Spatial adaptation of Rusunawa Muara Baru residents, North Jakarta in livelihood activities

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Abstract. Illegal settlements are a form of increasing demand for settlements in the capital city of Jakarta triggered by urbanization. One of them is in Waduk Pluit, North Jakarta. This situation forced government to hold the normalization and relocation towards Rusunawa Muara Baru in 2015 to restore the function of the reservoir and restrain the urban settlement infrastructure. This research is a qualitative study using a humanistic geographical approach as its foundation. This research aims to determine changes in their residential characteristics and their basic needs as well as to identify the new form of adaptations in their livelihood activities after relocation. The results showed that residents who have relocated value the positive physical environment in their new housing but also increase in their basic needs, mainly due to rental fees. This condition causes residents to adapt by having additional jobs. Some residents who didn’t have additional jobs, work in the services sector. Otherwise, some residents maintain it with same or different types of business. The business space location determines the type of business, this causes some of them to change the type of business based on market conditions around their business space. They use public space as additional jobs’ location.

1. Introduction

DKI Jakarta is the capital city of the Republic of Indonesia which is one of the destinations for people to live and seek the job. People who come to Jakarta come from various areas in Indonesia. Known that the population of Jakarta at this time has reached 10.374.235 inhabitants in 2017 increased as many as 96.607 inhabitants from the previous year, where the pace population growth each year amounting to 0,94% [1]. This population growth continues to occur from year to year. The population growth was caused by permanent mobility as known as migration or non-permanent mobility like a commuter.

With the increase of population in DKI Jakarta, the land requirements for settlement will also increase. For the people with low income, choose to live in an illegal settlement who doesn't have a building permit because of limited costs. Waduk Pluit, North Jakarta is one of an area that used for illegal settlements. This has negative impacts on the environment around Waduk Pluit. Initially, Waduk Pluit region has an area of 80 hectares then shrinking to 60 hectares. The reason is 20 hectares of Waduk Pluit area has been inhabited by illegal settlement. The environment around Waduk Pluit also filled with garbage and household waste that pollute the reservoir area. In addition, another impact is siltation due to sedimentation that causes a decrease in the reservoir depth from around 10 meters into 2-3 meters.

The negative impacts endanger the environment around Waduk Pluit region so that the DKI Jakarta Province Government normalized and relocated illegal settlement residents to other places. Rusunawa Muara Baru is one of rusunawa chosen by the government as a new residence for the people relocated. The relocation program by the government encourages illegal settlement residents to adjust the situation
and environment in the new residence. It also will change several life aspects in household conditions before and after moving towards Rusunawa Muara Baru. Changes might affect the economy of the household so that residents need to adapt in livelihood activities.

2. Literature Review
By the change of location experienced by the community, formed a new interaction in space. These interactions can be in form of interaction with the environment or interaction with the fellow individual. In the process of an interaction experienced by the community, an adaptation is needed. Adaptation is a personal adjustment to conditions that occur in a new environment. Adjustment means changing personal according to environmental conditions and can mean the opposite, namely changing the environment itself with a state of personal desire [2]. There are limitations to adaptation. According to the concept of adaptation [3], limitation in adaptation are:

1. Process of overcoming obstacles from environment
2. Process of changes adjust to the changing situation
3. Change the order by the conditions created
4. Used the limited resources for environmental and system purposes
5. Cultural adjustment and other aspects as a result of natural selection

The adaptations that occur in individuals also affect social and economic. Social activities are related closely to relationships between humans. While adaptation to economic activities is an adaptation to livelihood activities and fulfillment of daily needs such as clothing, food, and shelter. Adaptation of livelihoods for humans to be able to adapt in new environments and to survive [4]. Adaptation to activities in the form of livelihood activities or adaptation for fulfillment daily needs related closely with the location factor of one of them is focused on the question “where” by using a spatial approach.

Adaptation is a result of the spatial behavior towards the environmental changes experienced. Human spatial behavior is a result of cognitive from the retrieval process human decision based on human characteristics, constraints from the environment, situation and response to the policy [5]. Also, human spatial behavior can be interpreted as a series of processes that are carried out both consciously or unconscious in human life whose results related to the selection or change of location [6]. Spatial behavior is closely related to how humans make a decision.

3. Research Methods
The research located at Rumah Susun Sederhana Sewa (Rusunawa) Muara Baru in Kelurahan Penjaringan, Kecamatan Penjaringan North Jakarta as new residence for some people who relocated from Waduk Pluit region. Rusunawa Muara Baru consists of 12 towers where four blocks (Block A, B, C, D) was established by the DKI Jakarta Provincial Government in 2009 while another eight blocks (Block 5,6,7,8,9,10,12) was established by developer services in 2014 and began to be inhabited since the beginning of 2015. In this study, the focus is on communities who relocated. So, the research area is only done in eight blocks (Block 5, 6, 7, 8, 9, 10, 11, 12) at Rusunawa Muara Baru. While four blocks (Block A, B, C, D) is intended for the community of Kelurahan Penjaringan affected by flooding on the banks of Kali Gendong, North Jakarta in 2013. The following is a map of Rusunawa Muara Baru, North Jakarta,
Data in this research are divided into changes in the characteristics of the new settlement and changes in basic household needs. Changes in settlement characteristics divided into changes in form, condition, situation, and environment around the settlement, while changes in basic household needs are divided by changes in expenditure costs for residential rental fees, water requirements, electricity needs, and food needs. Data variables of type and location in livelihood activities will describe the form adaptation of Rusunawa Muara Baru resident in livelihood activities. This research use qualitative research method combined with a spatial approach. The qualitative method that describes this research is the phenomenology method. This method is used to describe events, activities or symptoms that occur in the community. The type of data used in this study are primary data and secondary data.

| Types of Data | Data Variables | Data Resources |
|---------------|----------------|----------------|
| Primary Data  | Change in residential characteristics | Survey and interview |
|               | Change in basic household needs | Survey and interview |
|               | Types of livelihood activities | Survey and interview |
|               | Household income | Survey and interview |
|               | Location of livelihood | Survey and interview |
|               | Sketch of utilizing the ground floor as a location for additional livelihoods | Observation |
| Secondary Data | Map of Rusunawa Muara Baru, North Jakarta | Google Earth |
|               | Administration of Kelurahan Penjaringan and POI (Point of Interest) as the public facility points and location of livelihood | Geospatial Information Agency |
|               | Population data of Rusunawa Muara Baru residents | Public Housing and Settlement Area Agency of DKI Jakarta Province and Rusunawa Muara Baru Management |
Data collection techniques carried out were in-depth interviews and surveys. In-depth interviews are the process of obtaining information for research purposes by a face-to-face interview between interviewers and informants, with or without using an interview guideline where interviewers and informants are involved in relatively long social lives [7]. In-depth interviews in this research were conducted based on interview guidelines that had been made using the snowballing method. The people who become informants are people who move from Waduk Pluit, North Jakarta to Rusunawa Muara Baru. Meanwhile, the survey was to observe the situation of Rusunawa Muara Baru residents and their daily activities.

From the results data interviews, verbatim transcripts were made then analyzed by coding and categorizing so that found several themes. Coding is done to select results interview according to the research question. So that the result of data processing is in the form of spatial descriptive analysis that is following the research purposes. The spatial qualitative analysis phase is started from the reduction stage, the data presentation stage, and ends with the conclusion stage [8].

4. Results and discussion
4.1. Household Profile

There were 15 informants in this research. The informant was a family who experienced relocation on the banks of Waduk Pluit, North Jakarta. The family moved to Rusunawa Muara Baru and lived in eight blocks (Block 5,6,7,8,9,10,11,12). The form of family living in one residential unit is a nuclear family consisting of parents and children. There were no changes in family form that occurred in one residential unit both before and after relocation.

Based on the result interview, one residential unit consists of family members that range from two to six people. The number of family members who live together is not the number of nuclear family members that officially registered on the family card. This is caused by the presence of other informant family members who are in their hometown or separated from other family members. Every family member has their respective roles and duties. A father in a household as the head of the family who has the duty to work to fulfill household needs. However, other members have assignments to work well as the main actor or as the second actor in carrying out livelihood activities. Number of family members in each household will affect the basic needs for each month. This will also affect the amount of expenditure that will be issued each month. The more family members, the more basic household needs of Rusunawa Muara Baru residents.

4.1.1. Basic Household Needs. Basic household needs Rusunawa Muara Baru residents consists of four basic needs include residence Basic household needs Rusunawa Muara Baru residents consist of four basic needs include residence needs, water requirements, electricity needs, and food needs. Expenditure of basic household needs issued by each informant various every month. Expenditures in residential unit rental costs differ on each floor, where the higher floor of the residential unit, the cheaper fee that will be spent. The water needs in Muara Baru Flats come from PAM Jaya water while the electricity needs come from the electricity token system. The family who consists of more than four members has high basic household needs. That family has an expenditure of more than Rp600.000. It is also influenced by ownership of some electronic devices such as television, air conditioner, washing machine, refrigerator, and others. The usage with high intensity results in increased expenditure.

By staying in a formal residence, residents are more independent in fulfilling their basic needs or in other words residents cannot help each other in providing basic needs such as water and electricity needs that can be done in the previous residence. This is caused by the existence of management and system that applies in Rusunawa Muara Baru so that the basic needs of each household are managed by the manager itself. This causes residents to live more regularly.

4.1.2. Main Livelihood Activities. Based on the result interview, there are some divisions of roles in a household. The head of the family is the main actor in livelihood activities. There are various types of main livelihood activities, namely boat guards (informant 2), fish sellers (informant 3 and informant 11), police (informant 4), state army (informant 5), labor at Muara Baru fish market (informant 6),
mariner (informant 8), bajaj driver (informants 10), becak driver (informants 12), fish loaders (informants 13), security guards (informants 14) and private employees (informants 15). The type of livelihood was done both before and after moving to Rusunawa Muara Baru.

Most of the Rusunawa Muara Baru residents still maintain their main livelihood activities after the relocation happen. The distance of the location not far from the previous residence resulted in the mileage of Rusunawa Muara Baru residents not experiencing significant changes. This also does not affect the use of the transportation mode. Most residents do mobility using a motorcycle to work. The following is the distribution of the workplace of each informant.

![Distribution Workplace and Distance to Rusunawa Muara Baru Map](image)

**Figure 2. Distribution Workplace and Distance to Rusunawa Muara Baru Map**

Main livelihood activities location spread in various areas in DKI Jakarta such as North Jakarta, Central Jakarta, and West Jakarta. Based on the map on Figure 2, there is main livelihood activities with a distance more than 10 km from Rusunawa Muara Baru. Besides, there is also the location of main livelihood activities is dominated in the North Jakarta area with a distance less than 10 km.

4.2. Changes in Household Life Aspects

The fundamental change happens is the change in the location of the residence due to relocation settlement. The location of previous and new residential have difference in some aspects. The previous residence is an illegal settlement located on the banks of Waduk Pluit. Besides, the form of settlement is an informal settlement that does not have a binding system. So, people can freely to fulfill basic needs in various ways.

This results in fulfilling the basic needs of every community having different ways and sources. It is different for the new residence namely Rusunawa Muara Baru Flats, which is a formal settlement. Some systems apply to it. The systems have been determined by the Rusunawa Management Unit so that for meeting the needs, residents must follow the applicable rules. The changes in residential location from Waduk Pluit to Rusunawa Muara Baru effect residents experiencing changes in the characteristics of the housing and changes in basic household needs. Below is a table of changes experienced by residents of Rusunawa Muara Baru.
Table 2. Change Before and After Relocation of Rusunawa Muara Baru Residents

| No | Change Aspects                      | Before                        | Changes                                                      |
|----|-------------------------------------|-------------------------------|--------------------------------------------------------------|
| 1  | Form of residential                | Horizontal housing            | Vertical housing                                             |
| 2  | Residential condition               | Wide                          | Narrow                                                      |
| 3  | Residential environment             | Hot, unorganized, and not noisy | Cool, comfortable, organized, and a little noisy or often noise |
| 4  | Environment near residential        | Slum, lots of mosquitoes and lots of garbage | Clean and safe                                               |
| 5  | Road condition near residential     | The road is rocky and narrow  | Asphalt and wide road                                        |
| 6  | Willingness of public facilities   | There are no public facilities near residential | There are a lot of public facilities inside the residential area |
| 7  | Proximity to public facilities     | Distance to public facilities is relatively the same |                                                            |
| 8  | Ownership system                   | Own property                  | Rental system                                               |
| 9  | Water requirements                  | The use of free-pay every day and various water sources | Provision of subsidies from the government and water source is from PAM water |
| 10 | Electricity needs                  | Kilometers electric           | Voucher electric Buy inside residential area (in store or from pitcherman) |
| 11 | Food needs                         | Buy on the traditional market |                                                             |

Based on some interviews, it is known that changes in the residential atmosphere felt by the residents of Rusunawa Muara Baru have a positive impact on changes in residential characteristics. The atmosphere and environment of Rusunawa Muara Baru is considered better than the previous residential. This can increase the comfort of residents while staying in Rusunawa Muara Baru rather than the previous one. Changes in better conditions are characterized by a healthier, cooler and organized environment.

By living in Rusunawa Muara Baru, which is equipped with various types of public facilities, it makes easier for residents to access various public facilities. In addition, there are various types of public facilities that can reduce mobility and create a sense of comfort by staying in Rusunawa Muara Baru. This also seeks residents not to feel a significant difference in proximity to public facilities when compared to the previous one. So that Rusunawa Muara Baru residents can more easily meet basic household needs.

Another change that was felt towards the change in the residence of Rusunawa Muara Baru residents was the change in the fulfillment of basic household needs. This affects several aspects, one of them is the expenditure needs in every month. It can be concluded that the most influential thing was a change in the ownership system which demanded the residents of Rusunawa Muara Baru pay the housing rental fees. That way, the expenditure of each household will increase so there is a change in the basic household needs.
The changes in meeting these basic household needs resulted in a greater amount of expenditure than before. These expenses must be paid every month by each resident due to the system imposed by the management of Rusunawa Muara Baru. With the increase in expenditure costs, residents of Rusunawa Muara Baru must adjust efforts to increase household income. This is a form of adaptation to livelihood activities as a source of household income.

4.3. Adaptation of Livelihood Activities

With changes in household life aspects, so that Rusunawa Muara Baru residents made some adjustments. Changes in residential areas are the trigger for changes in other aspects of household life. These changes then form different adaptations for each household. Adaptation was formed due to the main problem that asked Rusunawa Muara Baru residents to adjust the costs of income and expenditure for household needs. So that the adaptation formed is an adaptation to the livelihood activities of Rusunawa Muara Baru residents. Adaptation is done to second or additional livelihood activities. There are various types of adaptations carried out by residents of Rusunawa Muara Baru.

**Case one** is a resident who forms an additional job. Before moving to Rusunawa Muara Baru, that residents did not have additional jobs. With the increase in expenditure costs every month, so the adaptation is formed an additional job. Additional job carried out by residents of this first category is an additional job in the service sector. Additional job in this service area does not require business land so there is no need to spend more funds than other types of additional job. The examples of adaptations that are formed are services in maintaining and protecting the parking area for motorcycle in evening and laundry services.

**Case two** is a resident who maintains an additional job with the same type of business. These residents already have an additional job before moving to Rusunawa Muara Baru and rebuilding businesses in a new residential location. In addition to rebuilding the additional job or business, residents in this case also maintain the type of business. Informing a business in a new residence, residents only need new business land because business assets are available beforehand. Based on the results of interviews, the type of business is the form of a grocery shop.

Before moving to Rusunawa Muara Baru, they opened a business in their previous residence. But when moving, the business location is located on each ground floor of rusunawa blocks. The ground floor is used for public spaces where there are various types of activities in it. Each ground floor has different characteristics based on the activities formed.

**Case three** is the resident who moves the location of their business or additional job and changes the type of business. One resident named Ms. Iin, who is 48 years old and lives in block 9 Rusunawa Muara Baru, opened a new business in the form of a clothing store. Ms. Iin has a business in the form of a grocery shop in her previous residence or before moving to Rusunawa Muara Baru. The reason Ms. Iin decided to open a clothing store business was that there were business opportunities caused by locations. Meanwhile, the reason Ms. Iin did not open a grocery shop like before because of the large number of grocery shops that already opened in her blocks, so Ms. Iin chose to look at business opportunities and open another type of store.

4.3.1. Livelihood Adaptation Location.

It can be seen the additional job location of Rusunawa Muara Baru residents in case one to three, the resident business locations are spread in six blocks, namely blocks 6, 8, 9, 10, 11 and 12. If further analyzed each case has different business location characteristics. The difference in each location characteristic are formed based on proximity to objects or public facilities around the place of business and the environment around the place of business. The location used for the additional job is ground floor of each block in Rusunawa Muara Baru.
The main reason for choosing a location for additional jobs is that the ground floor is a public space that is designated for various types of activities, one of which is for the business area. Also, the limited space in the residential units resulted in some residents choosing to open a business on the ground floor. This illustrates by using limited resources for environmental and system purposes [3].

**Case one** is a resident who forms an additional job in the service sector. The location for the additional job for this first case is located inside Rusunawa Muara Baru area itself. Because they do not need business land, therefore, in distributing services, they can move from various blocks in Rusunawa Muara Baru. But for the additional job in the form of services to maintain and protecting parking areas, it is only done in the block where the resident lives. So, the point on the map (Figure 3) represent the location of the residents’ unit.

**Case two** is a resident who maintains an additional job with the same type of business in the form of a grocery shop. Some residents build a grocery shop on the same block as they live. Therefore, the points on the map (Figure 3) represent the location of the grocery shop itself. This is happening due to the main reason for the construction of a business location based on the Rusunawa Muara Baru manager's regulations, but there are differences in the process of place the business locations on each ground floor. Some residents place their grocery shop on the ground floor since moving in, but some residents previously place their grocery shop at the same location as their units and then moved into the ground floor due to limited space.

**Case three** is the resident who moves the location of their additional job and changes the type of business. The resident changes her business from grocery shop into a clothing store. The store is located near the playgroup school on the ground floor of block 9 (Figure 3). The main reasons for the formation
of new businesses and the choice of business locations in block 9 are influenced by business competition in the Rusunawa Muara Baru Area and the existence of public facilities which are considered to have more value than other locations. This value is formed due to the proximity of the business location with public facilities so that the place will be visited more by the community who live both inside and outside Rusunawa Muara Baru area.

![Figure 4. Left: Grocery shop (Case 2), Right: Clothing store (Case 3)](image)

5. Conclusion
Changes in settlement from the informal sector into the formal sector experienced by residents of the vertical house for several aspects of life are divided into positive changes such as changes in the atmosphere and environment of residence and negative changes in the form of increased basic household needs. These negative changes increase in household expenditure costs for each month. This condition causes residents to adapt by having additional livelihoods as a source of additional household income. The adaptation that is formed is by forming and maintaining additional jobs in new housing. Residents who do not have additional livelihoods previously will form a new additional livelihood in the service sector because they do not need business space. Meanwhile, residents who already have additional livelihoods will maintain it both with the same or different types of business. The business space location that is provided by Rusunawa management determines the type of the business, this condition causes some of them to change the type of business based on the prevailing market conditions around their business space. The location used for the additional job is on a ground floor also called public space.

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