

# Participatory Design - Designing with Kids in Kampung Sewu, Surakarta

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**Abstract:** For many urban inhabitants in Asian countries, Kampongs are residential areas characterized by lack of facilities and infrastructures. They are also assumed to be unclean because of the absence of domestic waste management. Taking a case study of the Kampung Sewu of Surakarta, this work aims to address both, which are the provision of one of the facilities needed i.e. playgrounds for kids/children, and the management of plastic waste by recycling it into eco-bricks. A specific method is used for this work. The provision of the facility is organized in a participatory way where the users (i.e. the children and the community) decide the type and location of the playground. Then the physical works are conducted with users who take part in producing eco-bricks as building material and erecting the structure itself. The work concludes the participatory approach which is considerably appropriate with this selected case. Participatory design involving children is created to meet the need for the playground. However, the use of plastic waste for construction reveals that locally collected waste is not sufficient enough to be the raw material for the eco-brick.

**Keywords:** participatory design, re-use, plastic trash/waste, eco-brick

## I. INTRODUCTION

Participatory design (originally co-operative design, now often co-design) is an approach to design which attempts to actively involve all stakeholders (e.g. employees, partners, customers, citizens, end users) in the design process to ensure that the result meets their needs and is usable.

Participatory design is an approach that is focused on processes and procedures of design and is not a design style. The term is used in a variety of fields e.g. software design, urban design, architecture, landscape architecture, product design, sustainability, graphic design, planning, and even medicine as a way of creating environments that are more responsive and appropriate to their inhabitants' and users' cultural, emotional, spiritual and practical needs. It is one approach to placemaking.

Henry Sanoff is an architect who is famous with his theory of "participatory design". He said that: "Educate people, designers to improve the ability of user groups to reach their goals" – which means that the architects stimulate people to recognize their environment's strength/potency, weakness, opportunity, and threat (SWOT), in order to meet their needs, in designing their environment. While another architect, Roger Trancik: "One

approach to create a place is to let the end users to design, i.e: participatory design".

Surakarta has a slogan "Kota Layak Anak" (Child-Friendly City), i.e, a city that is convenient for children and has facilities for children. Many attempts have been made in order to implement this vision. However, in reality, there are still deficiencies of facility provision regarding to the children, in terms of quantity and quality. The number and dimension of the facilities are below the demand; type of facility is another problem; while uneven distribution and mis-location exaggerate it. That means the implementation of the 'Child-Friendly City' was not appropriately conducted for the inefficient provision of facilities. Hence, the purpose of this research is to support the vision in an efficient way through participatory design.

Kampung Sewu, one of the urban traditional settlements setup at the early development of the city, is chosen as the project location. As it is in the most kampung (kampong), this area also has a lack of infrastructures and facilities, including a playground for children. The aim of this project is applying a participatory designing with children.



Fig. 1. The Map of Kampung Sewu Area  
Source: Kampung Kota Team, 2018

## II. METHODS

For adopting a participatory design, behavioral approach is needed. It has at least five (5) steps: identifying users' needs, choosing location, pop-up modeling, Focus Group Discussion (FGD) and constructing process.

Identifying the users' need focuses on "people doing things" and it has two (2) approaches formal and informal ways. The formal one is done by playing with the children to find out what they use to do and what they use to play. The informal way is done by observing what the community usually does.

Choosing location involves observing spatial behavior of the users - where the children use to play in a small group due to lack of space (this means that they need a bigger space). This activity was done to see their playing activities and their chosen playgrounds. Field observation with the end users (children, 7-10 kids) is usually done after school time (14.00-16.30). The facilitator team, which consists of Architecture students, tried to approach the children by joining their playing activities and tried to communicate as if they were friends. They offered interesting games, giving snacks, as a way to get information. Kids tend to be more friendly and informative than adults. In this step, the students indicated the kids' favorite playing activities, playing tools, to playing places. The data and information gathered will be used to compose pop-modelling.

Pop-modeling with the kids and their parents (mostly mothers), to decide where to place the public space/playing ground for the kids ( $\pm$  30 children). This program was held one of the weekends at about 19.00 to 20.30 in a community member's house. They decided the place and the time which was convenient for all of them. Pop-up modeling to meet the needs is the most interesting and amazing process for kids, since they use many kinds of media, such as: colorful building model, big map, sketch paper, etc. that help the children to comprehend their living environment and inspire their design. The kids were asked to put the colorful sticky notes and building model (miniature) on the site plan, supervised by their parents (mostly mothers). Mothers would approve safe places to use and avoid dangerous places to play (i.e. adjacent area to the dike). The result of this pop-modeling would be discussed on the FGD.

The FGD were done twice. The first FGD was done to introduce the participatory design to the community, including kampung leaders to show them the result of the pop-modeling activity. The dialog in this session was decided based on which places in the district are to be used as public spaces, especially for children. This FGD was attended (30-40 people) mainly by parents and kampung leaders. Since most of them work from morning to afternoon, they usually held the FGD from 20.00-22.30. Fortunately, in Kampung Sewu, the community agreed to all the plans. Although there was a little debate to decide the places of public spaces but at the end, they got the agreement from all parties. The second FGD that was attended by stakeholders, kampung leaders including Lurah (district leader), and the end users (the community, especially kids) was held in an attempt to make a final decision. This activity was a forum to discuss the topics of the design process and to decide

playground locations in RW 05 and RW 07 that matched with the Government program. In all of the FGD, the people's reaction and commitment was commendable. It was indeed a memorable experience for the Architecture students who never witness any serious constraints while doing the participatory design in Kampung Sewu. In the past, there were reports of students who faced a lot of challenges in kampung while doing their participatory design. In most cases, these challenges occur because of personal problems among the communities or personal conflict between some inhabitants.

The last step was the constructing process of the playgrounds in RW 05 and RW 07: preparing building materials and constructing. Since the design process involved the children, it used the simple tools in playful ways.

## III. RESULT AND DISCUSSION

The following are the results of the discussion of the participatory design in kampung Sewu (RW/neighborhood 05 and RW 07) using the behavioral approach, especially for the children.

From the first step: identifying users' needs, the results which are the children's aspirations, are as follows:

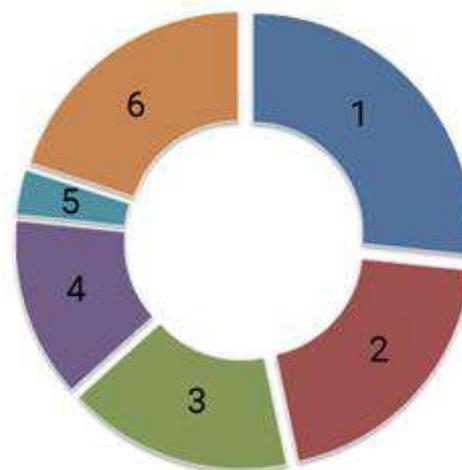


Fig. 2. Diagram of playing facilities  
Source: Kampung Kota Team 2018

- Legend:
1. Concrete sliding surface
  2. Shelter
  3. Basket ball ring
  4. Jungkat-jungkit
  5. Pool
  6. Swin

The second step, choosing location for the end users, finds out the gathering space for socializing, the place where the kids tend to play hide and seek in an empty house, playing rollerblade, cycling, and soccer. The kids obey their parents to avoid dike zone as a dangerous place to play. They use to play in a certain zone A and B (see the map). Those two (2) playing zones were not decent places to play.

The kids took the zones as their playing ground since they did not have any public space for them.

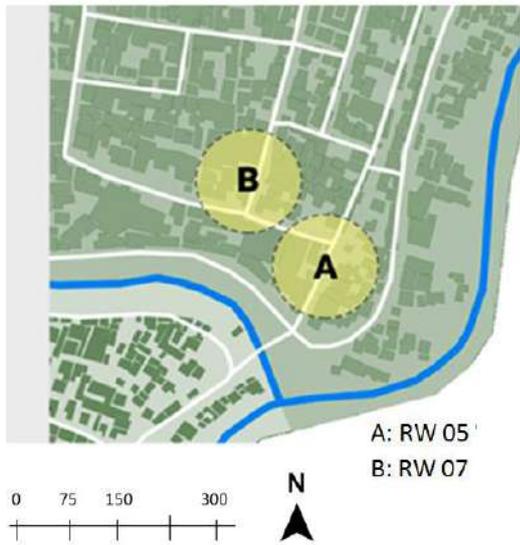


Fig. 3. Playing locations  
Source: Kampung Kota Team 2018



Fig. 4. Playing location  
Source: Kampung Kota Team 2018



Fig. 5. Playing location  
Source: Kampung Kota Team 2018



Fig. 6. Playing location  
Source: Kampung Kota Team 2018

The third step, pop-up modeling helps the kids to recognize their environment and decide the playground location as their public space where they can take a rest during cycling and rollerblading. The favorite aspirations of playing facilities are sliding surface, and swing etc.



Fig. 7. Pop-modelling activity for kids  
Kampung Kota Team 2018

The fourth and fifth steps of this participatory design were Focus Group Discussion (FGD) attended by the community, the kampung leaders, and the stakeholders. The findings from the first FGD was the collection of location data to decide the better and the safest place for the playground. While in the second FGD, the parents want to avoid the dike area and river bank for the safety of their kids and chose the location for the playground in RW 05 and RW 07 that matched with the Government program.



Fig. 8. Focus Group Discussion (FGD)  
Source: Kampung Kota team 2018

Kampung Sewu is a settlement that is located adjacent to the river bank of Bengawan Solo. The main problem regarding the river is the huge deposit of plastics trash/waste that makes it dirty and causes flooding. Related to this case in the design process, “eco-brick” was introduced as a design approach. An eco-brick is a plastic bottle stuffed up with non-biological waste to create a reusable building block.

The making process of an eco-brick consist of several steps. The first step, is collect your clean and dry household waste. Please choose only waste that you cannot recycle (like food wrap), or anything non-biodegradable and dry. Then, twist your waste and insert it into a 1500 ml or smaller bottle. Compress it as tightly as you can with a stick. Keep doing this until you are sure that your bottle is un-squeezable. After it reaches more or less 500 grams, the eco-brick is ready to be used as building material (as shows in the public facility construction process).

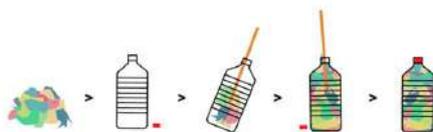


Fig. 9. Ecobrick making process  
Source: Kampung Kota team 2018



Fig. 10. Ecobrick workshop in Kampung Sewu  
Source: Kampung Kota team 2018

The local people are empowered to produce the ecobricks. A series of workshop is organized by Sigap Bencana Terpadu (SIBAT) Sewu, a local disaster response community group. The workshop is targeting children, who are “the will be” end users of the developed facilities. Because the estimation of eco-bricks needed for the playground facilities design is exceeded compared with the amount of plastics trash that can be collected from the neighborhood itself, the product then become the main materials for the structure of the facilities. To do this project on a limited scale, we need to import the plastic bottles and the plastics trash from outside the neighborhood.

The fifth/last step, constructing the playground. There are two (2) stages in this step: preparing the building materials and building process. The projects are located in two (2) places - RW 05 and RW 07.

In RW 05, the community public spaces/facilities built are pergola/shelter and sliding surface. The design forms are the connection between the pergola and the sliding surface. This design uses the sloop of the dike (3 m high) as the playground. The sliding surface that is the aspiration of the children is located beside the stairs. The pergola functions as a shelter as well as a warning for the motorcycle riders to be careful. The pergola is also corniced by herbs plantation. The eco-bricks are used as infill components of pergola columns, sliding surface, and also handrailings. The design is provided as a playground and a place for socializing.

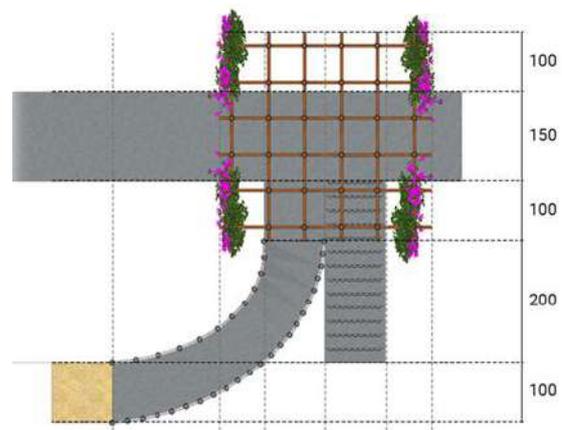


Fig. 11. The ground plan of the pergola/shelter and sliding surface  
Source: Kampung Kota team 2018

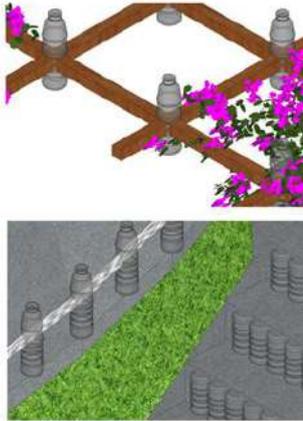


Fig. 12. Bird-view perspective of the details  
Source: Kampung Kota team 2018



Fig. 13. Bird-view perspective of the whole design  
Source: Kampung Kota team 2018

The design of the playing facility in RW 07 has six (6) columns with many functions. The main structures are made of PVC pipes, which contains concrete and eco-bricks. This design is used as a public space for the inhabitants, and playground as well as a pit-stop for the kids. While they are playing around, cycling, and playing rollerblade, socializing, they can take a rest in this place.

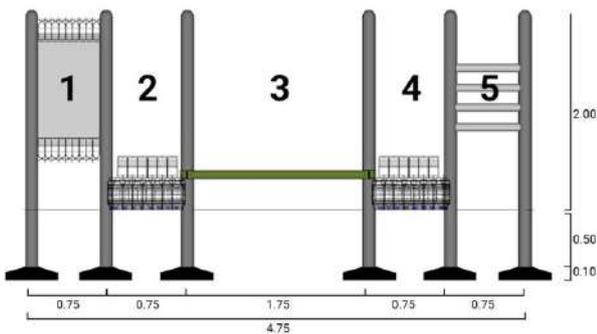


Fig. 14. The playground facility design at RW 07 ecobrick bench  
Source: Kampung Kota team 2018

Legend:

1. Information board
2. Ecobrick bench
3. Balancing beam
4. Ecobrick bench
5. Urban farming model



Fig. 15. Construction process using ecobrick  
Source: Kampung Kota team 2018



Fig. 16. Constructing ecobrick columns  
Source: Kampung Kota team 2018

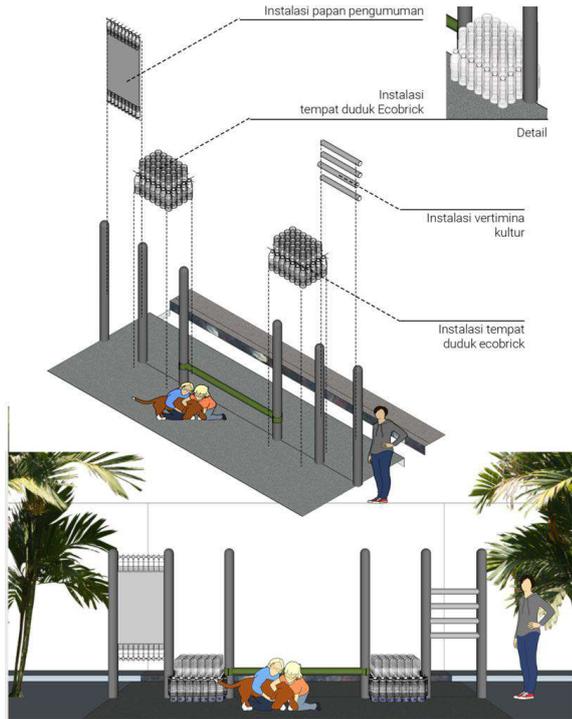


Fig. 17. The detail of the facility design  
Source: Kampung Kota team 2018

The kids' participatory scheme is ended at this point, because construction works need well-trained builders. The role of the children is shifted to a "supervisor" to ensure that their design is appropriately built to reflect the reality.

However, participatory development model takes longer time to be done, but the Team had a limited time frame (limited by academic semester), and so the project was not finished entirely. The rest of the project work had to be transferred to local community.



Fig. 18. The participatory design - constructing process of the playground facility at RW 07 ecobrick bench  
Source: Kampung Kota team 2018



Fig. 19. The design of the playground facility at RW 07 ecobrick bench  
Source: Kampung Kota team 2018



Fig. 20. Enjoying the playing ground  
Source: Kampung Kota team 2018

#### IV. CONCLUDING REMARKS

Participatory design technique is the best way to get the design solutions that meet the needs/demands of the end users. The designing with children should involve not only architects and designers, but also educators, psychologists, health-care specialists, safety experts, but this project only involved architecture students and supervisors.

To get a good result, some steps/activities are needed: (1) site observation with children to find out what and where they usually do/play in their leisure time; (2) pop-art modeling with the end users (parents and children) to decide what kind of public space they need; (3) FGD with the end users (parents and children).

Using eco-bricks on the design helps people to reduce and re-use their plastics trash/waste. But the making of eco-bricks is not as simple as we see. One eco-brick needs many plastics trash, plastics bottles, and power to fill until it is ready to use as building elements. This project involves children, but to produce eco-bricks we need assistance of adults.

Lesson learned from the participatory design activity is that different places have different people, different problems, and different solutions. Although the participatory design is done in the same way, it may lead to different results.

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