DESIGN OF PLAY SPACE IN DENSE SETTLEMENT BASED ON HETEROTOPIA SPACE AND LAND READJUSTMENT
Case Study: Kampung Dupak Surabaya

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ABSTRACT

A dense settlement has a bad impact on the children's space. This causes several problems to the children's activities such as in Kampung Dupak Surabaya. Spaces in this settlement cannot accommodate the all changes and several of children's imagination and creativity yet. Based on this problem, the design is intended to design a play space which is able to adapt to the all variety of children's creativity nd imagination in this settlement.

This process begins with observation, survey, and interview as research methods and heterotopia as a design method. The concept idea from this design is rearrangement settlement space with principles of land readjustment and heterotopias space as design approach, so it can create a various form and characteristic of play spaces in all areas of settlement. Play spaces is expected to be able to optimize a various possibilities of children's imagination and creativity in this settlement.

Keywords: heterotopia space, land readjusment, play space, children.

1. INTRODUCTION

Densely and disorganized spaces in Kampung Dupak cause low quality of children's play space. Space arrangement in the kampong is not pay attention to the needs of the activity space for children. This condition makes children's play activities are very limited and undirected. The spaces in this settlement have not been able to optimize the whole change children's imagination and creativity and yet embody all the children needs. Children's play activities in this settlement are often interfered with the activity of community, such as the other neighbourhood's activities.

If the problem of children's play space in this settlement cannot be overcome, then their growth and development will be disrupted. Playing is one of the most important activities during children's stage. It is also an activity that can optimize growth and development in children, both physical, social, emotional, and creativity.

From the basics theory above, then the design was conducted with the purpose on providing a kampong spaces as design solution that can adjust changes children's imagination and creativity when playing. The solution based on the principles of land readjustment and heterotopia space. The principle of land readjustment is used so that children's playspace can solve the problems of the spaces in this settlement comprehensively, even in conditions of dense space enough. By means of land readjustment, the all spaces in this settlement become eligible for children's play activities. The children can play in all settlement areas, with a variety of ways. Heterotopia spaces are the dimensions or spaces which are not real in the real space [3]. Heterotopia space theory used in this design is very important to optimize the unreal spaces such as changes in patterns of activity or behavior to the imagination or creativity while playing, so in the design of land readjustment and heterotopias space must be based on the patterns of children's imagination and creativity. This research employs several methods, among other things, surveys, interviews, and observation. These methods serve to capture all the data about the children's imagination and creativity in daily life. Further, The acquired data will be analyzed and developed by heterotopia as a design method to obtain ideas of the concept in the form of a play space that suits the children's imagination and creativity when playing in this kampong. Through the principle of land readjustment and heterotopias space can produce various shapes, forms and characteristics in different play space in all settlement areas. The design of play spaces is able to optimize the various possibilities of children's imagination and creativity when playing. The play space is expected to optimize the potential of all children especially the potential of imagination space so they feel comfortable to do activity or play in their own hometown.

2. THEORITICAL REVIEW

2.1 Land Readjustment

According to Seele [6], land readjustment is a land-management tool used to reorganize land for urbandevelopment by forming its location, shape and size according to the spatial plans, and provide land needed for public purposes such as roads and green areas. Land readjustment is an instrument for land organisation, which means both the provision of land needed for public purposes and the suitable formation of private land are according to the rules of town planning .

According to Doebele [2], Land readjustment is a land development method by which a public authority assembles numerous small parcels of raw land without paying monetary compensation to the owners, services and subdivides the land for urban use, returns part of the building sites to the original owners in proportion to the value of their land contributions, and sells the remaining sites to recover all public costs, and it encourages the participation of all stakeholders in the process of urbanization.

According to Archer [1], Land readjustment can also be defined as a technique for managing the urban development of urban-fringe lands, whereby a group of separate land parcels are assembled for their unified planning, servicing and subdivision as a single estate, with the sale of some of the new building plots to recover the costs and the redistribution of the other plots back to the landowners.The systems of *land readjustment* has two main principles [7], i.e :

A. Replotting

Replotting design is an essential tool in land readjustment. It results in newly designed lots after a project has been developed. They are made to correspond to the original lots before the commencement of the project. Every lot in a project area is designed as a replot. Even though the replot may have different shape, size and location compared to the original lot, all rights of the original lot are transferred to the replot, that is, each landowner is given a replot based on his original lot. In general, a replot fetches a higher value than the original lot, even though the acreage of the replot may be reduced.

B. Contribution

The principles contribution is important in land readjustment. Every landowner in a project area has to contribute part of his land towards the provision of infrastructure, amenities and financial land. However, even though. a landowner has to contribute part of his land, he benefits more in terms of land value.

2.2 Heterotopia Space

Heterotopia is space theory introduced by Michael Foucault [3]. Heterotopia space is sliced of real space and unreal space itself. This space can not be categorized in real space (intangibles, prolific, can be felt by the human five senses) or unreal space (emotional nature, spiritually, perception, etc). Foucault explained that the community live in a set of social relations that marked a presence of these spaces. Similar to this design, existence of play space can not be separated from the social life of children. Foucault gives six principles to create a heterotopias space which is called six heterotopology [3], as follows:

First Heterotopolgy; there is no universal or permanent in the form of heterotopolgy. The form of heterotopias spaces is varied and changeable. This is the influence of culture somewhere. In this principle, he exemplifies *heterotopias of crisis*, such as boarding schools and military schools for young men, and old age homes. There are also *heterotopias of deviance*. These Heterotopias can be seen at the clinics, psychiatric hospitals, and prisons. These heterotopias represent sites for people whose actions deviate from the norms in some ways.

Second Heterotopolgy; heterotopia space highly depends on changes in a certain period of time in which a space was located, so the heterotopia space has a different form and function according to the community itself. By Foucault, this principle can be exemplified in a very different view of the cemetery of Europe in the 18th and 19th centuries by the communities. This is due to changes in the traditions and culture related to cemetery in the city

Third Heterotopology; Heterotopia is capable to juxtaposing in some unreal space in one real space or different space. This principle can be exemplified in cinema halls and theaters where a whole series of other space to each other converge on the stage or screen, represents heterotopias of many spaces in one combination.

Fourth Heterotopology; Heterotopia space is closely related to time. Heterotopia space is not only able to present time but also present in past time, or in other words heterotopia spaces can present all the time era. An example of this heterotopolgy is museums or libraries.

Fifth Heterotopology; Heterotopia space is assumed as a system that is not only "isolated" but also "penetrable", this heterotopia space is not only has a function as a fully enclosed private

spaces, but also the open public space. This Heterotopia can be seen in a prison or barracks and also Scandinavian saunas where can be entered based on ritual purification ceremonies or hygienic cleansing.

Sixth Heterotopology; the function of a space heterotopia is able to create the illusion space in which the illusion space is able to show a real space is more illusion than in the illusion space, and vice versa. In other words, heterotopias space can create a real space that looks more perfect and better, but a reflection of the real space are crushed, chaotic and messy, as well heterotopia space can create the illusion or a different new unreal space. Foucault defines in some 17th century puritan societies in the Jesuit Villages of Paraguay as the most extreme example of these heterotopias, a realized utopia, a very strict planned settlement that symbolizes the sign of Christianity and a mechanized order of communal life.

3. METHODOLOGY

Research method from Linda Groat and David Wang was used in the stage of collecting primary data on this design i.e. patterns of behavior of children in daily life as well as the mind imagination to their creativity while playing in kampong. They mentioned that this design method using interviews, surveys, and observations. Method of survey and observations will be obtained figures and data associated with the physical environment as well as the context on the site design which is like spaces in settlement areas. Observation and interview methods used to obtain data regarding non-physical (unreal space) which is like the behavior patterns of children, group playing, etc.

It was concluded that the use of these methods to get the data either the primary data about the physical (real space) and non-physical (unreal space) data. The data in this study were developed by the heteropia design method. Heterotopia method can be described as a step in the process of the design that has no specific guidelines that lead the designer in their process [5].

4. ANALYSIS, RESULTS, AND DISCUSSION
4.1 Land Readjustment

The principle of land readjustment can be described as the concept of rejuvenation or re-rearrangement from an unplanned and unorganized settlements into regular, integrated, balanced and proportional settlements which can be beneficial for the public interest and in accordance with the rules of urban planning. Principle of land readjsutment used in this design in order to create settlement spaces serving as a playing area for children, even in conditions of dense space enough. The system of land readjustment has two important system i.e. reploting and contributions. So in this rearrangement the settlement should be based on these two systems.

Figure.1 Existing Conditions of Kampung Dupak

Reploting
Design Strategy:

In the context of this settlement, every house will be redesigned with a new size based on the proportion of land in the existing conditions. In this rearrangement, the number of houses on the existing conditions should remain the same but with a different design. Spacious of existing house is 35m2 with asize 5 m x 7 m will be transformed into 24m2 with a size of 4 m x 6 m and a system of two floors. Reduction of land the house aims at giving spaces on public spaces, green spaces, and other facilities and infrastructure. The reduction of the size of the houses also has an impact on setting of spaces in it. The spaces on the new house design are also based on the space activities of residents in existing house.
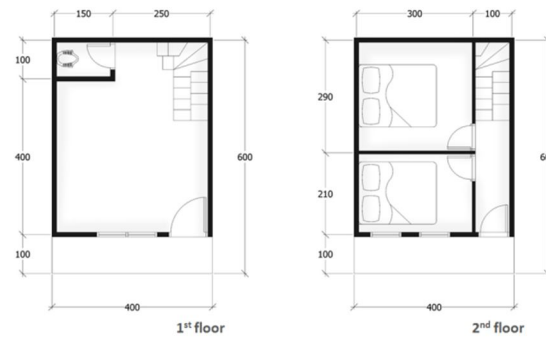
Figure.2 Examples of Alternative Layout Plan of Houses in the Settlement

Contribution
Design Strategy:

As described in the previous points, every land owner in this settlement should donate a portion of their land for public facilities. Through this system, the arrangement of new settlement have roads facilities which cannot be use by kampong people in dailylife but also for firefighter vehicle and the track inspection of riverside. Through the rearrangement, the design of this settlement has an area of green space by 35% of the total land of settlement area. The rearrangement of the kampong also created play spaces spread in the settlement areas. In addition, the rearrangement of this settlement also maintains the other public spaces such as mosque and community center facilities. It follows the schematic arrangement of new settlement.
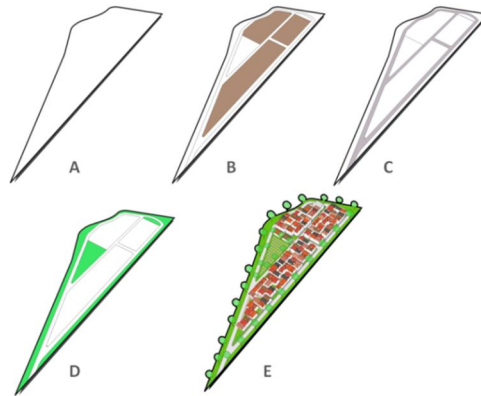

Figure.3 Schematic Concept of Spatial in Settlement

Description scheme concept of the spatial in settlement:

1. 1.07 Ha of land settlements area.
2. Arrangement settlement area remains the same number as the existing house conditions. The arrangement of houses in this settlement is not only based on the principle of land readjustment, but also integrated on the concept of the heterotopia spaces which further analysed in detail in the next sub-chapter.
3. Access road in this kampong surrounding the entire area of settlement so all community have the same access as good in this settlement. Access road also serves as firefighter access and river access when it comes to an emergency condition.
4. The arrangement of open green space in this kampong. Green open space in this settlement can be passed 35% of the total land area of this settlement. Most of these green open spaces also serve as children's play spaces located in the middle of the settlement area.
5. The condition of settlement space after applying the principle of land readjustment. Following the siteplan design of this settlement.

Figure.4 Bird's Eye View Perspective of the Settlemnet's Condition

4.2 Heterotopia Space

Heterotopia space is the main concept in the design of play space for children. Through the principle of heterotopias space, the potential of virtual spaces (creativity and imagination) in children can grow and develop to the maximum. Here are the detailed description and analysis about play space with the principles of heterotopias space.

First Heterotopology

Design Strategy:

In this settlement there are various different forms of play space with the characteristic of heterotopias space. The various forms of heterotopia playspace can be seen in some areas such as residential areas, main play space, and riverside area. Here is the following analysis explanation detailly about heterotopia play space in this settlement.

1. Through the principle of land readjustment, this settlement was re-arranges so it can be beneficial to create spaces that can optimize the children's spaces of imagination and creativity at their activities when playing. In creating heterotopia space, the arrangement of houses in this settlement take the characteristic of children toys, in this case is tetris toys. By taking the characteristic of this toy, indirectly the children can feel the atmosphere of toys through the arrangement of the house masses. Through the arrangement of this house masses,

it will create new blank and different spaces among the house groups. Later, these spaces function can be interpreted and determined by children in accordance with their imaginations and creativities. Following the scheme of arrangement of house masses with tetris toys as heterotopia space.

Figure.5 Scheme of House Mass Group

The arrangement of the settlement also included other virtual spaces which in this case is maze space. Maze space was created by the arrangement of the house group mass. House group mass arranged to create maze spaces among the masses of the house. Heterotopia of maze spaces is also a response of the children's imagination and activity patterns that do not have a specific place and often change places. Through the maze virtual, the children feel free to explore the entire spaces in this settlement.
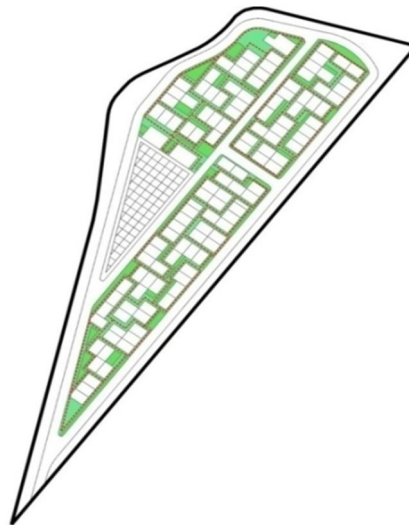
Figure.6 Maze Space Scheme at Settlement

Figure.7 Atmosphere Maze Space Between the Houses

2. Main play space in this settlement created by the land readjustment system was dedicated to children when they gathered together and requires a wider space. The main play spaces can accommodate the changes of children's activity and imagination when playing, such as changes in the number of group, places, up to their needs of dimensional space. Based on this condition, play space was designed by modular systems that can be increased or decreased. The character of this module was taken from the characteristic of lego toys. Through these forms of play space, children can optimize the virtual spaces such as their creativities and imaginations.
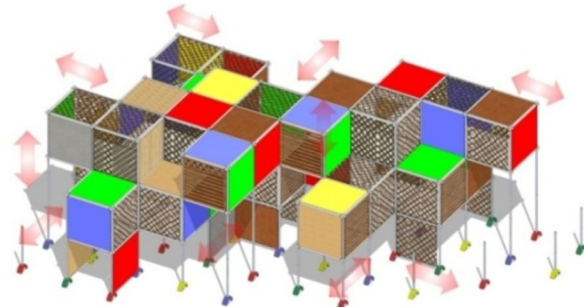
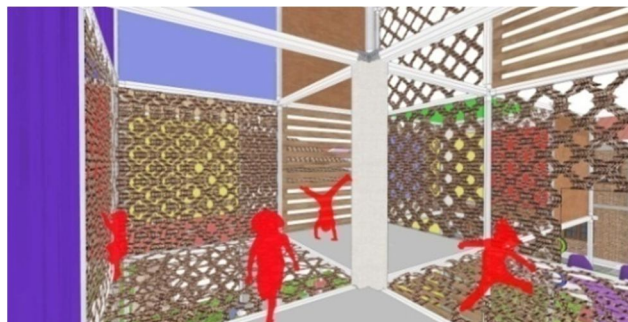**Figure.8** The Main Play Space Module Schema

Figure.9 The Atmosphere of the Main Play Space

3. On the riverside area, a play space takes the characteristic of the slinky toy. This toy is able to extend or reduce the form one time. This character makes the play space on the riverside

have several forms of space in it. The function of play space in the riverside does not to eliminate the habit of children to play in this area, but to provide the different space from the earlier existence.
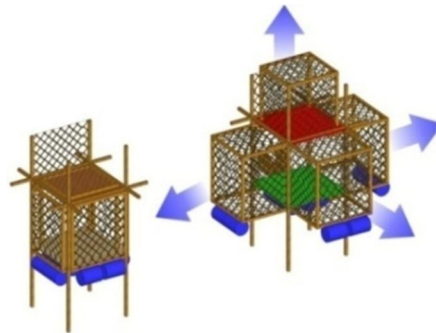

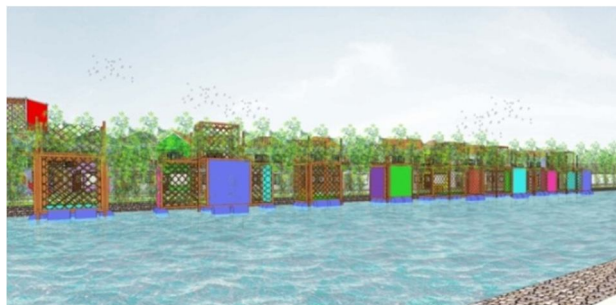**Figure.10** Concept Schema Module of Play Space on the Riverside

Figure.11 The Condition Of The Play Space At The Riverside

Second Heterotopology
Design Strategy:
1. Through the arrangement of house masses it can created new blank spaces, where these spaces can have different functions in accordance with the interpretation, creativity and imagination of children when using the spaces at certain times.
2. On the main area, play space does not only respond to the number of subjects, place, and space requirements but also quickly spend playing time. Using a "wall" on the play space that can be opened and closed flexibly was a solution in responding to the time changing when children's playing. The displacement wall in this space can lead to the different function so children can interpret the function of this different form. Children may interpret the function of different form spaces. The applied of the character of this space inspired by the rubik's slide and puzzle toys. This changing play space was created from a "wall" which made from fabric curtains and rope nets that can be opened and closed flexibly. Also, the various forms of the playspace are a response from the children's ability to play on the disorganized spaces.
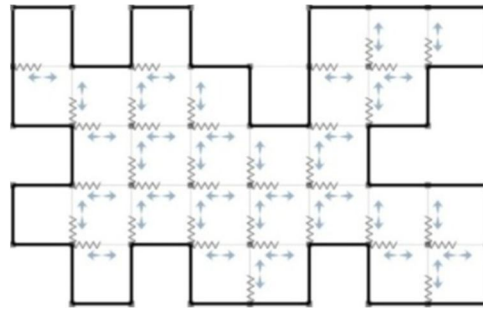
Figure.12 Concept Scheme of Changes the Main Play Space

As vertically, this play space has different shape. This different of play space module can provide different functions in each space according to the children's imagination and creativity when they are playing in it. The difference in the scale of this space is also a response from the children's needs which is different to each other.
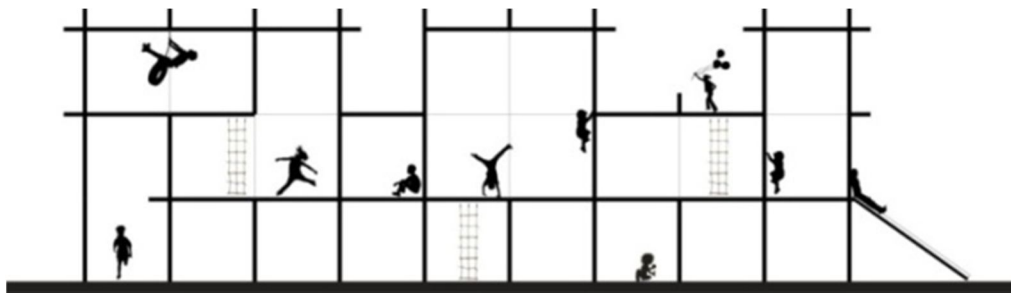

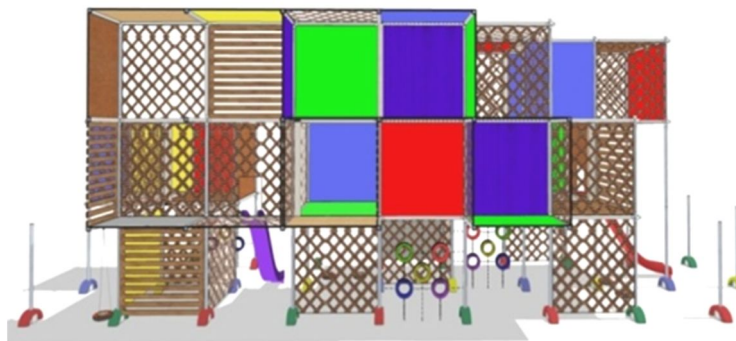**Figure.13** Concept Scheme the Main Play Space

Figure.14 The Section of the Main Play Space

Figure.15 The Condition of the Main Play Space

3. On the riverside area, play space form can change at any time depends on the type and function of the children's games in it. The shape changing of the riverside play space is also the response from the different children's needs of their play space.
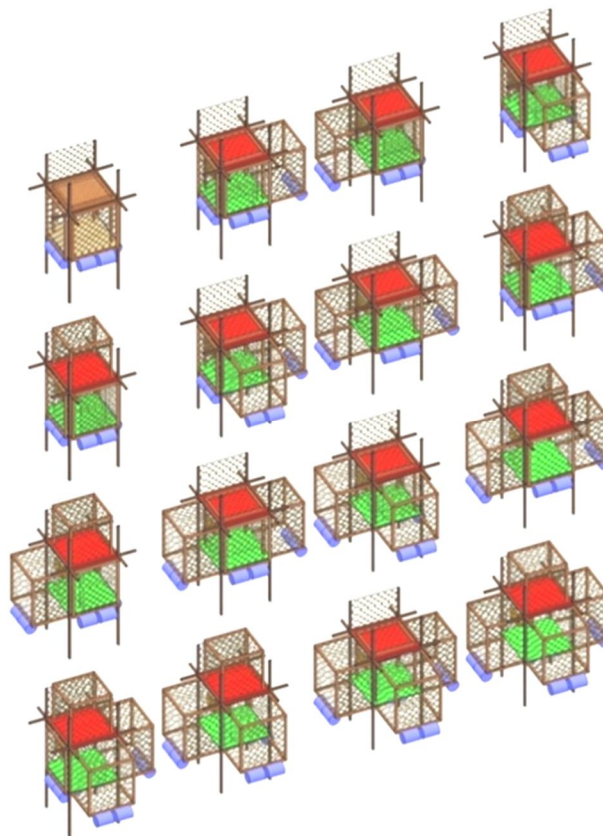

Figure.16 Various Forms of Modules Play Space on the Riverside

Third Heterotopology
Design Strategy:
1. Play space in all settlement areas have the nature and characteristic of the different types of toys. So, indirectly the children have been playing with some type of toys but with the

different form and experience of the original toy. The nature and character of various toys which also contribute in creating play space in this settlement according to the children's needs. The form of toys as unreal space can be seen on the arrangement of settlements, main play space and riverside play area. The usage characteristic on some type of toys also aims at provoking an unreal space in children mind, such as the space of imagination and creativity while playing.

2. This settlement's design has the ability to reflect the unreal spaces in real spaces in this settlement area. It can be said as a settlement area and also as a children's play area because they can play freely in all spaces in this kampong. The houses in this settlement does not only has a primary function as residential but also as a play spaces through the strategy of maze space on the arrangement of the house group.

Fourth Heterotopology

Design Strategy:

Through the principle of land readjustment and the concept of heterotopia space based on old characteristics of the settlement, so this settlement design has the ability to bring the atmosphere of the settlement in the past time with a new form design of settlement. This settlement can be said to be dense or may not. This settlement can be both chaotic and arranged. This settlement can be said to be limited or unlimited. Two opposite characteristic can be seen in this arrangement of settlement which based on the unreal space and children's activity patterns. Children can play and feel the character of their old settlement space but with a new and different form of space.

Figure.17 Conditions of the Various Spaces in Settlement

Figure.18 Siteplan Design

Fifth Heterotopology

Design Strategy:

1. Through the arrangement of the house (according to the first heterotopology) which was able to create a new blank spaces in between, for which this space can be used by the household or other community in this settlement.

2. Not only on the residential areas, but also on the main playing area. Through the use of module system on the main play space where its spatial delimiters can be opened or closed flexibly. So, the function of play space modules can be turned into a private area for certain group of children or opened public for several groups of children in doing activities simultaneously.
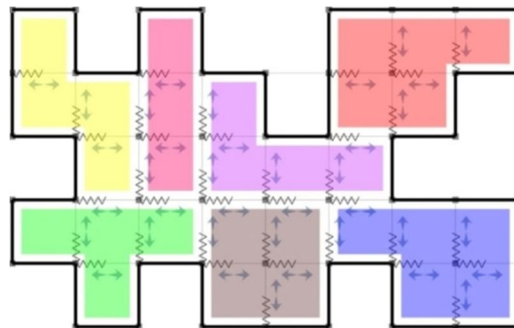

Figure.19 Concept Scheme Of Grouping Children Activities

Sixth Heterotopology

Design Strategy:

Play space in this settlement was designed to be able to optimize the unreal space on children which in this case is their space of imagination and creativity. To lure out the spaces of imagination and creativity in children, this playspace design adopts characteristic on different types of toys. Furthermore, children can freely imagine to interpret their own to every different and changing form of play space with various forms of unreal spaces in their thought, so they can create the illusion space in real spaces around them by themselves. It is also a response to children's activities which cannot be forced when playing, and the children's ability to respond and interpret various forms of disorganized settlement spaces as well.

4. CONCLUSION

By means of principles of land readjustment and heterotopia space on designing play spaces in this settlement, created the variety of children's play spaces was exist in the entire settlement. Through the principle of land readjustment, the children can play freely in all spaces in kampong areas. The play space design in kampong has many forms and different characteristics, such as in the middle of settlement area, the main area, and the riverside area. These areas have different design strategies of heterotopias space by means of several characteristic of toys. By taking the characteristic of these toys, indirectly the children can feel the atmosphere of toys with different experience. Differences in the forms and characters of the play spaces are a response to children playing pattern that are diverse and changeable. Children can interpret or provide its own function in the play spaces in this settlement in accordance with their thought, creativity, and imagination when playing in these spaces. Through the principle of heterotopias space, children can create illusionary spaces in real spaces around them. The children can play with various ways and a variety of game types in the settlement's play spaces, so that play spaces can optimize various possibilities of activities patterns and potential in children when they're playing in this settlement spaces.

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