of the home-based business as follows:

- **Spatial Practice** (the perceived space): the way space is created based on daily experience. The repeated experience will define the space. In the home-based business context, a spatial practice emerges when space is created due to the working and dwelling experience occurring in the same space and time.

- **Representations of Space** (the conceived space): the way the users define the function of space leads to the creation of the meaning of the space. In home-based enterprises, this is related to the way dwellers divide the domestic space and working space.

- **Representational Space** (the lived space): the way spaces are created through symbolization, depiction, or properties that represent the existence of space. It refers to the statement of McBride and Clancy [9] about the social properties which occupy and give territories to space. Symbolization or depiction is related to the positioning of objects which support working or living activities inside the house. Those objects will define the territories or space for working and living.

The Spatial Triad is inseparable from the act of working as a form of domination. The domination process is about the need to clearly choose and control the spatial distribution to make users follow those rules. In adding working space into the house context, the domination process happens by means of work as a control variable in arranging the flexibility and space implications. The actors' response is viewed as a form of space appropriation in which they mutually synergize and negotiate the space in home-based enterprises [5].

2.4. User behavioral adaptation

Crowding in home-based enterprises occurs due to the placement of working and dwelling activities in limited spaces [2]. Furthermore, the emergence of home-based enterprises in high-density settlements means that physical factors are unavoidable in affecting the perception of its users. Therefore, spatial negotiations based on the degree of privacy will determine the users' behaviors as two-way interactions called the adaptation process [10]. Ezeadiche [2] found that to cope with the issue of crowding, the inhabitants of home-based enterprises in high-density settlements need behavioral adaptation. One study about behavioral adaptation by Berry [10] studied the relationship of behavioral adaptation to the physical environment, as explained below:

- **Adjustment.** This process happens when individuals adjust their behavior to adapt to the environment. The environment is a permanent variable.

- **Reaction.** Individuals will change environmental elements to adjust these to their behavior.

- **Withdrawal.** In this situation, individuals will withdraw from the environment that does not support their specific behaviors. Yet, both the individuals' behavior and the environment will be unaffected by one another.
Therefore, negotiation as a form of spatial and behavioral adaptation is an essential response to crowding in the environment [2]. The process of negotiation between the environment and changing behavioral adaptation will mutually affect one another.

3. Methods and location
This research used qualitative observation, mapping, photos, and illustrations. The research area was narrowed down to Gang 23 as one of the alleys located in Jalan Sawahlio, Jembatan Lima, Tambora. For this study, three representative houses in Gang 23 were observed for further discussion. Spatial observation in the home-based garment industries and their views on working activities were used as the control variable. In this case, the negotiation of space appropriation is regarded as a possible response. This research explored working and living activities as spatial practices and how spatial negotiation emerges because of domestic interruptions by the workers in the garment industries. Three adaptation strategies by Berry [10] will be used to view the different spatial practices done by the workers and owners to cope with crowding in the high-density settlement.

4. Results and discussion

4.1 Distribution of the home-based garment industry in Jalan Sawahlio Gang 23
Most of the inhabitants of Kampung Tambora are migrants from Kalimantan, who came equipped with sewing skills as their strategy for survival. From the year 1980, the community in Tambora utilized their skills to establish a home-based garment industry as a means of earning a living. Its existence is supported by neighboring garment centers such as Mangga Dua, Tanah Abang, and Senen that provide lower-middle-class clothing. According to Statistics Indonesia (BPS), Tambora in 2017 had a population of 260,100 in the 5.4 km² area. Kampung Tambora is well known as a high-density settlement characterized by a mix of housing and garment industry.

Kampung Tambora’s inhabitants applied a method of integrating the garment industry into their homes, which is recognized as a form of informal economic activity. The work activities disrupt the domestic area, enforcing a process of spatial negotiation to accommodate the flexibility of working and living needs [5]. Re-configuring the physical elements in the domestic spaces is seen as a means of reaching equilibrium [6]. They are dissimilar when compared to other informal settlements in Jakarta, such as Kebon Kacang [1], which have heterogeneous types of HBEs, which support the formal sector in Jakarta CBD. Kampung Tambora has a homogenous type of HBE, where the other emergent types of HBEs support the garment home-based industry.

There is an alley at Jalan Sawahlio Gang 23 Tambora which is located near Angke Traditional Market and the hawkers centers of Sawahlio and Kendang. This alley consists of 41 houses, one mosque, and several informal home-based enterprises such as traditional food stalls (wargae), shop (warung), and sewing machine reparation shop. The houses are arranged back to back and separated by a tight alley. However, due to limited space, all houses are attached to each other. Nineteen houses in Gang 23 are running home-based garment industry as their main livelihood. Therefore, with the flexibility of working and living within one space, Tambora’s home-based garment industry is classified as home-based growth enterprises [7]. The houses are divided into three types of housing based on various stories, size, and volume of dwellings to accommodate the activities of the home-based garment industry. All selected houses are sited in the same location as other garment industries along the alley, as explained in Figure 1.
Figure 1. The context of Jalan Sawahlho Gang 23, a high-density settlement. Home-based garment industries and other HBEs are colored in white. The other colors are the observed representational houses.

House type 1 (House A) consists of three-floors, which extends to the back. Therefore, the front view of the house towers over other houses and is massive. House type 2 (House B) was initially a single floor house with a large terrace, which was then expanded with a second floor to accommodate garment industry activities. House type 3 (House C) was a two-floor house with blocked façades. The house also has a very narrow terrace. House A is typically built more recently than House B and House C. For security reasons, all three types of houses have a closed façade covered with zinc, an iron fence, and wire mesh. All house types are compared to uncover the spatial negotiation that occurs inside and find how it shaped the house’s characteristics. Houses with garment industries inside are larger and have more levels compared to the non-garment industry houses. HBEs in other informal settlements mostly have an open façade, as the front of the house is used as a shop or kiosk [1, 2]. The residents fulfill domestic needs behind the shop with solid boundaries to maintain privacy. Therefore, usually, other types of HBEs use a single-floored house because the working activities do not require much space and specific processes.

4.2 Domestic spatial negotiation overview

Figure 2. Longitudinal section of the three house types shows the distribution of work and private space.

Inside the three types of houses, the owners and workers work together. Activities in the garment home-based industry consist of counting and categorizing the fabrics; cutting and sewing it into clothes; and packing the clothes. The working activity is regarded as a dominant factor [5], which means that it is the defining factor in the functional division of the house. As seen in Figure 2, House A places private spaces on the third floor and utilizes the rest of the space inside the home for the
home-based garment industry. Both House A and House B negotiated by incorporating the private and working areas in the same space with the aim of efficiency; this means that the domestic activities are mixed with work activities to ensure the ability of the owner to control the work activities.

Figure 3 shows how the Spatial Triad by Henry Lefèvre works in the three types of houses, in terms of how the owners and workers appropriate the space for working and living activities. The owners emphasized the division between working and living space using the physical space as a part of the representation of space. They placed working and personal objects to create symbolization of space. The owners and workers occupied the space as spatial practice based on their jobs. In this research, the domestic spatial negotiation on the first floor is observed based on three categories: 1) the translation of the terrace; 2) creating the space of ownership and workers’ space; and 3) placement of private areas.

4.2.1. The translation of the terrace. The terrace is the first space encountered when people enter the house. Typically, a terrace is seen as open space, however, in different home-based garment industry houses, it has different perceptions and functions. Figure 3 shows how the terrace in every house is different in size and function. Both House A and House C preserved the terrace as a transition area (Figure 4). They cleared the area between the fence and the main door to let people come into the house. However, the terrace in House A functions as a storage area. House C has the narrowest terrace compared to the other types. Here, the owners placed various personal family objects, and there was hardly any remaining empty space. In House C, the terrace was translated into storage, while in House B, the owner translated the spacious terrace as working spaces. On the terrace, the workers packed and unpacked categorized fabrics, and conducted the first step of sewing.
4.2.2. Creating the space of ownership and workers’ space. As the representation of space, the inhabitants use the placement of objects as the representational space. They also determine the spatial practices and configurations in the main room of the first floor. In each of the house types, inside the main room, the inhabitants similarly emphasize the existence of space of ownership. The owners mostly occupy their private space to work while controlling the workers' performance. Figure 5 shows the different symbolization and response to create space of ownership. Both House A and House B used the affordances of the table with a size of 1x2 meters as the representational space to indicate the ownership. Owners in House A usually sit at the table while folding clothes, taking notes of administrations, and controlling workers who are positioned below to cut fabrics. The owners in House B placed the table at the center of the room. It is deliberately positioned in such a way making it the focal point, which influences the placement of working objects surrounding the table. The owners worked at the table while smoking and chatting. This position enabled the owners to have direct access to the private areas on the first floor while gaining control of workers in the terrace and working space on the first floor (Figure 3).

Unlike the two other types of houses, in House C, the central part of the house was utilized for various work activities for the female owners. Here, the clothes were spread throughout the area without leaving any space for circulation. The workers and other family members should take turns going in through the hall on the other side of the room to enter this area. In all three house types, everyone created his/her own symbolization spaces by placing working objects that define his/her job description. For example, they placed objects and covered openings (windows) by placing papers, clothes, and fabrics. As they changed the function of the windows from the ventilation element into places for hanging clothes, the room becomes stuffy and blocked. The owners of House C applied a different way to express their representational space. They placed a worship altar (Hio Hwee) which symbolizes their spatial negotiation.
While all house types utilized the second floor as working spaces, each house has a distinguishable way in which it translated the function of the balcony. Moreover, the orientation differs in the organization of the tables, the placement of working objects for every worker, the arrangement of workers’ personal belongings, and the storage to keep the belongings of the workers. Figure 6 shows how each house translated the function of the balcony differently. In the case of House A, the workers translated the balcony as both resistance space and the place to respite when they are tired of working. In the case of House B, since the second floor is also used as dwelling spaces for several workers at night, they used the balcony as storage to place their personal belongings. One worker in House C translated the balcony as his working area in response to crowding because of the limited space and the many objects on the second floor.

Notwithstanding the same tendency to utilize the whole second-floor space for working activities, every house type has its spatial negotiation. The owners apply different configurations and place objects according to the workers’ requirements to work comfort ability. As shown in Figure 7a, the owner of House A configured the table to be linear so that it intentionally encouraged the workers to focus. They placed the fabrics prepared for sewing on the other side of the room. Workers use the railing and the steps of the stairs as storage and to categorize fabrics for sewing and sewn clothes.
Therefore, two different spaces on one floor become the representational spaces without any effort to install physical boundaries.

House B created a centralized configuration by making the area in the center free from anything. For the workers, this space is regarded as a place for dwelling after working hours. In this case, although the table configuration signifies permanent space, the workers occupy the space for sleeping and place their personal belongings there.

In House C, the central area is utilized to place all fabrics or sewn clothing. They are stacked up based on their color or clothing types. The next process of sewing is done in rotation based on the type of clothing component. Although the configuration of the tables is deliberately positioned to avoid workers from chatting while working, they still have moments of interaction together while they sew. The workers also try to emphasize their territory by hanging their personal belongings on the wall or the window above their work desk. There is a sense of consistency in the way they negotiate which windows would be used to place their belongings. They also form a perimeter through their placement of the garment tool objects such as strings, scissors, and other stuff in the storage in the back of the room. Moreover, to provide a little bit of cold air and illumination, the hanging fan and neon lights were kept on all day.

4.2.3. Placement of private areas. The owners of House A built more floors and provided space for daily domestic private activities on the third floor. The owners of House B and House C tried to negotiate the living and working spaces within one floor, but they arranged the objects and working space’s location with efficiency in mind. Therefore, by occupying the same floor, they could access their private areas, while controlling workers’ performance. In House A, the family had to move vertically to control workers on the first and second floors.

![Third-floor plan of House A](image)

Figure 8. Third-floor plan of House A.

Figure 8 shows that there are two possible choices for fulfilling the owner’s individual needs. Since House A does not have physical boundaries to define domestic space, on the third floor, the owners inserted several physical boundaries to create different spaces and circulation. Nevertheless, due to the limitation of space, for certain spaces, there are activities that affect other spaces. For example, cooking activities at the kitchen extended into the balcony and family storage is placed between the bedroom and bathroom.

To summarize, all three house types utilized all available spaces such as the balcony and terrace to support either working activities or for respiing during break times. To negotiate with the limited space, all actors translated the meaning of the window differently. Rather than an opening, the window was translated into the attribute to place objects. All houses displayed similar façade characteristics, which were shown by similar elements and shapes. Whereas other types of home-based enterprises only insert their working activities to the front of the house or occupy public space [1], the spatial negotiation in the garment home-based industry does not only occupy one space as their working space. There is also a cultural impact in negotiating space, such as the emergence of worship elements in one of the houses. Nevertheless, inside each house, different domestic spatial negotiations were created which can be summarized as in Table 1.
Although specification of space function awed and encouraged the home-based enterprises found their way to cope with crowding, industries density settlement created an economic network. Whereas most HBEs in Jakarta emerge to create sustainable livelihoods in harmony with various formal sectors, home-based garment industries in Tambora have a specific reciprocal relationship to create sustainability in the clothing sector. Moreover, home-based garment industries have similar characteristics, which are not only economically binding but also create the flexibility of spatial networks and morphologies in one area.

The community negotiated the availability of space in various ways that have implications for the houses’ characteristics. Integrating working activities into the private area causes the problem of domestic interruption since the garment activities tend to dominate the private area. In this case, the distribution of the roles between owners and workers affected the spatial negotiation inside the houses. As a result, appropriation emerged as a response to spatial negotiation between the garment and domestic activities. Spatial negotiation based on the Spatial Triad [5] appears in three ways: 1) the spatial practices emerged from the daily life of the actors (both the owners and workers) through working and dwelling; 2) representations of space emerged from specification of space function; and 3) representational space emerged through symbolizing the working place and personal objects inside domestic areas.

For both owners and workers, the spatial negotiation in the domestic area was mandatory and exerts behavioral adjustment based on their activities [10]. When they needed to respite, they withdrew from working areas, either by occupying the terrace/balcony inside the house or escape into the alley in front of the house. It was the only way of adaptation to crowding. Home-based garment industries, as part of HBEs in informal sectors, added the meaning of open private space for the workers apart from public space. It contrasts with the prevailing idea of informal settlements like kampung which typically occupies public space either for work or respite activities [1].

It is essential to further investigate the home-based garment industry in high-density settlements to understand how it affects the well-being of this potential area. Although each house type in the high-density urban settlement has its own domestic spatial negotiation [4], the home-based garment industry requires open space with various function possibilities. Although the actors of the home-based enterprises found their way to cope with crowding, it is necessary to find solutions that could increase their well-being and improve the environmental quality of similar high-density urban.

| Category of Spatial Negotiation | House A                                                                 | House B                                                                 | House C                                                                 |
|--------------------------------|------------------------------------------------------------------------|------------------------------------------------------------------------|------------------------------------------------------------------------|
| Terrace                        | Terrace as transition                                                 | Terrace as working space                                              | Terrace as storage space                                              |
| Space of ownership             | Table affordance                                                      | Table affordance                                                      | Elements of worship                                                    |
| Working Space in Second floor Configuration | Linearity                                                            | Centralized to leave the central area empty                           | Centralized to be filled with work stocks                              |
| Translation of Balcony         | As respite space                                                      | Workers personal storage                                              | Worker’s private working space                                        |
|                                | Construction of a third floor                                         | In a perimeter with space of ownership (first floor)                   | Behind the space of ownership (first floor)                            |

5. Conclusion

Tambora’s community fulfills its livelihood in the form of the home-based garment industry, through the flexibility offered by combining domestic and working activities in the same place. The emergence of the home-based garment industry in Tambora was initiated by several embryos, which then encouraged the other homes to be used for home-based garment industries. Tunas [1] saw that the process of HBEs dispersion created an economic network. Whereas most HBEs in Jakarta emerge to create sustainable livelihoods in harmony with various formal sectors, home-based garment industries in Tambora have a specific reciprocal relationship to create sustainability in the clothing sector. Moreover, home-based garment industries have similar characteristics, which are not only economically binding but also create the flexibility of spatial networks and morphologies in one area.
settlements that are spread out in many parts of Jakarta. The starting point could be to find bottom-up spatial regulations based on spatial negotiations that emphasize the community’s living characteristics. Well-being can be improved by overcoming the flexibility of limited space and finding their spatial network to understand the morphologies and adaptation in an area. In the long term, the spatial regulations and flexible spatial network will help empower informal settlements containing HBEs [1].

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