Co-design as a strategy to improve ecological awareness of communities

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Abstract. One strategy of communities to easily embrace ecological awareness is by involving directly in the improvement of their environmental quality. This paper discusses the case study research of the co-design process of the neighborhood regeneration project in Kampung Tongkol at the Ciliwung riverbank, Jakarta. This project is carried out collaboratively involving residents of the area and facilitated by ASF (Architecture Sans Frontières) Indonesia. The main important object of this regeneration project is the construction of a self-supporting sample house. This house aims as an ideal model which another neighborhood can replicate. Residents are directly involved in the organizing, the design process, to the construction stage. The primary purpose of regeneration is to improve the quality of the residential environment. The principles of sustainable design are employed as the main guidance from the beginning of the process. This study concludes that the final achievement of this project not only results in a higher quality environment but also raises the ecological awareness of the residents of the neighborhood.

1. Introduction
As other major cities in the world, Jakarta also faces problems of spatial planning related to the arrangement of residential areas. In more specific, Jakarta has an issue with improving the quality of housing for its residents. Since the days of the Dutch East Indies colonial government, Jakarta has been a magnet for immigrants. Jakarta, or Batavia at that time, was designed to be inhabited by a population of 800,000 people [1]. However, urbanization causes the population to experience a very rapid increase. In 1961, the census results stated that Jakarta was inhabited by approximately 3 million people [1]. The amount significantly exceeds the original plan when the city was designed. As a result, not all residents have decent housing. The report in 1952 stated that there were 30,000 huts for the residents of Jakarta [2]. Since the beginning of independence, the data illustrates how Jakarta has experienced very serious residential space problems.

Various attempts have been made to solve the problem of housing and space planning. These programs formally aim to provide a better-quality environment, both socially and ecologically. One of the initial arrangement programs carried out was the arrangement of the Senayan area in 1957 [3]. The arrangement was the construction of a sports complex in preparation for the Jakarta Asian Games. Another program that had a significant impact was the Mohammad Husni Thamrin (MHT) project launched by Governor Ali Sadikin in 1969 [4]. This project aimed to improve the quality of basic infrastructure in drainage and kampung streets, aiming to provide a more decent and healthier environment in Jakarta's slum kampungs. The project was deemed successful and subsequently
expanded into the Kampung Improvement Program (KIP) project, which had funding support from the central government. The following governor has continued other kampung structuring programs.

All these programs are running by implementing eviction actions. Evictions are carried out as a quick way to reduce density in an urban area. This arrangement model can be suggested to use a top-down approach so that residents do not have the space to play a role nor a voice. The government does all planning through a team of appointed experts. This pattern causes residents not to feel they belong to their new environment. As a result, residents tend to ignore and then abandon the environment resulting from the arrangement.

In 2014, an eviction was planned for settlements along the Ciliwung River in the Kampung Tongkol area, North Jakarta. The plan was met with resistance from residents. To prevent the threat of eviction, the residents collaborated with a team of architects to conduct self-help arrangements for their environment. This project is carried out with a participatory approach through the co-design method. This method provides an opportunity for residents to be actively involved in the structuring process. The arrangement was also able to build people's awareness to create a more ecological environment. This paper aims to discuss how the co-design method in the Kampung Tongkol project can encourage residents to have ecological awareness in designing their environment to be more sustainable.

Co-design methods differ from traditional design methods due to their collaborative nature and the shifting roles of designers and users during the process [5]. In the scale of neighbourhood planning projects, this method provides space for residents to influence their environmental planning [6]. Further, Sanoff [6] defined co-design as an attitude about the forces for change in creating and managing the environment. Its strength lies in its ability to build a movement that transcends professional and cultural barriers. He emphasized the active participation of the community in shaping their environment to be better, not only positioned as passive consumers [6].

This method also encourages a shift in power in making design decisions [7] so that it is considered appropriate to be carried out in the Kampung Tongkol project. As a consequence of the shift in roles and power, the design process may not always aim to solve the problems formulated at the beginning of the process [8]. Likewise, co-design produces positive results beyond problem-solving in several practices outside Western countries, for example, increasing social cohesion and strengthening citizens' political role [9]. These results align with Papanek [10] and Margolin's [11] call that design should have more responsibility for social and ecological themes.

2. Methods

This study employed a case study method to the co-design project of design and construction of a sample house in Kampung Tongkol, Jakarta. This project was initiated by the Urban Poor Consortium (UPC), which then collaborated with the Indonesian Architecture Sans Frontieres (ASF ID) to assist residents in managing their neighborhood. This project started in 2014 and completed construction in 2015. The case study method has been conducted as an appropriate method to get a detailed picture of the problems.

Data collection was carried out in 2017 after the project finished by conducting interviews with residents involved in the design process, the designer team, and the community facilitators team. In addition, observations were also made on the daily activities of the residents as well as when they held formal/informal meetings. The analysis follows three stages, starting with data reduction, data presentation, and data verification. In the end, reflection was conducted on the results to understand the role of co-design in encouraging people's ecological awareness.

3. Results and discussion

This project began with residents who wanted to resist the evictions by the Jakarta city government. Residents argued that they had the right to live in their area as legal citizens of the city. The eviction process was slow because it was influenced by the political atmosphere in Jakarta ahead of the 2014 gubernatorial election. Residents who felt insecure gathered and took the initiative to fight back. Discussions with UPC resulted in the decision to organize their environment as a form of resistance to eviction. To carry out the plan, UPC collaborated with AFS to assist residents.
The co-design project primarily aims to build a sample house. The sample house is expected to become a prototype of housing in kampung arrangement for the riverbank neighborhoods. Residents hope that success in managing their area will prevent the city government's intention to evict them. In addition, residents want to change the stigma that residents on the riverbanks must be slums, ignore environmental quality and become the cause of flooding.

The co-design stages that are carried out begin with problem formulation, followed by design development and construction stage. The whole process involves residents as the main actors. In more detail, the co-design process begins with formulating the problem. One resident said that he had been living in Kampung Tongkol since the 1980s and said that the eviction felt unfair to him and other residents. He added that the issue of eviction is the primary concern to be addressed. The following process is to develop a plan on how to address the problem. The residents and the design team agreed to improve the quality of their environment as the solution. After several initial meetings, they agreed to build communal housing that would be used to model healthy housing on the riverbanks area. They also agreed that environmentally friendly design principles would be a significant consideration in planning.

However, the enthusiasm of the residents to be involved in the collaborative process is not easily achieved. One of the community facilitators said that initially, not all residents were eager to collaborate in designing their area. He said many residents did not believe the process would be able to prevent evictions. To address this issue, he utilized the co-design process, especially the design workshops. He believed the workshop could encourage residents' enthusiasm. During the workshop, he proposed an idea to build a "shared dream" to spark people's enthusiasm. He proposed a "harmonious of living together" as their collective dream (Figure 1).

The next stage is the construction of the sample house and its environment. At this stage, the residents propose some environmentally friendly design principles. First is the ventilation to ensure good air quality. Second, the use of eco-friendly building materials (Figure 2). While the third builds a communal septic tank which will be connected from one house to another. The awareness to put forward sustainable design principles emerged as a dialectical process during the co-design process. Another sign of the emergence of residents' ecological awareness is that residents have started planting around their homes, especially vegetables and fruit in pots (see Figure 3). One resident said that she started planting as a form of her participation to create a greener and healthier environment. Furthermore, some residents expressed their ideas to build rainwater treatment installations to be used for their daily needs.

![Figure 1](image1.jpg)  **Figure 1.** A resident explains the concept of space planning of the sample house

![Figure 2](image2.jpg)  **Figure 2.** The opening serves as natural ventilation for the interior of the sample house. One of the eco-friendly design features
The Kampung Tongkol case study findings confirm that the co-design process often produces outcomes that were not always planned to be addressed from the start. In this case, increasing the ecological awareness of the residents was not explicitly planned. The co-design process focuses on the goal of producing healthier housing and its environment for riverbank residents. Residents' awareness grows with their involvement in the co-design process.

Interviews and observations on residents' daily lives lead to several reasons why this ecological awareness arose during the project. First, the co-design process that allows dialogue and intense interaction between designers and participants have encouraged residents to absorb ecological values, reflecting in actual actions such as planting around them. The finding that co-design encourages more democratic interactions more than the traditional ones amplifies the statement expressed by Ehn [12] and also Gregory [13].

The second reason is that residents have the freedom to explore their views, visions, and collective goals in the co-design process. Freedom will not be obtained if the regeneration planning is carried out using the traditional method (top-down). The traditional design process perpetuates oppression because of the ongoing power inequality [14]. The inclusive design process encourages residents to embrace the values of environmental awareness, which are ultimately applied as design criteria.

Co-design allows an inclusive and non-oppressive process. The application in this project is considered appropriate because the design process involves underprivileged groups who have never had the space to be involved in managing their environment. The application of co-design helps residents to influence the agenda and priorities they want to achieve freely. Therefore, when they want to obtain a healthier and environmentally friendly environment, the co-design process can facilitate it.

However, we need to explore further how this ecological awareness came to be in the first place. The community facilitator said that the process occurred when the residents began to embrace their shared dream. That moment became a kind of turning point in the people's awareness and enthusiasm. So, it can be said that co-design facilitates and makes it easier for residents to achieve their collective dreams.

4. Conclusion
The sample house project in Tongkol Village started from a desire to refuse eviction. Residents agreed to improve environmental conditions as a strategy to resist eviction. The application of a participatory approach through co-design carried out by ASF ID not only produces a healthy and ecological environment and housing. However, it is also able to raise ecological awareness among residents.

Co-design delivers an inclusive process. A process that allows the oppressed group to have a voice and take a role in making decisions. This inclusive process has proven to encourage the residents of Kampung Tongkol to propose an ecological agenda as one of the criteria for environmental arrangement.

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References

[1] Sedyawati E 1987 Sejarah Kota Jakarta (The History of Jakarta) (Jakarta: Department of Education and Culture)

[2] Surjomihardjo A 2000 The History of Development of Jakarta (Jakarta: Dinas Museum dan Pemugaran Propinsi DKI Jakarta)

[3] Ardhiati Y 2005 Bung Karno, The Architect (Jakarta: Komunitas Bambu)

[4] Hilman I 2008 Kampung Improvement Program: Muhammad Husni Thamrin Project in Jakarta 1969–1979 Skripsi FIPB UI, Jakarta

[5] Sanders E B and Stappers P J 2008 CoDesign 4 5–18

[6] Sanoff H 2011 Focus 8 7

[7] Hussain S, Sanders E B and Steinert M 2012 Intl. Journal of Design 6 91–109

[8] Reyes D and Botero A 2012 Proc. Participatory Design Conference 12 (Roskilde) 2 p 85–88

[9] Setiawan A, Dunn N and Cruickshank L 2018 The International Journal of Architectonic, Spatial, and Environmental Design 12 25–35

[10] Papanek V J 1984 Design for the Real World: Human Ecology and Social Change 2nd ed. (London: Thames and Hudson)

[11] Margolin V and Margolin S 2002 Design Issues 18 24–30

[12] Ehn P 1993 Participatory Design: Principle and Practice, ed D Schuler and A Namioka (New York: Erlbaum Associate)

[13] Gregory J 2003 Int. J. Engng Ed. 19 62–74

[14] Costanza-Chock S 2020 Design Justice Community-Led Practices to Build the Worlds We Need (Cambridge: MIT Press)