ASEAN Journal of Community Engagement

Volume 3
Number 2 *December*

Article 6

12-31-2019

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Recommended Citation

Wijayanti, Sri Hapsari; Pandia, Weny Savitri S.; and Sutarno, Herman Yosep (2019). The concept of Green Rusunawa for the urban community in Indonesia. *ASEAN Journal of Community Engagement*, 3(2).
Available at: https://doi.org/10.7454/ajce.v3i2.1061

The concept of Green Rusunawa for the urban community in Indonesia

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Received: May 26th, 2019 || Revised: July 9th, 25th & October 18th, 2019 || Accepted: October 28th, 2019

Abstract

With the inevitability of population growth and urbanization, governments have initiated the development and spatial planning of smart and green cities. By conducting direct observation and focus group discussion (FGD) with management unit representatives and residents, this study identified three priority issues in Rusunawa Muara Baru, Pluit, North Jakarta: access to clean water, management of household waste, and the lack of a public area for social activities or interaction. This paper aims to solve these problems through the implementation of an integrated model of Green Rusunawa, especially in Towers 5, 6, and 7. The stages of this program include preparation, implementation, and evaluation and sustainability. This program adopted a qualitative descriptive approach using observation, interview, and FGD to reveal the challenges, conducted informal deliberations as well as attributed the audience to the local government, observed and recorded the infrastructure program establishment and implementation, and held informal discussions and training for program management and resident representatives for the final stage. Green Rusunawa was created within the concept of green living, green environment, and green space, each through the successful utilization of rainwater harvesting (RWH), management of the waste bank, and the availability of the learning center. RWH and the waste bank quantitatively provide tangible benefits for the fulfillment of water needs and augment family income, respectively. Meanwhile, the learning center is to be developed into an interaction space for residents to conduct positive activities.

Keywords: learning center, rainwater harvesting, waste bank, public rental housing, empowerment, green living, green environment, green space

1. Introduction

Population growth and urbanization in cities are unavoidable; thus, governments of many developing countries have authorized expansion and spatial planning (Steinberg & Lindfield, 2012) to solve relevant problems and advance the concept of smart and green cities. According to Vogl (2012), a smart city is an "intelligent and attractive approach in building sustainable cities that are capable of combining the involvement of infrastructure, technology, and the local community with the vision based on local conditions, capabilities, and resources"(Vogl, 2012), thus highlighting the role of social capital in sustainable urban growth (Vogl, 2012). Moreover, the three core components

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of a smart city are infrastructure, human capital, and information (Bakici, Almirall, & Wareham, 2013).

Every city in developing countries has a smart strategy to overcome their respective problems in sustaining the quality of life in urban areas. Because housing needs are the right of the residents, the government built vertical or simple flat houses (*rusunawa*) especially for middle-low class, but apparently another problem arose; some issues such as water availability remain global problems (Baird & Esteban, 2012). In addition, solutions include using RWH technology for drinking and nondrinking resource management to maximize efficiency of use (Lindfield & Steinberg, 2012). Furthermore, to overcome issues surrounding waste and its management, Singapore, for example, has worked toward a green city through burning and recycling (Steinberg & Lindfield, 2012). Meanwhile, Korea has developed a holistic vision through a U-city model, consisting of smart economy, living, energy, mobility, environment, people, and government (Vogl, 2012). Smart solutions to support large, overpopulated countries like India created through (a) e-governance and citizen services, (b) waste management, (c) water management, (d) energy management, (e) urban mobility, and (d) telemedicine and tele-education, incubation/trade facilitation, and skill development centers (Kumar & Dahlya, 2017). In Indonesia, cities such as Bandung, Balikpapan, Makassar, and Surabaya have previously implemented the concept of a smart city (Hayati et al., 2017). Surabaya shows its environmental friendliness through grassy open spaces, the efficient use of public transportation, and the application of technology and additional infrastructure (Hayati et al., 2017).

Smart cities and green cities are popular and are known to develop many countries (Lindfield & Steinberg, 2012); *greening* refers to certain infrastructural services encompassing transportation, water and sanitation, waste management, and energy sources (Asian Development Bank, 2012). However, in some countries, including Indonesia, this form of transportation solution is evidenced by vehicle-free areas or car-free Sundays to reduce pollution. Meanwhile, both smart cities and green cities are similar with respect to solving various urban problems caused by population density. In addition, government-provided solutions are tailored to each city's resources.

This paper refers to the term *green* in the context of public rental housing (*rusunawa* acronym of *rumah susun sederhana*) in Muara Baru, Pluit, North Jakarta, Indonesia. Consisting of 12 towers and 100 units, Rusunawa Muara Baru is the governmental

program for organizing green open spaces and land efficiency (Marianata, 2014). There are more than 1,200 households with heterogeneous in terms of social, cultural, and economic backgrounds. Most of the heads of family are fishermen, but some are also laborers, traders, or private employees. A crucial point in public housing is how to provide residents adequate shelter (Gan et al., 2016).

The Green Rusunawa concept aimed to solve the three problems in Rusunawa Muara Baru about water harvesting, waste bank, and social space. Residents have experienced these difficulties since they first inhabited the place in 2013. To confirm and identify the problems in Rusunawa Muara Baru, a personal approach was adopted toward residents and the management unit. Rapport was built, especially with the spiritual leader, which further assisted in the survey of the location.

The instrument for the interview and Focus Group Discussion (FGD) was then designed, considering demographic data and obtaining information on the potential facilities, infrastructure, various problems faced by residents, as well as solutions of the problems. From this activity, 30 participants recognized the need for a water collection system, waste management schemes, and a learning activity center. They expressed willingness to support these programs.

First, because the region sits on a geographically lower surface than the sea, problems arise in sourcing clean raw water. Thus, the Ministry of Public Works (*Kementerian Pekerjaan Umum*) and the Bandung Technology Institute (*Institut Teknologi Bandung*) built a treatment facility to process water from the Pluit reservoirs, adjacent to Rusunawa Muara Baru. *Perusahaan Air Minum Jaya* (PT PAM Jaya) provided free of charge of groundwater tank to the residents. However, because of the insufficient amount of water, residents tend to buy water to fulfill their daily needs, and others install privately owned water tanks equipped with a pump. With this option, they incur high costs when buying water from PT PAM Jaya for additional electricity costs required by pumps that distribute water to the stacked house units. Furthermore, to overcome water insufficiency, rainwater is used through the appropriate harvesting technology (called green living).

Second, all towers in Rusunawa Muara Baru are equipped with garbage disposal channels on each floor where residents dispose of household waste without decomposition. This disposal ends in a rubbish bin located at the base of the tower, which is cleaned every day by a janitor. Furthermore, the waste is then transferred to a temporary landfill (*tempat pembuangan sampah sementara*) and then transported to the

terminal refuse site (*tempat pembuangan sampah akhir*). In addition, temporary locations within the open area pose the problem of environmental hygiene, which is not only visually unpleasant but also causes a bad smell. Moreover, residents have not practiced proper waste management to reduce pollution and environmental damage; thus, overcoming this requires waste management technology, including conservation in related banks (called green environment).

Third, like big-city inhabitants, residents in Rusunawa Muara Baru appear to be individualists and seem busy with household or business affairs. Residents not only need open green space, but also friendly public space. Therefore, the absence of public spaces results in the lack of public gatherings and positive activities to foster social closeness. These spaces are useful for social interaction, such as *arisan*, tutoring, meeting, or celebrations. Furthermore, these solutions involve establishing a learning center to serve as an area for public contact that blends with a reading atmosphere (called green space).

Generally, a comfortable built environment is a critical element in urban living. Therefore, investments in infrastructure and further development must be made to accommodate the rising number of people moving to cities, further increasing the pressure on available resources and generated waste (Schuurmans, Dyrbøl, & Guay, 2018). Based on these reflections and the needs of a community, three problems were identified in Rusunawa Muara Baru, namely water consumption, waste management, and social space. Meanwhile, the solutions involved concentrating on the greening concept, which entails green living, green environment, and green space. The term *green*, however, refers to a comfortable life of familiarity with proper water utilization, waste management, and public space allotment.

1.2 A Collaborative Project using the Empowerment Model

Each community possesses unique characteristics in terms of population and socioeconomic, historical, and cultural profile, as well as the level of autonomy in dependencies and organizations. Furthermore, one significant difference seen in the societal approach is the "one size fits all" principle (Hashagen, 2002). Conversely, people tend to have social capital that is seen as important, especially in the process of empowerment (Bhuiyan, 2011). This includes "an instantiated informal norm that promotes cooperation between two or more individuals" (Fukuyama, 2000). The existence of social capital is characterized by closure, stability, and the existence of

community ideology (Coleman cited in Beard & Dasgupta, 2006) and further indicated by exchange networks, trust, and reciprocal relations as seen with cooperation (*gotong-royong*) (Beard & Dasgupta, 2006). Meanwhile, social capital, as a resource, can produce outcomes with massive impact if used according to the community's local conditions (Bhuiyan, 2011).

One type of community engagement model, according to Hashagen (2002), is the service development model, which emphasizes the process and not the outcome (Hashagen, 2002). Participants' live empowerment activities in society and those of Rusunawa Muara Baru focused on the expectation to independently conduct and implement the concept of greening. Hashagen (2002) described the related services as follows:

> Many community groups and organizations have grown from providing direct responses to gaps in public service provision or to identified local needs. These include playgroups and playschemes, youth clubs, food co-operatives, credit unions, community flats, arts and sports groups, lunch clubs, environmental clean-ups, community transport and many other activities. Much of the work of the local voluntary sector, and of volunteers, lies in this area. (p. 8)

Also, the greening concept established green living, green environment, and green space. Meanwhile, the investigated region also supported the concept of urban development as one of the pillars of a government plan, mainly based on the 11th point of the Sustainable Development Goals, which includes cities and settlements, on safety, resilience, and sustainability (Sustainable development knowledge goals, n.d.).

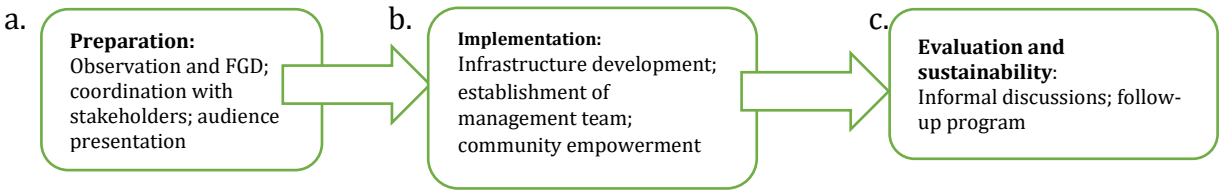
Green Rusunawa is a collaborative approach involving six parties, with full participation (term collaborative approach borrowed from Shandas & Messer, 2008). First, Coca-Cola Foundation Indonesia, as a private entity, fully supported the creation of a sustainable community in Rusunawa Muara Baru to become a model for other Rusunawa in Indonesia. Second, team management, which is the main point for project approval, involved the local government of DKI Jakarta. Hence, coordination became exciting but time-consuming because of a personnel change in the Public Housing Management Unit (*Unit Pengelola Rumah Susun*/UPRS). Third, the regional government and related parties, including the Department of Housing and Regional Government Building (*Dinas Perumahan dan Gedung Pemda*/DPGP) and the Department of Empowerment for Child Protection and Population Control (*Dinas Pemberdayaan Perlindungan Anak dan Pengendalian Penduduk*/PPAPP), consistently managed

infrastructure development permissions. Fourth, an interdisciplinary team of lecturers (engineering, economics, psychology, as well as the community empowerment unit) collaborated to run this project. Fifth, students from multiple disciplines handled technical operations, including organizing activities with residents. Sixth, professional consultants worked toward an integrated and comprehensive concept of infrastructural development. In other words, the Green Rusunawa program run with involved local government, management units of rusunawa, industry, and university (Cossetta & Palumbo, 2014).

The purpose of such community engagement is to solve problems through the implementation of the Green Rusunawa concept, which involves caring for the environment and aspiring to become a good example for other rusunawa in Jakarta specifically and Indonesia generally. This integrates three programs—clean water management through RWH, waste management through the waste bank, and the provision of social interaction through the learning center—to create (green) environment outcomes, one determinant of residential satisfactions (Byun & Ha, 2016).

2. Methods

This study adopted a qualitative descriptive method using observation and focus group discussion (FGD) with 30 participants (two groups) to identify the main problems at Rusunawa Muara Baru. Subsequently, to achieve the study objectives, three stages adopted, shown in Figure 1. The first step was coordinating with and controlling the audience and stakeholders, including the Regional Government of DKI Jakarta and related parties. This aimed to synergize the program with middle- or long-term plans that have been arranged to obtain building permits and support for infrastructural development. The next stage was the physical construction of RWH, the waste bank, and the learning center as well as trainings to increase the management capacity of the resident representatives. During this phase, actual observation and recording were performed, and all data were prepared for use in the results and analysis if needed. The final stage involves program evaluation and sustainability. Informal discussions were held with program management and resident representatives. Meanwhile, 17 respondents participated in discussions regarding progress, obstacles, and follow-up programs.



Fg. 1 (a) Preparation; (b) Implementation; (c) Evaluation and sustainability

3. Result and Discussion

This section explains each stage of the activities, including preparation, implementation, and evaluation and sustainability. The implementation of this program was divided based on activities involving infrastructure development, the establishment of a management team, and community empowerment using the three concepts of Green Rusunawa: green living, green environment, and green space.

3.1 Preparation

When the program started, discussions were held with the Rusunawa's team management to obtain support. Then they facilitated the observation and FGD with the residents to identify their priority needs. Moreover, there was also a need to coordinate with stakeholders from the start of implementation, including (a) the housing agency, (b) the Public Housing Management Unit, (c) the Regional Government of DKI Jakarta, (d) the Minister for Public Works and Human Settlements, (d) the Department of Housing and Regional Government Building, (e) the Public Housing and Settlement Areas Offices, and (f) The Office of Child Protection Empowerment and Population Control. Furthermore, these stakeholders were visited and approached through scheduled audience presentations to explain and obtain permission to build the infrastructure that would become the property of the regional government. This licensing mechanism was set for transparency in ownership and utilization, and such assets would subsequently require the participation of residents along with a specific budget for maintenance costs in the following years. Conversely, strengthening program support requires networking efforts by the same committed parties but in a non-participant manner and without any form of bonds.

3.2 Implementation

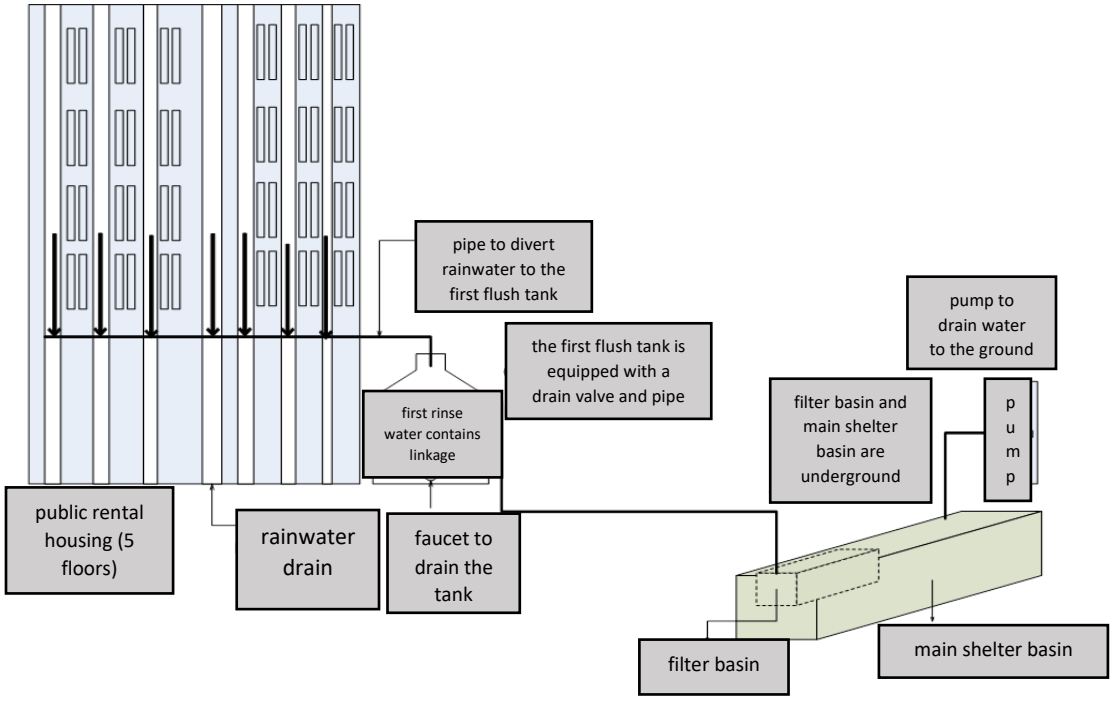
In 2017, permissions were finally issued to build infrastructures that integrated into the Green Rusunawa Program within the selected locations at Tower 5, Tower 6, and Tower 7. This was decided after the organizer considered the land for the shelter although the residential need, especially for those living on the ground floor, was the lack of water access. This phase includes infrastructure development and community empowerment.

3.2.1 Infrastructure Development

3.2.1.1 Rainwater Harvesting (RWH)

As seen in Figure 2, a total of two tubs were built including a small type for Tower 6 and a large type for Towers 5 and Tower 7 with the following specifications:

- Large body: 18.4 × 3.70 × 2.80 × 1 m^3 = 190.6 m^3
- Small tub: 8.50 × 5.50 × 3.20 × 1 m^3 = 149.6 m^3
- Total capacity = 340.2 m^3
- Filter type: activated carbon, zeolite, and palm fiber



Fg. 2 RWH work system

Source: Author (2017)

Building construction commenced by digging the soil by as deep as 1.5 m, penetrating the foundry with a height of 1.5 m, above the ground surface. Furthermore, excavations involved the use of heavy equipment (Beque) and steel frame casts, with a mixture of Adhimix ready mix–quality K-300 cement concrete; hence, measurable quality was assured. The construction of a large and small RWH body is shown in Figure 3.

Fg. 3 After installation

Source: Author (2017)

3.2.1.2 Waste Bank

The waste bank is "one of the community-based waste management systems that enable the public to actively participate in environmental management" (Wijayanti & Suryanti, 2015). The buildings north of the complex were close to the disposal location at Tower 7, with a garbage disposal unit 6.40 × 4.40 × 1 m^2 in size. This space is separate from the building, and the small circular building is in the shape of a bottle. The inner area is for storing essential and valuable equipment, including notebooks, shelves, chairs, and tables, and the outside area is used to enhance the activity of receiving goods worth selling by the customers. Figure 4 and Figure 5 show the before and after of the waste bank's construction and its management activities, respectively.

Fg. 4 Waste bank before and after construction

Source: Author (2017)

Fg. 5 Waste bank management

Source: Author (2017)

3.2.1.3 Learning Center

The availability of a space for activities was a necessity for the residents, which was initially revealed by Agyaputeri & Rahayu (2017). According to them, Rusunawa Muara Baru lacks a place where people can gather and hold activities that strengthen social relationships. Furthermore, the same need was also identified through a discussion with a representative of the residents, whose daily life appeared individualistic and did not allow people to know one another, worsening the lack of communication and the absence of activities. Moreover, the learning center, which residents named Ceribel (*cerita dan belajar*/storytelling and learning), was built in a 5 × 6 m2 space at Tower 5, which was completed with furniture, bookshelves, decorations, and more than 500 books and magazines to create a comfortable atmosphere for anyone who wants to read or hold

discussions and meeting. Learning center rules must be clear so that residents do not abuse its function. Thus, the Ceribel management helped determine the following learning center aims:

- To foster interest in reading among children, teenagers, or adults;
- To support school learning achievement;
- To facilitate residents' events, such as meetings/deliberations, birthday commemorations or wedding parties, and to safely store goods or food for celebrations;
- To become an educative venue, promoting recreation and play;
- To facilitate the needs of the people (children, teenagers, and adults), which include training, counseling, and seminars.

3.3 Establishment of Management Team

The RWH management team is responsible for the use and physical maintenance and installation of RWH. Therefore, the team was formed by the Rusunawa Muara Baru community and management to represent the government and party owners. Formerly, the waste bank community consisted of only six members, which gradually increased to 40, and the turnover of existing money reached approximately 3.7 million rupiahs, which continues to grow. Furthermore, unlike the RWH team and the waste bank, the selection of the learning center crew required a much longer time, as the majority of the *daengs* (a name for a man from Bugis, South Sulawesi) lived in Tower 5, and there was criticism regarding the activities in the center and people's efforts to take care of the structure. Finally, with mutual understanding, the team was selected voluntarily.

3.4 Community Empowerment

3.4.1 Socializing RWH Utilization and Management Training

The socialization of RWH utilization was coordinated by its management team, that is, the representatives of the residents, preferably those who lived in Tower 5, Tower 6, and Tower7. Using an informal approach, the facilitator explained the RWH utilization and its process, as shown in Figure 6.

Fg. 6 RWH training

Source: Author (2017)

This approach was more effective because these residents lived in the Rusunawa Muara Baru, some of whom were mechanic officers, and more than 75 people received clarification on the use of rainwater, which eventually continued to advance. Meanwhile, at the time of implementation, this training was attended by Rusunawa Muara Baru management, especially those responsible for infrastructure aspects, and another session for the capacity building of program management discussed water electricity, as seen in Figure 7.

Fg. 7 Water electrolysis training

Source: Author (2017)

Water electrolysis training aimed to develop and enhance the management teams and community representatives' knowledge, which was expected to further increase their awareness of alternative sources of clean water from rain and its safe application. The water was evaluated for quality and consumed after boiling.

The two RWH tubs could serve 398 family heads, who were the main target of the program, with 1,614 inhabitants in Tower 5, Tower 6, and Tower 7.

- Large tub: 18.4 × 3.70 × 2.80 × 1 m^3 = 190.6 m^3
- Small tub: 8.50 × 5.50 × 3.20 × 1 m^3 = 149.6 m^3
- Total capacity = 340.2 m^3

These calculations were obtained from the recordings on the water meter located near the tubs. Therefore, at full capacity, both tubs can serve residential demands for about 21 days, assuming each person needs 10 liters per day. Hence, the RWH in Rusunawa Muara Baru provides a total of 7,570,00 liters (1 m^3 is 1,000 liters) to residents, with the small tub accommodating 378 m^3 and a large 379 m^3 body.

3.4.2 Waste Bank Management Training

Waste bank management was initiated earlier than that for the RWH and the learning center programs. This involved collecting and sorting garbage in residents' respective homes and then bringing them to the waste bank facility to be weighed, and an incentive was provided depending on the standard price. Furthermore, the collected garbage is then sold to the central waste bank in South Jakarta.

Every member of this management team was accustomed to daily sorting, which is dominated by plastics. Some residents saved on a lot of waste every week because they owned grocery store businesses at home, while housewives who rely only on household garbage usually took two to three weeks to save.

As agreed by management, the amount is withdrawable after a benchmark of IDR 50,000 is reached, and it is obligatory to have a residual balance of IDR 10,000. Gradually, waste bank was developed because of the concurrent existence of built house or storage bin. This enables the ease of management team because they can save more before delivering the waste to the central waste bank.

In addition, the training aimed to strengthen micro-enterprise, and numerous households with a store of nine food staples (*sembako* acronym of *sembilan bahan pokok*) generate relatively more plastic garbage. Hence, there is a need to adapt and train on the sorting process. However, as seen in Figure 8, this was attended by only 135 people, with the purpose of enabling the residents to realize the possibility of garbage collection, reuse, and sale.

Members who supported more than 40 housewives were able to save on plastic waste or drink from plastic bottles. As waste bank customers, each had a deposit book containing the types of goods consigned, the weighed items, the price (per kilogram), and the total savings. For example, three kilograms of plastic waste was worth IDR 9,000, and waste banks need to take the savings at least once every three months. June or July was the most appropriate month to withdraw money because of children's schooling needs.

Fg. 8 Waste bank activities

Source: Author (2017)

3.4.3 Learning Center Service

The learning center service was not only meant for people who want to read books and magazines but also for them to hold activities to build hard skills and soft skills. Its reading services open in the morning on weekdays and in the evening on Saturdays and Sundays. The learning center has become a social interaction location that involves any aspects of literacy (reading, science, finance, and technology). Hence, residents' insight, knowledge, and skills are expected to improve.

3.5 Evaluation and Sustainability Program

The three programs of Rusunawa Muara Baru, Pluit, North Jakarta, run smoothly and according to plan. The programs, which were supposed to end in December 2017, were finally completed in June 2018 because of certain bureaucracies or procedures as well as the process of obtaining infrastructural development permits from local governments, some of which exceeded the allotted time, taking months. Furthermore, the turnover of the management unit heads took time to acquire licensing, and the approach toward residents and the local government required some artful efforts given the diversity of

population life. Hence, it was not easy to build trust and cooperation; blending in with the residents, observing their daily activities, and serving not as "guests" but as one of them were indispensable in building more flexible interpersonal relationships. In addition, convincing the government of the benefits of the program also required hard work in showing that raising the quality of life in public housing needs the involvement of all its elements, including university and private sectors.

Program sustainability became the responsibility of the Rusunawa Muara Baru management unit, the residents, and Atma Jaya Catholic University of Indonesia, where Green Rusunawa was also designed sustainably among inhabitants, lecturers, and students. First, the programs' strategy was designed by the team in each program. Second, work was strengthened and developed through evaluation and mentoring. Third, Atma Jaya Catholic University of Indonesia, in collaboration with the RWH, waste bank, and learning center management teams, keep continued to develop a network with community groups outside the Rusunawa Muara Baru, including the waste bank in North and West Jakarta, regional libraries, and other communities related to rainwater management. Four, the harmonization of social life and community empowerment is consistently encouraged to enable the residents to survive and interact with each other better, thus increasing mutual understanding and tolerance and further reducing conflict.

People living in Rusunawa Muara Baru had been settling illegally on the banks of the Pluit reservoir before building houses, thereby reducing the water area and capacity. The area around the reservoir, which should have been designated for green land, turned dirty. As a result, during the rainy season, the area becomes flooded and increasingly uninhabitable (Agyaputeri & Rahayu, 2017). To overcome floods, the Provincial Government of DKI Jakarta normalized the Pluit reservoir and relocated the people who lived there to Rusunawa Muara Baru. This was a strategic plan to curb slums while improving the quality of life of the local community (Khalil, 2012 as cited in Agyaputeri & Rahayu, 2017).

Rusunawa Muara Baru is a public rental housing program that aims to provide a residential area with shared parts, shared objects, and shared land and create a healthy, safe, harmonious, and sustainable environment and integrated settlements to foster economic, social, and cultural resilience. All facilities at Rusunawa Muara Baru are used by residents together; thus, quality service became a primary factor for their satisfaction. Pancawati, Supriyono, & Mardiyono (2013) divided these facilities into clean water,

electricity, garbage, and cleaning services, all of which are available at Rusunawa Muara Baru to be used by more than 1,200 heads of family. There are several facilities, such as mosque, green space, motorbikes parking space, ATM (automatic teller machine), integrated child-friendly public spaces (*Ruang Publik Terpadu Ramah Anak*) and play groups. Rusunawa Muara Baru then completed with RWH, waste bank, and learning center to fulfill the healthy housing that cover physical requirements, biological requirements, and social requirements (Wedmaerti & Junadi, 2019).

According to Agyaputeri and Rahayu (2017), the relocation to Rusunawa Muara Baru improved residents' lives compared to when they were living in the Pluit reservoir. However, the interaction between residents while in the Pluit reservoir was better than that in Rusunawa Muara Baru at present. This was evident from the FGD with resident representatives. Because the residents of Rusunawa Muara Baru are those who have been relocated from the Pluit reservoir, they compared their lives before and after moving. They feel dissatisfied especially about three main problems: water, waste, and public space. The issues of waste, its management, and water consumption are found in most large, overpopulated countries (Kumar & Dahlya, 2017; Steinberg & Lindfield, 2012).

The implementation of the Green Rusunawa Program focused on RWH facilities, waste bank, and the learning center to address water availability, garbage disposal, and public space issues. Green Rusunawa consists of the concepts of green living, green environment, and green space, and residents reap great benefits from RWH, waste banks, and the learning center.

Initially, the ground floor in Rusunawa was not intended as a residential area; thus, residents are unable to access water for daily consumption, as it is not provided. In addition, buying water becomes a burden, as revealed by a resident on the ground floor at Tower 5: "*Di lantai dasar gak dikasih aliran air jadi kita harus beli sendiri airnya. Satu gerobak 20 ribu, untuk nyuci bisa pakai dua gerobak*." [On the ground floor, there is no water flow. I have to buy the water, one tin is IDR 20,000, meanwhile I need two tins for washing] (S, female). Furthermore, after the RWH was built, they admitted that their problems were resolved although they had to share with other residents. This program provided abundant water supply, especially during the rainy season. *"Kalau hujan, melimpah, Bu, sampai luber-luber*." [During the rainy season, Mam, the water so much.] (H, female). The technology provides residents the alternative of rainwater for drinking, washing, and cooking. Therefore, green living in Rusunawa Muara Baru has been

established. RWH is a way out for middle- and low-income residents to live cleaner, more economically, and more safely which influence of healthy housing.

Meanwhile, changing individual behavior is not easy. Initially, residents paid less attention to waste (plastics) in their households, as these were thrown from the top floor to the ground. Meanwhile, after management training, the residents made a conscious attempt to reduce by sorting and saving waste, taking it to the related waste bank, which helped address their families' needs. Though it was possible to take their money anytime, they generally planned to withdraw at a better period, such as when children enter a new academic session or when paying school fees. Furthermore, the waste bank was an embodiment of a green environment, and the residents began to realize the importance of ecological protection through proper disposal and sorting and by saving for the future. Therefore, plastic waste can become "a close friend" which adds another source of family income besides creating a green environment.

Besides RWH and the waste bank, before Green Rusunawa was implemented, there were no close spaces for residents to gather for activities; even social gatherings such as *arisan* were not possible as the program went on. The learning center, which has libraries and is equipped with educational games, has been used as a public space for gatherings and various activities. Meanwhile, some of these events were designed and organized as needed, with a consistent effort to accommodate all groups, from children to adults. In addition, an interesting training was the master of ceremony (MC) session for teenagers and housewives, collectively creating the opportunity to raise their confidence in public speaking. The result, in a special moment in Rusunawa Muara Baru, one participant appeared as a professional MC. From the training held in the learning center—with the cooperation of university—the residents can upgrade their talents and raise their potential skills, which has economic implications. Furthermore, the learning center is currently used for community meetings, temporary storage space, wedding ceremonies, receptions, tutoring place. Before that, residents initially had difficulties identifying the shared space. This function meets green space expectations and increases knowledge and skills, benefiting residents, as it is designed as an open and friendly green space.

The three programs were planned and implemented with the involvement of residents as the target of activities. All facilities provided residents with social capital to maintain, preserve, and sustain the program, as Bhuiyan (2011) stated that social capital can produce large-impact outcomes. The residents were involved from identifying problems,

creating the process, to evaluating and finishing the program. They were users and actors who keep the program running continuously and sustainably. They were also equipped with skills to use and maintain the infrastructure. This means they were engaged to play a role in managing the program. They still need supervision at the moment, but they can be independent and empowered over time.

The schedule involves encouraging the Rusunawa community to accept behavioral changes although the three programs also led to such changes when implemented collectively. This requires a long process and time, enabling users to improve the quality of social interaction through sharing, tolerating, caring, and fostering interpersonal relationships.

The program was successfully implemented in Rusunawa Muara Baru, as shown by the benefits obtained by the residents. Their dynamics appear better as they participate in the utility of shared facilities, and the three approaches demand the involvement of residents to ensure harmonization with the environment alongside realizing a peaceful life. Hence, the concept of greening becomes a shared responsibility.

4. Conclusion

Healthy living in a healthy environment is no exception being a hope for those who live in Rusunawa Muara Baru. For create this, physical, biological, and social requirements must be fulfilled. RWH and the waste bank in Rusunawa Muara Baru quantitatively provide tangible benefits for the fulfillment of water needs and augment family income, respectively. Meanwhile, the learning center is to be developed into an interaction space for residents to conduct positive activities. Those living in Rusunawa Muara Baru were directly involved in their empowerment; that is, they were engaged and cared for the facilities together to sustain the concept of Green Rusunawa, which includes green living, green environment, and green space. These smart innovations require university involvement and participatory of government and industry to monitor and evaluation Green Rusunawa Program and make the program functionally. Involvement can be in the form of providing skills, knowledge, or assistance so that people's lives can be better economically, socially, culturally, and healthy. However, resident awareness and involvement in program sustainability is more important. They are the ones who fight, take care of the physical of RWH, waste bank, and learning center and keep them alive. This ensures that the concept of Green Rusunawa can be maintained.

Acknowledgments

We sincerely thank Coca-Cola Foundation Indonesia as an extraordinary partner, the Unit of Residential Management, the local government of DKI Jakarta, The Office of Child Protection Empowerment and Population Control in the province of DKI Jakarta, and Atma Jaya Catholic University of Indonesia, which has entrusted us to run this program.

Author Contribution

This article combines three different projects but in one theme: Green Rusunawa. Each author reports the results of the project with appropriate theories and methods. Sri Hapsari Wijayanti and Weny Savitri S. Pandia raise a big theory that covers all three projects. All authors contributed from the preparation to the final manuscript.

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