

An Incremental Tamansari

*A proposal for a new kampung development
system in Bandung, Indonesia*

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 **TU Delft**

MSC THESIS URBANISM - P5 REPORT

Title	An Incremental Tamansari
Subtitle	A proposal for a new kampung development system in Bandung, Indonesia
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ABSTRACT

The report will review the co-relation between rapid urbanization in Bandung with the city's health issues in the informal areas of Bandung. Rapid urbanization is becoming a worldwide phenomena that leads to the realization of informal neighborhoods. Informal urbanization is a phenomena that will only keep on growing in the upcoming years. By 2030, it is expected that almost one in seven people will be living in an informal settlement, better known as a slum.

These informal settlements are characterized by overcrowding, poor-quality housing, lack of basic infrastructure and poverty. The informal 'Kampung'-neighborhoods in Bandung are lacking basic hygiene because of overcrowding and insufficient infrastructure. Because of the rapid growth, the pressure of the city will heavily increase in the near future, which will worsen the unhealthy environments most of the new migrants will have to live in.

After understanding the informal urbanization, the paper will focus on the current health issues, as a result of rapid urbanization, in the kampung of Tamansari. By doing this the research seeks to answer the question:

How can we re-interpret the old 'Healthy City' identity of the 1920's, in order to improve the public health, and therefore the livability, whilst meeting the densification requirements of kampung Tamansari in Bandung?

This report will gradually work towards a new design proposal for a improved healthy, livable, green, sustainable, affordable and feasible development model for the slum-neighborhoods of Indonesia. The design itself has been conducted on the location of kampung Tamansari.

This report will inform urban planners and other practitioners on the growing challenges and threats of the Kampung-neighborhoods, and give an alternative development model for Indonesia's slum neighborhoods.

ACKNOWLEDGMENTS

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INTRODUCTION

With the rise of the world's urban population, the growth of the urban poor grew just as rapid. It is expected that by 2030, every one is seven people will be living in an urban slum or informal neighborhood (PSUP Nairobi, 2016). This means that this way of housing will gain more importance in the upcoming year.

The urban slums, or informal neighborhood, are often characterized by overcrowding, poor-quality housing, lack of basic infrastructure and poverty (Scovronick, 2015). The combination of these factors in making the slums unhealthy living environments, resulting in thousands of death annually because of poor hygienic quality (Stillwaggon, 1998).

This Thesis will focus on the biggest and densest informal neighborhood of Bandung, Indonesia's third city: Kampung Tamansari. Bandung is a rapidly growing city, a city growing thus fast, that the government isn't able to construct affordable housing for all the new migrants. Therefore, the Kampung, or urban slums, are often the only possible solution for the new migrants to settle.

In this research, the focus will lay on turning the urban slum into a more livable and healthier living environment for the future generations.

Img 00.1 - One of the few public spaces in kampung Tamansari
(Source: Authors own)

Taman

(noun) / ta-man /

taman (also kebun, kebon) - Garden

taman (also kebun raya) - Park

Sari

(noun) / sa-ri /

sari - concentrate core essence extract juice pith

sari - flowers

Tamansari

(noun) / Ta-man-sa-ri /

Tamansari - Garden of scents

Tamansari - Beautifull garden

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Img 00.2 - Boy playing in front yard (Source: Authors own)







01 BANDUNG, A HEALTHY CITY

The chapter 'Bandung, a healthy city' will introduce the context of the thesis research. The research and design will take place in the city of Bandung, the third largest city of Indonesia. The city has been realized during the era of the Dutch-Indies, which means that the city has a strong colonial character. This strong colonial character has left its marks on the city of today, as the city is still dealing with the marks the colonial city had left. After the independence of Indonesia in 1945, the country entered a new phase of urbanization. The relations between these different events will be explained in this chapter.

This chapter will explain Bandung as it is right now, and will go back into history to explain why Bandung became the way it is currently is.

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Img 01.1 - View from the Minaret
of the Grand Mosque in the
center of Bandung (Source:
Authors own)

01.1 BANDUNG NOWADAYS

Bandung is Indonesia's third largest city, behind Jakarta and Surabaya, and it is located on the island of Java, the most inhabited island of the world. The city of Bandung is located in the province of West-Java, about 140 km southeast of the capital Jakarta. The city currently knows a population of around 2,5 million, with the metropolitan area even reaching a total of over 8,5 million inhabitants. Estimated is that around 92% of the population in Bandung follows the Islamic religion (BPS Kota Bandung, 2014).

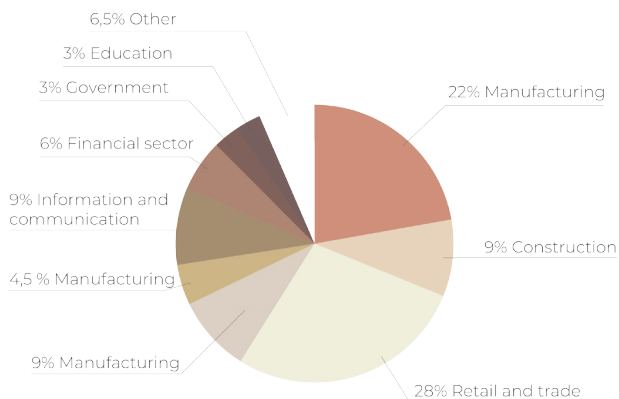
The city is located at a height of 768m (2520 ft), as it is positioned inside of the valley of different volcanic mountains. This geographic location makes that Bandung has a cooler climate than that of other Javanese cities, which was also the main reason for the Dutch to settle here, during the occupation.

As can be seen in the im-

age 01.2, the center of the economical, commercial and service activities can be found around the node where the three main backbones of the city come together: the Grote Postweg, the railroad and the Chikapundung-river. These three backbones have been hugely important for the development of the city, which also explains why the point where they come together functions as the center of the city.

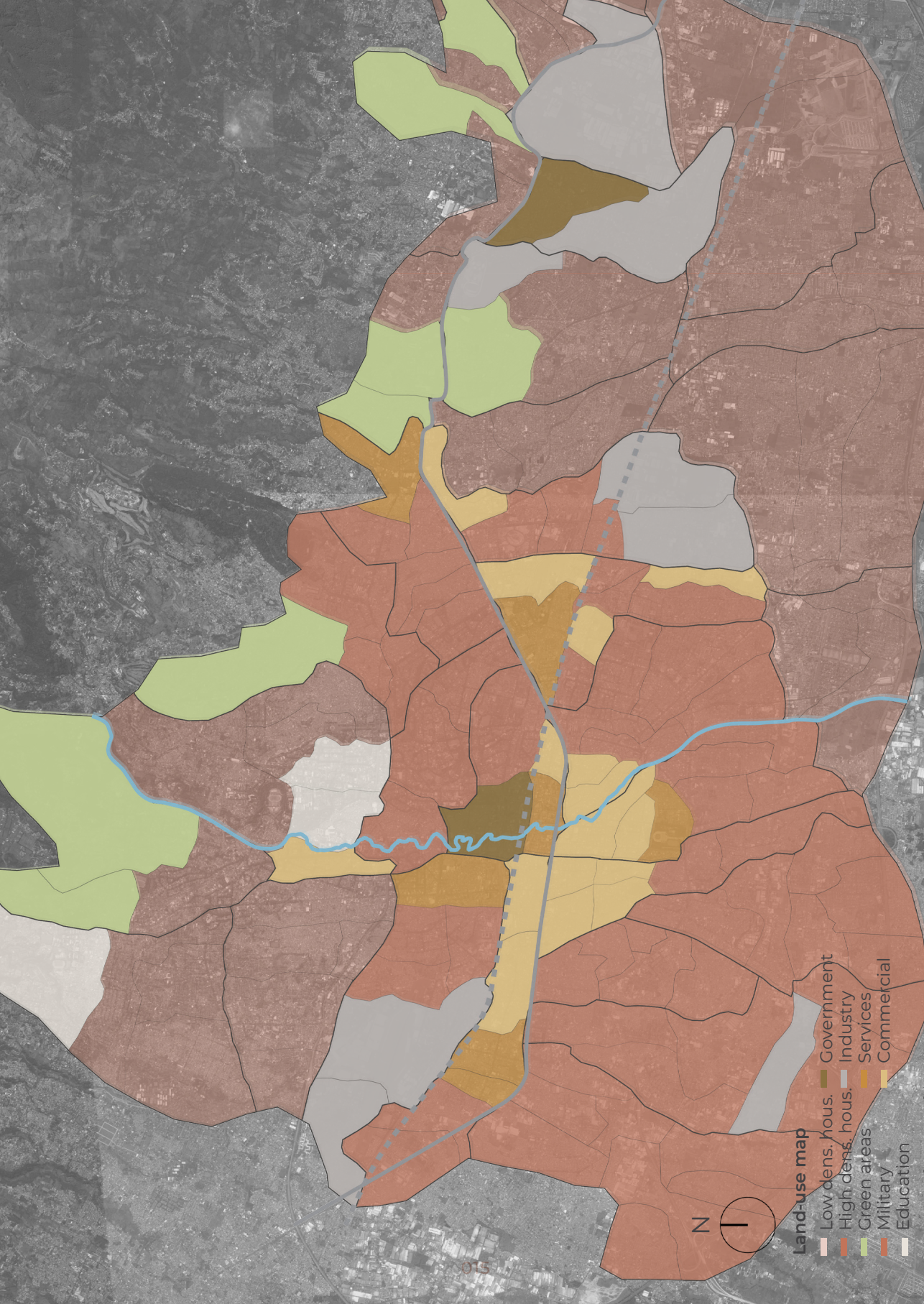
When looking at the density of the residential neighborhoods, as can be seen in image 01.3, we can see that the densest inhabited neighborhoods are located directly around the center-area of the city.

The economy in Bandung is mainly built upon tourism, business, creative industry, high-tech and manufacturing industries, educational institutions, technology, retail services, financial services, pharmaceutical companies, and food



Img 01.2 - Contribution economic activity to GDP (Source: Authors own)

Img 01.3 - Land-use map Bandung (Source: Authors own)



Land-use map

- Low dens. hous.
- High dens. hous.
- Green areas
- Military
- Education
- Government
- Industry
- Services
- Commercial

production (Discover Bandung, 2008).

Bandung is also known as one of the biggest student-cities of Indonesia, with over 50 higher educational institutions. The recent upcome of the creative industries have turned Bandung into an innovative hub for creativity and entrepreneurship. It is estimated that around 56% of Band-

ung's economic activities are design-related, with fashion, graphic design and digital media being the top actors in the local creative economy (UNESCO Creative Cities Network, 2015).

01.2 THE FOUNDING OF BANDUNG

In the 16th century, the British and Dutch tradesman started to focus on the different islands in southeast Asia, from which they were hoping to find different spices as Nutmeg, Clove and Pepper. In 1602 the Dutch East India Company was realized, after which they quickly

gained power over Indonesia. After the Dutch East India Company went bankrupt in the 1798, the country gained the name 'The Dutch-Indies' and officially became a colony of the Netherlands, with Batavia as it's capital.



Img 01.4 - Pamphlet advertising Bandung as the ideal city and 'Europe in the tropics' (Source: Bandoeng Vooruit, 1930)

Img 01.5 - Advertisement showing that Bandung is also 'a paradise' for the youth (Source: Bandoeng Vooruit, 1930)

Img 01.6 - Advertisements of the different entertainment facilities Bandung is offering (Source: Bandoeng Vooruit, 1930)



• Europeesche ontspanning
na den schoolarbeid. •

BANDOENG
EN OMGEVING

zijn een Paradijs, ook voor de Jeugd!



HOTEL VILLA „JSOLA“

Dit
BIEDT BANDOENG U!

accessible, and therefore easier to defend. This 1000 km long road also connected the other settlements to what is now known as the city of Bandung.

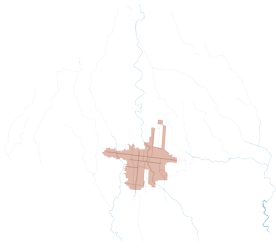
At this time, the city of 'Bandoeng' had already around 11,000 inhabitants, of which only 9 were non-Indonesian citizens. After the new Resident, The colonial administrators of the Netherlands East Indies, decided to settle in Bandung, because of it's more desirable climate, the city entered a period of rapid development. The city grew to a total of around 40.000 inhabitants by the year of 1882.

The railroad was realized in 1894, connecting the city to the capital of Batavia (Nowadays Jakarta). With the realization of the new railroad, the national railroad company also realized housing for its employees in Bandung.

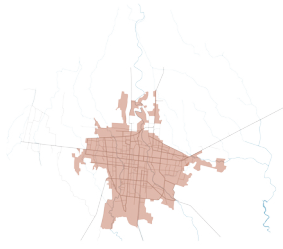
After the year of 1910, the city started to urbanize even faster, after the local government realized a central water, gas, and electricity network together with a big hospital.

Img 01.7 - De Groote Postweg
(Source: Adjusted from <https://goo.gl/images/vi8XMe>)

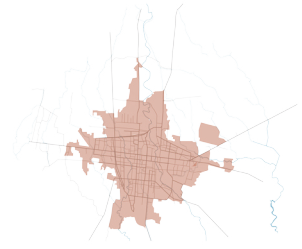




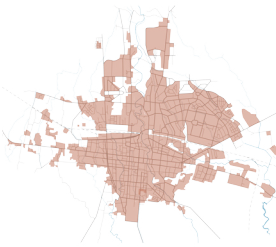
Img. 01.08
1825



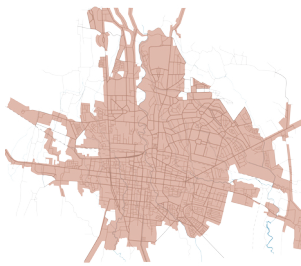
Img. 01.09
1882



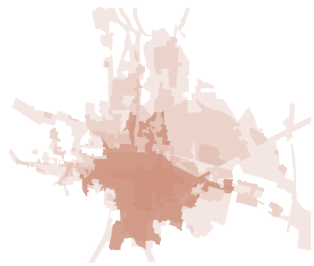
Img. 01.10
1905



Img. 01.11
1928



Img. 01.12
1954



Img. 01.13

Img. 01.8 - 1825

After the realization of 'De Groote Postweg' (Great Post Road) in 1810, Bandung developed into a small settlement. The city was mostly southwards oriented, since the north was going up the slope of the volcanic mountain north of Bandoeng.
(Source: Authors Own)

Img. 01.09 - 1882

In 1882, the small settlement gained popularity because of its pleasant climate in the mountains. At this time the city had about 40.000 inhabitants. The city was still developing southwards because of the mountains in the north.
(Source: Authors Own)

Img. 01.10 - 1905

After the realization of the railroad, the Dutch actively started to develop Bandung. The city now started developing northwards, as the valley in the south started to flood during the raining season. Most of the development was only for the Dutch.
(Source: Authors Own)

Img. 01.11 - 1928

In 1928 the Dutch finished most of their big-scale developments as the hospital, governmental buildings and the Technical University. The city started to develop around these function following the garden-city concept.
(Source: Authors Own)

Img. 01.12 - 1954

After the independence of Indonesia in 1945, the city rapidly started to develop, as people migrated towards the big cities in hope for a better future. This led to a huge expansion of the city in multiple directions.
(Source: Authors Own)

Img. 01.13 - Overlap

When placing all of the urbanized areas on top of each other, the transition of a south oriented development in the 19th century vs the north oriented development in the 20th century is better visible. The development until went multiple directions.
(Source: Authors Own)

01.3 BANDUNG AS A HEALTHY, LIVABLE CITY

It wasn't until the 1920's that the Dutch started to really invest and develop the country. In Bandung, the northern 'garden-city'-expansion was realized, after which a huge flow of Dutch immigrants followed to settle in new promised land. The new garden-city expansion in the north was characterized by wide lanes with vegetation, big modern, freestanding houses. It wasn't until the 1920's that the Dutch started to really invest and develop the country. In Bandung, the northern 'garden-city'-expansion was realized, after which a huge flow of Dutch immigrants followed to settle in new promised land. The new garden-city expansion in the north was characterized by wide lanes with vegetation, big modern, freestanding houses with a lot of recreational parks. The city gained the nickname 'The city of flowers' and was promoted to the Dutch as 'Europe in the tropics'. The low tax-rates, the high livability and health offered everything they could wish for. In 'Bandoeng de Ideale Woon- en Vacantiestad' (Bandoeng; The ideal living and holiday city) the city of Bandung is being described as:

"A city, not too big that it takes ages to reach the nature. Neither too small, that there is nothing to do. The area knows a wide variety of different examples of natural beauty, and has busy, popular shopping streets, high quality hotels and has exciting entertainment venues. The city has a healthy, pleasant climate and is inhabited by pleasant people who enjoy the cheap prices. At final, does this ideal-city offers a qualitative transport network" (Bandoeng Vooruit, 1930).

The new flow of Dutch inhabitants also meant a huge chance in the city-structure. The city was designed as a segregated city, in which the 'inlanders' (Original inhabitants) were only allowed to enter the Dutch quarters to work as a servant for the Dutch families. The Indonesian people lived in so-called Kampung, mostly in the south-west of the city. The circumstances in these neighborhoods were completely different then in the European quarters. The Kampung neighborhoods were characterized by low-quality housing in poor hygienic living environments. It wasn't until the 1930's that the Dutch started to invest in these Kampung neighborhoods, but only because they were afraid that the Indonesian servants would bring diseases to the European quarters.

Also during the 1920's, the Dutch-Indies Government started realizing the plan to move the capital from Batavia to Bandoeng. They started the realization

Img 01.14 (Top) - Alun-Alun, the central square of Bandung (Source: Authors Own)

Img 01.15 (Left) - De Groote Postweg nowadays (Source: Authors Own)

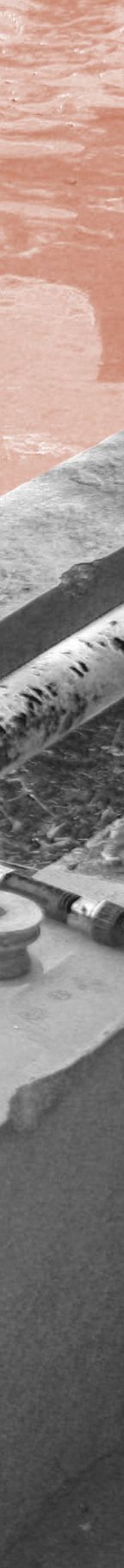
Img 01.16 (Right) - Jalan Asia Africa, central road named after the Asia-Africa conference in 1955 (Source: Authors Own)

Img 01.17 (Bottom) - Gedung Sate, the seat of the governor of West-Java (Source: Authors Own)

of the military barracks, the central government building (Gedung Sate) and other governmental buildings. The plan was eventually stopped because of the second world war, which also was the end of the Dutch-Indies. Indonesia gained independence in 1945, after a 3-year lasting occupation by the Japanese (1942-1945).







02 METHODOLOGY

The Methodology chapter will explain the process from the problem statement to the final result. It is basically setting the step-stones which to follow throughout the research process. By doing so, we can manage to organize and provide insight into the research that needs to be done in order to answer the (sub) research questions.

The chapter will start with explaining the problem statement, after which the research questions and aims will be introduced. The conceptual framework will determine the position of the project within the wider theoretical field, after which will be explained what research will be done, and how to do this research. The final research framework is giving the complete overview of the research process.

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Img 02.1 - Fishing in the highly polluted Chikapundung river
(Source: Authors own)

02.1 INTRODUCTION

Kampung improvement, the Indonesian type of slum, as the main focus of this thesis, has always been an important focus point in the history of planning in Indonesia. With national policies as 'zero slums' and the 'Kampung Improvement Project' (KIP), we can see the focus from the national government on the improvement of these informal neighborhoods.

Mouton, views research methodology as focusing on the research process and the kind of tools and procedures to be used (Mouton, 2001). The design of the research process, which is the main focus of this chapter, can be considered to be the glue that holds all of the different tools and procedures of the research together (Sastriy, 2013). In order to have a smoother and more productive research process, it is important to first plan the different steps of the research out. Inaan Akhtar, in his paper on research design, compares the research design to the blueprint of a building, which is needed for a better economical and attractive construction of a building, made by an architect. Similarly, we need a research design, or a plan, in advance of the collection of data and the analysis of the research project (Akhtar, 2016). Therefore, this chapter will function as the plan of the overall research process, and the explanation of how this structure came to stance.

The chapter has been constructed in such a way, that it will chronologically explain the process of the final realization of the research framework, in which all the different components, and the relations between them, will be highlighted. First, the different components that altogether form the 'foundation' for the research design will be explained. In here, the focus will be on the content they consist of and how this interrelates in between the different components. Secondly, the focus will lay on how this research framework shaped the overall research methodology. After the alignment of the methodological considerations, there will be a more in-depth explanation on the final research design, as shown in the theoretical framework. In here, the research, as planned, will be both described and explained, in order to understand how the different research components relate to one another.

02.1 THE RESEARCH FOUNDATION

The foundation of the research, which will guide the rest of the research, consists of following components: the problem statement, the research question(s), the research aims, the expected output of the research and the hypothesis of the final results. Together, these components will explain us 'what' will be researched, and explain 'why' it needs to be researched.

Problem statement

By 2030, it is expected that almost one in seven people will be living in informal settlements, or slums (PSUP Nairobi, 2016). This means that the informal settlements will become a more important way of housing, which explains the need for a greater body of knowledge of these unknown areas.

The informal neighborhoods, or slums, lack hygienic living conditions. Slums are often characterized by overcrowding, poor-quality housing, lack of basic infrastructure and poverty (Scovronick, 2015). These different factors are what make the slum-neighborhoods unhealthy living environments. Illnesses related to the water supply, waste disposal, and garbage kill 30,000 people per day and constitute of 75 percent of the illnesses that afflict humanity (Stillwagon, 1998). The digestive-tract diseases arising from poor sanitation and the pollution of drinking water are the leading cause of death in the world (Thapar, 2004).

In Bandung, the third city of Indonesia, more than 50% of the districts contain slum areas. During the Dutch occupation, Bandung was being promoted and developed as a highly livable and healthy city, with a lot of green and wide lanes with housing. The cooler climate, because of the location in between the volcanic mountains, made Bandung a more preferable city to be in then cities like Batavia (Jakarta) or Surabaya.

After the independence of Indonesia in 1945, the country entered a period of rapid urbanization, as people started moving towards the more urban regions. This spurt of urbanization caused the city of Bandung to grow from a total of 250.000 inhabitants in 1945, to more than 2,5 million in 2018 (World Population Review, 2018). By 2040, the city is expected to reach a total of 4,1 million inhabitants, which means that the city will grow with 1,6 million inhabitants in the upcoming 20 years.

The prompt growth of population in the city of Bandung also caused a high amount of informal urbanization. There wasn't a sufficient housing supply available to meet the demands of this population spurt. Therefore, migrants started to take matters into their own hands and started created their own shelters. These new houses were created in empty, often green, locations in the city, such as parks. The unregulated development of these neighborhoods, which were lacking decent hygienic facilities as sewage systems or clean water supply, caused the city to loose it healthy and highly livable identity. The expected growth of the population will only lead to increasing pressure on the city.

There are a lot of studies done on slums and informal enclaves; on how they came into existence, on similarities between slums in general and even on how to improve the living conditions in these slums. In trying to find solutions to improve slums, organization often generalize slums, and look for generic solutions. For example, we can see that the government of Indonesia is looking for a solution on a national scale with the Kampung Improvement Projects or the United Nations with a solution on a global scale. But every slum or informal neighborhood is created by a different context and a different set of variables. The UN's household-based definition of slums lacks emphasis on the locational aspects, and mainly focuses on aspects as infrastructure and basic services (Olthuis 2015).

Research on future densification, livability and health is necessary to prepare the kampungs of Bandung for the expected population growth, and on how we can create healthier living environments for the current inhabitants and the new flow of migrants.

Research question(s)

Research questions represent an attempt to 'tame' curiosity. The process of formulating, developing and refining research questions allows researchers to make connections with existing theories and previous empirical findings and helps avoid unnecessary repetition of or overlap with previous work. This process also allows researchers to clarify their ideas, to reflect on the definition and operationalization of important concepts, and to make links between the questions they aim to address and the most appropriate research design (White, unknown).

This thesis will look into answering the following research-question:

How can we re-interpret the old 'Healthy City' identity of the 1920's, in order to improve the public health, and therefore the livability, whilst meeting the densification requirements of kampung Tamansari in Bandung?

This research question will be answered through answering the following sub-questions:

- SQ1 *How were the concepts of livability and health being perceived and developed in the city of Bandung during the 1920's?*
- SQ2 *What are slums and how do they develop?*
- SQ3 *What is livability, and how are we able to asses it, and improve it?*
- SQ4 *What is health, how does it relate to livability and how are we able to make a change in it?*
- SQ5 *What are the current characteristics and problems present in kampung Tamansari?*
- SQ6 *What is the current status of public health, as a sub-component of livability, in Kampung Tamansari, Bandung?*
- SQ7 *What are the solutions other cities are implementing for answering similar problems?*

Research Aims

The thesis will look into the current status of the kampung in comparison to how this once was envisioned when the city was promoted as a 'Healthy City'. The objectives which need to be met in order to do so are:

- 1 Re-defining the 1920's idea's of a 'Healthy City', and implement these.
- 2 Finding an answer to the high housing demand in the near future.
- 3 Improving the livability and urban health in Bandung's Kampung-neighborhoods.
- 4 Understanding the qualities that are present behind the Kampung's chaotic aesthetics.

Conceptual framework

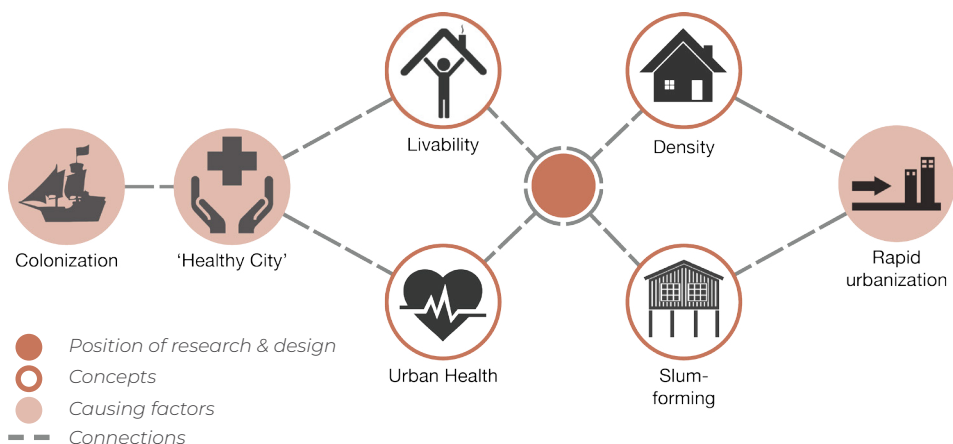
Research, as defined by Karlinger, is a systematic, controlled and critical investigation of a hypothetical proposition about the presumed relations among natural phenomena (Karlinger, 1975). In order to understand and be able to research the presumed relations among the natural phenomena, it is important to first frame the phenomena. The different phenomena and the relations between them, are shown in the conceptual framework (see image 02.2).

The different concepts that are being addressed in the research, and the relations between the different concepts is what making this research stand out from existing research. The concepts of livability, public health, densification, and kampung improvement together are the four main components. In the parts where these different theories meet the design-part of the thesis will take place. The design, as an activity aimed at imagining a possible solution to a (wicked) problem (Boekholt, 1984), will modify the existing presence of these components, to maximize their influence on the neighborhood.

Hypothesis

Having a hypothesis before starting the research can help us limit the field of literature that needs to be addressed. This means that the research is in need of a hypothesis in order to guide the research (Sastry, 2013), and helps in setting up the stepping stones for the path of research. Higson-Smith and Kagee defined research design as "... operations to be performed, in order to test a specific hypothesis under a given condition" (Higson-smith & Kagee, 2006).

Img 02.2 - Conceptual framework (Source: Authors own)



Expected is that the livability and health factors of the informal kampungs are forming the main problems in the area. With health being a sub-component of livability, the focus will be on improving the livability through improving the public health of the area. The kampung Tamansari, which has completely been developed by bottom-up initiatives, the implementation of a top-down plan can help to provide the people with decent infrastructure and creating a framework for regulating the future development of the area.

Expected Research output

Defining the expected research output before starting the research can help us with creating a focus. This focus can help us determine what to focus on, and what not.

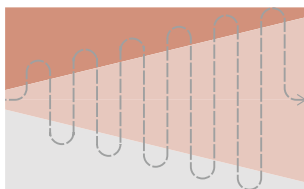
The expected outputs of the research are a vision for the kampung area of Tamansari and a neighborhood design in the kampung area. The future vision of the region will show the implementation of the different processes that need to be started for improving the health of the area. The neighborhood design will afterwards focus on a specific area, there the implementation of the research results will be shown.

02.3 ALIGNMENT OF THE FOUNDATION AND THE RESEARCH

This chapter will explain how the 'what' and 'why' of the research foundation lead to the 'how'. The different components of the foundation altogether explain us 'what' the research must consist of and 'why' the research is needed. Prior to framing the research design, a researcher first needs to determine two fundamental tools: The 'what' (descriptive) and 'why' (explanatory)(Sastry, 2013). The descriptive and explanatory elements help us with determining what to focus on, and what not.

Now we have determined why we need to do this research and what needs to be researched, we can look into how we will do this. The concepts that need to be researched together make a specific path of research that needs to be taken. Terms like livability, public health and slum-forming will need to be defined, explained and adjusted to make them useful for the research. To do this, a review of the body of knowledge is needed. In describing and explaining the current kampung Tamansari, it is more important to analyze the neighborhood, and map it. This just shows how every research will need a different focus.

Img 02.3 - The location as a third component in the research by design process (Source: Authors own)



- Research
- Design
- Location

02.4 THE RESEARCH FRAMED

This chapter will focus on the 'how' of the research. It will explain the different types of research that will be done, and explain the main philosophy behind it. This chapter will function as the underpinning of the research framework, as can be seen in Image 02.4.

The research

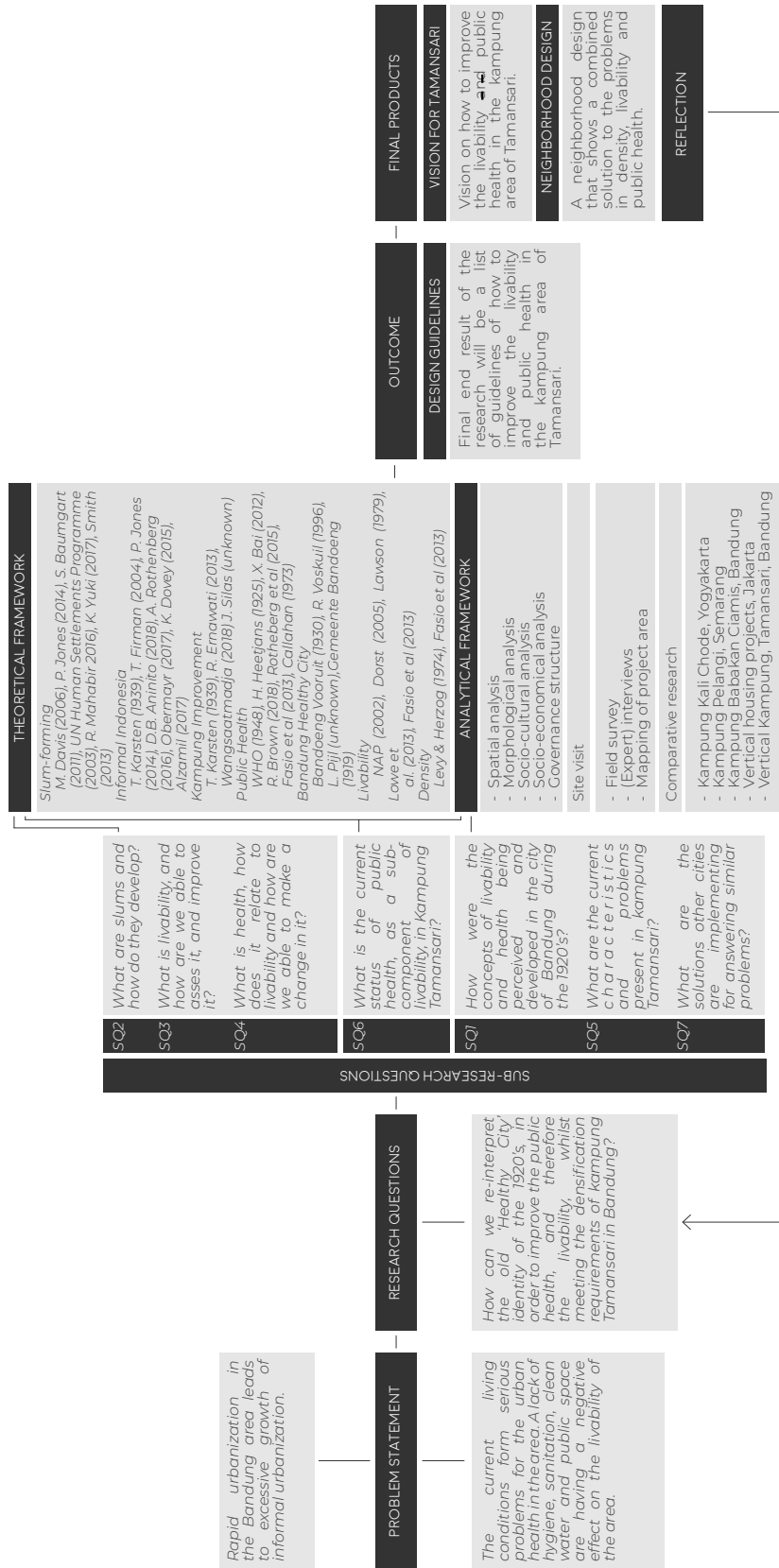
The Faculty of Architecture at the Technical University of Delft (TU Delft) developed the expression of 'Research by design', or 'Research through design' (V.A. 2000). In research by design, the substantial part of the design in the research process has been highlighted. This means that the neighborhood design of kampung Tamansari is being done continuously with the research, as they will influence one-another. Research by design produces forms of output and discourse proper to disciplinary practice, verbal and non-verbal that make it discuss-able, accessible and useful to peers and others (Haugberg, 2011). In addition to the combination of research and design, the components of location has been added, because the given context is in this case so specific, that it will both equally influence the research and the design. (See image 4.2)

Since the research is taking place to substantiate the design, we're speaking of an applied research. Applied research is the original investigation undertaken in order to acquire new knowledge. It is, however, directed primarily towards a specific practical aim or objective (OECD, 2002).

Max Weber (1864-1920) argues that all humans are attempting to make sense of their worlds. In so doing, they continuously interpret, create, give meaning, define, justify and rationalize daily actions (Babbie & Mouton, 2008). This explanation directly aligns with the definitions of both livability and health, the two main concepts that are being addressed in the thesis. Both of these terms consists of a strong subjective assessment, as the objective elements do not directly affect the perception. (Campbell, 1976). The Phenomenological approach is an approach that aims to understand people (Babbie & Mouton, 2008), and therefore better aligns with the needed research.

The research will therefore have a bigger focus of qualitative research over quantitative research. As Schwandt explained, reality should rather be interpreted through the meanings that people give to their life world. This meaning can only be discovered through language, and not exclusively

Img 02.4 - The research
framework (Source: Authors
own)



*“Nothing
is more
practical
than
Theory..”*

- Ludwig Boltzmann

*“One good
example is
worth a ton
of theoretical
arguments.”*

- Sir Francis Crick

through quantitative analysis (Schwandt, 2007). The purpose of research in phenomenological research is understanding and interpreting everyday happenings (events), experiences and social structures – as well as the values people attach to these phenomena (Collis & Hussey, 2009, Rubin & Babbie, 2010). In the phenomenological approach, the researcher engages in active collaboration with the participants to address real-life problems in a specific context; these are directed towards the offering and implementation of feasible solutions to the problem (Blumberg et al., 2011).

Pure research is aiming to obtain knowledge which should enable us to understand the universe and our role in it (Delbruck, 1986, Barrow & Tipler 1988). Pure research consists of both Analytical and theoretical research, which are of equal importance to it. In analytical , or empirical, research the main goal is to measure various natural phenomena (or simulated phenomena), whilst in theoretical research one attempts to capture the processes of Nature and relationships between phenomena in formal mathematical statements (Casti, 1989).

Theoretical research

The main purpose of any theoretical framework is to explain and to systematize the experimental observations by a few unifying concepts (Lowdin, 1990). The exploration of these concepts will be done in the theoretical research. The components of slums, livability and public health will be researched, so we can build upon the knowledge that is already

available. Because one cannot attain absolute knowledge (Benfey, 1977).

The research done will have a strong deductive character. The overall definitions and lists of components of both livability and public health will be shorted into a small list, of maybe three to five components, through prioritizing components that are of a bigger importance to the area. Therefore, the general ideas and theories behind the concepts of livability and public health will be modified to a specific situation, being the problems in kampung Tamansari.

Analytical research

The term analytical, or empirical, refers to knowledge derived by the process of practical and scientific experience, experiments and inquiries (Skager & Weinberg, 1971). An empirical investigation involves a planned process of collecting and analyzing data – in a way that is systematic, purposeful and accountable (Isaac & Michael, 1997). The purpose of this analytical investigation is, therefore, to obtain reliable and valid data, in accordance with the research problem and the accompanying research aims.

The strong subjective understanding of the terms being addressed in the thesis, ask for a qualitative research approach. Qualitative approaches are those in which the procedures are not as strictly formalized, while the scope is more likely to be undefined, and a more philosophical mode of operation is adopted (Mouton & Marais, 1990; Delport & De Vos, 2011).

Ethical considerations

As someone coming from a western country, I have to be careful with the subjective assessment of the concepts like livability and public health. Indonesia is a completely different context as The Netherlands, which can also mean our western vision on things is not the same as the Indonesian vision. Besides the subjective assessment, there also needs to be paid special attention to my position as an outsider. Why would I, as a foreign city-planner, be needed to solve the problems in a completely new country, which has its own city-planners? My position as an outsider can be used to give a different view on things, but can also work as something negative, as a lot of experiences will be new to me.

Research limitations

Since the project is focusing on an informal, slum area, there is only very limited information and

data available. Most of the information and data are for the whole Kelurahan (neighborhood), and are, because of the huge difference in living environments, not representative for the slum-area. Most of the assessment therefore would need to be made out of a subjective assessment, where a certain objective influence would be appreciated. Future research into information gathering of the kampung Tamansari would be desired, before re-designing the area.

02.5 CONCLUSION

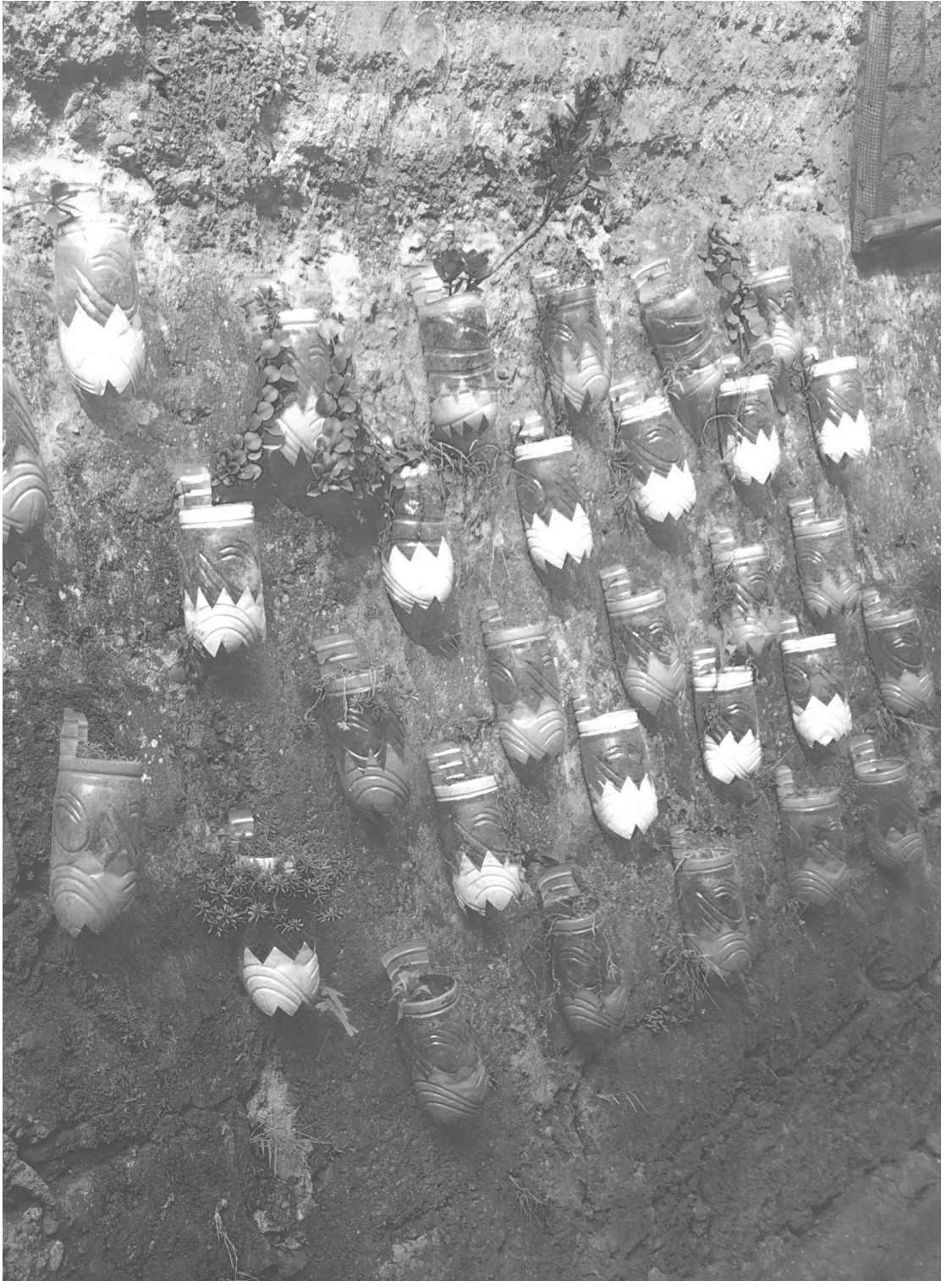
This chapter on the research methodology is showing how the different research elements are being expected to be held together, as if it was the glue keeping the whole construction together. It explains how the foundation of the research (problem statement, research question(s), research aims, conceptual framework, hypothesis, and the expected output of the research), is guiding the research methodology. The chapter is basically 'designing' the 'research'. It has created a construction, which will be the grip to hold onto in carrying out the research.

The 'why' and 'what' concerning the research, has been addressed in the foundation of the research. These descriptive and explanatory features are forming the main tools which help narrow down the needed types of research. The different components that are being addressed, are being shown in the conceptual framework. The theories behind these concepts are the main elements that need a specific type of research.

Because of the subjective nature of the concepts of public health and livability, the main body of research will contain qualitative research on the assessment of the public health and livability. This subjectivity is one of the main factors that makes the research really specific, as it is in need of a certain underpinning by research.

Since we're doing research by design, both processes are happening simultaneously. This means that the research, as it is framed right now, has to adjust to different or new indicators arising from the design-part. This interaction between the two elements is making sure that the research framework is not a fixed thing, but has to be adjusted to the results of the research and the design. Therefore, the current framework is only functioning as the stepping stone to get from the problem statement to the final design proposal. Currently, the expected route from the problem statement to the design proposal has been set out, but this route might change during the research and design process.

Img 02.5 - Vertical farm in a back-alley in Tamansari
(Source: Authors own)







03 THE FORMING OF A SLUM

The chapter 'The forming of a slum' will give insight into what a slum is, and how they came to be. It will start off with general theories of what slums are, and why they are there. Then the content will become more specific, by focusing on both Indonesia and Bandung. It will explain what a 'kampung' actually is, and give an overview of the different types of kampungs that exist, which all have their own set of characteristics and specifications.

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03.1	Slum forming	038
03.2	Rapid urbanization	041
03.3	Indonesia's kampungs	041
03.4	The kampungs of Bandung	044
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Img 03.1 - a 'gang' in kampung
Tamansari (Source: Authors
own)

03.1 SLUM FORMING

Almost every big city, in the third world, knows slum-neighborhoods in their urban structure. The UN-Habitat is describing slums as a group of individuals living under the same roof in an urban area who lack one or more of the following:

1. Durable housing of a permanent nature that protects against extreme climate conditions.
2. Sufficient living space which means not more than three people sharing the same room.
3. Easy access to safe water in sufficient amounts at an affordable price.
4. Access to adequate sanitation in the form of a private or public toilet shared by a reasonable number of people.
5. Security of tenure that prevents forced evictions.

(UN-Habitat, 2006)

Research by the United Nations Human Settlements Program in 2006 states that more than half of the slum-dwellers suffer from at least two of the, above mentioned, five deprivations. An estimated 20% of the slum-dwellers live in extreme poor conditions, and are lacking more than three of the mentioned shelter needs. These areas often lack a combination of sanitation and (clean) water with insufficient living space for families and inadequate, self-constructed housing (UN-Habitat, 2006).

Slum-forming is often the result of a mismatch between the supply and the demand of affordable housing in an urban region. These densely crowded areas are often the result of a rapidly growing urban population. The Affordable Housing Institute (AHI) even states that the process of slum-forming is an unavoidable process through which every rapidly urbanizing city must go through - including ancient Rome, 1780s London and 1880s New York (D.A. Smith, 2013).

The dynamics of the urbanization process in Indonesia, and other Third World countries, show similarities to the processes of nineteenth and early twentieth-century Europe and Northern America. The urbanization of Europe and Northern America was a reaction to the period of industrialization. Some could argue that urbanization without industrialization is an unbalanced process, as is the case in Southern Asia. Third world Urbanization continued its pace during the 1980s and 90s, in spite

Img 03.2 - Slum forming in 'Gang 7' in northern Jakarta
(Source: Authors own)





Img 03.3 (top) - Traffic jam in Jakarta (Source: Bastamanography,)

Img 03.4 (left) - Peak hours at the Jalan Maliaboro in Yogyakarta (Source: Authors own)

Img 03.5 (right) - Slum forming Right underneath high-rise apartment buildings (Source: Authors own)

of falling wages and prices and extreme numbers of urban unemployment. This was the first period where cities of which the economy shrunk with 2 to 5 percent could still have a population growth of 4 to 8 percent, which would therefore only worsen the economic situation (Simon, 1997).

Researchers from the ILO (International Labor Organization) have estimated that the percentage of formal housing in the new housing stock only rarely transcends the 20 percent. So out of necessity the people take matters into their own hands. This kind of urbanization can often be found in open, unbuilt areas in cities. These new migrants are coming to a certain city in the hope to find a better future. Therefore, the location within the city in which they live can be of huge importance to their income. This resulted in informal neighborhoods in highly dangerous, but central, locations, such as underneath highways, right next to a railway or right along polluted rivers (Dayaratne, 2003).

03.2 RAPID URBANIZATION

Rapid urbanization started becoming an important phenomena during the 20th century. This was the era in which the big growth of the world's urban areas took place, growing from an average of 13% of people living in urban areas to finally cross the 50% in 2007. By 2030 it is expected that a total of 60% of the people will be living in urban areas (UN Population Division, 2014). This ever growing amount of people in the urban areas, of course, have a huge influence on the structure and living environment these cities consist of.

When the population grows in such high numbers, it is almost impossible to provide everybody with a decent, affordable house. This gap between the demand and supply of affordable housing often results in informal urbanization, as the migrants take matters into their own hands and create their own shelter against the nature in free, open spaces.

But slum-formation does not merely arrives from the mismatch between rapid urbanization and the housing supply. The large amount of slum populations in developing countries, and particularly in rapidly urbanizing regions like Asia, are contradicting this. The essay by G.L. Ooi and K.H. Phua is highlighting the lack of capacity of the local governments to provide decent infrastructure which meets the economic and social needs of the region. They continue with blaming city governments for not effectively linking the economic development trajectory to implications for urban growth and housing needs (Ooi & Phua, 2007).

03.3 INDONESIA'S KAMPUNGS

The era of rapid urbanization in Indonesia started around the independence of Indonesia, in 1945, in combination with the growing migration of people from rural to urban areas, in search for a better future. Jakarta, the capital of Indonesia, grew from 1,5 million inhabitants in 1950 to over 16 million inhabitants in 2004, an growth of 14,5 million people in a period of just over 50 years time. (UN-HABITAT Urban Indicators Database , 2002) Currently, it is estimated that a total of 20,9 million people are currently living in an Indonesian slum, which makes up a total of 23,1 % of the total population (Davis, 2004).

The word 'kampung' officially translates to 'village', but is nowadays mostly used to refer to informal settlements within urban areas. Before the colonial times, the term Kampung was used to describe rural

villages. During the Dutch occupation the meaning of the term changed, as it was then used to describe residential areas where the non-European or Chinese inhabitants lived. These neighborhoods were often characterized by low-quality housing within a unhygienic living environment. Nowadays, there are two different types of kampungs: the kampung and the urban-kampung. Whenever the term kampung is mentioned in this thesis, it is being used to name the urban-kampung. The urban-kampungs are residential areas within an urbanized region of a more rural character, in other words: slums.

The historical kampungs are often positioned in the inner plots in the historical parts of the city. The 'formal' colonial buildings were often realized at the outside of the plots, leaving the inner plots open for kampung development. The newer urban-kampungs are often realized in open, central spaces in the city, such as parks or next to rivers or railroads, which can lead to dangerous living situations.

Since the kampungs have been realized in a spontaneous, unplanned way, the neighborhoods are characterized by an unstructured street-plan of small streets. These small streets also often function as gathering places, playgrounds and as roads for the many scooters and motorbikes. The housing

Img 03.7 (top) - Kampung neighborhood in northern Jakarta (Source: Authors own)

Img 03.8 (bottom) - A urban slum in the inner colonial block (Source: Authors own)

Img 03.6 - Historically preserved kampung Naga (Source: Authors own)





in these areas know a wide variety in shapes, colors and qualities. They can go from a freestanding, stone building to a self-build shed made out of leftover junk. Even though the living environments often lack a certain quality, the neighborhoods are also known for their strong sense of community and their mix-used tissue, made out of a wide array of small-scale shops, schools and mosques.

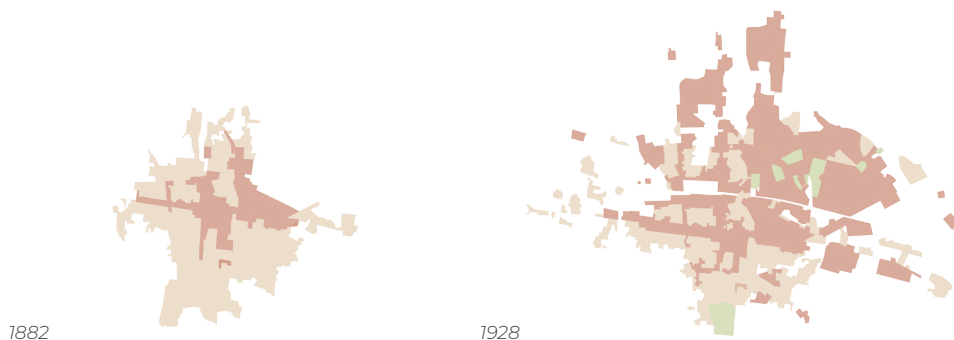
03.4 BANDUNG'S KAMPUNGS

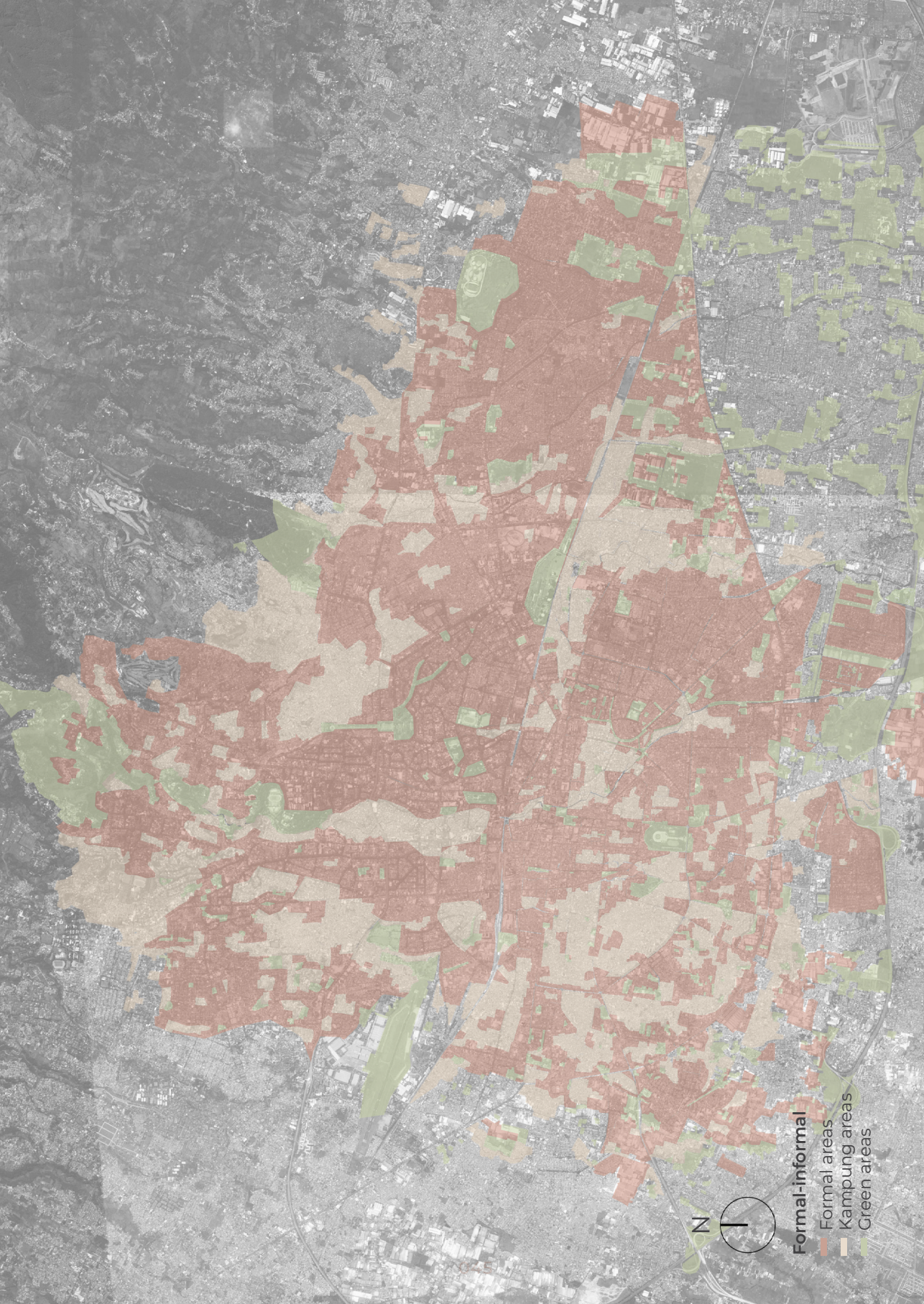
In Bandung, this process was no different. The more historical kampungs can be found in the center, and are positioned in-between the formal, colonial edges of the blocks. The contrast between the two nowadays has created a pleasant contradiction, with the formal, colonial buildings facing outwards and the kampung-building facing inwards. Because of this, the kampung areas are now creating a more peaceful and quiet environment, away from all the hustle and bustle or the busy roads.

The urban-kampung have mostly been realized after the independence of Indonesia, in 1945. Because of a lack of affordable housing together with the new flow of migrants wanted to settle as central as possible, a lot of informal housing has been realized on open pieces of land in the city. Most of the parks, realized in the northern garden-city area, have been transformed to informal kampung areas. Besides parks, other available places in the city, such as parks along the Chikapundung-river or next to the railway, were squatted as well, resulting into dangerous and unhygienic living environments. This change has also resulted in a shortage of green, open spaces in the city, as there were not many left.

Img 03.10 - Map of Bandung showing the kampung neighborhoods in the city (Source: Authors own)

Img 03.9 - Formal-informal division in historical maps (Source: Authors own)





Formal-informal

- Formal areas
- Kampung areas
- Green areas

The city, as designed by Dutch, had a maximum capability of 200-250 thousand inhabitants, but after the process of rapid urbanization started in the 1940's, the city quickly became overpopulated. The city of Bandung grew from 250.000 inhabitants, in 1945, to over 2 million in just over 50 years. The city currently hold a population of over 2,5 million inhabitants, and is even expected to reach a total of 4,1 million inhabitants by 2040. This new growth will create an even bigger pressure on the urban population (BPS Kota Bandung, 2014).

When talking about a growing pressure on the urban population in these kind of contexts, a distinction between dealing with density and crowding needs to be made. Both terms are closely linked, but can have different effects on the people's overall well-being. In this research, crowding is defined as the dwelling unit density and the density as the areal density. The difference between these terms can be found in the informal kampung-areas, where low-rise buildings predominate. These low-rise buildings tend to decrease the areal density, while the dwelling-unit density can rise to a very high figure, especially when multiple families are occupying a single building (L. Levy, A.N. Herzog, 2018).

Img 03.12 - Kampung dwelling along the Chikapundung river
(Source: Authors own)

Img 03.11 - Formal-informal division along the northern Chikapundung river in historical maps
(Source: Authors own)





03.5 CASE STUDIES

With the kampung forming such an important living typology to the urban fabric of the Indonesian city, it is important to fully understand what it means to live in a kampung. Therefore, during the field trip to Indonesia, a journey throughout the island of Java had been made, in order to see a wider range of kampung neighborhoods.

The idea of seeing these different case studies was to be able to make a better comparison between the kampung Tamansari in Bandung, and other kampung neighborhoods on the island of Java. In order

to understand what the characteristics of a kampung are, and what life looks like inside of the isolated living environments, a series of kampungs with different characteristics has been visited.

Within the city of Bandung, there are already a wider range of different kampungs, as the urban kampungs in the center of the city, the kampungs with a more rural character in the periphery of the city, the river-bank kampungs dating back from the Dutch colonial times and the more modern river bank kampungs, like kampung Tamansari. All of these kampungs

even though they are located within the same city, have different characteristics to them.

The case studies which have been done are focusing on all different types of kampung neighborhoods; from the poorest slums of Jakarta to award winning kampung improvement projects in Yogyakarta; each one of the projects has specific characteristics to them of what makes them great or bad living environments, which are important lessons to be learned before being able to design a health and livable kampung environment.



'Gang 7'

*Example of one of the worst slums in Indonesia
Jakarta, Java*

The slum around the pathway 'Gang 7' is one of the poorest slums in Indonesia. The living environment is showing serious health hazards, as most of the dwellings are constructed out of scrap material and positioned right above the sewage canals,

which are constantly realizing toxic gas. The people who live in these neighborhoods are some of Jakarta's poorest people, living in inhumane circumstances.

The neighborhood has been realized in-between a junkyard, from which

the community takes their building materials, and the Waduk Pluit; a sewage lake in the north of Jakarta. As can be seen in the images, most of the buildings are elevated from the ground, as the area is known for major flooding risks.



Railroad slum

*A slum build around the rail lines; one of the most dangerous areas
Jakarta, Java*

With the immense population growth of Jakarta, and the city's inability to realize a mutual amount of dwellings, a lot of the new migrants go on to inhabit some of the most dangerous open spaces within the city. This railroad slum, in the

center of Jakarta, is a 2-3 story slum neighborhood which is connecting the ground floor to the height of the railroad line. The railroad track is also used as a public space, where the people make use of the space by, for example, letting the children play here.

The neighborhood is thus dense, that a 50-60 cm wide alleyway is completely enclosed with surrounding structures, that no daylight can enter. On both sides of this alleyway, small apartments (of about 4 to 10 m²) are positioned



'Inner city block' kampung

*An urban kampung positioned in the center of the colonial blocks
Bandung, Java*

As could be seen in the historical research on the development of the city, the colonial city blocks were often constructed by a outer line of colonial buildings with an informal kampung environment in the center of the block. Even through the colonial

buildings have changed during the years in aesthetics and functions, the kampung centers are still functioning.

These 'inner city block' kampungs, are nowadays forming quiet and peaceful living environments within

the loud and chaotic city streets of the city. These living environments are often seeming to have a more qualitative housing supply, as the original kampung dwellings have made place for a series of free standing buildings.



Babakan Ciamis

*An urban river-bank kampung from the colonial era
Bandung, Java*

Kampung Babakan Ciamis is a slightly smaller kampung positioned only a few hundred meters south of kampung Tamansari. The kampung is the most northern river-bank kampung dating for the Dutch colonial era.

The kampung is positioned in-between the meandering of the Chikapundung river, and is therefore almost fully encircled by the river. Cutting right through the neighborhood is a small canal, as can be seen in the upper picture, which was previously used by a

steel factory for cooling down their machinery.

The inhabitants of the kampung are origin from the village of Ciamis, which explains the name of the kampung.



Kampung Naga

*A preserved, original rural kampung
Kampung Naga, Java*

Kampung Naga, located close to the city of Bandung, is one of the few original rural kampung villages, where it is still possible to experience what life was like in the rural kampungs. That means that the kampung is completely off the grid

and is not connected to any infrastructure.

The kampung has been build up from several family homes, all aiming in the same direction. The Kampung knows, besides the many residential buildings, also a community center

and a mosque, which are located at the head of the village square.



Kampung Pelangi

*The rainbow kampung
Surabaya, Java*

The kampung, of 390 dwellings, used to be known as one of the slum neighborhoods of Semarang, but through an investment of Rp. 300.000.000 (€18.500,-) by the local government (SOURCE), the kampung has been turned in a colorful display of

paintings and murals.

The investment was made with the idea of boosting the local economy and turning the kampung into a touristic hotspot. And indeed, the bright colors and name of Kampung Pelangi (Rainbow

Kampung) attracted a wide number of tourists, and the area became a Instagram-hotspot.

The rapid growth in tourist numbers has also boosted the local businesses in the area, such as flower-, food- and souvenir shops.



Kampung Kali Code

*An award-winning, collaborative kampung improvement project
Yogyakarta, Java*

The kampung Kali Code was once considered a slum, full of criminal activities and unhealthy living environments. The kampung was realized by illegal immigrants, who were forced to build their needed shelter on top of refuse dumps and open sewage lines.

This was until Y.B. Mangunwijaya stepped in, and fought for the improvement of the kampung neighborhood. Mister Mangunwijaya managed to realize a cooperative system with the local community to rebuild their neighborhood.

The development of the kampung happened gradually, and was mostly realized to meet the needs of the community and to deal with the underlaying topography. The work by Y.B. Mangunwijaya has been awarded with the Aga Khan Award in 1992.





04 KAMPUNG TAMANSARI

The chapter 'Kampung Tamansari' is meant to give an insight into the project area. The chapter will start of with the scale of the Kelurahan (the neighborhood) and will then further on go more specific into the kampung area and will finally highlight the relation between the project area and the surrounding kampung neighborhoods.

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04.2	History of the kampung	056
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Img 04.1 - View on the
Chikapundung river in
kampung Tamansari (Source:
Authors own)

04.1 KELURAHAN OF TAMANSARI

Tamansari is one of Bandung's so-called Kelurahan, which can be described as an urban community, which form the subdivision of the city's districts. The kelurahan of Tamansari is located in the northern region of the city. The name Tamansari can be divided into 'Taman', which translates to garden, and 'Sari' which can be translated to beautiful or flowers. The kelurahan Tamansari in Bandung, as the project location, is thanking it's name to the green backbone, on which the Kampung has been realized. The name Tamansari, is more famous because of it's namesake located in the historical center of Yogyakarta, a popular tourist destination in the southeast of Java. Here, the water-castle Tamansari, translated to

'the perfumed garden', was realized in mid-18th century, as the royal garden of the Sultanate of Yogyakarta.

The Kelurahan of Tamansari holds a total population of around 25.000 people, of which 76% (19.000) people are expected to be living in informal kampung-neighborhoods (Kelurahan Tamansari, 2009). The Kelurahan in Indonesia are being subdivided into smaller Rukun Warga's (RW's), which function as community service formation, and are even being further subdivided into Rukun Tetangga's (RT's), which form the lowest administrative division of Indonesia, and are build from a collection of different families within a certain area . The Kelurahan of Tamansari currently

holds 20 RW's, which are further subdivided by 151 RT's.

The Kelurahan has a total size of 102 Ha, of which 92 Ha are being used for housing, 9 Ha is being used for service and 1Ha is unusable land (presumably the Chikapundung river). Tamansari is located in a beneficial point, right in-between the city-zoo, the Islamic university, the Technical University of Bandung, the Cihampelas shopping area holding the newly constructed Pasarpati Flyover, the new Icon of Bandung. Because of it's location, the kelurahan is having a growing interest of students looking for cheap housing and restaurants and hotels looking for central, yet cheap locations to settle.

RW	Inhabitants	Households
RW 01	534	115
RW 02	233	72
RW 03	816	342
RW 04	965	211
RW 05	1421	259
RW 06	1053	257
RW 07	1877	652
RW 08	277	31
RW 09	1494	477
RW 10	935	290
RW 11	1159	334
RW 12	1567	303
RW 13	1604	340
RW 14	712	168
RW 15	2988	750
RW 16	1901	524
RW 17	1405	264
RW 18	2067	623
RW 19	530	222
RW 20	1335	364
Total	24.987	6598

Img 04.2 - Statistics of the different Rukun Warga's in the kelurahan of Tamansari (Source: Authors own, based on: Profil dan Tipologi kelurahan Tamansari, 2009)

Img 04.3 - Devision of the different Rukun Warga's in the kelurahan of Tamansari (Source: Authors own, based on: Authors own)



04.2 HISTORY OF THE KAMPUNG

Next to the northern Chikapundung-river was once an enormous green, open space which functioned as the main green backbone of the city. During the 1920's and 30's, when the Dutch-Indies were planning to move their capital from Batavia to Bandoeng, the plan was made to turn this green, open space into the new public park of the 'Europeesche Zakenwijk' (European Business Neighborhood), as the new north-eastern expansion plan was called. But, because of the start of the second world war, and therefore the end of the Dutch occupation, this park was never realized.

As can be seen in image 04.4, The park lay-out was already included in the expansion plan for Bandoeng-noord. The Europeesche Zakenwijk can be seen southeast of the Tamansari area, Bordered by the Chikapundung river and the eastern railroad line. The new to-develop park had been designed with a English landscape style, as was popular at the time, and extended all the way to the northern part of the Institut Teknologi Bandung (ITB), The red plot most north in the map. Nowadays this area is housing one of the densest and biggest informal kampungs of the city: Kampung Tamansari.

Professor at the Technical Institut Bandung, Allis Nurdini, explained in an interview that most of the kampungs in Indonesia are named after the region the inhabitants originally migrated from, for example; the inhabitants of kampung Babakan Ciamis origin from the village of Ciamis, from which they were forced to leave after attacks from Muslim extremists. Kampung Tamansari is one of the exceptions in this process. The inhabitants of Tamansari are origin from the area of Garut (South of Bandung) and came here as a result of the Indonesian Freedom Movement in the 1950's and 1960's. Even though the first buildings in Tamansari date back from this time, it wasn't till the 1970's that Tamansari started urbanizing rapidly, as a result of rural-urban migration.

The new migrants inhabited the Tamansari area, because of a combination of different factors. The newly developed 'Europeesche Zakenwijk' came with a wide array of functions and services, which weren't anywhere else to find in the city. The proximity of these functions made squatting open, unused space in the north-eastern quarter very favorable. The presence of the Chikapundung river was another factor. Since there was no sanitation system, or fresh water supply the people were dependent of the river water. The fact that the green backbone hadn't

Img 04.4 - Zoom-in on historical map of Bandung in 1927 (Source: unknown, 1927)





Img 04.5 - Chikapundung
river in the kampung (Source:
Authors own)



04.3 KAMPUNG TAMANSARI

Kampung Tamansari is located along the Chikapundung river, in the Kelurahan Tamansari. It consists of a western and eastern side, with the Pulosari island in the middle. The island of Pulosari is the densest part of Bandung, with 408 people living in the space of about 0.8425, making it a total density of around 964 people per hectare (96.400 inh/km²)(Muniwir, 2015).

The Kampung neighborhood has a total of around 19.000 inhabitants, over an area of around 33 hectares, giving it an average density of around 576 people per hectare (57.600 inh/km²)(Kelurahan Tamansari, 2009).

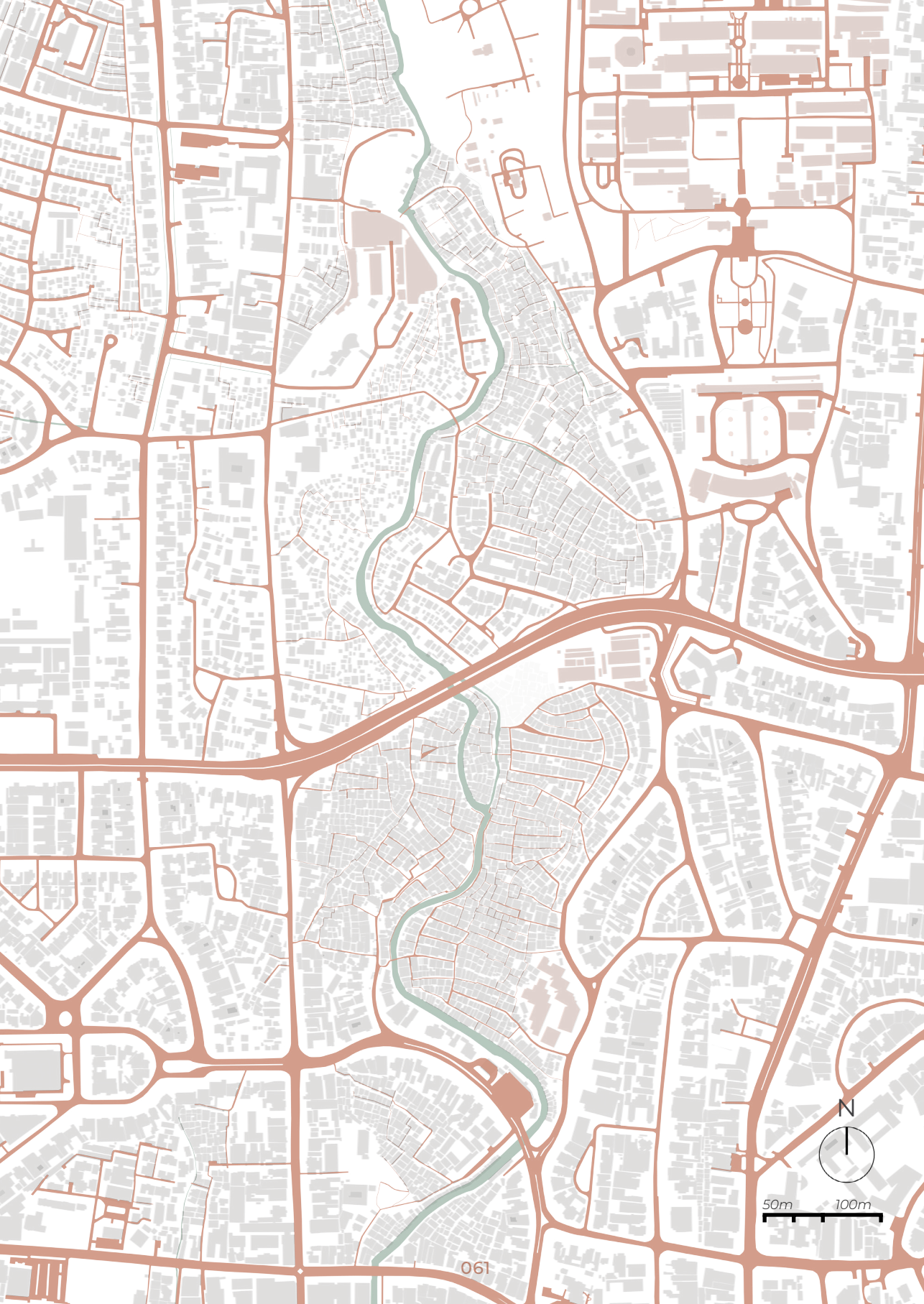
The Kampung knows a clear east-west orientation, as can be seen in image 04.6. The different 'gangen' (alleyways) are entering the kampung from the Jalan Tamansari and are from these points branching into smaller pathways throughout the whole area. The kampung is completely car-free, as the small widths of the streets make it impossible for cars the access. Instead, most of the inhabitants of the kampung have the possession of a motorbike as their main mode of transport.

The Chikapundung river has had it's positive and negative influences on the area. Of course, the river was used for disposing the waste the people produced, but the river also flooded regularly. The would reach till up to a meter into the people's houses. The problem has recently been tackled with the realization of a new pathway along the riverbanks, which also heightens the water barrier.

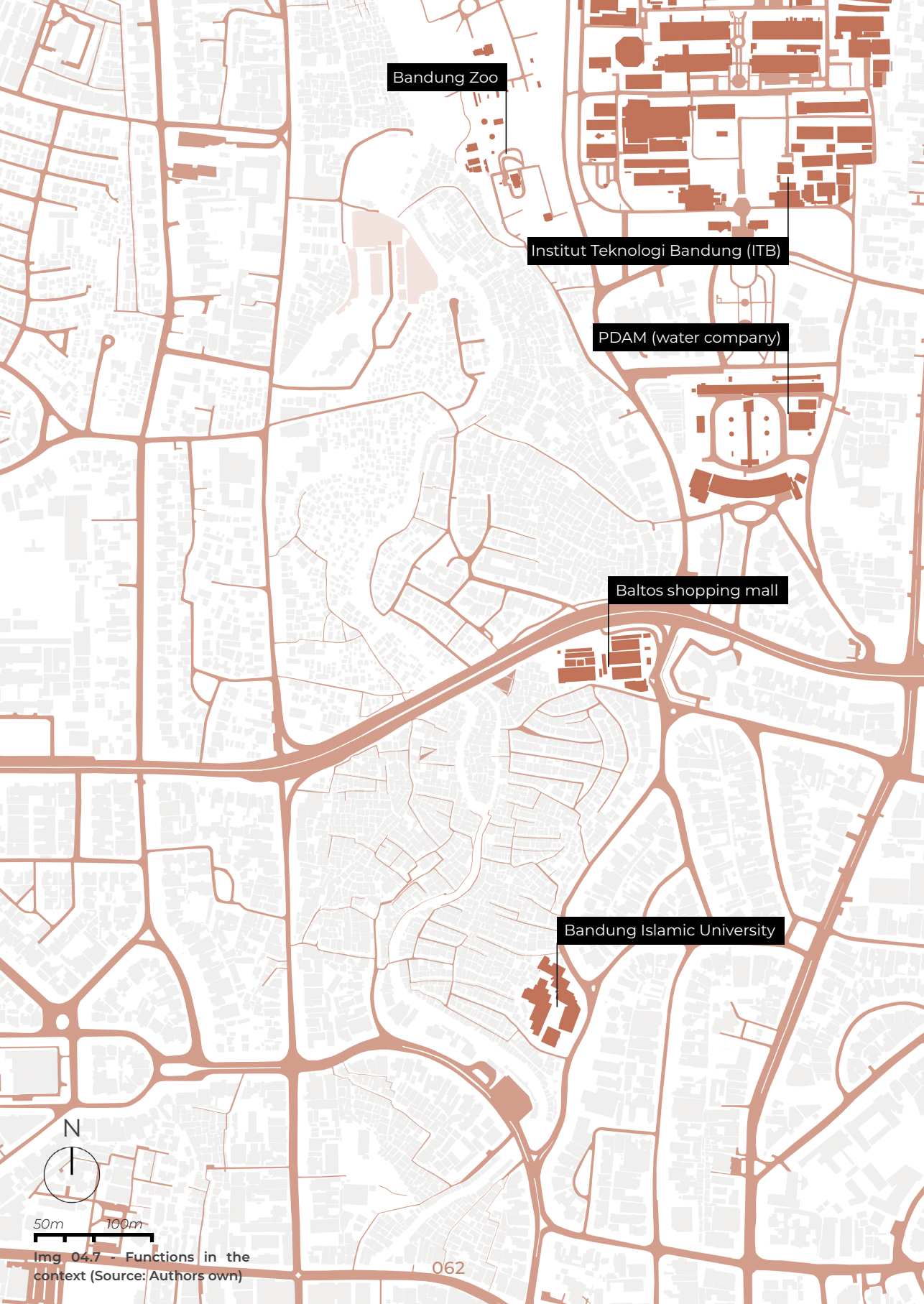
In this thesis, the project location is situated on the eastern bank of the Chikapundung-river. Because of the presence of the river, the kampung area is realized on a slope. The nearest volcanic mountain, north of Bandung, is creating a south facing slope, whilst the river itself is creating an east-west orienting. The different in the steepness of the slope, is also creating a fragmented urban tissue in the kampung area. Even though the Kampung is seen as one area, the neighborhood knows a wide variation in different qualitative neighborhoods.

Since the most outward entrances to the kampung, along the Jalan Tamansari, are that much higher then the lowest part along the river (15 - 20m), they often are following a straight line towards the flatter surfaces. Because of the steepness of the slope, some of the entrances have been realized in a diagonal way, to be able to create a less steep road.

Img 04.6 - Morphological map of Kampung Tamansari and context (Source: Authors own)



061



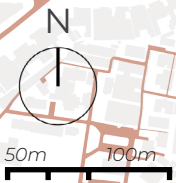
Bandung Zoo

Institut Teknologi Bandung (ITB)

PDAM (water company)

Baltos shopping mall

Bandung Islamic University



Img 04.7 - Functions in the context (Source: Authors own)



Img 04.8 - Kampung areas in the context (Source: Authors own)

Life in the kampung

One of the main qualities of the kampung area is the strong sense of community, topped with the huge amount of participatory incentive into improving the kampung area. Because the local government is trying not to get involved with the informal kampung neighborhoods, the people manages to arrange everything on their own, resulting in a wide range of solutions into creating their own informal social and economical structure.

The inhabitants created their very own economical structure, in which everything can be bought and sold within the kampung area. Besides for work, nobody is forced to leave the kampung area if they desire not to.

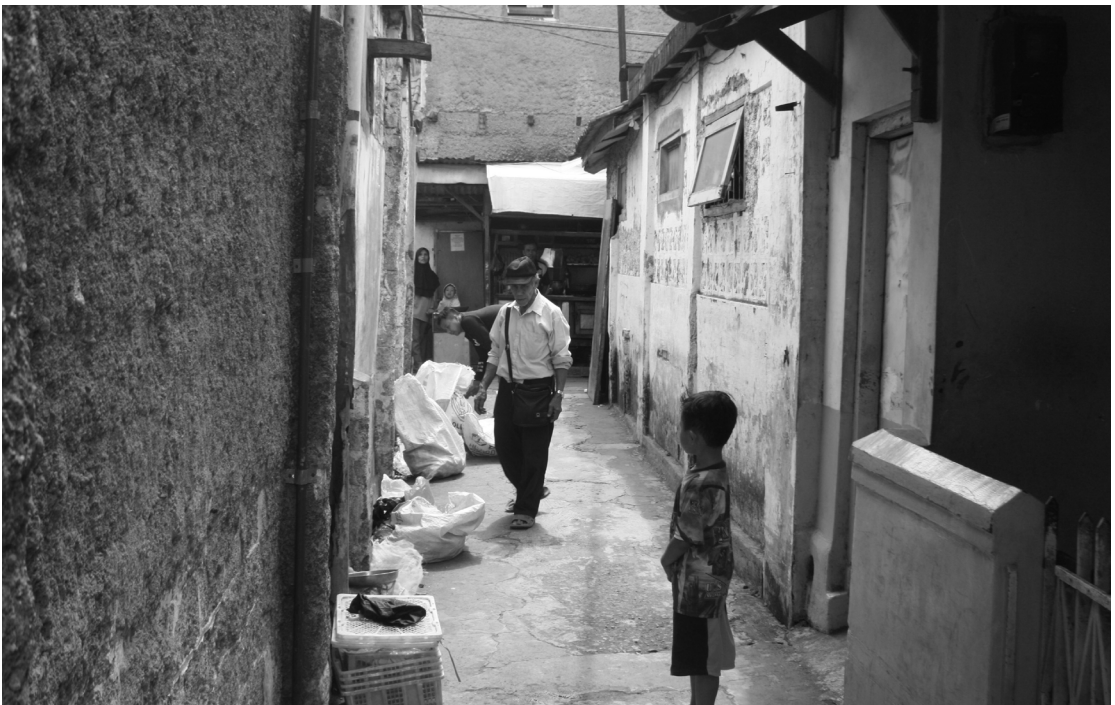
Market salesmen leave for the markets in center, and buys fruit and vegetables, which they later sell in an informal market in one of the narrow 'gangan' (alleyways) of the kampung. The markets in the city are often very early, especially if you want to manage to get the best products, and far away from the kampung, which explains why people are willing to pay these products inside the kampung.

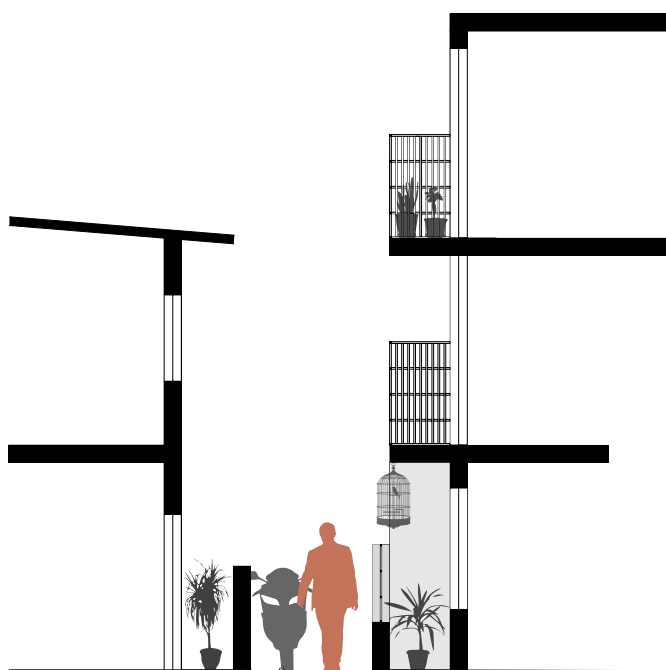
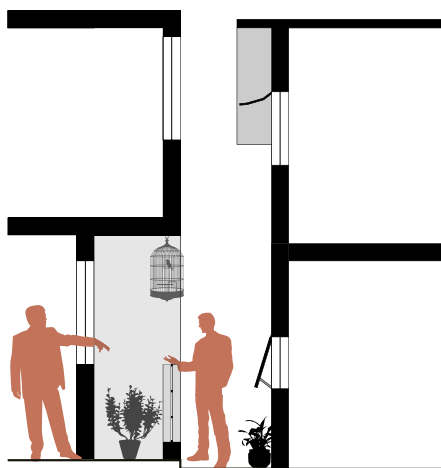
The RW's all have their own Tucan (handyman) which is being payed by the people themselves. This

Img 04.10 - Section A: Section of a typical street in the 'maze' area (Source: Authors own)

Img 04.11 - Section B: A wider variation of a street in the 'maze' area (Source: Authors own)

Img 04.9 - Informal food market in a kampung alley (Source: Authors own)







Tucan is helping the people with the construction of new dwellings, or with improving the quality of the kampung.

Other examples of this informal economy are the local waste-men, which come and pick up the household trash and bring the trash to a central point, to where the garbage trucks do manage to reach. These people are fully depending on tips from the local community.

The strong sense of community is also visible in other aspects, as the night-watch duty, all the men have to take part in one night every few days. Every RT has its own security-post, positioned on a central point, which during the day functions as the social meeting point for the community. Such a security-post can be seen in image 04.14.

During the day, the demographics in the kampung change, as most of the men have a job outside of the kampung, with only the elderly, women and children staying behind. Therefore, the RW's are organizing different activities, such as social gathering of the housewives and central sport- and dance activities.

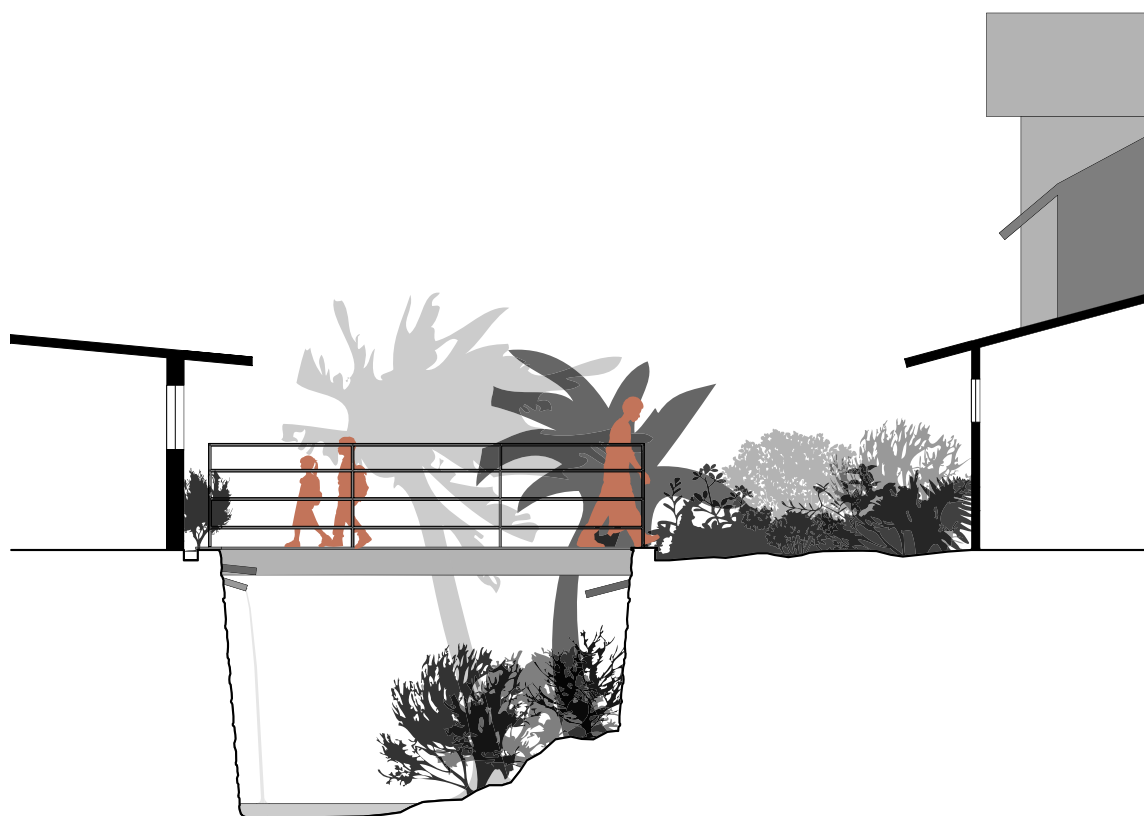
Img 04.12 (left) - Sofa taking up full front lawn for social purposes (Source: Authors own)

Img 04.13 (top right) - Small social gathering place next to the local Masjid (Source: Authors own)

Img 04.14 (bottom right) - Security-post on Pulosari island (Source: Authors own)

Img 04.15 - Section C: Section of a typical street in the formal pockets (Source: Authors own)

Img 04.16 - Section D: Section of connection between the formal pocket (right) and Pulosari Island (Source: Authors own)



04.4 THE PROJECT AREA

The project area of this research is positioned on the east-bank of the Chikapundung river in the southern part of kampung Tamansari. The project location has been determined during the field research, where, whilst walking through the area, a distinction between the different parts of the kampung became clear.

As can be seen in Img 04.19, the kampung could be categorized in two different environments: the 'maze' area and the two 'formal' neighborhoods. These nicknames arrived during discussion, where they were used to explain about what part of the kampung was referred to. The 'maze' area is thanking its nickname to its high density and chaotic structure of small 'gangen' (alleyways) in which it was hard to find your way. The other 'formal' neighborhoods had a way clearer structure and a higher quality of buildings and public space.

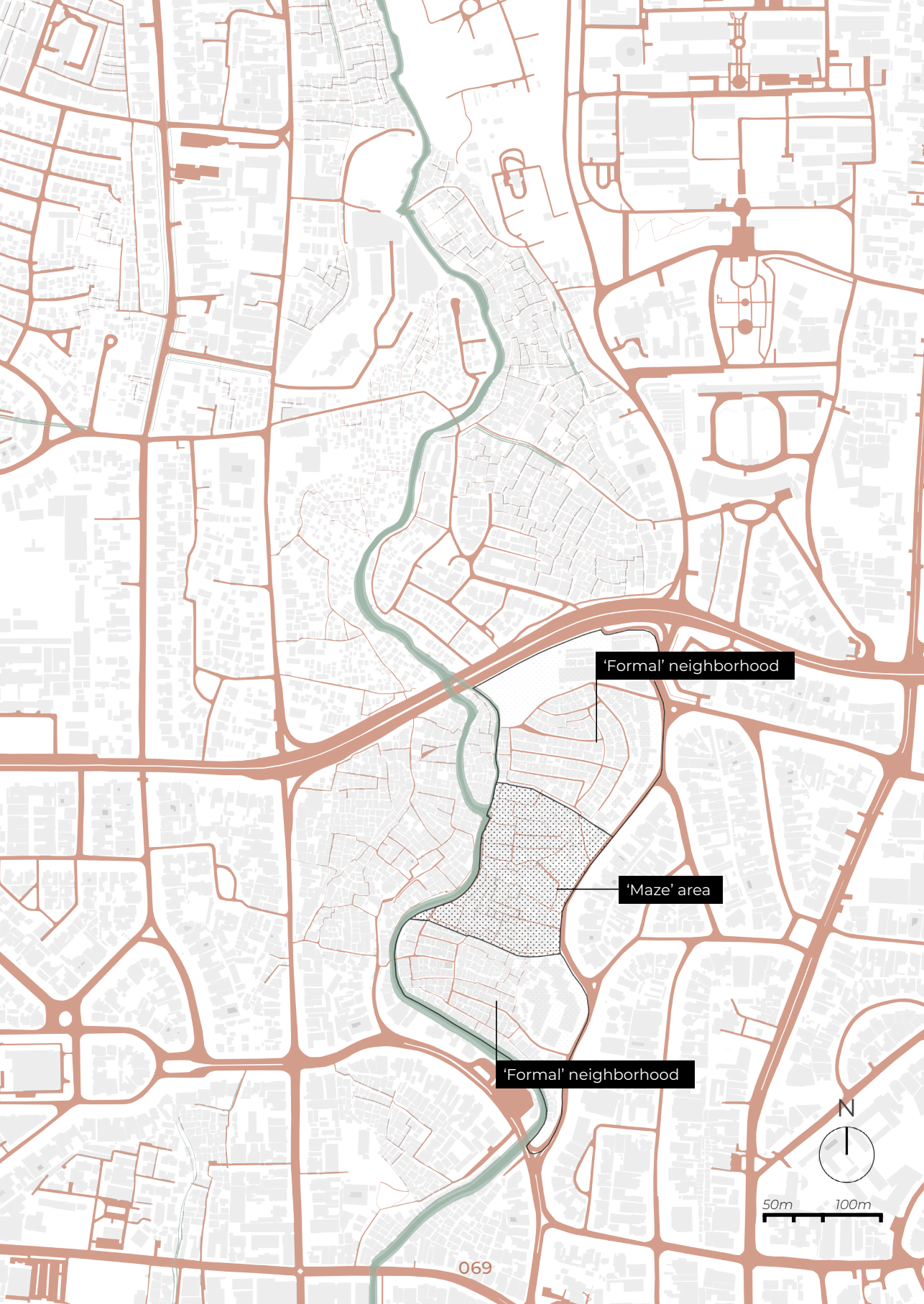
The 'maze' area is positioned right in-between the two 'formal' neighborhoods, and is therefore forming a gap or barrier between two well functioning areas. In addressing the central part of this area, we can manage to have a bigger impact on the final result, as not only the design area itself will be improved, but its results will spread through a bigger area, as it will also create a better functioning neighborhood.

Img 04.17 (left) - Typical street-view in on of the 'formal' neighborhoods (Source: Authors own)

Img 04.18 (right) - Typical street-view in the 'maze' area (Source: Authors own)

Img 04.19 - Map of Tamansari showing the 'maze' area and 'formal' areas (Source: Authors own)





'Formal' neighborhood

'Maze' area

'Formal' neighborhood



50m 100m

069



Img 04.20 - 1:1000 model of
Eastern bank of kampung
Tamansari (Source: Authors
own)



Project area RW13

Islamic University

Chikapundung

The 'formal' pockets

The 3D-section, below, is showing the basic structure of the 'formal' neighborhoods. In here, we can see that the strip can be subdivided into a total of three different structures, with the Chikapundung river being a topographical, fixed element.

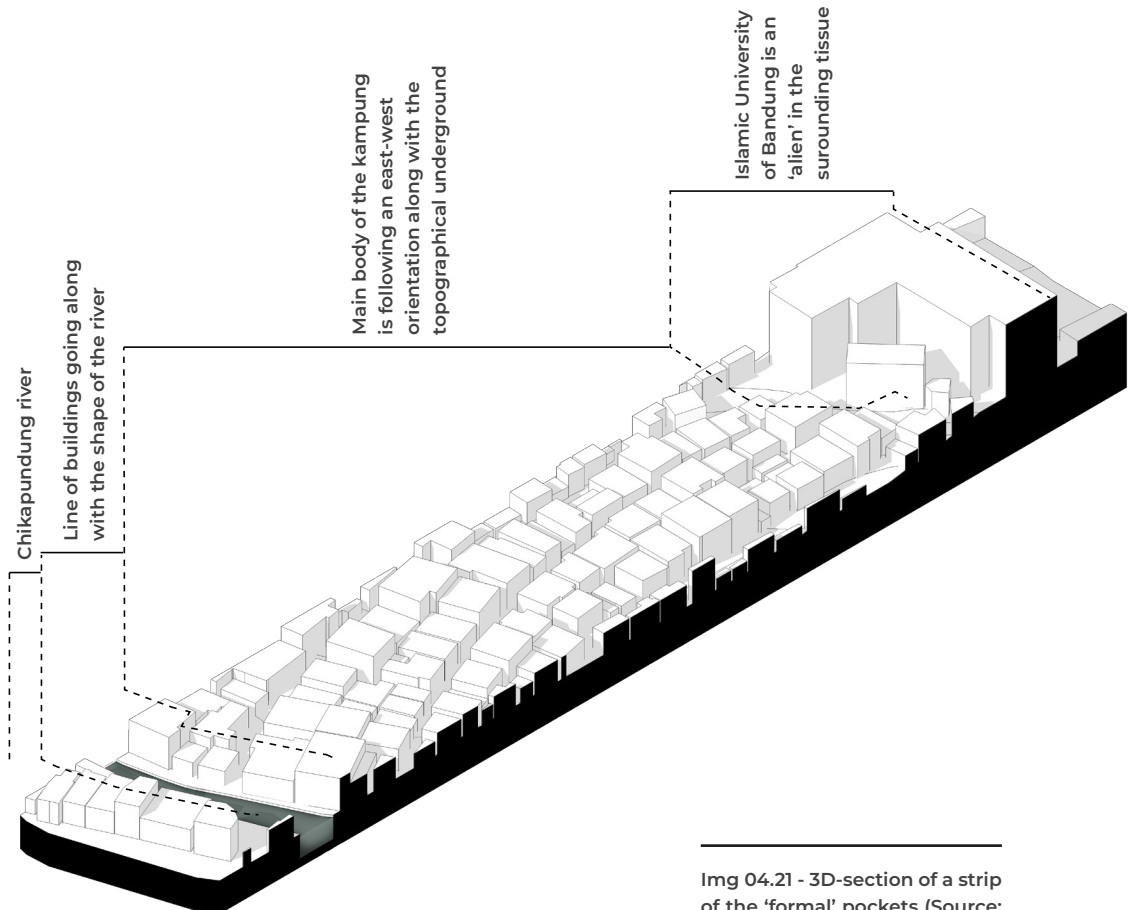
The buildings along the Chikapundung river are all turning their backs towards the Chikapundung-river, as the river is mainly

conceived as the central sewage line of the city. So instead, the buildings are all oriented to the street going parallel with the river.

The main body of the kampung in the 'formal' pockets is structured contra to the underlaying topography, utilizing the natural slope to, for example, lead the storm-water into the lower positioned Chikapundung river. You can see a clear, ongoing

structure in the area, with wide streets.

The Islamic University building is fully ignoring any surrounding structures, and has positioned itself as an alien in its context. This can also be seen in the unclear transition from the existing structure into the university ground.



Img 04.21 - 3D-section of a strip of the 'formal' pockets (Source: Authors own)

The 'maze' area

In a first comparison in the two sections, we can see that the 'maze' area consists of a wider variation of structures. These multiple structures come mainly due to the steeper slope in the area.

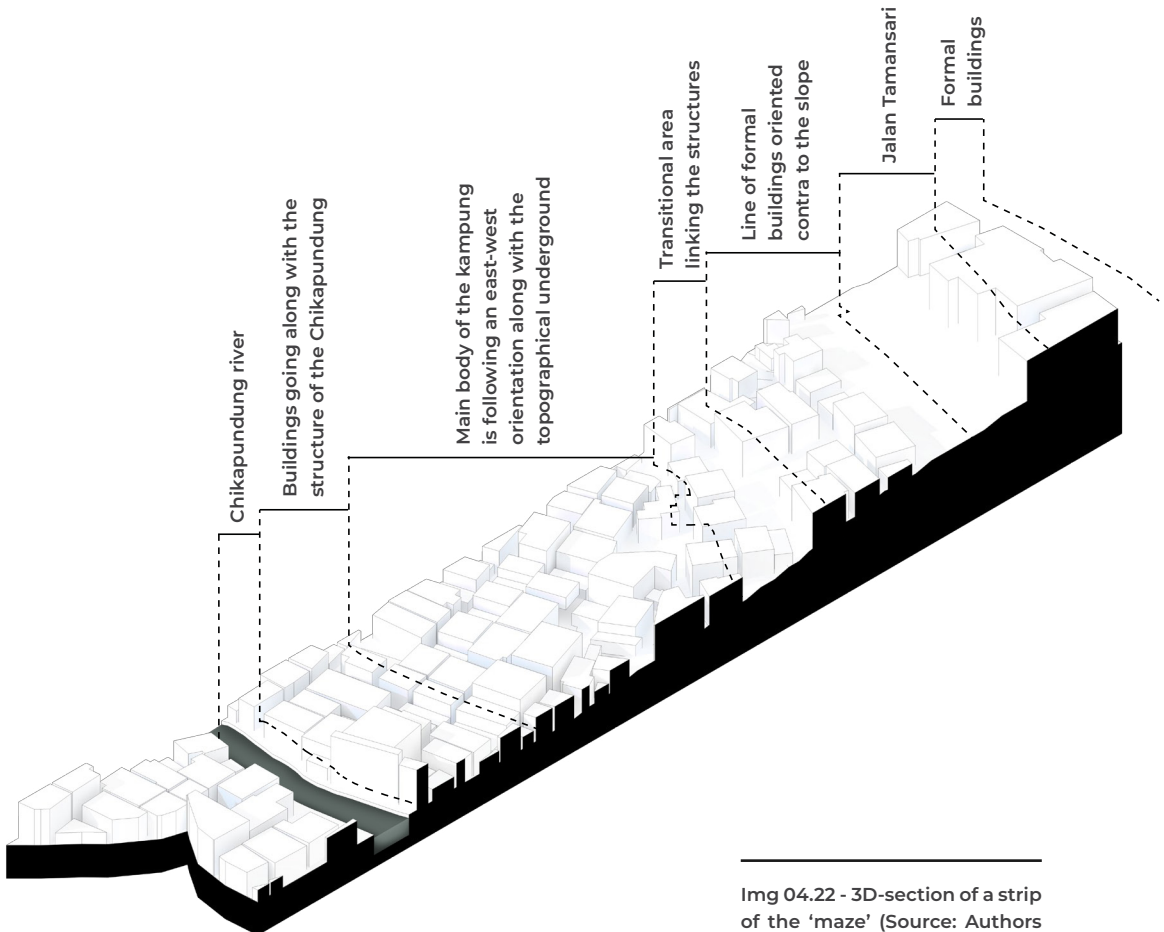
Just as with the 'formal' pockets, there is a line of buildings following the structure of the river, but are not fully turning its backs on the river, because of a 'gang' leading directly along

the riverbank. This is only for this exact location, as most of the buildings are also facing into the opposite direction.

After this line of buildings there is the main body of the kampung, which is nothing different from that of the 'formal' pockets, besides the fact that there is less of a clear street structure visible, and the streets itself are of a smaller width. The main body is smaller in length than the 'formal'.

The building positioned on the steepest part of the slope are oriented along with the slope, so counter-wise from the main body of the kampung. The slope makes it easier to build in this way, instead of the steep topography.

In-between these two structures is a small patch trying the link the two structures, resulting in a chaotic structure with no clear orientation.



Img 04.22 - 3D-section of a strip of the 'maze' (Source: Authors own)





05 LIVABILITY AND PUBLIC HEALTH

The concepts of Livability and Public health are the main characteristics of the problems within the kampung neighborhoods. This research will focus on the theoretical knowledge that exists of these concepts, and will give an understanding of how we can manage to work, and improve, the perception of Livability and Public health. It will end with creating a research and design focus within the theory, which will be research in a more empirical way. This focus will also mark the main design components.

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Img 05.1 - View on the Chikapundung river in kampung Tamansari (Source: Authors own)

05.1 LIVABILITY

Since poverty is so strongly related to ill-health, it therefore also directly influences the perception of well-being of an individual. The livability of a place expresses the amount to which a context is fulfilling the demands of a certain person. This chapter will look into the difficulties around livability, how we can influence the livability in the design-practice and will highlight the relation to public health.

Livability is a complex and vague concept, which currently doesn't even have a clear definition. Before, livability often was linked to the gross domestic product (GDP), as they assumed that the economical well-being was the main indicators on the perception of qualitative life. Even though there do is a link between the two components, the GDP is not directly equal to the livability of a place. For example, if there would be decided to cut down a Forrest, this would have a positive influence on the GDP, but the cut down Forrest would on the other hand decrease the livability of the place. Concluding this misconception of livability is that the GDP, or financial well-being, does not go hand in hand with social, environmental and economic progress (Eurostat, unknown).

Even though there is yet to date no clear definition, it is clear that Livability is about the relation between subject (organism, person or community) and its surroundings, and the extent to which this surrounding is able to sustain the needs of the social life it sustains (Dorst, 2005 & Hankins, et al, 2009). The problem with defining Livability is that it consists of both objective and subjective matters. The subjective matters make it that every person is able to perceive the livability in a different way (Balsas, 2004). Thus, even though the objective matters are creating the physical components of well-being, they still don't directly influence the experience of well-being (Campbell, 1976). Somebody's personal experience of well-being is not only created by the physical environment, but also to the contrast with that of what a person perceives as normal (Dorst, 2005). For example, somebody from a slum might experience an average neighborhood as really livable, while somebody coming from a richer neighborhood might have a more negative experience of the same neighborhood. These different characteristics of livability make it very difficult to determine how livable a certain place is, but it is not impossible to get a understanding of the livability.

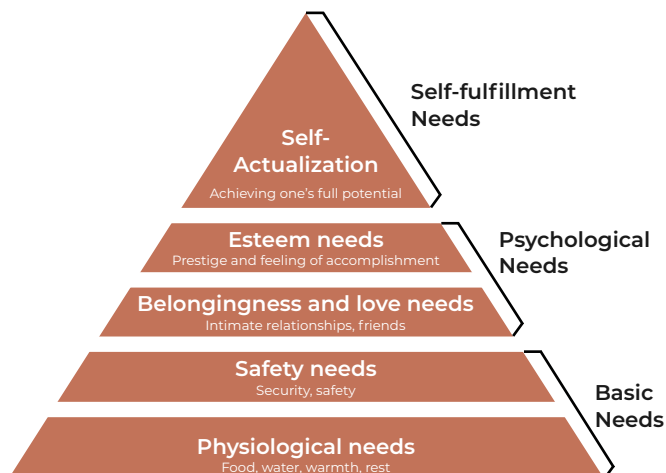
Psychologist Abraham Maslow invented the pyramid scheme, as can be seen in image 05.2, in which he

showed the hierarchy of the needs of people. This classification system is reflecting the universal needs of society as its base and is proceeding to more acquired emotions in the top of the pyramid (Dekkers, Lambert, 2018). The scheme is showing how drive and motivation, which are the main goals in this scheme, are co-related within human behavior.

The concept is working in such a way, that one layer must be satisfied, before one can achieve the motivation for the next layer. All of the different layers are need to be met by a person, in order to perceive a feeling of satisfaction. The five different layers, which can be seen in the scheme, all have different actors and components involved. The bottom two layers, which combined form the 'basic needs', are mainly created by the surrounding environment in which a certain object or organism is finding itself. Because these components are more about setting the context, the components have a stronger spatial dimension to them. The psychological needs and the self-fulfillment components are much more based on the social and personal perception of life, and have a less strong spatial dimension to them. Therefore, it is important that as urban designers, we make sure that we provide the people with all of the physical components in within the 'basic needs'.

Even though Livability doesn't have a clear definition, we all have an idea of whenever something is positive or negative for the livability of an area. As explained by Myers in his contribution to the Journal of the American Planning Association in 1988: "Livability is an 'ensemble concept' (Myers, 1988). In

Img 05.2 - Maslow's Hierarchy of needs (Source: Authors own)



here, Myers explains us the term Livability actually exists of different sub-components that altogether make 'Livability'. But just as with the definition of Livability, this list of sub-components is just as undefined and knows a lot of different lists with different components and reasons involved.

A certain list of components might be more usable in one place then in the other. For example, in 1990 the Toronto Star Index was implemented in order the compare the livability of different cities in northern America. Some of these indicators were, for example, average ticket costs for rock concerts and baseball games, in order the express the economical capability of the citizens (Lawson, 1979). These kind of indicators are of course really context-specific and would not be applicable in contexts were rock concerts or baseball games were less popular. Multiple possible lists of components of livability have been compared to one another in order to find the best suiting description of what the concept of livability consists of. This paper will further continue to work within the list of components as presented by Lowe, et al, (See figure 05.3) for measuring the livability of Melbourne, from which the focus of Health and social services will derive.

As we can see in this set of components, is that all the different components are quite general, different from the Toronto-star index for example. The difficulties with a list like this, is that each component can still have a set of different variables to them, which might be different from one another according the object or organism involved, and the

Components of Livability	
1.	Crime and safety
2.	Housing
3.	Education
4.	Employment and income
5.	Health and social services
6.	Transport
7.	Public open space
8.	Social cohesion and local democracy
9.	Leisure and culture
10.	Food and other local goods
11.	Natural Environment

Img 05.3 - Components of livability (Source: Authors own, based on Lowe, et al, 2013)

context in which this organism is finding itself. But what this list does show us, is an understanding of different components that will always influence our perception of the quality of life, apart from the context. So since we have an understanding of the current life in the kampung of Tamansari, we are able to twist the components in such a way that we can create a better quality of life.

One of the most important factors for creating a more livable kampung neighborhood, is to realize a healthier environment. Since the kampung neighborhoods are characterized by low hygienic standards and unsafe living environments, it is causing huge problems concerning the public health of the kampung inhabitants. Even though the components here has been described as 'Health and social services', the choice has been made to continue with the topic of public health, as social well-being, and therefore social services, are included within the concept of public health.

05.2 PUBLIC HEALTH

Addressing public health, as an sub-component of livability is importance as the slum-population will rapidly grow in the upcoming years. The current, unhealthy living environments, that the kampung areas are being a threat to the public health of the kampung population. In understanding what health is, and how we can work within this concept, we can achieve to create healthier living environments for both the current population, as the new migrants settling in the kampungs.

In order to asses the urban health of kampung Tamansari, as a sub-component of livability, we will need to get a better understanding of what health actually is. After the second world war, the World Health Organization was one of the first projects initiated by the United Nations. In 1948 they defined health as:

“A state of complete physical, mental and social well-being and not merely the absence of disease or infirmity”

- World Health Organization, 1948

A common understanding of 'health' was considered important, as the United Nations, at the time, saw health as the gateway to worldwide peace. The improvement of world health would make an important contribution to world peace, as health and peace were seen to be inseparable, something that later found out not to be related with one another. Even though this is still the official definition of what health is, there is a growing resistance against the definition, as it is described to be 'too general'. The description is thus general, that it can also be used to describe other terms, as 'ultimate happiness'; a term that can be measured through the same criteria, but still has a different meaning to it. Furthermore, the general description would also make it possible for misuse of the term, as the concept hasn't yet been clearly delineated. One other critic on the definition is that there is not clear distinction between health as a norm, and health as an ideal, something which should derive from the definition (Callahan, 1973).

Most of the critics against the current definition of health, have failed to come up with a better alternative. According to Callahan, in his review-essay on the definition of health, explains what is wrong with the current one, but is admitting that there is no better alternative yet, after which he continues with saying that health is "an intrinsic relationship between the good of the body and the good of the self" (Callahan, 1973), in which he is aiming to clear the relation between the health of the body and the health of the mind.

So it is clear to say, that as with livability, health is a complex term to both understand and work with, but again, it is not impossible. Since the concept of health is also determining on a big subjective perception, we won't ever be able to fully please everybody involved, but by understanding the health problems there are right now, and getting an understanding of how health is being shaped by the physical environment, we can influence the public health in such a way, that it is possible to improve the physical components that create people's own perception of health.

Because health is an umbrella term, by addressing health, you will be addressing a lot of different topics. According to the World Health Organization some of these topics could be: the support of aging populations, expanding affordable housing, upgrading water and sanitation infrastructure, etc. A focus on health is key to tackling all of these challenges, and many more (WHO, unknown).

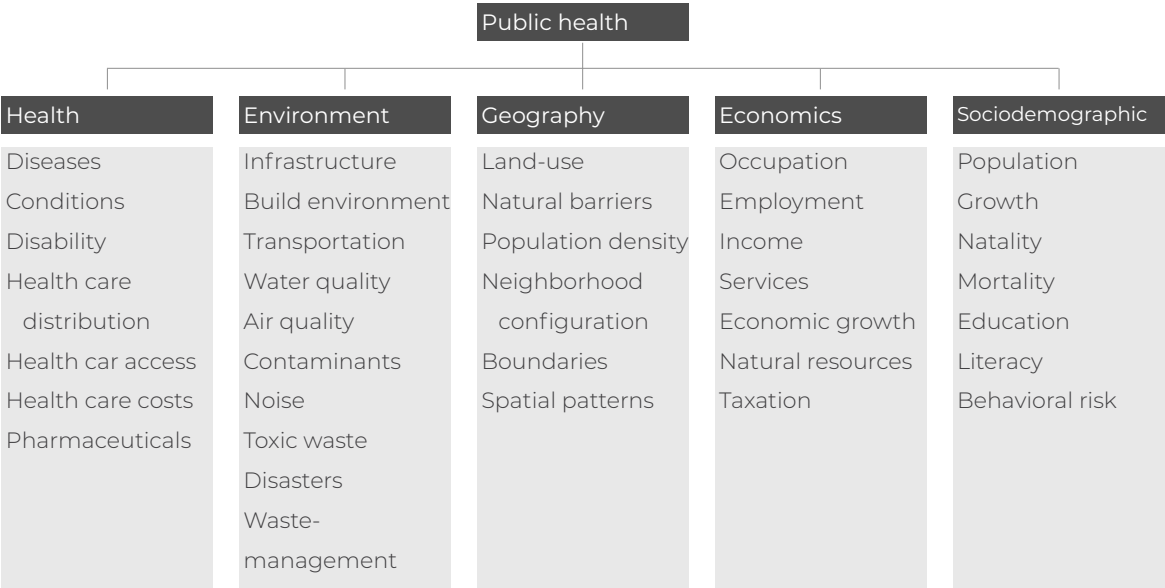
Other lists of determinants highlight other ideas, that might be important to take into consideration, as the World Health Organization’s own list, where a distinction has been made between:

- A. The social and economical environment
 - B. The physical environment
 - C. The person’s individual characteristics and behaviors.
- (WHO, unknown)

Even though this list gives a great understanding that the concept of health is being shaped by these three different aspects, it is lacking the detail that makes possible to work with this list. For example, by knowing that the physical environment is playing a role in the perception of health, we can get an idea of how this might work, but do not get an understanding of which components actually are affecting the health issues.

Similar as with Livability, Health also knows a wide range of determinants which altogether fulfill the meaning of health. Again, there are multiple lists with the indicators of health, from which non are right or wrong. It is key to pick a list which is best applicable in the desired context. The list, as shown by Rothenberg, et al, was chosen for this paper, as it was the most versatile description of what public health consists of (See Figure 05.4)(Rotherburg, et al, 2015).

Img 05.4 - Rubrics and determinants of public health (Source: Authors own, based on Rothenburg, et al, 2015)



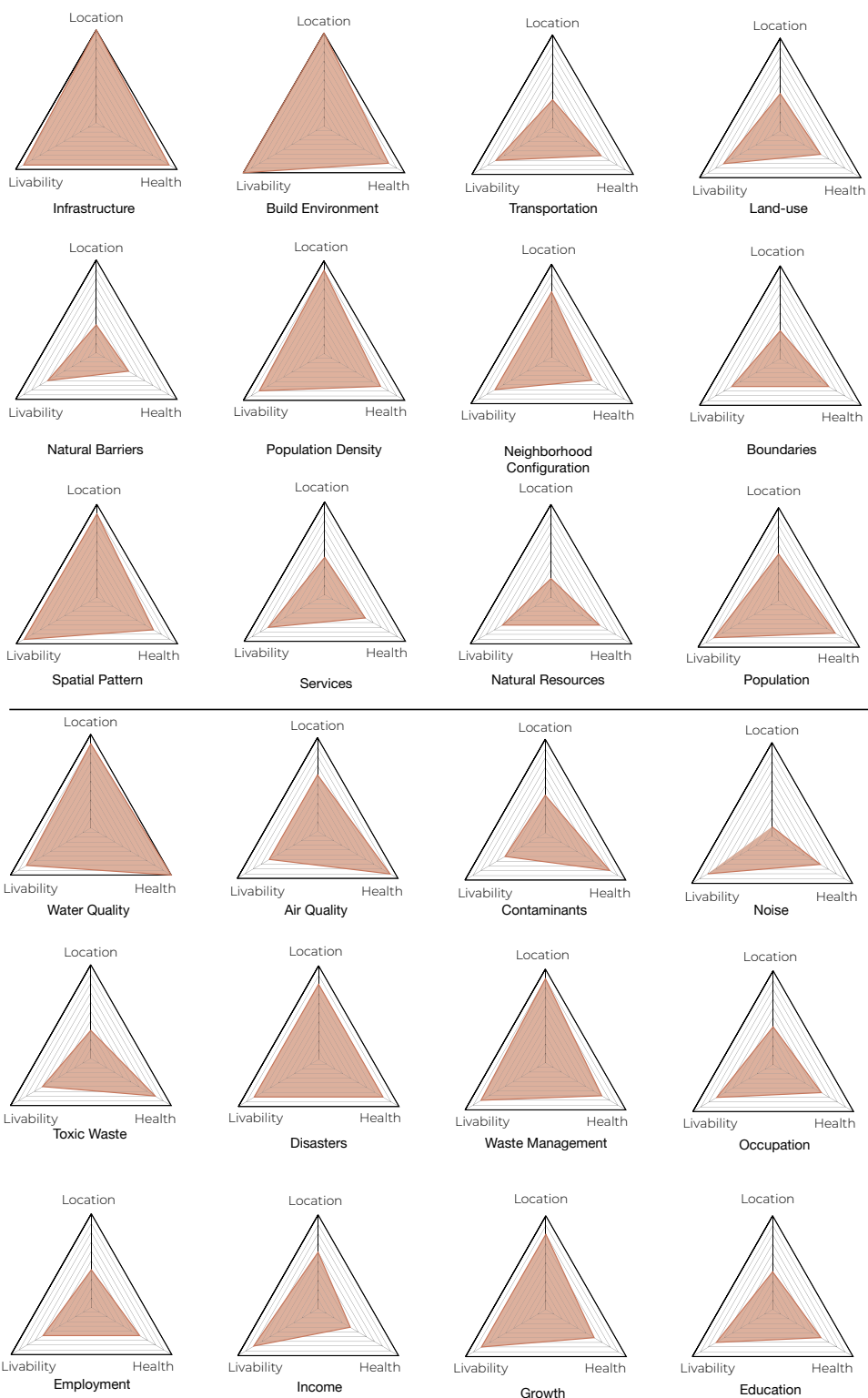
In this list we can see that public health is a result of a lot of different smaller indicators which influence the perception of health. The 5 'rubrics', as they are referred to, are showing that health can also be seen as a combination of (personal) health, the environment, the geography, economics and sociodemographic. Differently from the list by the World Health organization, this list is offering a set of sub-components, or determinants, which give a better understanding of which aspects are actually affecting the environment, for example. Knowing these aspects is giving us the opportunity to get an understanding of the current state of the health of the kampung, and will thereby also generate an understanding of how the current health status can be improved.

05.3 UTILIZING THE THEORY

Health is a complex term, of which the current definition is already being doubted. The term consists of thus many components, that decisions need to be made in order to create a manageable focus. The concepts of livability and health have a big overlap between the two, as they also both influence one another, as a better livability will result in a better assessment of the public health, and a better assessment of public health will result in a better perception of the quality of life. Since we look into the relation between both livability and health, an assessment has been made of public health determinants that will have the biggest influence in-between both of the concepts of health and livability and have a strong spatial dimension to them, which allows for design implications in the project (See Figure 05.5).

The different 'determinants' of health all have their proven influence on the public health. Thus, this does not mean that every term has an equal percentage of influence to the well-being of a person. The different terms that are categorized all have a different scale of influence, and most of them are even interlinked. For example, a lot of slum upgrade projects are focusing on the implementation of infrastructure, as this aspect is known to have the biggest impact on the health issues. Therefore, tackling the topic of infrastructure will for example create a bigger improvement in the health, then an improvement of the growth or natural boundaries in the area.

The terms infrastructure, Build environment, population density and spatial pattern stand out from all of the other determinants, and are therefore important features to analyze. The neighborhood configuration stands out less then the other ones, but has a rather high score on 'location', which is in



the end the main indicator when addressing the most urgent public health issues.

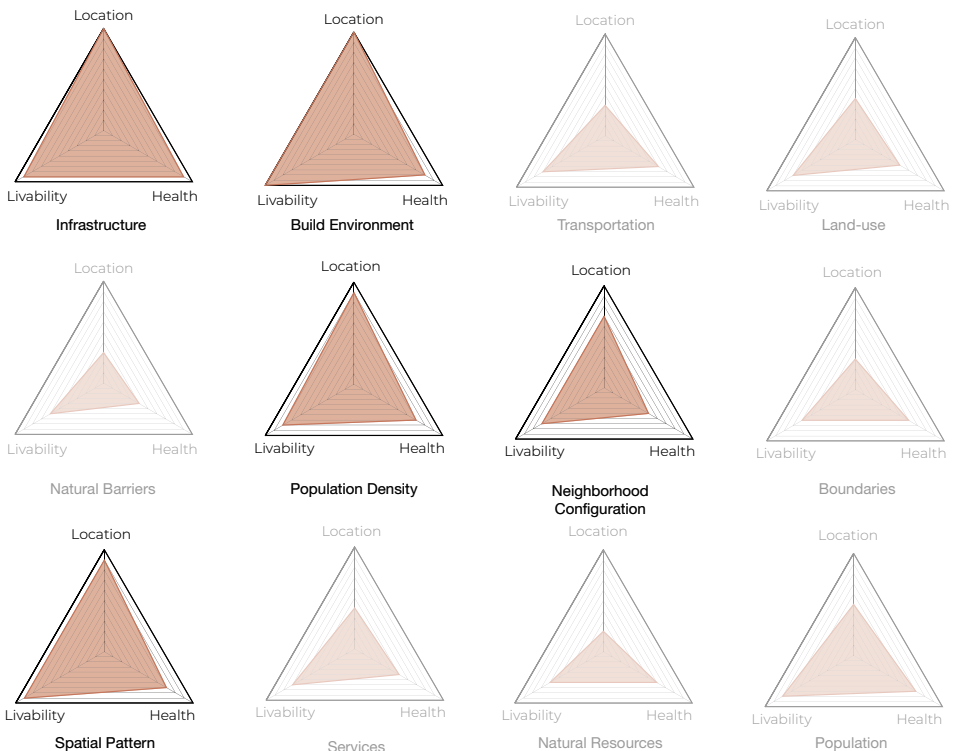
Dimension to them, but are still directly linked to the surrounding context. Most of the topics that are listed in this list, are external effects that can be improved through changing the determinants with a strong spatial dimension. For example, determinants like Waste Management or Noise still influence the assessment of Spatial patterns or Neighborhood configuration. This shows the amount of overlaps between the different determinants, and also shows the complexity of working with concepts like 'Health'.

Img 05.5 (top) - Health determinants with a strong spatial dimension (Source: Authors own)

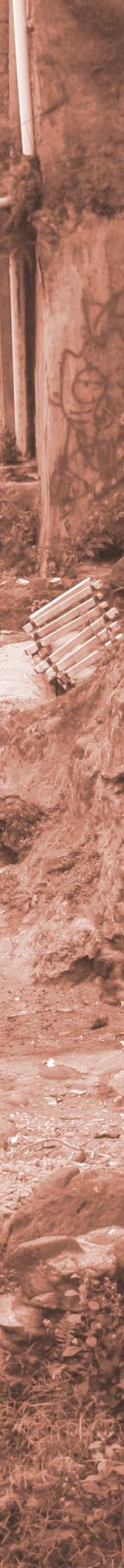
Img 05.6 (bottom) - Health determinants with a medium spatial dimension (Source: Authors own)

Img 05.7 - The 5 focus points of the research (Source: Authors own)

The assessment of this list of determinants will not actively have any influence on the analysis that will be done in the upcoming chapters, but will have it's importance during the design process, in which the determinants will being tried to be improved upon. An example of this could be that the water quality will be tackled through focusing on the infrastructure-determinant of the strongly spatial dimensions; when the sewage-problem will be solved, and the personal waste will no longer be disposed into the Chikapundung river, the water quality will benefit from this.







06 THE (UN)LIVABILITY OF THE KAMPUNG

This chapter will bridge the theory on livability and public health to the actual context of kampung Tamansari. It will assess how healthy (or unhealthy) the kampung currently actually is, by analyzing the five public health components which derived from the theoretical research on the concepts of livability and public health.

Each of the 5 components will be addressed separately to get a better understanding of its direct impact on the perception of health in kampung Tamansari. This chapter is meant to create an understanding of how and where to actually improve the health aspects in the kampung.

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Img 06.1 - View on the Chikapundung river in kampung Tamansari (Source: Authors own)

06.1 THE BUILT ENVIRONMENT

The Built environment is quite a broad term and describes the human-made surroundings that provide the setting for human activity, ranging in scale from buildings to parks. It has been defined as “the human-made space in which people live, work, and recreate on a day-to-day basis” (K, Roof. N, Oleru. 2008). The built environment of the Kampung area mainly consists of low-quality, densely packed housing combined with small streets in-between the different buildings. The current state of the public space and housing supply is creating a threat to the public health. This chapter will give an overview of what the current building typologies and available public spaces look like.

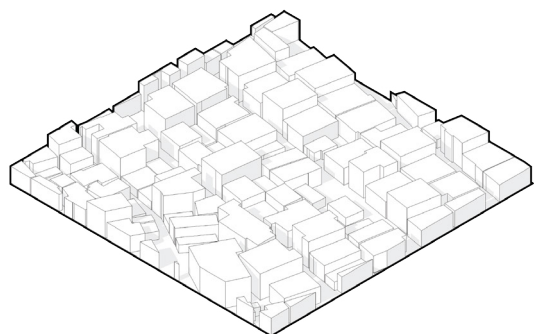
The effects that the built environment have on the public health, can mainly be found in the relation between a organism or object its physical activity. For example, in more western contexts, a lack of sidewalks or bicycle trails are contributing to a more ‘seated’ lifestyle. Therefore, the built environment can have a direct link to the numbers of obesity, cardiovascular diseases (such as heart attacks), diabetes and even some types of cancer, also referred to as the NCD’s (CDC, 2011).

The NCD’s in the global south, and especially in informal settlements are often overlooked, as the main focus mainly lies in infrastructural improvements. But these NCD’s are going to play a more important role in the near future, as is expected that these NCD’s will be responsible for around 69% of all deaths in the global south (Smit, et al., 2016, Allender, et al, 2008).

Public health discourses are often focusing on lifestyles (non-communicable diseases are also referred to as ‘diseases of lifestyle’), and it has only been since recently that recognition of impact of the built environment on human health (even though the link is complex and hard to quantify) has been increasing (Smit, et al., 2016, Cummins et al., 2007, Diez Roux, 2003, Macintyre et al., 2002, Perdue et al., 2003, Rao et al., 2007, Vlahov et al., 2007).

Therefore, an assessment of the built environment should help in realizing a healthier Tamansari, through an understanding of how these components negatively influence the human health inside the kampung. There has been made a distinction between the built objects, the kampung lifestyle and the different characteristics of the kampung.

Img 06.02 - Analysis of the urbanity of the kampung
(Source: Authors own)



100 x 100 m 'Formal pocket'

Floor Space Index

1,43

Ground Space Index

0,64

Open space Ratio

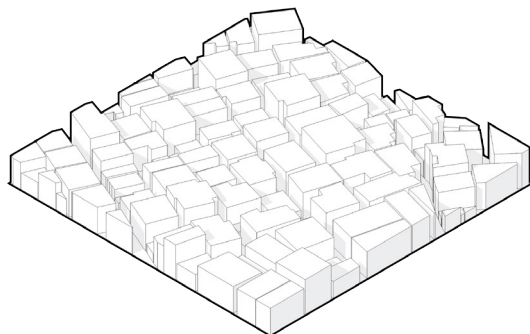
0,24

Average Amount of Layers

1,92

Average Street Width *

4,49 m



100 x 100 m 'Maze area'

Floor Space Index

2,24

Ground Space Index

0,77

Open space Ratio

0,10

Average Amount of Layers

2,24

Average Street Width *

2,19 m

* = Street width is measuring the distance from building to building, and is including the transitional spaces in front of the dwellings.

The built

The whole kampung area is originally owned by the local government, with the current inhabitants squatting the area. Since the first settlers arrived in the 1950's, the neighborhood has spontaneously grown, with most of the original families still living in the same places. Because the families have stayed on the same location for so long, they have started further investing and developing their houses. Because of this, the area knows a wide variation of different housing qualities. The housing supply can differ from two-story, freestanding houses in the more formal pockets to small, self constructed sheds made out of leftover building materials.

Img 06.3 - Street in the 'maze' area (Source: Authors own)



The more formal pockets, in the north and south of the project area, mostly consist of freestanding houses, of one to two layers. This are the plots that, most of the time, have been in the possession of the same family. Normally, whenever a family has children who are getting married, they move into the upper floor of the dwelling. Whenever the parents come to die, the children move into the main house on the bottom layer, and the circle continues.

Even though the kampung area is a squatting settlement, and the land does not officially belong to the people, they still have their on devision of the land. Some of the people have informally 'bought' the right to live somewhere, even though this land is still not officially theirs. Most of these buildings can be recognized, as they have walls around them, that protect them against potential thieves. The bigger, formal houses are generally been realized on the flatter areas, along the Chikapundung river, as these areas are considered more build-able.

The smaller, more vertically oriented buildings, with 2 to 3 layers in height, are mostly present in the 'maze' area. Here, the flat surfaces are of a much smaller size, explaining the need for vertical expansion. The average plot-size in these areas is also smaller then in the formal pockets, as the buildings are mostly vertically divided in-between different families.

On the steepest parts of the slope, the buildings are of a smaller size. The cascade-like structure between the different topographical layers, is a less desirable location to settle, explain the large amount of one-story dwellings.

On top of the slope, along the main road, the main typology consists of apartment buildings. The buildings here are visibly more modern and have been realized by specialized building companies, instead of the people themselves. The ground-floor of these buildings hold commercial functions which are all oriented towards the main road, with the different apartments placed on top.

The low-quality housing is not only characterized by the size, or the use of material, but less visible problems. Most of the self-constructed buildings, especially the vertically stacked dwellings, have an unstable construction. Especially with dangers like fire or storms, the weak construction is presumably not able to hold, making it a dangerous situation concerning the public health. Other, less visible, factors are ventilation and the entrance of daylight, which are having their influence on both the physical- and mental well-being of the inhabitants.

Img. 06.4
(left bottom)

An self-made construction of leftover building materials hanging over the small alleys in the 'maze' area, making use of alley impossible.

(Source: Authors Own)



Img. 06.5
(left bottom)

A self-build, instable construction made out of bricks. The construction is used to cover the behind-layer primary school. The windows are shut of with plastic sheets.

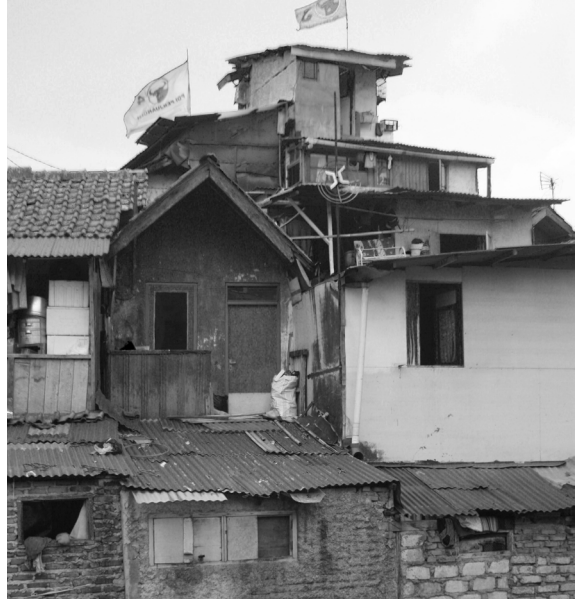
(Source: Authors Own)



Img. 06.6
(left bottom)

Vertically stacked, self constructed buildings on the top of Pulosari island. The buildings are facing outwards as the street is completely shut of.

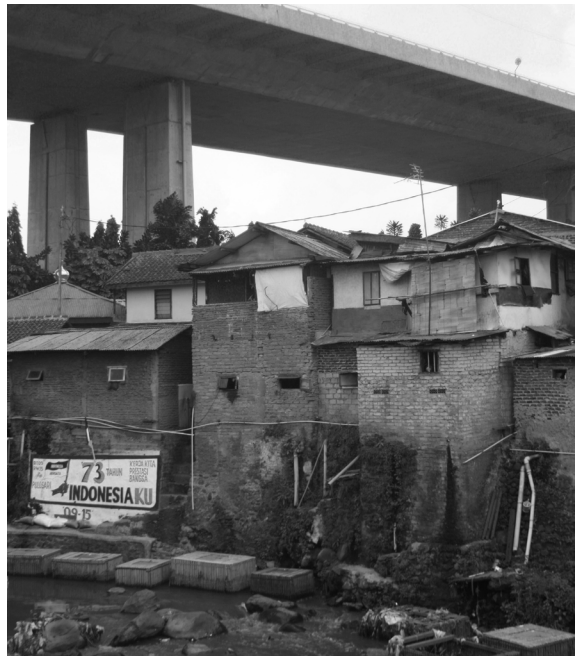
(Source: Authors Own)



Img. 06.7
(left bottom)

Low-quality housing on the northern bank of the Pulosari island. The baskets in the river are used for growing fish.

(Source: Authors Own)



Img. 06.8
(left bottom)

A higher qualitative building in the northern formal pocket. Most of the freestanding houses here have a transitional space in front of their house.

(Source: Authors Own)



Img. 06.9
(left bottom)

Buildings along the Chikapundung river are slowly changing their orientation towards the river, as can be seen in this building, where the windows have been placed more recently.

(Source: Authors Own)



Img. 06.10
(left bottom)

The second floor of an apartment building being shut off with plastic sheets to protect the squatters against the nature.

(Source: Authors Own)



Img. 06.11
(left bottom)

Some of the oldest building of the kampung, where the newly realized pathway has been placed in front of the building, making their facades look rather small.

(Source: Authors Own)



Functions

The formal pockets in the north and south, hold a large amount of shop-houses, street vendors and other commercial functions. Most of these commercial functions are located within the private houses of the owners. The central 'maze' area has a more homogeneous character, with hardly any other functions then residential. The streets in this area are also less crowded then the streets in the formal pockets, as most of the streets are narrow and have a dead end. On certain places, which don't necessarily have a strategic location informal markets take place in the morning. Here, the people sell their self-grown vegetables and other food-related items.

Another important functions within the urban texture of the Kampung are the Mosque's and Medrasa's (Islamic schools). The green buildings, as green is the color representing paradise, are positioned in central, well accessible places in the kampung. The bigger mosque's, as shown in image 06.13, are mostly being visited by the men, whilst the women often make use of the smaller mosques. As the available space is limited in the kampung neighborhoods, the mosque's are also often used as gathering places.

Img 06.12 (left) - Small informal shops in the different 'gangen' of the kampung (Source: Authors own)

Img 06.13 (right) - Map showing the different mosques in the area (Source: Authors own)



Public-space

Because of the dense structure of the kampung, there is rarely any space left over for public usage. The kampung inhabitants are looking for potential public spaces, and are using every possible space to create social gathering places.

Some of the current public places are a result of the meeting of different spatial structures, as can be seen in image 06.14. Here, three structure come together, leaving an triangular place open in the middle. The small square is a popular place for street vendors and hold multiple small shops along it. The square itself is being used for social functions and sports activities.

Other public spaces, which are being left open, such as playground or concrete sports fields, are currently being used as parking spots for the large amount of motorbikes in the area. Hereford, the children still have to play in the narrow kampung streets, which are also being used by the same motorbikes.

Img 06.14 - Small triangular open space in the formal pocket (Source: Authors own)



06.2 SPATIAL PATTERN

The influence of the spatial pattern is closely related to the influence of the build environment. Spatial patterns can be defined in the following way: "A spatial pattern is a perceptual structure, placement, or arrangement of objects on Earth. It also includes the space in between those objects. Patterns may be recognized because of their arrangement; maybe in a line or by a clustering of points" (L, Keys-Mathews, 2003).

The spatial pattern is a broad terms, and consist of a lot of different sub-terms, such as: Housing, and Open Public Space. The configuration between the two of these has been largely addressed during the interviews we had during the field trip. The housing is often unregulated and unsafe, and therefore forms a threat to the public health of the inhabitants.

There is a huge difference in spatial patterns in the project area. The basic structure, where the building are facing outwards on both sides, with the (open) sewage system running through the backsides of building, can only be found in the more formal quarters. We can see that in the 'maze' area, there is a more unstructured housing pattern. In these areas, we can see that the structure is basically

missing. You can have a street where the front sides of the buildings will be continued with the back side of the next building.

There also is a huge difference in street widths, with the main difference being that the formal pockets have a street width of over 1,5 m and the 'maze' area under 1,5 m. Most of the streets in this area have been privatized by the inhabitants, which means that you will sometimes have to walk through someones private property to continue your way.

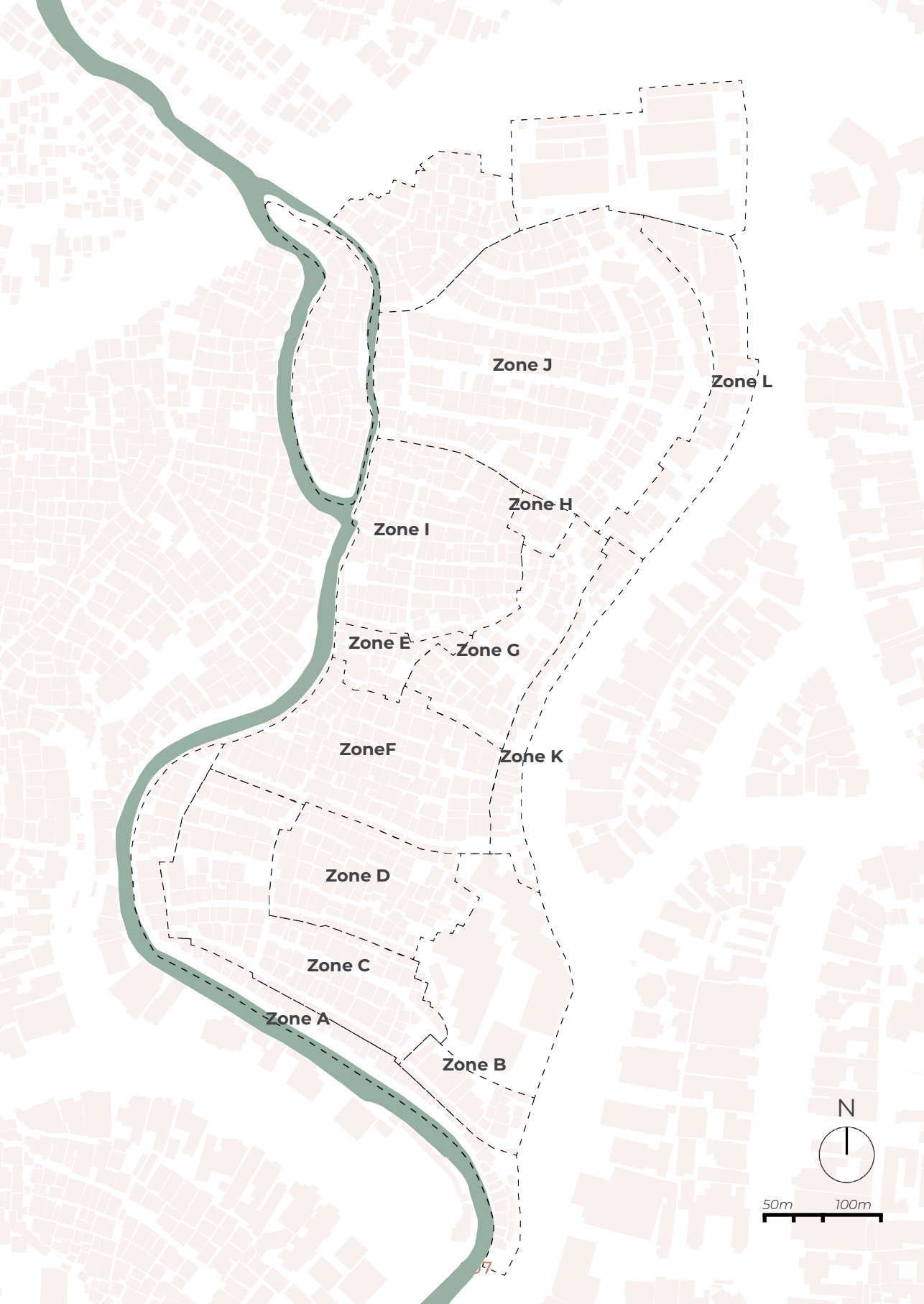
The lack of decent, usable public space has also been addressed multiple times during the interviews. Even though the Kampung-inhabitants use public space in a completely different way then we do here in the West, they still feel the lack of public place, such as green spaces, upgraded community spaces, places for activities such as reading and places for the children to play safely.

This lack of public space is restricting the people's freedom in movement, expression and possibility for exercising. Currently, public life is taking place in the small streets of the neighborhoods. At the same time these same streets have also been taken over by Indonesia's

insane amount of motorbike-users. The present public space that is available has often also been occupied as a parking space for the huge amount of motorbikes, as there is not enough parking place and parking outside of the Kampung is too risky because of the high numbers of motorcycle-theft.

In the next pages, a in-dept analysis of the spatial patterns will be shown, in line with the zoning you can see on the next page. This zoning has been made through studying the spatial pattern and combining it with the underlying topography, what the 'spatial configuration' will continue on. The different 'zones' all know a different spatial pattern, and through isolating these from each other, the functioning of these structures can be explained further.

Img 06.14 - Map of Tamansari showing the different spatial clusters (Source: Authors own)



Zone J

Zone L

Zone H

Zone I

Zone E

Zone G

Zone F

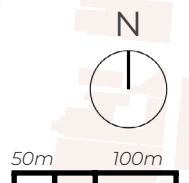
Zone K

Zone D

Zone C

Zone A

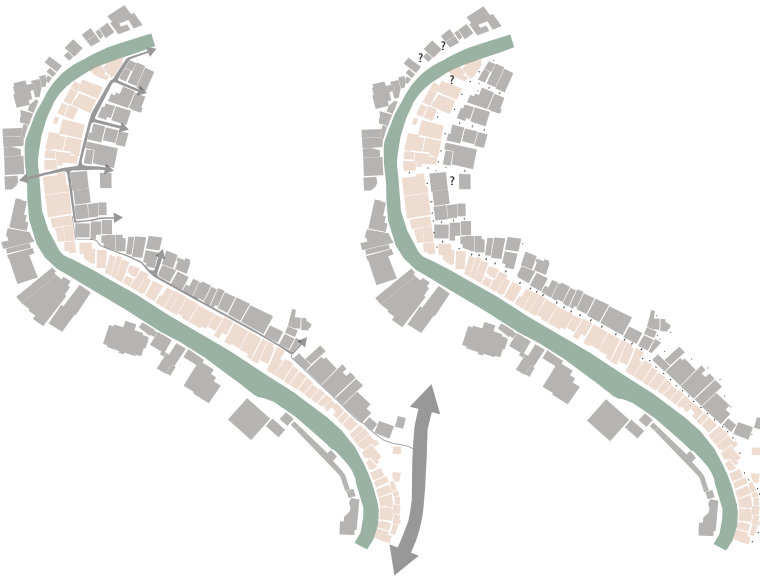
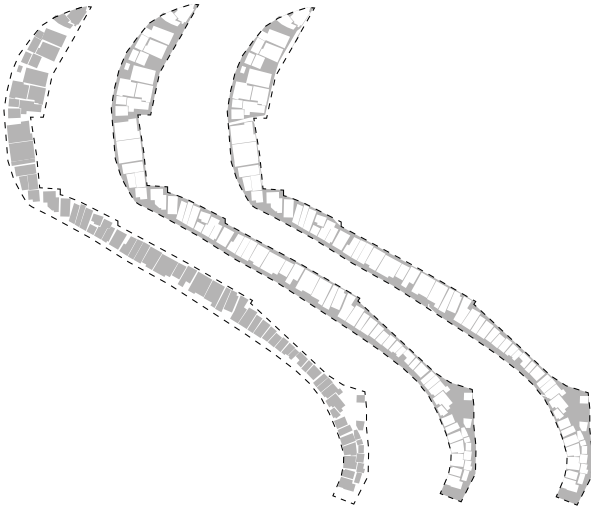
Zone B



Zone A

This ribbon development is situated along the southern side of the project area, forming the border between the southern 'formal pocket' and the Chikapundung river. The zone has all of its building oriented towards the river, and is therefore following the natural landscape the river is shaping. But just like in all the other parts of the kampung Tamansari, all the buildings are facing their back to the river, using it only for sewage purposes.

There are also very few openings in the buildings towards the river, which proves that the current population is not seeing the potential of the river.



Zone B

This zone is situated in-between the Islamic University and the ribbon development of zone A. The buildings here are all facing north, towards the main southern entrance of the Kampung. This also means that they are facing their backsides to the front side of the ribbon development of zone A.

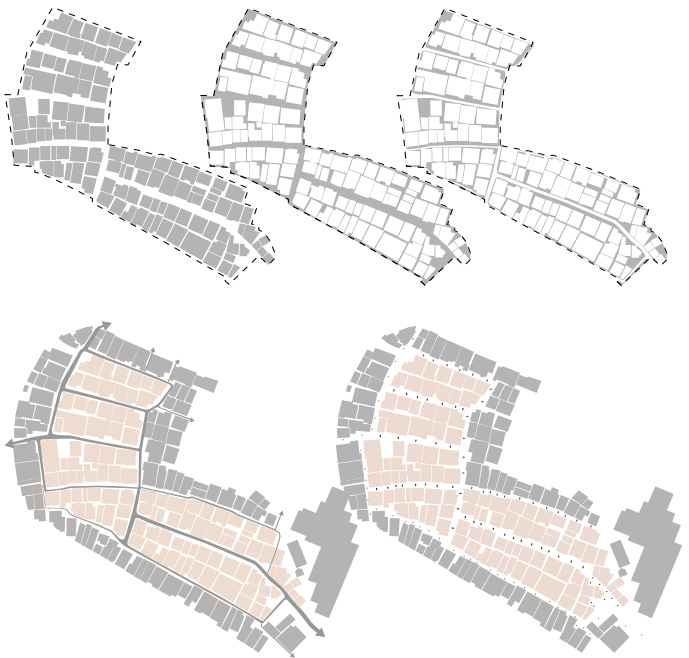
Most of the buildings in Zone B have a commercial-or office function. The differentiating orientation of the buildings comes from the proximity of the main road, east of the zone.



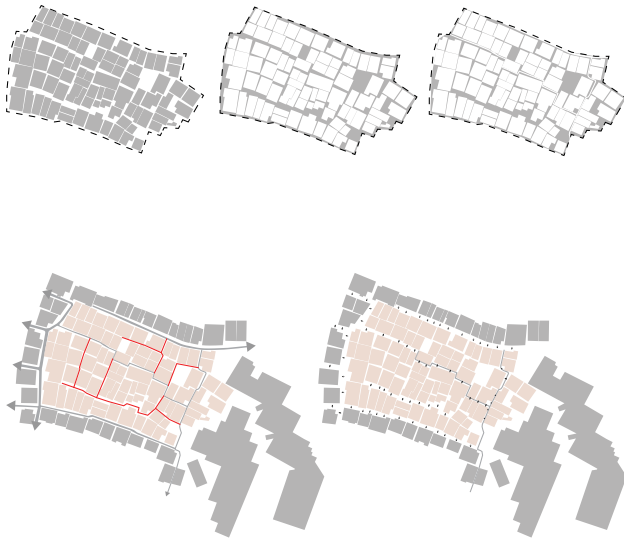
Zone C

This zone is situated west of Zone B and is enclosed by the ribbon development of Zone A. In this cluster, we can see the 'normal' spatial structure of the formal kampung pockets. We can see small blocks of back-to-back facing buildings in which all of the buildings are facing outwards, leaving a small, unused, open space in-between them, in which the sewage system is located.

Most of the buildings in this zone are of a decent to big size. Same goes for the 'gangen', which are of a decent size and all have their own transitional space between public and private areas.



Zone D



Zone D is situated north of zone C and is basically functioning as the transition between the more formal, organized pockets to the more unstructured 'maze' area. This can be found back in the street pattern. The most northern and southern blocks are realized in the same way as the 'normal' structure, as can be seen in zone C. Nevertheless, the central part of this zone is already more unorganized than the outer blocks. The buildings here are no longer realized back to back, and are of a much more random order. The streets here also turn into alleys, and have a rather small width.

Zone E



Zone E is situated north of zone F and is basically the leftover space between the different spatial structures. This also explains the chaotic structure in the area, as it's basically trying to orient to every other structure around it.

The most western part is connecting to the Chikapundung river, with the buildings facing inwards. The southern buildings are facing their backs to the buildings south of them. The most northern and eastern buildings are, on the other hand, facing outwards, connecting to the paths of the surrounding structures.

Zone F

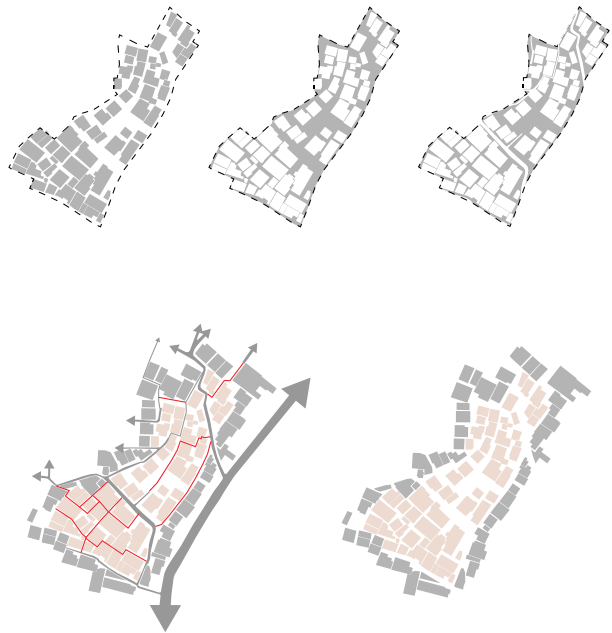
Zone F is situated north of Zone C and D, and south of Zone E. This area is also one of the major 'maze' areas. The main structure in this area arrived from the steep pathways entering the kampung from the main road in the east. The buildings are often realized back to back, but because of the many alleys in-between the different buildings, the orientation of the buildings varies. The chaotic structure is mainly deriving from the chaotic street pattern, which has been realized in this way because of the slopes.



Zone G

Zone G is situated northeast of zone F, and is situated on top of the steepest part of the slope. The buildings in the north are realized in a cascaded structure, with the most eastern building topping out over the underlying building, at the west. The buildings along this slope are facing the pathways.

The diagonal, steep pathways entering the zone are causing more chaotic structure in the other parts. As they are cutting diagonally through the north-south orienting structure.

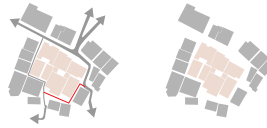


Zone H

Zone H is situated north of zone G, positioned right on the point where the steep slope turns into the flatter surface.



Zone H is the smallest of all zones, and only consists of a total of 7 buildings. The buildings are surrounded by different pathways, on different heights, which is making this zone that much different from its surrounding structures.



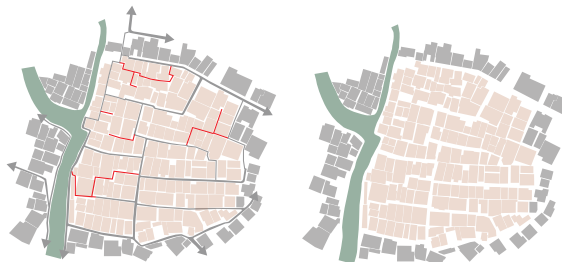
The different buildings in this zone are all facing outwards, making it function like a small scale, 'normal' structure like in the formal pockets, but then without the sewage line running through the plot.

Zone I

Zone I is north of zone E, and is the transitional area between the most northern formal pockets and the 'maze' area south of it. Zone I still has the same aesthetics as the 'maze' area, but already knows a more structured spatial system.



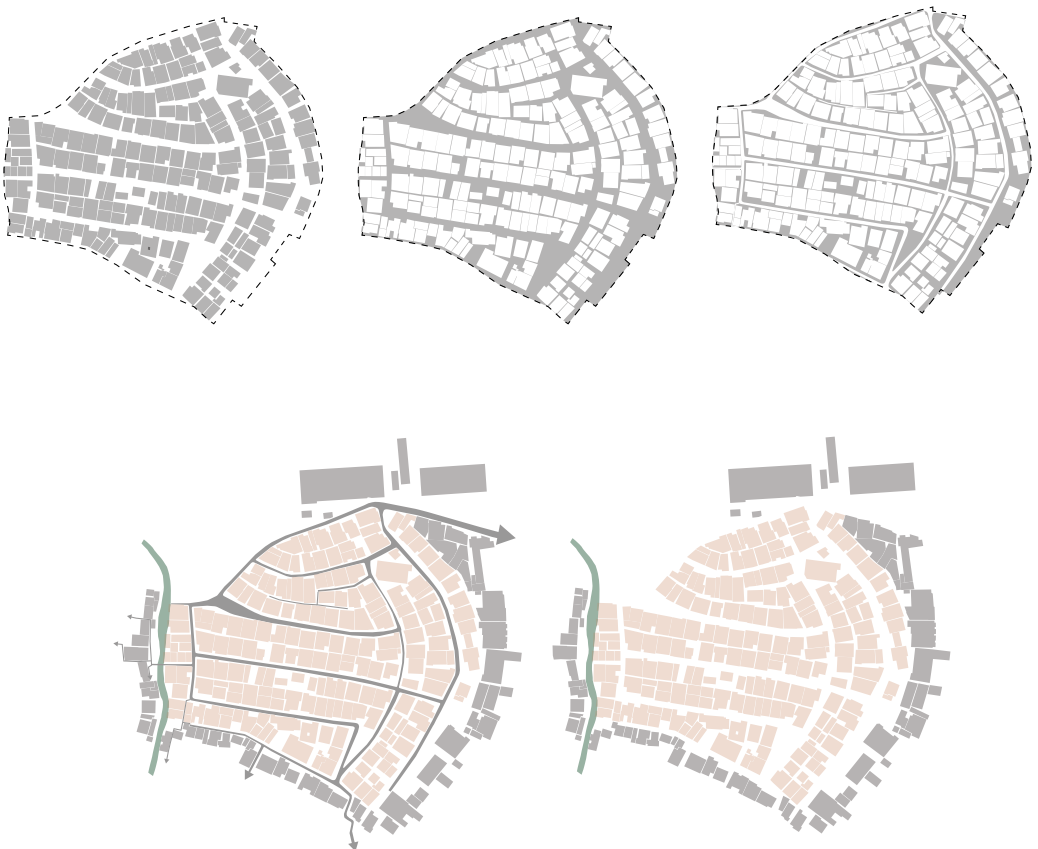
In the morphological map, a clear east-west and north-south orienting road structure is visible. It is because of the slope in the eastern side that the structure is tapered. We can see that a large amount of the buildings has already been realized back-to-back, whenever this was possible.



Zone J

Zone J is the most northern formal pockets of the kampung area. It is positioned south of the Pasarpati flyover, and it is connected to the Baltos Mall in the north.

The area has a clear back-to-back structure with an east-west orienting street plan in the center with north-south orienting pathways in the east and west, connecting the different east-west orienting pathways. The circle-like structure in the east is deriving from the slope.





Zone K

Zone K is the south-eastern ribbon development along the main road. All of the buildings here have a commercial function, and are oriented towards to road. Most of the buildings are of a small scale, and are not combined with residential functions, as is the case in Zone L.

The structure is cut through at multiple locations with entrances towards the camping area. The more diagonal entrances are positioned on a steeper slope, whilst the right-angled entrances are places along with the slope.

Zone L

Zone L is positioned north of zone K, and also has its commercial functions oriented to the main road.

The buildings are positioned at the top of the slope, and often have their commercial functions places on the bottom layer, with big-scale apartment blocks positioned on top. These buildings are therefore also form the boundary of what can be seen from within the kampung. Most of the buildings have a small setback for the implementation of parking lot.



Img 06.15 - Alleyway in the 'maze'-area (Source: Authors own)



06.3 NEIGHBORHOOD CONFIGURATION

At the first glance, there is very little difference between the definition of 'spatial pattern' and that of 'neighborhood configuration'. Neighborhood configuration is defined as 'The topological relation between different spatial objects or complex volumes' (T, Chen, M, Schneider, 2011). When comparing the two definitions of the terms, there can be seen that there is a main difference between the two: where the spatial patterns is more focused on the structure and placement of the different objects in comparison to one another, the Neighborhood configuration has a bigger focus on the relation between the topography and the neighborhood. Therefore, it is important to get a better understanding of how the topography is shaping the neighborhood, as it is one of the main characteristics which the neighborhood design has been depending on.

The relation of neighborhood configuration with the topic of public health can, just as with the spatial pattern' mainly be found in the mental health aspects. External affects of the structure of the neighborhood on the public health can be found in, for example, the structure of the underlying infrastructure of the neighborhood.

The Chikapundung river

The river, which is cutting the Tamansari kampung in two, is having a huge influence on the spatial structure of the area. The meandering of the river has created an uneven width of the neighborhood, making the upper northern part and most southern part way wider than the central part. In the more formal parts, we can see the clear east-west orienting spatial structure, which is only slightly tilted because of the adaption to the shape of the underlying land. The ribbon development along the river is creating a pathway along with the shape of the river, ending in the newly constructed, elevated, pathway along the river.

The part where the river, is slightly pushing into the central part of the 'maze' is visually causing structural problems in the urban tissue. This is also where we can find the most chaotic structure. The 'maze'-area is therefore finding itself in the 'bottleneck' of the area, where both the slopes as the river are pushing inwards, creating an uneven tension compared to those of the northern and southern 'formal' pockets. The different naturally shaped elements are making it difficult to create a grid-like structure, as can be found in the 'formal' pockets, explaining why the structure in this area is so different than that of its 'formal' neighbors.

Img 06.16 - Height map of kampung Tamansari with the position of neighborhood section AA (Source: Authors own)



The slope of the area

As the kampung of Tamansari used to be a important green space for the city, the topography had never been 'prepared' for urbanization on such a level. The topography of this exact space had always been focusing on bridging the height difference, of over 20 meters, between the Jalan Tamansari and the Chikapundung river. And thus, the kampung is finding itself located right on the steepness of the hill.

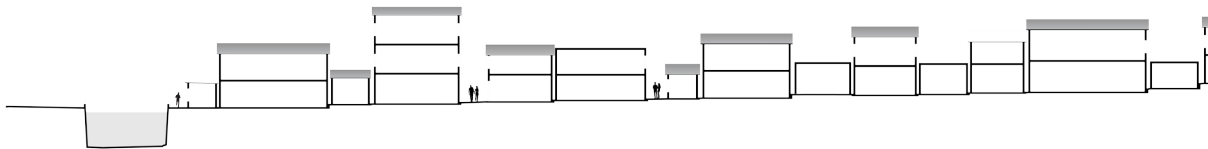
The relation between this

slope, and the current neighborhood structure can be found in some of the spatial results of the informal development. The entrances of the kampung, which are located on the highest parts of the kampung, have to deal with the steepness of the slope, and still making it possible to maintain the accessibility for pedestrians and motorbikes. Because of this steepness, most of the entrances have been realized diagonally, so the height difference is being divided over

a larger amount of distance.

Currently, the underlying topology of Tamansari is more conceived as something negative then something positive. The steep slop facing the river often lead to very steep streets with weird angles of corners and a layered system of streets.

A more positive feature of the underlying landscape was the possibility for the inhabitants to create an open sewage structure leading the black- and Grey water directly



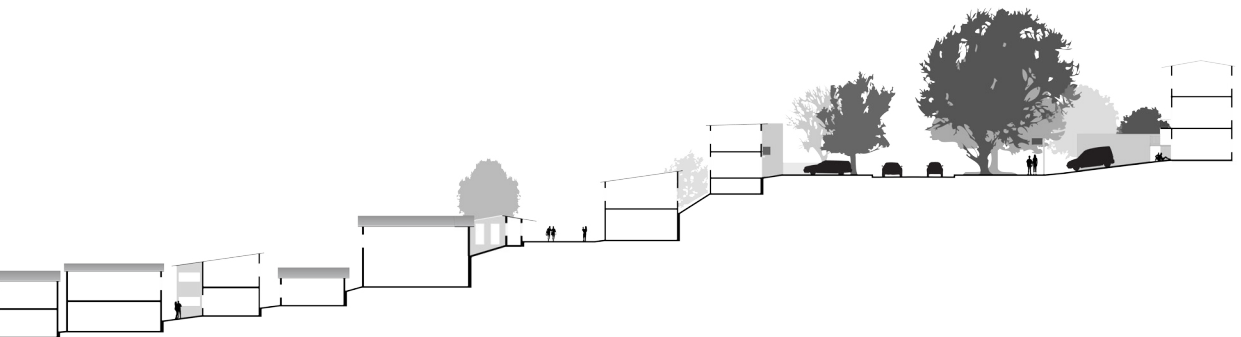
towards to river, using nothing but gravity.

As can be seen in the neighborhood section of image 06.17, the structure of the neighborhood is depending on the underlying topography. In the analysis on the spatial patterns, it became clear that the buildings positioned on top of the steepest parts, are structured along with slope, as where the most flatter parts are positioned counter-wise to the steepest parts of the slope, making it possible to bridge the

height difference in a more gradual way, whilst still getting the possibility to utilize gravity for sewage functions.

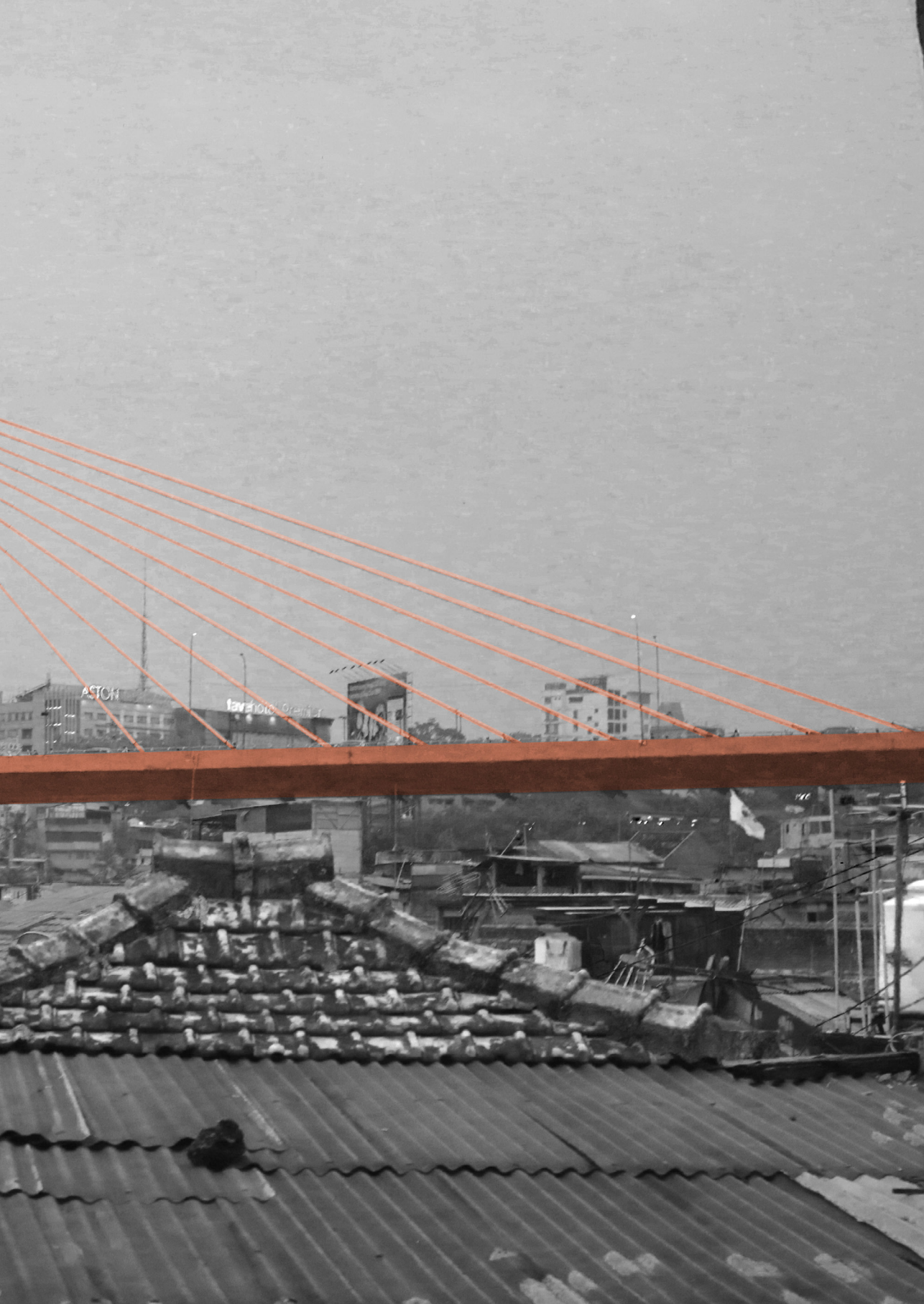
The section further shows how the steepness of the slope is lowering the building density of the area, as the buildings are not being able to be positioned as compact as those in the flatter areas. This shows how the slope is currently being perceived as a barrier in the structure, instead of a component which can create new opportunities.

Img 06.17 - Neighborhood section AA (Source: Authors own)





Img 06.18 - View on the
landscape of roof-tiles, as the
5th facade of the kampung
(Source: Authors own)



06.4 POPULATION DENSITY

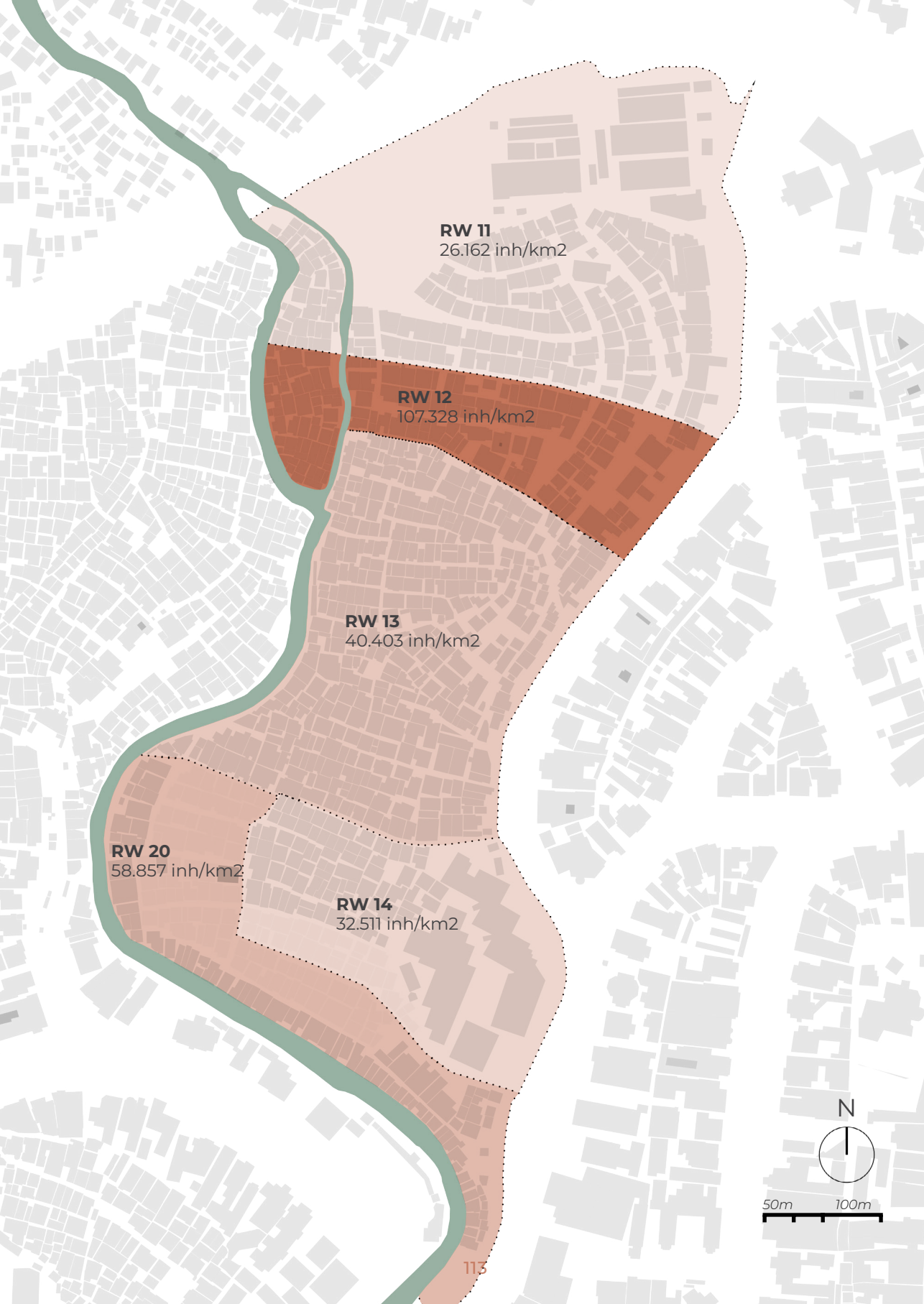
The density in the project area knows a wide variation. The density over the different RW's in the project area, shows that the highest can be found in the northern 'maze' area (RW 12), where a total of 1567 people are living in a space of 1,46 ha (0,0146 km²), which makes the average density to 107.328 people per hectare. The high density is mainly because of the inclusion of the Pulosari island, the island that knows the highest density of Bandung (Manuwir, 2015). The lowest density can be found in the northern formal pocket, where a total of 1159 people are living on a space of 4,43 Ha (0,0443 km²), making the average density 26.162 inh/km².

If we take into account that the average amount of layers in the kampung is slightly above the 2 layers, and most of the buildings are free-standing family houses, we can see how compact the neighborhood has actually been realized. A density of 40.000 inh/km² is higher then that off neighborhoods like New York's Manhattan (28.000 inh/km²) or Amsterdam's de Pijp (20.000 inh/km²) (Census, unknown).

The growing population and the amount of people that are currently 'stacked' in this area are creating on of the major threats in the area. The overcrowding is thus huge, that it is creating a huge pressure on the neighborhoods' infrastructure and build environment, which cannot cope with the growing amount of pressure. It is expected that the population in Bandung will increase rapidly in the upcoming years and if we don't find a way to regulate this, the current problems in the area will only increase.

Overcrowding, as is currently present in the kampung of Tamansari, has negative effects on the people's mental well-being. A study by Mitchell on the overcrowded conditions in Hong Kong show that overcrowding does not lead to hospitalized disorders but can produce signs of psychological stress (complaints, unhappiness, worry) and can have negative effect on the control on children (Mitchell, 1971). In the western context, where overcrowding is not related to lack of sanitation, abject poverty, poor nutrition etc, overcrowding mostly functions as a minor negative or irritating factor, but does not have any major impacts on people's well-being. In areas like Tamansari, where such factors do are present, high amounts of overcrowding might lead to rising rates of illnesses and social disorganization. Therefore a decent amount of square meters per person is required in order to not overcrowd the kampung neighborhood.

Img 06.19 - Density map of the different RW's on the eastern riverbank of kampung Tamansari (Source: Authors own)



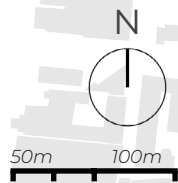
RW 11
26.162 inh/km²

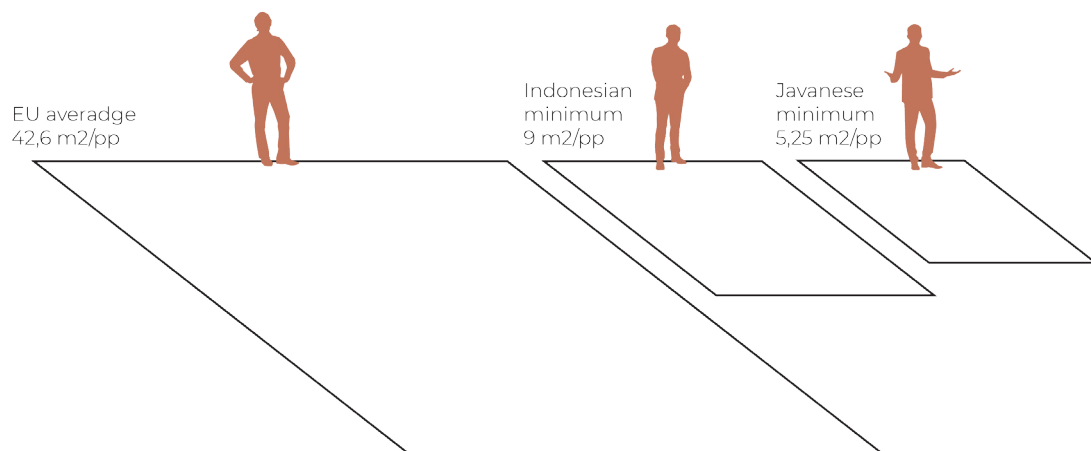
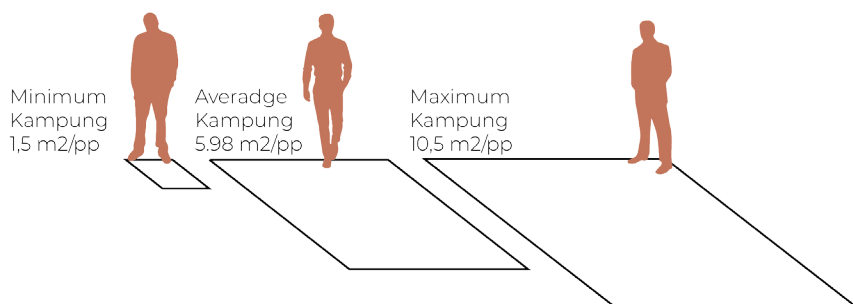
RW 12
107.328 inh/km²

RW 13
40.403 inh/km²

RW 20
58.857 inh/km²

RW 14
32.511 inh/km²





The floor area per person is one of the main factors when it comes to dwelling comfort. It also helps us understand the difference between being really dense or being really crowded. The indicator is a result of the size of the dwelling (m² floor area) and the amount of persons living in an dwelling.

Research by Evawani Ellisa on the kampungs of Jakarta, has shown that the average floor size of an kampung-building is around 23.5 m² (Ellisa, 2016). With the Indonesian law, that a family can have no more then 2 children, the average household size comes up slightly underneath the 4, at 3.79 people. The average floor area per person for a average kampung dwelling therefore results in a total of 5.98 m² per person. But, then again, the Kampung does not only exist of average sized housing, but knows a wide variety of dwelling sizes. The research by Ellisa shows us that the smallest dwelling had a total of 6m² and the biggest one a size of 41m². When we would calculate the floor area per person for these extremes, we can see that the m² per person, can go from as minimal as 1,5 m² per person to a total of 10,3 m² per person. Of course, it is not said that the dwelling of 6m² is actually inhabited by 4 people, but it is giving us an indicator of what an average square meters per person is.

The Indonesian government has implemented a minimum of 9 square meters per person. As we can see in a quick comparison, only the biggest houses of the kampung would meet this minimum requirement of the 9 square meters per person (Veridona & Prabawa, 2019). More recently, the Indonesian government came up with a model of what would be the minimum requirements of a dwelling, on the island of Java, to be quantifiable as a 'healthy house'. This healthy house has a minimum of 21 m², which also makes the minimum floor size for a newly realized dwelling (Salim, 2015). With the average of 4 people per household, this would mean that the average square meters per person would come down to a total of 5,25 m² per person, which is lower then the countries minimum of 9 square meters per person. This minimum requirement of a healthy house, is therefore only applicable to the island of Java, as the other islands are still expected to meet the minimum of 9 square meters per person.

As an comparison, the average m² per person over all the EU-countries results in 42,56 m² per person, more then four times as big than the maximum in Indonesia's kampungs. Countries with a rather large population, such as the Netherlands, France and Germany, have floor sized above the EU average (European Commission, 2011).

Img 06.20 - Square meters
per person in the kampung
(Source: Authors own)

06.5 INFRASTRUCTURE

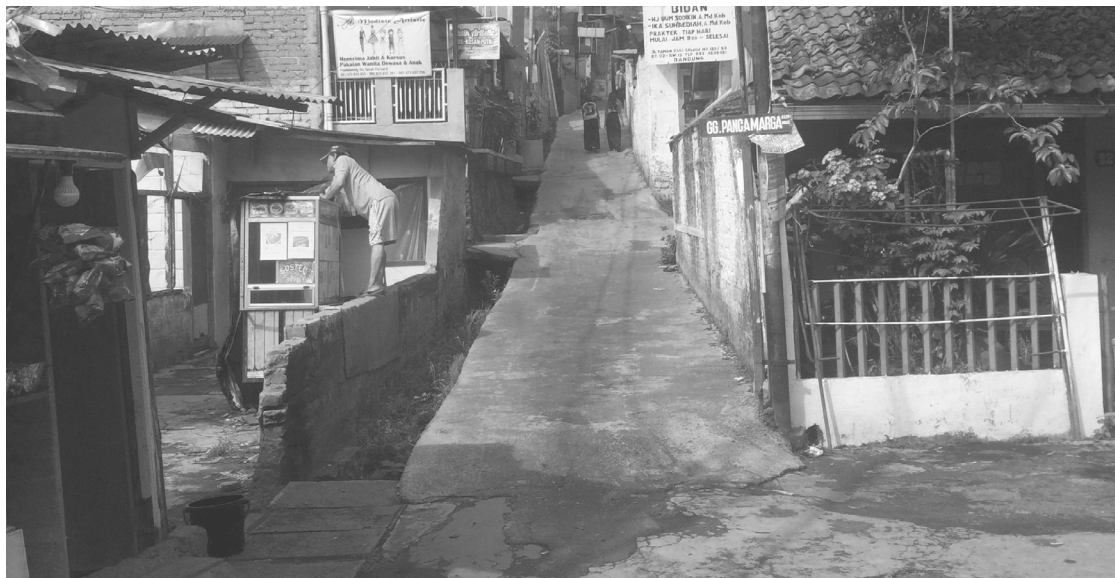
It is important to understand that Infrastructure consists of way more than just the roads or public transport-lines provided, but also focuses on the underground infrastructure such as water supply and sewage systems. Since the kampung area is car-free, and only accessible by motorbike or by foot, the focus in this chapter will be on the underground infrastructure. Some of the neighborhood's biggest problems are included in these underground infrastructure, as it also is focusing on the sewage and water problems within the area.

Public-health expert Eileen Stillwaggon explained that: "Every day, around the world, illnesses related to water supply, waste disposal, and garbage kill 30,000 people and constitute 75 percent of the illnesses that afflict humanity. Indeed, digestive-tract diseases arising from poor sanitation and the pollution of drinking water including diarrhea, enteritis, colitis, typhoid and paratyphoid fevers are the leading cause of death in the world, affecting mainly infants and small children" (StillWaggon, 1998). Often, the contamination of food and drinking water through sewage and waste defeats the most desperate efforts of slum residents to practice protective hygiene (Davis, 2006).

With the kampung's open sewage networks, we can see how these threats are present in the kampung. Even though there is a rising awareness in the kampung about the presence of these open sewages and their effects on the health issues.

Img 06.21 - Image showing an open sewage line along the street (Source: Authors own)

Img 06.22 - Map showing the assumed sewage structure of the kampung (Source: Authors own)





50m 100m

Sewage system

Kampung Tamansari is currently still using the river as their sanitation system (see image 06.20). They created their own open sewer-system leading the Grey and black water directly into the river. These open sewers and the contaminated water it holds are often rife with intestinal parasites such as shipworm, roundworm and hookworm. Other pests, such as rats are also attracted to the open sewers, and are known for carrying diseases on them. Proximity to these sewage lines can cause threats to the personal health, as the chance of getting infected is rather high.

The sewage system in the kampung is facing the river and is purely functioning through gravity. Whenever the block has been realized back-to-back, the (open) sewage line running through the backside of the buildings towards the river. Because the system is making use of the natural slope, the orientation is of the system east-west. Within the central 'maze' area, the sewage system is less clearly organized. The chaotic building structure is making it impossible to create straight lines, forcing the sewage system to make twists and turns. This also means that the sewage line can be in the same place as the street is, making it a bigger threat to the public health.

The kampung area north of the Pasarpati flyover has two communal septic tanks placed, which collects the human waste. This is the first stage in a broader plan to clean the Chikapundung river. A plan has been made to also realize septic tanks along the Chikapundung river in the project area, but the problem with the placement of the septic tanks is that they also will have to be emptied by trucks, meaning they need to be able to have access to the Septic tanks. With the current kampung structure, this won't be possible, making the implementation very difficult. The realization of a setback-area, along the riverbank, should give a solution to this. The plan of the local government is to create a 3-5 meter setback from the river, which should be turned into a boulevard, which allows for incidental use for the trucks.

Img 06.23 - Map showing the different locations of the public wells and the newly realized connection to the water supply on the western riverbank (Source: Authors own)



The water system

Since the neighborhood has been realized in an unplanned and spontaneous way, there had never been any water supply present in the kampung area. The kampung has always been dependent of the manually dug wells in the area. The kampung is positioned on a layer of bedrock, which has to be passed before reaching the groundwater layer. Therefore the wells can differ from a depth of 9 until 15 meters deep.

Recently, the western part of the kampung has been connected to the city's water supply network, after they financed it themselves. They now have a limited supply of water, since there is a shortage of fresh water in the area, of a few hours per day. The water is not the highest of quality, as the people are not paying the same amount of taxes over the water as the normal housing does. Therefore, the water is often not drinkable, and has to be left in buckets so separate the water from the contaminations. Afterwards the water still needs to be boiled first in order to make it drinkable.

The eastern part, the project location, hasn't yet been connected to this water supply network, and is therefore still depending on the manually dug wells. The wells are positioned around the crossings of two main streets, as they therefore serve a bigger audience. The water network and the positions of the different wells can be seen in image 06.23.

Img 06.24 (left) - One of the existing wells in the kampung
(Source: Authors own)

Img 06.25 (right) - New connection to the water supply
(Source: Authors own)



Other infrastructure systems

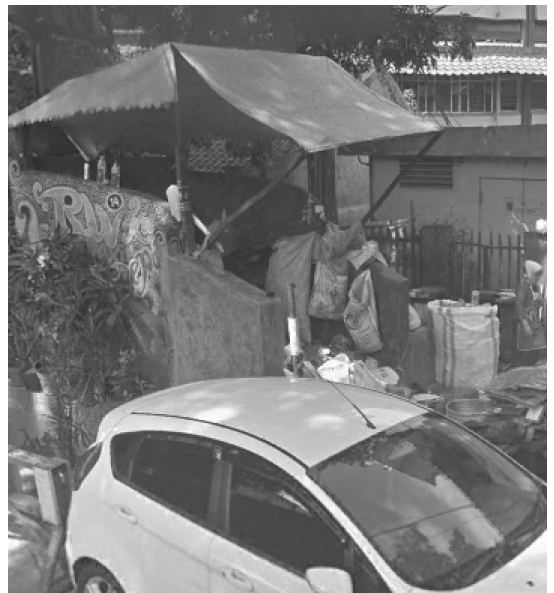
The kampung households are currently making use of the formal electricity network, in an illegal way, by tapping of the electricity. This also leads to dangerous results, with a large amount of wires running all-through the area. The cables are positioned through the air, and are leaning on wooden poles, on most of the corners.

Since the kampung is car-free, garbage trucks also can't access the neighborhood, making it impossible to collect the waste from the neighborhood. Instead, one of the locals is hired as the waste collector, with a small carriage. He or she goes from door to door, to collect everybody's waste, and bringing this to a central collection point next to the big road. This local waste collector, or garbage man, is not being funded by the local government, but by the local residents. They altogether pay to money for the man or woman to collect their waste, but the collectors are mainly depending on small tips, the inhabitants give the collector, as the payment is not high.

The households along the river still occasionally make use of their proximity to the Chikapundung river. From one of bridges or pathways along the Chikapundung river, it is nothing unusual to see one of the small openings in the facade, which are also often made out of wood, open, with an arm holding a bucket full of trash coming out. The household waste will, as if it's the most normal thing in the world, be emptied into the river, after which the small window-frame will be closed again.

Img 06.26 (left) - Wooden pole holding whole spider web of electricity cords (Source: Authors own)

Img 06.27 (right) - Garbage collection outside of the kampung (Source: Google Earth)



06.6 CONCLUSION

Bandung is a city that is facing a period of rapid growth in its population, with a lot of these new migrants expected to be living in the informal Kampung of the city. The health issues within the informal Kampung neighborhoods will become even worse, as the huge flow of migrants will create an even higher pressure on the already insufficient (infra)structure of the city.

The urban health problems in the Kampung can be directed back to the process of rapid urbanization, as the main cause for the existence of the area in the first place. But understanding the relation and the processes becomes more important when we mirror the existing situation to the theoretical criteria.

Kampung Tamansari is currently lacking decent regulations and planning when it comes to the improvement of public health. The spontaneous development of the kampung has brought the area a lot of positive qualities, such as a strong sense of community and sense of belonging. But the unregulated expansion mainly lead to a lack of collaborations between the different physical aspects of the neighborhood, which when aligned with one another would be able to solve a lot of the existing problems.

The housing supply, especially in the central 'maze' areas, need to be tackled. The current constructional threats, the lack ventilation of day and sunlight, the in-safety concerning fire hazards and the insufficient amount of living space are creating direct pressure on the city's health.

The spatial patterns need to be addressed in order to benefit the sense of orientation, the possibility of movement, recreating and providing the inhabitants with a decent, livable living environment. Whenever you start, spontaneously, developing a neighborhood from different directions, you will at one point meet in the middle, where the different patterns are no longer being able to be adapted. This is exactly what is happening in the central maze area, and therefore needs to be tackled.

When it comes to using the underlying topography in a beneficial way, the kampung area can make some adoptions. The slope can be used to develop in different vertical layers, and not be merely used as a problematic surface for development.

In the kampung area, a lot of the current housing stock is not providing the inhabitants the minimal floor space per person, especially not when, due to overcrowding, the dwellings are being inhabited by multiple families. Providing all of the families with a decent, livable floor space per person would help overcome mental and physical health issues, and would have a huge influence on the livability of the kampung.

Tackling the current infrastructural problems in the neighborhood will, without a doubt, have the biggest influence on the public health in the kampung. The current open-sewage system (which is polluting the Chikapundung river) and the lack of clean water supply are directly worsening the public health of the kampung. Providing the inhabitants with a clean, hidden and proper infrastructural system, will directly beneficially influence the kampung.

But the kampung, as it currently is, is not a merely problematic area, that needs to be wiped away as quick as possible, on the contrary, the neighborhood is having qualities that are hard to find in other, more formal neighborhoods. The strong sense of community, the 'kampung-way-of-life', the strong sense of belonging and responsibility, the willingness to improve, the huge participatory interest in the kampung and everything that is only merely connected to one of the terms, needs to be enhanced. With the people creating and therefore designing their own place to live, is giving the people a really big sense of belonging. Since the kampung is only limitedly supported by the local government, the people are in it by themselves, and are dependent on one another. The kampung has it's own way of life, which need to be supported in the urban lay-out.





07 KAMPUNG DEVELOPMENT

With Indonesia's 'zero slum' policy, the clearance of slum areas around Indonesia is happening rapidly. This chapter is aiming to get an understanding of the reasons behind these kampung improvement or redevelopment projects, and maybe even more important, give an understanding of the problems of the new social housing apartment buildings that the kampung inhabitants are being appointed to.

This chapter will create an understanding of the process of kampung improvement, after which the current development model will be studied in order to create an understanding for the design implication in the final part of the report.

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Img 07.1 - View from the western riverbank of the Chikapundung river (Source: Authors own)

07.1 KAMPUNG IMPROVEMENT

The growing demographic pressure on the cities structure is making high-rise vertical apartment buildings the easiest solution to their problems. The scarcity and lack of available land in the cities, is creating a pressure on the urban poor, as they have to make place for modern new skyscrapers and shopping malls, in the most central locations. The heterogeneous neighborhoods in which people lived, worked and interacted, the urban space in metropolitan Indonesia is slowly becoming more and more divided into class and wealth (Savirani & Wilson, 2018).

The improvement of the kampung neighborhoods, is not something new. The Dutch-Indies already started with improving the living environment of the kampung. The reason for this though, was not out of pity, worry or compassion, but mainly because the European families were afraid that their household helps, the natives living in the kampungs, would bring diseases along into the European quarters of the city.

Therefore, the government of the Dutch-Indies started with implementing basic infrastructure into the kampung neighborhoods, as can be seen in image 07.2 and 07.3, where the kampung dwellings are positioned around the newly constructed road network and sewage canals.

After the realization of these projects, there also came a rising criticism to the kampung improvement projects, as they would not respect the kampung neighborhoods structures, but just simply realize the needed infrastructure, just for the good of the European immigrants. These kind of improvement project can often be recognized by the concrete constructions, such as bearing, sewage canals or bridges.

The book 'Het Indische stadsbeeld; voorheen en thans' (1939) is a book written by the Dutch engineer Thomas Karsten, reflecting on the differences of before and after the realization of the 'improvements' of the Dutch-Indies. In this book, Karsten is aiming his criticism at the improvement projects, and is calling for design proposals which are more respectful to the existing situation and the 'kampung-way-of-life' (Karsten, 1939).

Img 07.2 - Picture of kampung improvement project during the Dutch-Indies era (Source: Devas, 1981)

Img 07.3 - Picture of kampung improvement project during the Dutch-Indies era (Source: Devas, 1981)



07.4 RECENT KAMPUNG IMPROVEMENT

The future of the housing in Indonesia's major cities seems to be 'vertical', if we take a look at all the different newly realized housing projects. The population that before inhabited a landscape of small, self-build dwellings and shops now is being forced to inhabit the high-rise social housing projects in the outskirts of the city.

As the current kampung neighborhoods are often 'squatter settlements', meaning that they don't have legal permission to be inhabiting the ground, the ground the kampungs have been realized on are still legally owned by the local government. Therefore, these areas are potential income generators for the government, as they could legally sell or rent out the land. Therefore, the presence of the slum-neighborhoods on these areas, is blocking them from selling or renting out the land, as the land itself is already being inhabited.

A second reason for the clearance of the slum-neighborhoods is Indonesia's policy to make the whole country slum-free in 2019. To make this plan even more optimistic, the ministry of Public Works and Housing, is also aiming to provide the whole country of clean water and sanitation (Jakarta Post, 2016). These plans come together in Indonesia's '100-0-100' plan. The name is basically explaining the goals of the project, as the first 100 is standing for the 100% supply of clean water throughout the country. The 0 stands for the zero slums in Indonesia. The last 100 is standing for the fulfillment of the sanitation (Habitat Indonesia, unknown).

In 2019, the time in which this report has been written, it can be concluded that they won't meet this goal. This does, of course, not mean that the challenge ends here, but this process will continue to happen in the upcoming years.

The people, who are being evicted from the current homes are often repositioned in social housing projects in the outskirts of the city. The social housing blocks are often cheap four to six story buildings which offer multiple apartments for the families, as for example the Rusunawa Marunda in the northwest of Jakarta, as can be seen in image 07.4.

The social housing projects are receiving a growing amount of critique, as they would not embrace the social living standards of the kampung inhabitants. Some of these critiques are focused on the housing project not being child-friendly enough, or the

Img 07.4 - The Rusunawa Marunda project in Northwest Jakarta (Source: Actxplorer)





Img 07.5 - View of the KS Tubun
Flat in West0Jakarta (Source:
Authors own, edited from:
Manggala mi / Arya)



main critique: the new living situations are creating a wider array of problems than what the social housing blocks are solving.

As the social housing projects are solving the physical health problems of the kampung, such as safe constructions or the lack of infrastructure in the kampung. The new housing project do also create new problems such as a financial unbridgeable distance to their former social and economical circle.

For example, a family which before would be living in one of the centrally located kampung neighborhoods, would make a living in a nearby shop or factory, making only a minimal income. This income was only about enough to bring food on the table and provide a decent living quality.

After being relocated to one of the social housing project in the outskirts of the city, the working family-members would now have to use (public) transport to get to their work, which is only shrinking their already minimal income. Other families are even forced to leave their job, making them jobless for the unforeseeable future. On top of this, the families are now also obliged to pay a monthly rent (in the newer projects of about 600.000 Rupiah (about 16 euro) per month. The combination of these two factors, is leaving relocated kampung families with huge debts, a loss of their jobs and their social circle.

The new kampung improvement projects are therefore not solving the issues the kampung inhabitants are dealing with, but are, again, only solving the problems for the (local) government, as was the case during the era of the Dutch-Indies.

Img 07.6 - Pulogebang Flats in Jakarta (Source: Poskotanews, 2016)

Img 07.7 - Rusunawa Rawa Bebek in Jakarta (Source: Widhana, 2016)









08 AN IDEAL FUTURE

The chapter 'An ideal future' will bridge the research on the 'problems' to the future design proposals. So, now we know the main problems of the project area, and we have an understanding of the qualities and the 'kampung-way-of-life', we can merge them and look to an ideal future for the kampung. Therefore, this chapter will give an insight into the vision for the 'maze'-area of kampung Tamansari.

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Img 08.1 - View on the Chikapundung riverbank in kampung Tamansari (Source: Authors own)

S

Strengths

Proximity of the Chikapundung river

Strong sense of community

Proximity to educational institutions, shopping facilities, etc.

Participatory interest

Governmental interest in developing the kampung

W

Weaknesses

Chaotic urban tissue

Overcrowding

Lack of decent infrastructure

Dangerous housing circumstances

Alignment between topography and structure

Land is not owned by the people

08.1 SWOT-ANALYSIS

The SWOT-analysis is giving an overview of the different main qualities and problems, surrounding kampung Tamansari. Therefore, the different components of the Swot-analysis are not considering kampungs in general, but are merely focusing on the kampung and the surroundings the kampung is finding itself.

The main strength of kampung Tamansari is the location it is positioned in. The kampung is located directly next to the Chikapundung river, but is also close to big educational facilities, shopping centers and bit governmental buildings. Other strengths which can be utilized during the design process are the high interest of the local government in the kampung areas, the strong sense of community and togetherness of the kampung resulting in a strong willingness in improving their neighborhood.



Opportunities

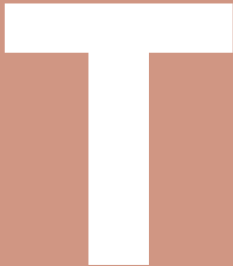
Bringing back the historical park identity of the place

Further strengthen the kampung's identity

Natural terrain (slope)

Development plans of the local government

Policies/plans for cleaning the Chikapundung river



Threats

Expected rapid growth of population

Loss of the 'kampung way of life' through vertical development plans

Annual floods

Gentrification of the area through development plans

Weaknesses are mainly focusing on the public health research outcomes, such as the urban tissue or the lack or inadequate infrastructure. Another weakness is the fact that the land is not owned by the people.

Opportunities are the development plans of the (local) government, such as the river setback or the '100-0-100'-plan. Another opportunity can be found in the heritage value of the place.

The main threats are the ongoing processes in Bandung, such as the annual floods in the area and the rapid population growth. Other threats are focusing on the loss of the kampung identity or the gentrification after the new kampung improvements have been realized.

08.2 APPLYING THE THEORY

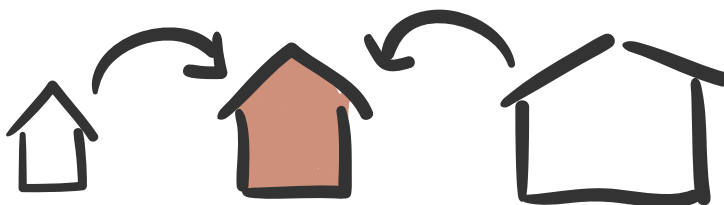
After getting an understanding of the concepts of livability and public health, and the 5 main determinants to work with, we can make a plan on how to 'work' with these concept, changing the negative perception to positive one. This chapter will reflect back on the theoretical research and will link this to the design components, with the goal to come up with a plan to utilize the understanding of these concepts.

Livability is closely linked to the concept of 'Quality of life'. The quality of life is focusing on a person perception of well-being, whilst the livability is more focusing on the 'objective' conditions of the environment. Together, these concepts give a total overview of how livable a place is, and how the individual organism is perceiving this livability.

The concept of livability has a way more 'objective' component to it, whilst the Quality of life is more focusing on the perception of the individual. For example, if a certain neighborhood is meeting all the requirements of a decent neighborhood (such a decent infrastructure, public green, available public space, etc.) It can be described as a livable neighborhood. But whenever a person from a neighborhood with a wide array of urban qualities moves to this neighborhood, he might conceive the neighborhood as less livable, as the new living environment is contrasting with what this person is used to. But whenever a person from a slum, or kampung, would move to this same neighborhood, he might conceive this same neighborhood as highly livable, as this person is used to a lower amount of urban qualities.

As we know, that we are working with people from a 'slum', or kampung, we are dealing with people with a very specific set of urban qualities. Certain qualities, as the access to decent infrastructure, are not something the population is used to, so a positive change is easy to be made here. But at the other hand does the kampung neighborhood have a very strong sense of belonging, togetherness and social cohesion, something which needs to be remained in the new design. If not, this can have

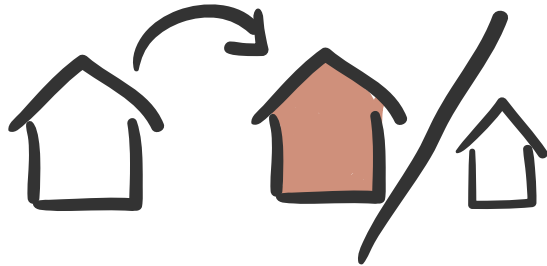
Img 08.2 - Livability as a perception of contrast (Source: Authors own)



serious problems concerning the perception of livability of the new neighborhood. This example is illustrated in image 08.02.

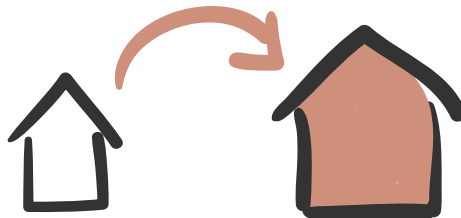
If we compare this knowledge to the realized social housing projects, as an alternative for the kampung environment, we can describe a positive change in for example, the more physical and easy-to-improve qualities such as safe constructions and decent infrastructure. But as the new project are located in the outskirts of the city, with all the corresponding problems as explained in the kampung improvement chapter, and the new living typology, which is destroying the community's social cohesion, sense of togetherness and sense of belonging, the projects are perceived as worse then the original kampung neighborhoods. This example has been illustrated in image 08.03.

Img 08.3 - Kampung improvement project are not perceived as improvement, and even as downgrades (Source: Authors own)



So, different from the social housing project which are being realized on the outskirts of the city, the goal is to manage a system in which both the social and physical components can manage to generate a positive perception. Through tackling the five public health components and making sure that the new kampung neighborhood is maintaining its strong social qualities, we can realize a project which will raise overall satisfaction. So the aim of this project is not just to realize a healthy neighborhood, but is also focusing on the bridging between the new neighborhood and the current kampung neighborhood, as this is just as important to generate a 'livable' kampung neighborhood, where the individual people can perceive a higher 'quality of life'. This example has been illustrated in image 08.04.

Img 08.4 - The focus of the design on realizing a livable neighborhood and an improved perception of the quality of life (Source: Authors own)



08.3 VALUES AND QUALITIES

Currently, with the Indonesian zero-slums policy, Kampung neighborhoods are being taken down for safety, health and legal reasons, and the kampung inhabitants are being rehoused in cheap vertical apartment buildings. These buildings maybe facilitate the people with the most basic needs, but do need take the current kampung structure and way-of-life into account. Besides this, the vertical kampung projects also rarely take the people financial capacity into account, making it unable for the slum-inhabitants to afford the new apartments.

The vision for this project is to offer an alternative development strategy for the redevelopment of the current kampung neighborhoods, with Tamansari as the prime example. The aim for the project is to turn Tamansari into a highly livable, healthy, green, sustainable, affordable, feasible neighborhood, which will be cooperatively be realized by the local government and the kampung inhabitants. The upcoming paragraphs will explain the role of the different key-values in the vision of the neighborhood, which will afterwards be explained in the overall vision.

“The aim for the project is to turn Tamansari into a highly livable, healthy, green, sustainable, affordable and feasible kampung”

Livability

Livability, as the personal perception of the quality of life of a particular place, is one of the main indicators of satisfaction of the new design. Therefore, the new design must allow the current kampung qualities to stay or even expand, whilst removing the problematic parts of the kampung. In here, ... the kampung way of life is an essential feature for the extend in which the new kampung neighborhood will be accepted.

Health

As being discussed as the main topic of the research body, it is clear that the current kampung is lacking serious health issues, which form a threat to public health of the people. With health being one of the key factors in the overall quality of life, improved health implication are needed for a more positive future of the kampung.

Green

The current kampung has been realized on top of the most important green backbone of the city, and the informal urbanization along the riverbanks of the Chikapundung has almost entirely removed all public green from the area. It is therefore important to reflect back to the heritage of the location, and bring back the public green as an important element of the kampung.

Sustainability

Since the squatter settlement is the result of an illegal process, the neighborhood doesn't have any legal connections to the city's infrastructure network. Because of this, the neighborhood has always be forced to be self reliant, and take care of their own problems. This mentality can be utilized to turn the kampung into a self sustaining entity, which is not relying on the city's infrastructure, wherever possible.

Afford-ability

As we are dealing with a really vulnerable target group, the urban poor, we have to be really careful when considering the afford-ability. A lot of the kampung inhabitants are living with an income from under the UN's poverty line of \$1,90 a day, therefore there are not a lot of expensive interventions possible. The new housing typologies shouldn't leave the people will huge debts, as is the case with the new kampung redevelopment projects.

Green

With the rapidly growing population of Bandung, the urban kampungs are vulnerable areas for mass densification, as the rural migrants have low financial capabilities and will therefore probably end up in the informal areas of the city. In making the new design thus flexible, that it will be able to fluctuate along with the demographic pressure, we can realize a development strategy which will be able to give an answer to growing housing problems of the city.

08.4 VISION FOR TAMANSARI

With the new design, the changes of the urban fabric, as the population has realized it themselves, will create a new type of living. The new streets, squares and green spaces are shaping a different framework for social life to take place in. This chapter is focusing on the perception of space and realization of the new living environment.

Alignment between the old and the new

The existing neighborhood structure is indirectly involved in the realization of the new urban fabric. As the road network is, partially, overlapping the existing structure, it makes it possible for current building to remain for a longer period. This makes it possible to redevelop the kampung more gradually, and not make too rigid changes.

The urban block

The urban block will be an entity which makes it possible for multiple families to benefit from each-other's presence. For example, the blocks will be able to share certain facilities and functions, to lower the overall rent of the apartments. Besides this, the urban blocks will also determine the units in which the electricity through solar panels will be generated, or where the rainwater will be harvested and used. Furthermore will the urban block also give the opportunity to for example grow their own fruits and vegetables.

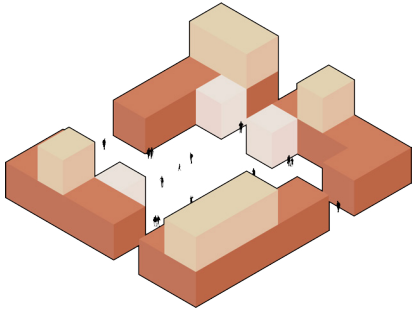
The housing element

Within the incremental development strategy it is necessary to have a basic building element to create the new block structure with. The basic element makes it both affordable and more feasible to be able to add on new structures to the urban blocks. This housing element will need to have a size which meets the requirements of what is considered a healthy living space in the Javanese context.

The Social structure

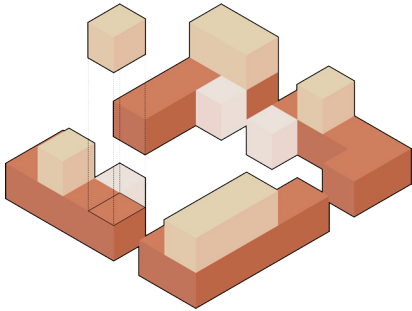
With the implementation of the new incremental development system, there is also a important role to play for the kampung inhabitants themselves. The vision is aiming at a collaborative approach between the kampung inhabitants and the local government, and coming up with a final result which is meeting the requirements of both parties.

Img 08.5 - The different design components of the ideal future for kampung Tamansari (Source: Authors own)



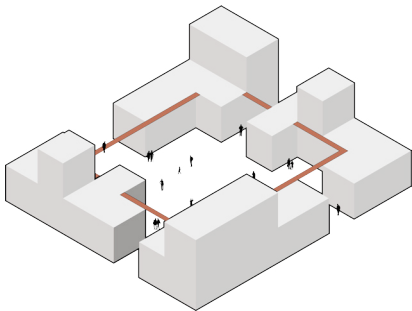
Block structure

The current back-to-back structure will be redeveloped into a new block structure. This block structure will result in a visual and mental understanding of clustering. Each block will have its own set of facilities and the opportunity to grow their own food. The back-to-back structure with the facilities in-between will be upgraded to a structure which further utilizes the concept behind this structure.



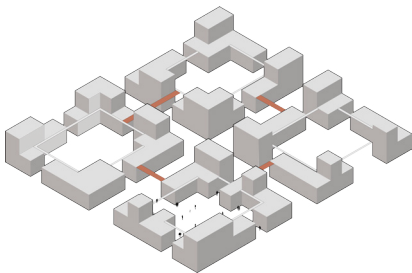
Incremental development

In order to create a both feasible, collaborative and to realize a sense of belonging, an incremental development model will be introduced. This model will give the kampung inhabitants the possibility to (re-)create their own neighborhood within a framework that has been set, to secure a healthy, livable city structure.



Vertical streets

In order to reach a high density with a combination of available public space, the roofs of the houses will be made available for semi-public use. Vertical streets on the inside of the block will give each rooftop an equal accessibility and will connect the different houses and rooftops of the first floor with the ground floor, giving the inhabitants of the first floor equal opportunities as the bottom floor.



Vertical street-network

To utilize the neighborhood's steep slope, the vertical streets within the building blocks will be connected with one-another to create a street network. These street networks on the elevated level will be made accessible from the same height of the slope.

Therefore, the incremental development is leaving a lot of freedom for infill by the inhabitants. By letting the population themselves decide on how to 'design' their homes, the aim is to create a greater sense of belonging. So the new kampung design won't be a new neighborhood provided by the local government, but will really be a result of a collaborative design process between both the local government and the kampung inhabitants.

Overall, the new kampung proposal is offering a new formal development system which is still embracing the kampung life as it is, and maybe even allowing for improvements.

The development

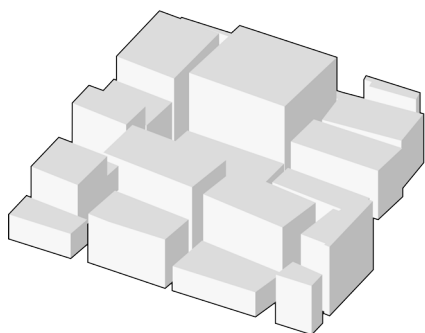
Through the incremental development strategy, the kampung will know a new way of development and densification: vertically. This is also asking for a different development process. As can be seen in image 08.06, the development will exist of different stages.

The current kampung structure will be replaced for the new urban block typology, which will be build up from the basic housing element together with a variation of other housing typologies, to provide opportunities for the varying (financial) capabilities of the kampung community.

Whenever a current kampung dwelling fits within the new block structure, and the construction of the dwelling has not been classified as problematic, the building can be embedded within the new urban block, as we are looking for a healthy, but also an affordable kampung model.

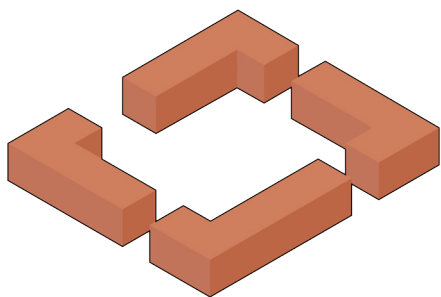
After the realization of the ground floor, as the part where the development is in the hands of the kampung community themselves, the development opportunities are already framed through the design. From this point, the kampung community will be able to add-on new housing elements stacked on the ground floor. In order the create a variation in the street view, and give the people to opportunity to personalize the housing model to their own desire, each dwelling will also conceive of a transitional space, which can be developed as preferred.

Img 08.6 - The different stages of the incremental development system (Source: Authors own)



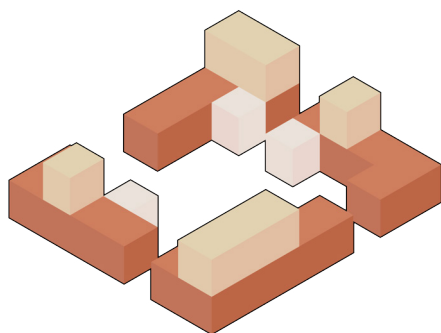
2019

The current kampung structure will be the basis for the new neighborhood plan.



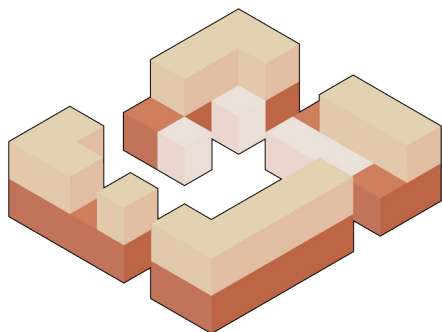
2030

Completely or partially cleared areas will be designed for a minimum housing number.



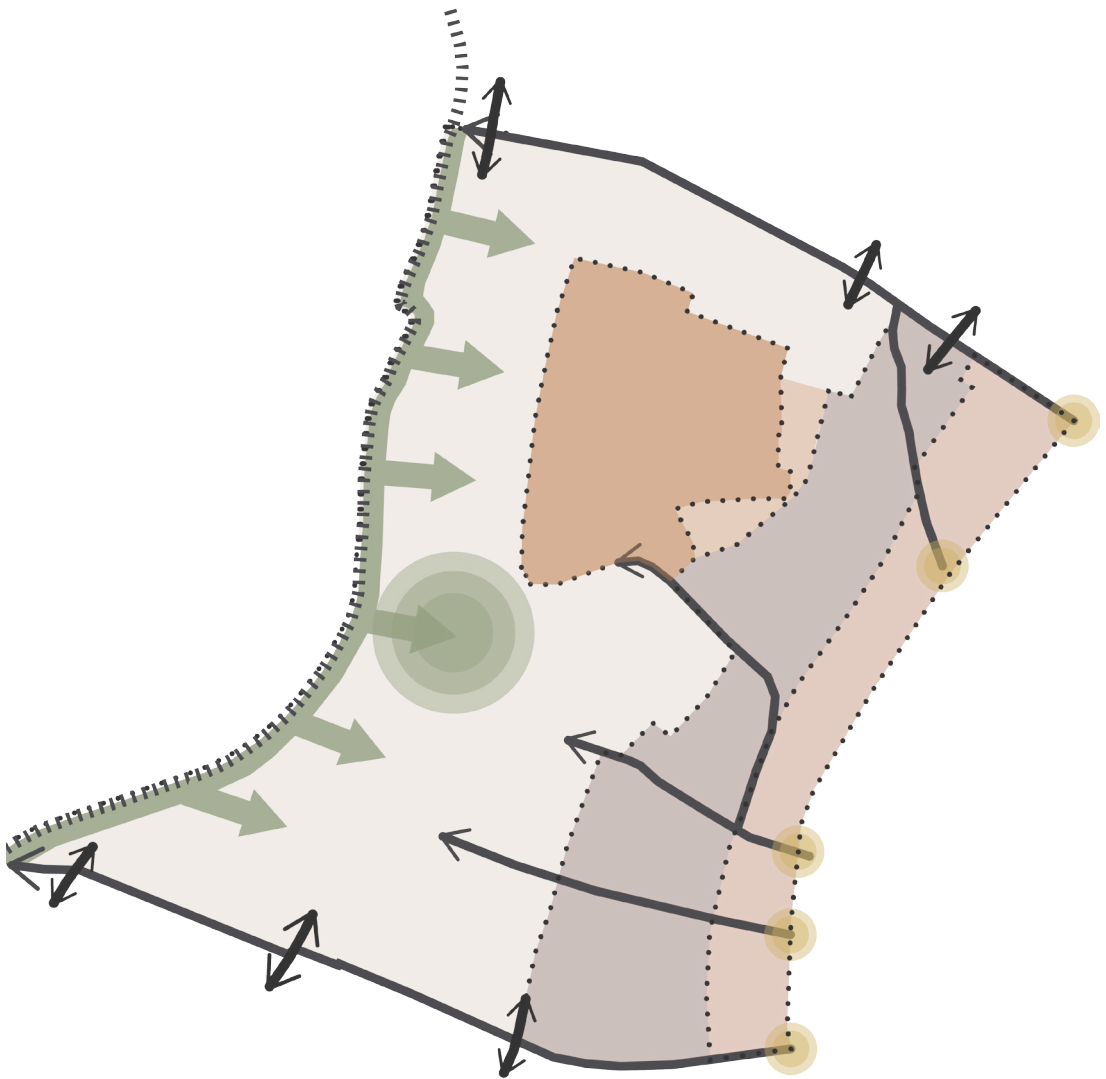
2035

From here on, the kampung population has to opportunity to expand their own block structure.



2050

The growing amount of kampung inhabitants will result in growing housing blocks.



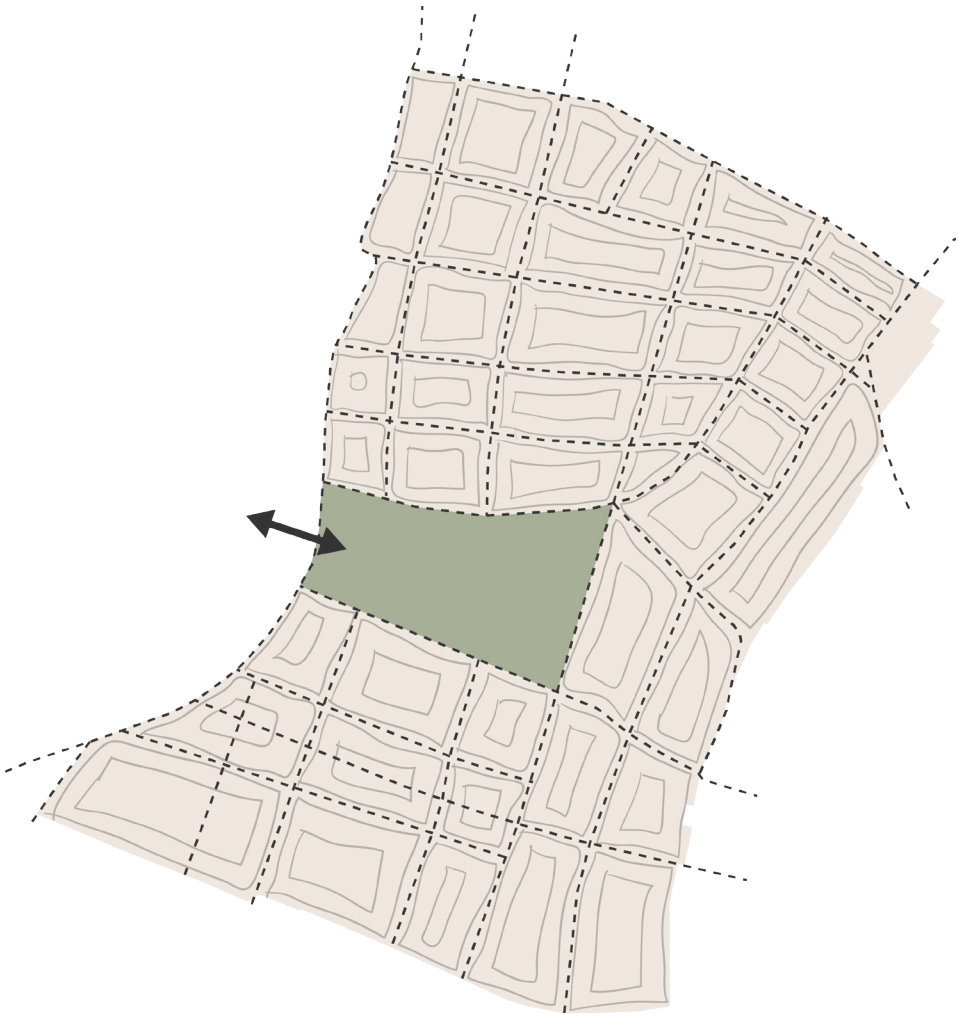
Img 08.7 (right) - Garbage collection outside of the kampung (Source: Google Earth)

Vision map

The new kampung neighborhood taking into account the river setback from the Eco-district plans. From this new boulevard along the Chikapundung river, there will be different neighborhood typologies in-between the Jalan Tamansari and the new Boulevard. The

different functions along the Jalan Tamansari will remain, as they are formal structures and do not need any major improvements. The new kampung neighborhoods are going to be centered around a new centrally positioned pocket park. This pocket park will also

be the space, together with the boulevard, where all main axes will derive.

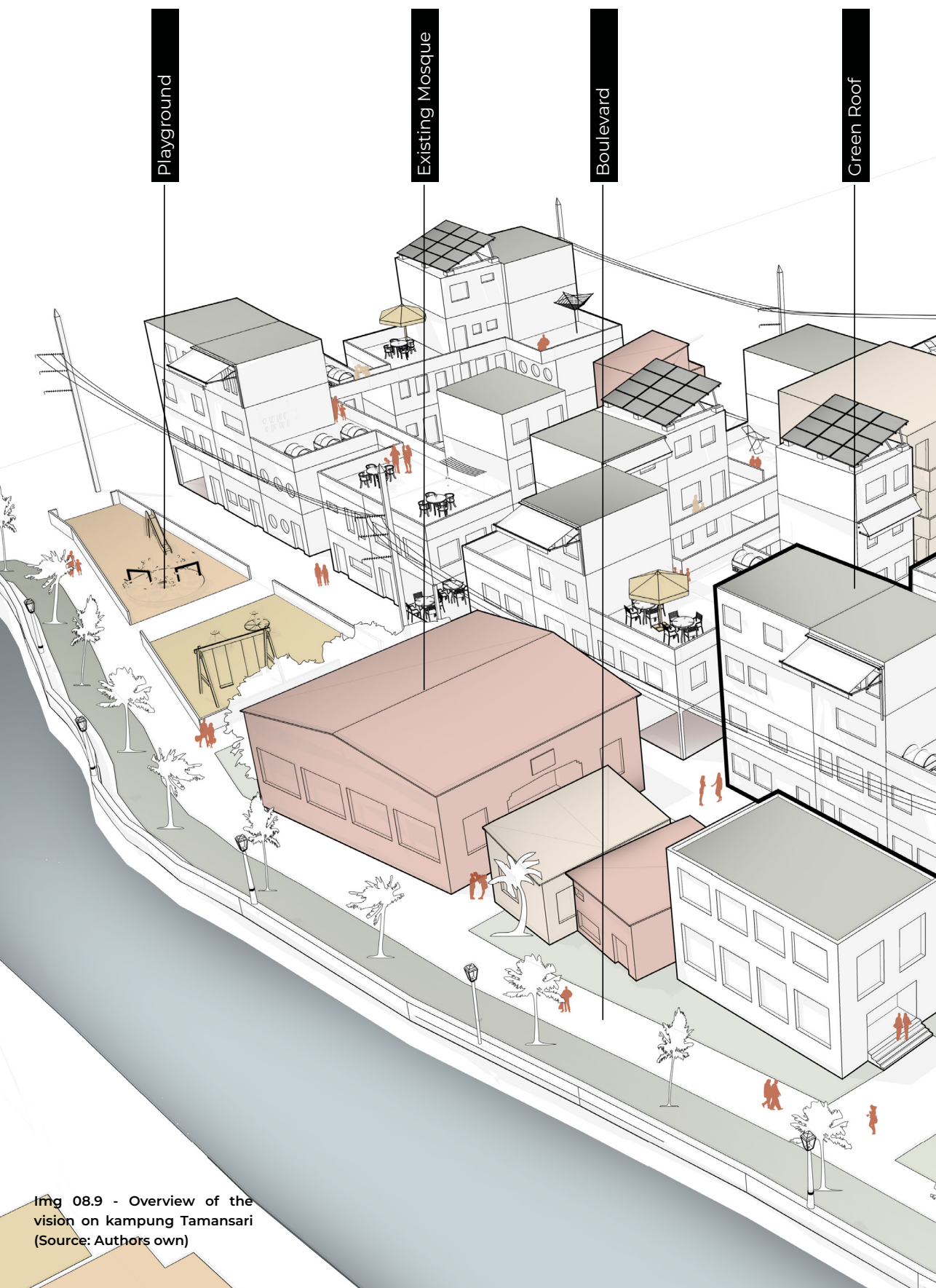


Img 08.8 (right) - Garbage collection outside of the kampung (Source: Google Earth)

Vision plan

The new kampung neighborhood will, as already describe, exist of different urban blocks which will follow the next street network. This network is connecting the existing entrances with the existing open ends from the surrounding urban fabrics. On top of the

ground street network, public. the plan will also consist of an elevated street network. The different urban blocks will hereby be Connected with one another. The central pocket park will also be connecting towards the opposite river bank, making the park more accessible for a wider



Img 08.9 - Overview of the vision on kampung Tamansari
(Source: Authors own)

Roofs

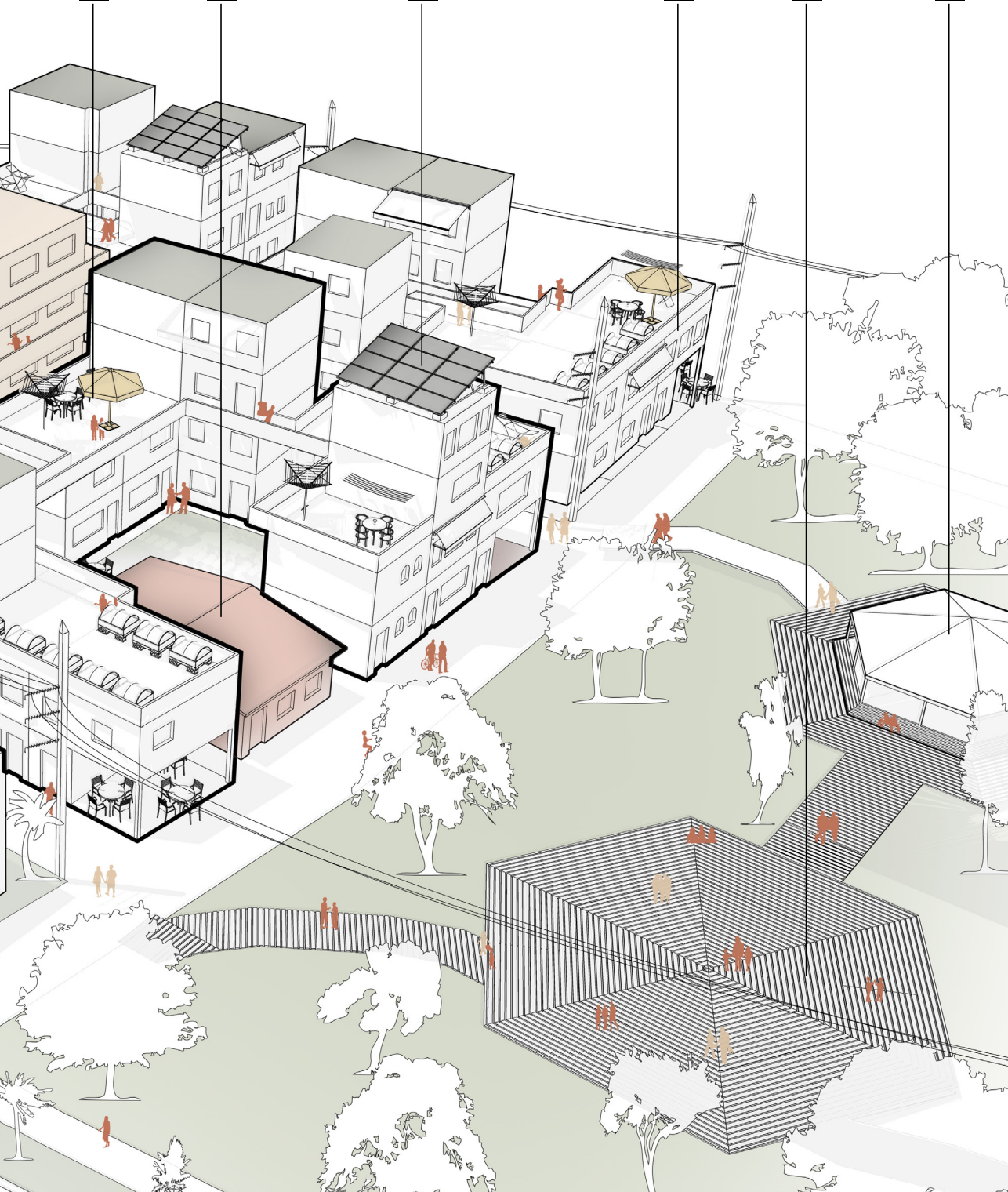
Existing building

Solar panels

Corner-stores

Market square

Community space







09 AN INCREMENTAL TAMANSARI

The chapter 'An incremental Tamansari' will lead you through the new design proposal. It will explain all the different components that will together make the new incremental tamansari, as for example the infrastructure, the phasing and the stakeholder analysis.

INDEX

09.1	In incremental Tamansari	152
09.2	Stakeholder analysis	196
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09.5	The housing element	220

Img 09.1 - View on the Chikapundung river in kampung Tamansari (Source: Authors own)

09.1 AN INCREMENTAL TAMANSARI

After the description of the ideal future of the kampung neighborhood, a process of design has taken place, bringing the initial ideas to a finalized development strategy. This chapter will explain and descriptive the different element that together will shape the design of the new incremental kampung neighborhood.

The design

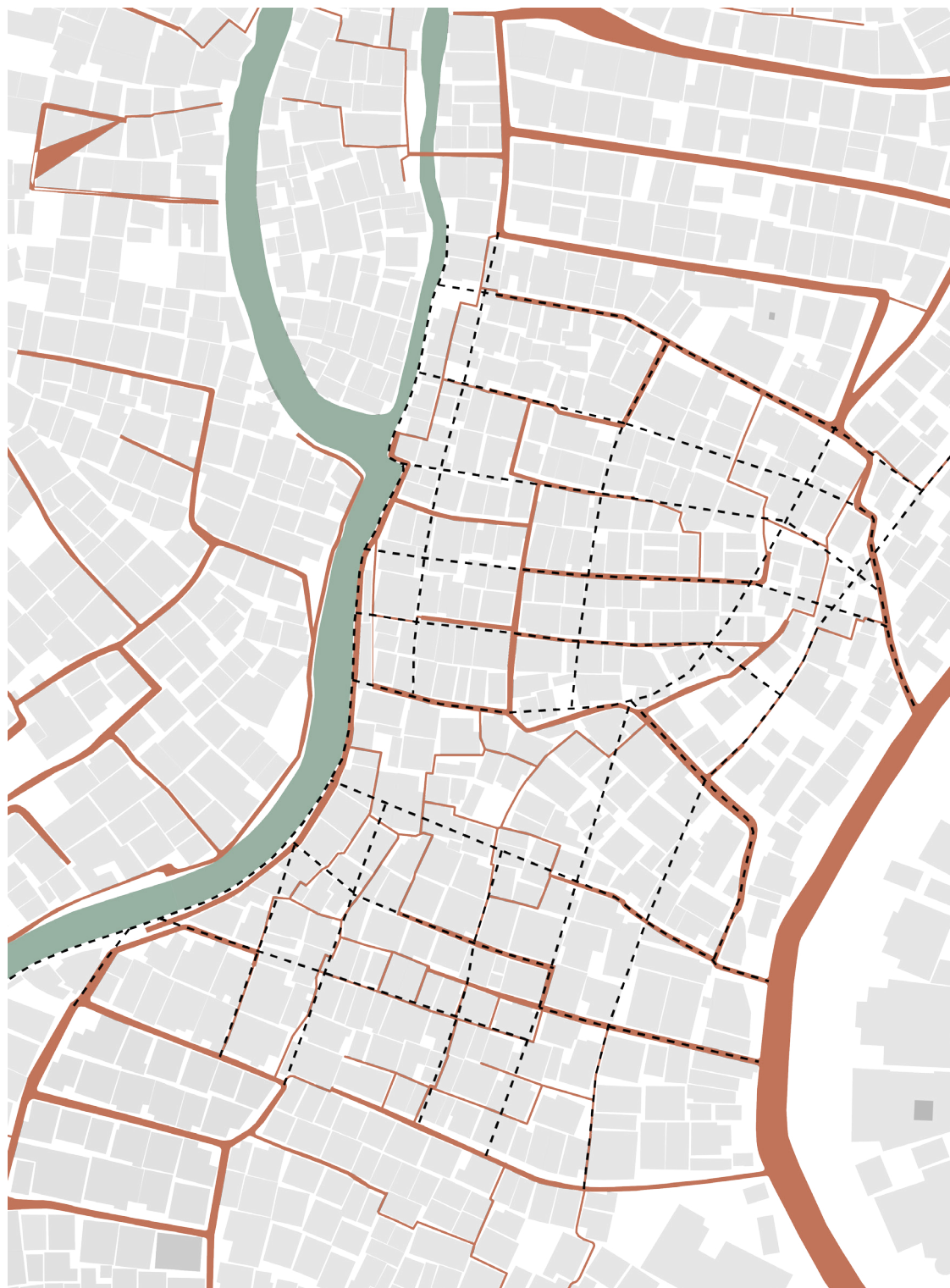
The overall neighborhood design has been based on a series of different aspects. One of the most important of these features was the alignment between the new and the existing neighborhood. As can be seen in the neighborhood plan, on the next page, the new design is not recognizably comparable to the current neighborhood structures. Even though by the eye, there may not be a clear alignment, the neighborhood design has been realized in such a way that it can be realized with the existing structure as its base. Examples of this are streets partially following the existing streets, and streets and squares being aligned with the existing buildings. This alignment will be made clearer in this phasing part of this chapter.

What we do can see, in image 09.2, is the overlap between the old and the new street network, in which we can see the alignment between the two street lay-outs. As discussed in the vision, the 4 entrances into the kampung from the Jalan Tamansari, in the east. These 4 entrances are forming the base from where the street network has been designed.

Differently from the current street network, the entrances became the new primary streets stretching throughout the whole RW. In the current situation, most of these streets had dead ends or resulted into network small alleys heading nowhere. With these 4 primary streets remaining, the east-west orientation of the neighborhood can stay in tact, making it easier for the new structure to be implemented.

The other primary and secondary pathways arrive from the existing axes from the surrounding kampung structures. The new design will restructure and heal the broken street network. In-between the different primary and secondary streets, we can find the smaller tertiary pathways, comparable to the existing 'gangen'. The further design of these different streets will be made visible later on in this chapter.

Img 09.2 - Map showing the overlap of the old and new street structure (Source: Authors own)



The housing units in the new design will be organized in urban blocks. In the current situation, the buildings are organized in a back-to-back structure, with the shared facilities in the middle, such as the infrastructure. The idea for the block structure came from the idea to 'enlarge' this concept of the back-to-back structure with the shared facilities in the middle. By enlarging the shared space in the middle, we are able to create units which can share certain facilities, such as toilets, bathrooms and laundry rooms. The inside of the block will also offer a semi-secluded public space which is open for different functions, which is giving an answer to the lack of public space in the existing structure. The Block structure is also aiming to enhancing the strong social connections between the inhabitants of the kampung.

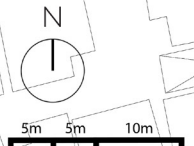
As been described in the vision, the plan is not a finalized master plan, but more of a framework in which the new kampung neighborhood can be developed. The incremental development strategy is making sure that the neighborhood is not a fixed entity, but instead, an always expanding flexible structure which always manages to balance the housing supply with the current demand. The housing blocks, as can be seen in the neighborhood plan on the next page, can be topped with a second layer, making it possible to expand the total of 665 dwellings can be expanded to a total of 1029 dwellings, which is a growth of 242% compared to the existing 424 dwellings in the area.

These 665 dwelling units, are not all the same housing element being copied over and over again. Even though this housing element is the main housing entity, a wider variation of housing typologies is needed to meet the requirements of all the different kampung inhabitants. Therefore the proposal also offers larger apartments and houses, to the households with a higher income. For the poorest people and/or the people who are staying by themselves there are also multiple Kos Kosan-buildings (Boarding housing) which offer private bedrooms in a building when all other facilities are shared. This typology is also a popular option for the local students in the area. The nodes in-between the different urban blocks are important places for economical functions. The corner-plots, which are slightly bigger than the basic housing elements, offer the opportunity for locals to create small corner stores or warungs. It is also possible to realize more dwellings in these corner plots.

The different urban blocks are all centered around the central park of the kampung. This new green

Img 09.03 - Map showing the new street hierarchy (Source: Authors own)





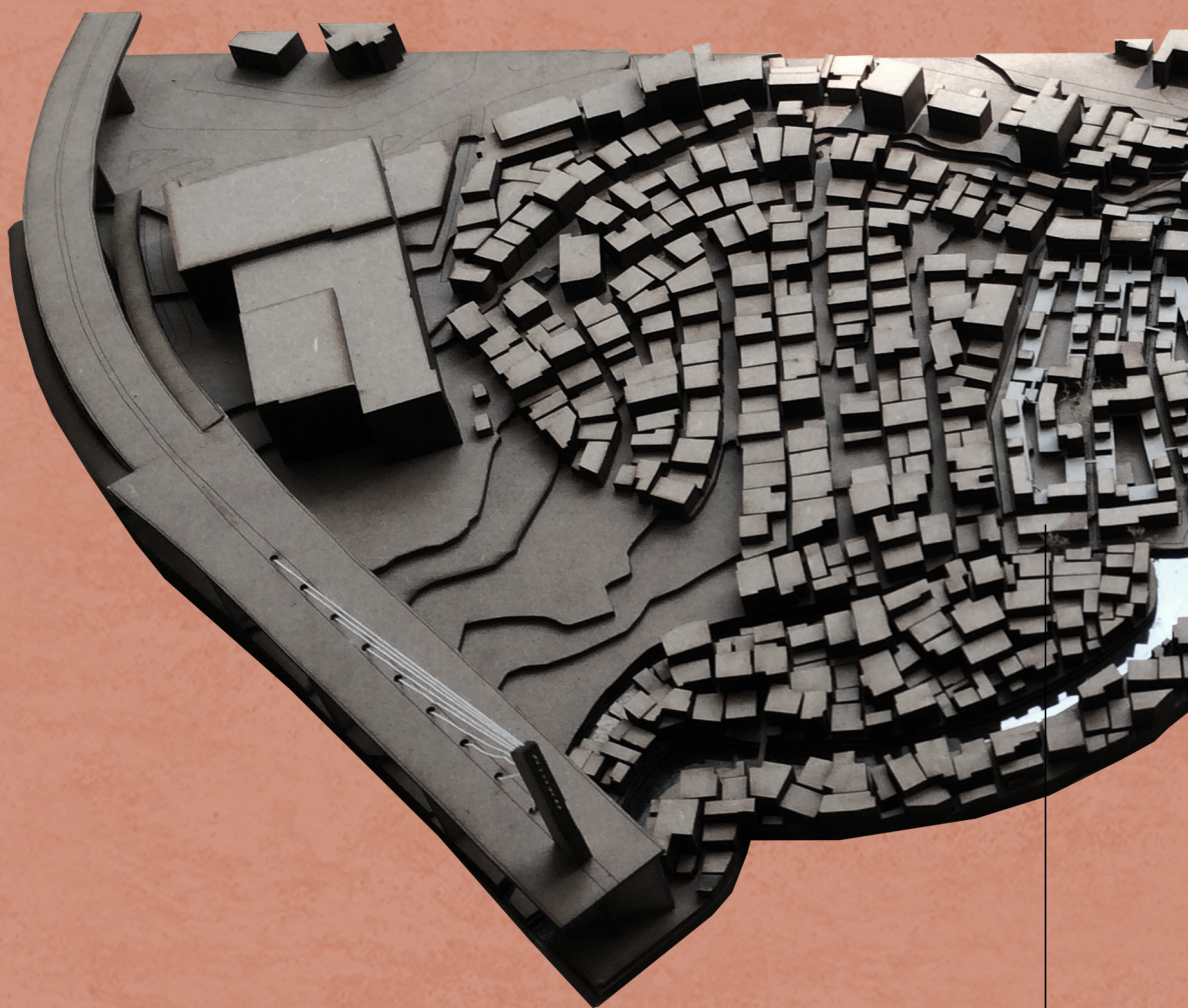
Img XX.X - Masterplan
(Source: Authors Own)

Functions & Facilities

- 1 - Community Center
- 2 - Mosque
- 3 - Mosque
- 4 - Mosque
- 5 - Kindergarten/Daycare
- 6 - RW-office
- 7 - Building material storage / Workplace
- 8 - Optional Shophouse / Warung

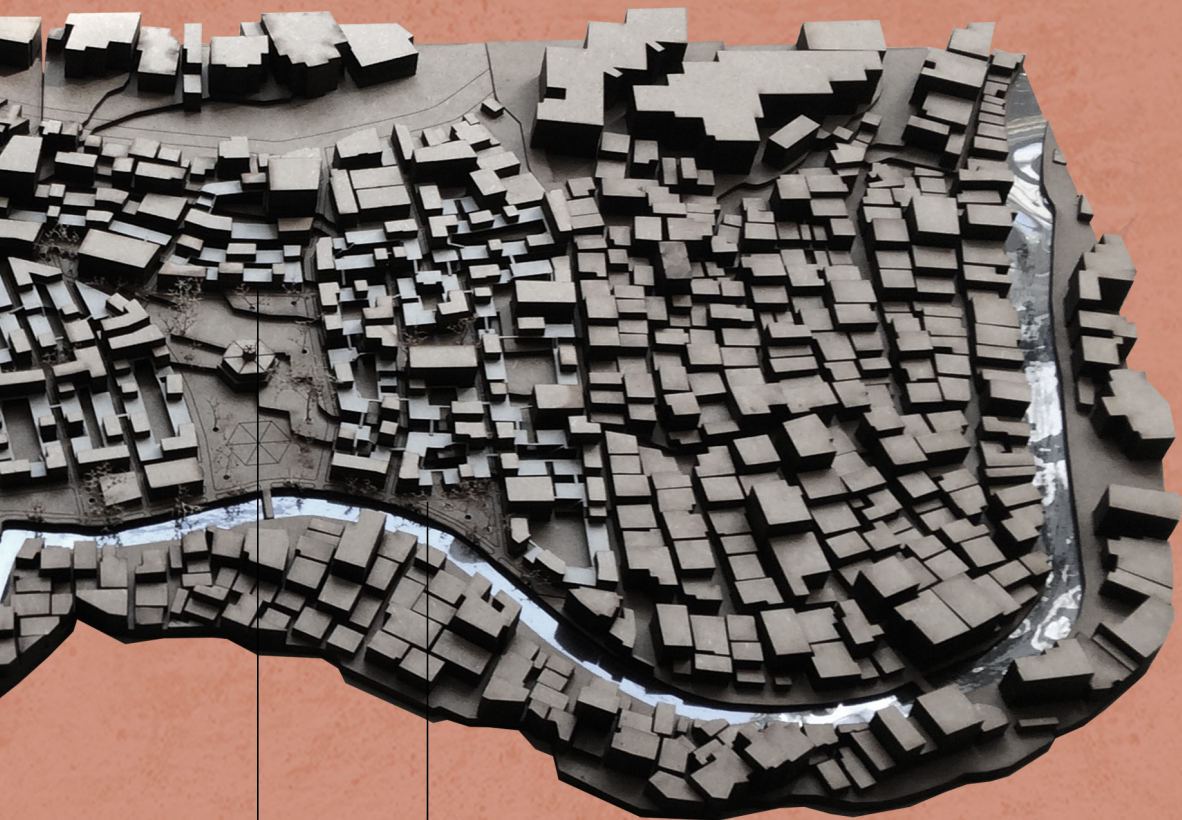
- 19 - Kos Kosan (Boarding housing)
- 10 - Apartment Building
- 11 - Housing element XL
- 12 - Community place
- 13 - Market Square
- 14 - Playground





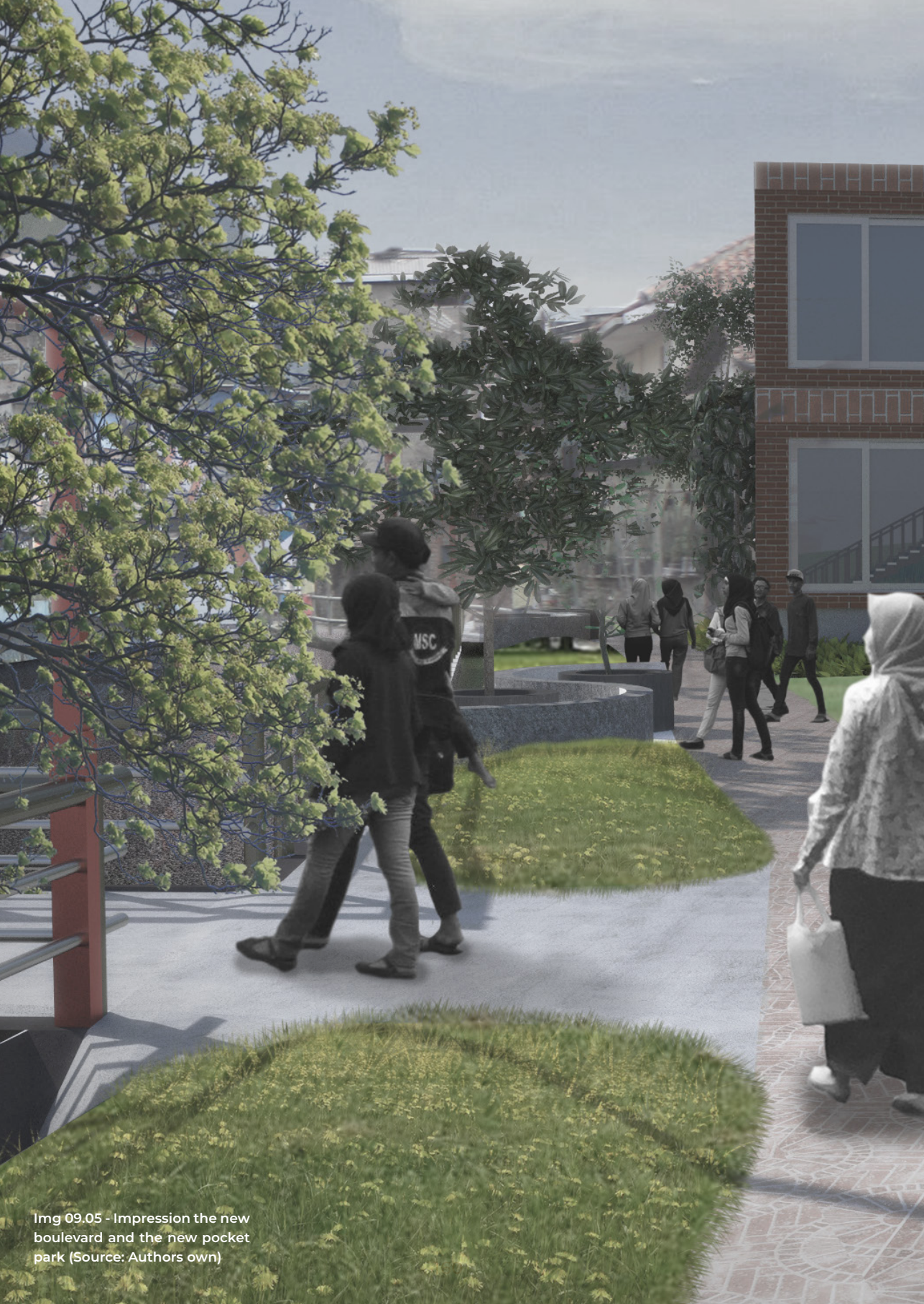
Riveredge function
strip

Img 04.20 - 1:1000 model of
Eastern bank of kampung
Tamansari (Source: Authors
own)

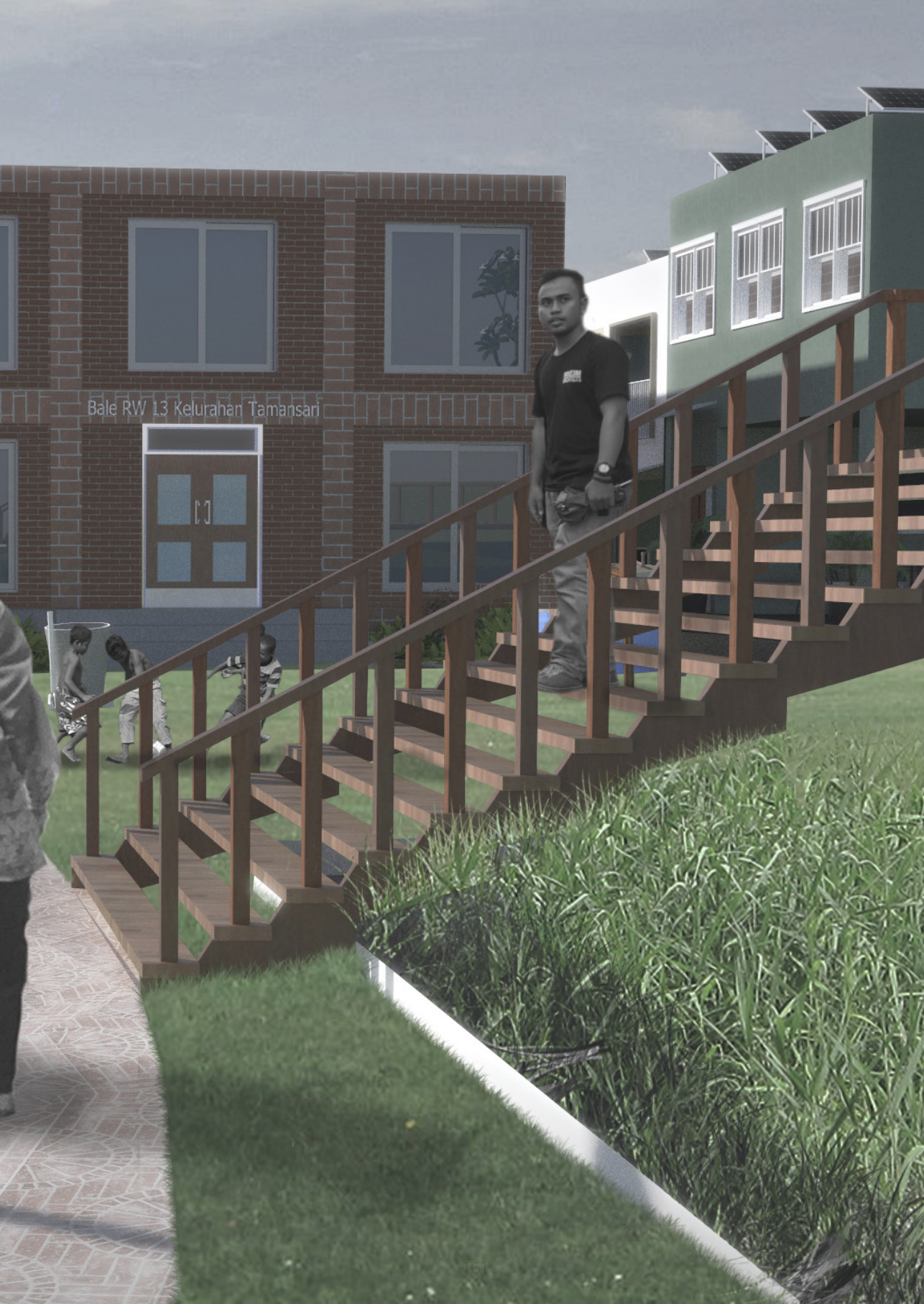


Central pocket park

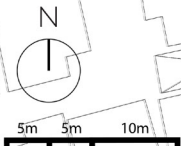
River boulevard



Img 09.05 - Impression the new boulevard and the new pocket park (Source: Authors own)



Bale RW 13 Kelurahan Tamansari



Img XX.X - Masterplan
(Source: Authors Own)

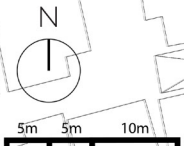
Functions & Facilities

- 1 - Community Center
- 2 - Mosque
- 3 - Mosque
- 4 - Mosque
- 5 - Kindergarten/Daycare
- 6 - RW-office
- 7 - Building material storage / Workplace
- 8 - Optional Shophouse / Warung

- 19 - Kos Kosan (Boarding housing)
- 10 - Apartment Building
- 11 - Housing element XL
- 12 - Community place
- 13 - Market Square
- 14 - Playground

Housing elements
Housing elements





Img XX.X - Masterplan
(Source: Authors Own)

Functions & Facilities

- 1 - Community Center
- 2 - Mosque
- 3 - Mosque
- 4 - Mosque
- 5 - Kindergarten/Daycare
- 6 - RW-office
- 7 - Building material storage / Workplace
- 8 - Optional Shophouse / Warung

- 19 - Kos Kosan (Boarding housing)
- 10 - Apartment Building
- 11 - Housing element XL
- 12 - Community place
- 13 - Market Square
- 14 - Playground

Other housing typologies

- Kos kosan (boarding housing)
- Apartments
- XL-housing elements





N
 5m 5m 10m
 Img XX.X - Masterplan
 (Source: Authors Own)

Functions & Facilities

- 1 - Community Center
- 2 - Mosque
- 3 - Mosque
- 4 - Mosque
- 5 - Kindergarten/Daycare
- 6 - RW-office
- 7 - Building material storage / Workplace
- 8 - Optional Shophouse / Warung
- 9 - Kos Kosan (Boarding housing)
- 10 - Apartment Building
- 11 - Housing element XL
- 12 - Community place
- 13 - Market Square
- 14 - Playground

Functions

- Warung/cornerstore
- Community center
- Mosque/Medrasa
- Daycare
- RW-office/Generator building
- Workplace/Storage unit






 5m 5m 10m

Img XX.X - Masterplan
 (Source: Authors Own)

Functions & Facilities

- 1 - Community Center
- 2 - Mosque
- 3 - Mosque
- 4 - Mosque
- 5 - Kindergarten/Daycare
- 6 - RW-office
- 7 - Building material storage / Workplace
- 8 - Optional Shophouse / Warung
- 19 - Kos Kosan (Boarding housing)
- 10 - Apartment Building
- 11 - Housing element XL
- 12 - Community place
- 13 - Market Square
- 14 - Playground

RW-structure

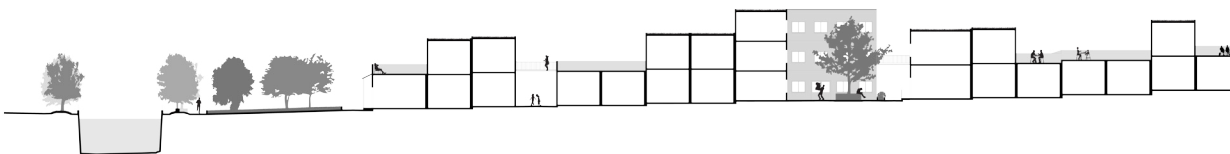
-  RW 01
-  RW 02
-  RW 03
-  RW 04
-  RW 05



pocket park (With a size of 0,34 Ha) is a key-element in the understanding of history of the neighborhood. As already explained in the forming of a slum, kampung Tamansari is realized on top of the most important green lung of the city. This park is an reminder of the heritage of the area and highlighting the importance of the history into the shaping of the future. The central pocket park will give the opportunity for leisure, sports and recreation, underneath the shadows of the canopies. The bottom part of the park is also the overflow area, in case of heavy rainfall and is also housing the central biodigester of the neighborhood. The new to realize bridge connection the pocket park to the opposite side of the Chikapundung is making sure that the impact of the park can be utilized by a even larger public, making the investment of the park also more feasible.

Utilizing the underlying topography

As can be seen in the neighborhood section in image 10, the new design is way better aligned with the underlying topography then the current situation. Instead of accepting the fact that steeply sloped area are more difficult to build upon, the new design is utilizing this height different the make the vertical street network accessible. The steep slope is being used to effortlessly being the walk upon the roof of the underlying dwelling, and from there enter the second floor of the neighboring building block. The height difference is in this scenario no longer a problematic aspect, but instead became a key-element in the functioning of the new neighborhood. Further does the height difference also give the opportunity to realize block facilities, which don't need any daylight, underneath the street level. This will be explained in more detail in



the chapter on the urban block.

Functions and facilities

Besides housing, the new kampung neighborhood also consists of different functions. The new kampung also consists of 3 Mosques, of which two are remaining from the existing situation, and one is a replacement for the mosque which needs to make space for the river-setback.

The community center, located in RT 01, offers the space to host social and cultural events. Besides these event, the building will also offers a small library and work places for the inhabitants.

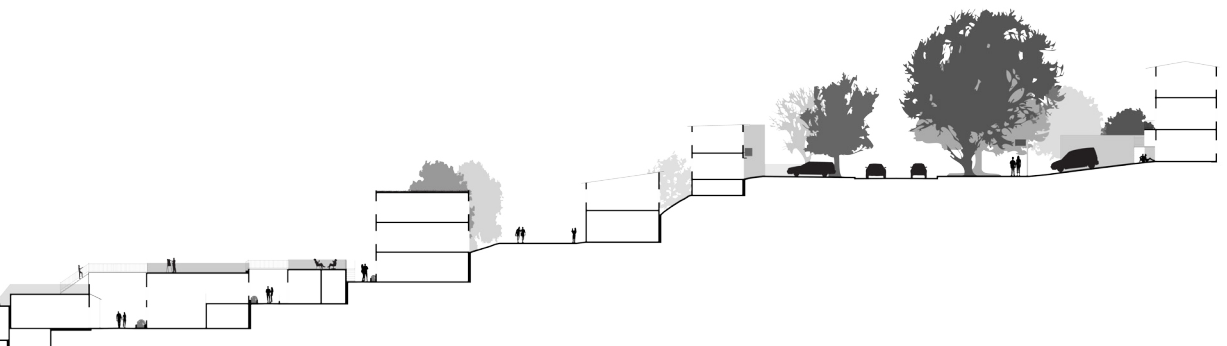
The existing kindergarten in the area will be relocated along the river-edge. The plot will consist of both a building as a covered yard for the children to play in, similar to the existing kindergarten.

The new RW office will be located directly next to central square and the new to realize bridge. The RW office will be the place where people can go with questions or suggestions, but will also function as generator building for all the different infrastructure networks, which will later on be described more detailed in the infrastructure part.

The Workplace and building material storage will be the new center of the RW's Tucan's (Local handyman). The workplace will be used to create the per-fabricated construction elements for the housing elements, and will also function as the storage space for these construction elements. This will be the center from where the housing construction will be organized.

Besides all these functional buildings, the central

Img 09.10 - Map showing the new street hierarchy (Source: Authors own)



park will also house two social functions. In the western wooden veranda, there will be the possibility for a market square, which can also be used for social activities, such as group exercises for the local housewives, which are currently also being held in surrounding RW's. More east from the market square we will find the roofed community space.

Public space

The new kampung neighborhood knows a wider variation in public space typologies than the existing kampung neighborhood. The current situation is a combination of different small streets connection one-another. The new design is a more complex diversion of different typologies of public space.

The new neighborhood street network has been build up from primary, secondary and tertiary streets, which together shape the different urban blocks. In image 09.11, we can see the street sections of these different streets. The difference in widths of the different streets has to do with the different amount of traffic utilizing the space and the infrastructure networks that need to be realized underneath the streets. The tertiary street will have an equal atmosphere to the average kampung 'gang'.

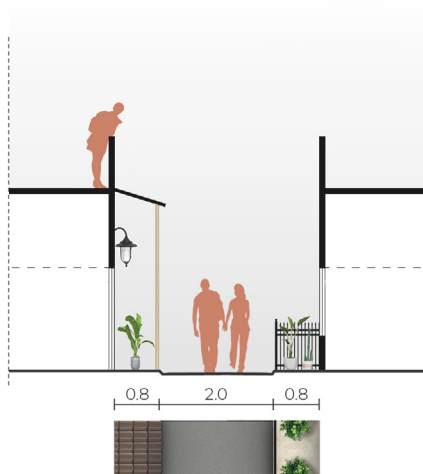
The different RT's have their own pocket square, which will function as the economical and social center of the RT. The RT-square will be the square where you would meet friends or relatives from surrounding blocks, or where children go and play with their friends. As the economical center of the RT, this will also be the place where the street vendors will focus their sales.

Img 09.11 - Street sections of
the different streets hierarchies
(Source: Authors own)

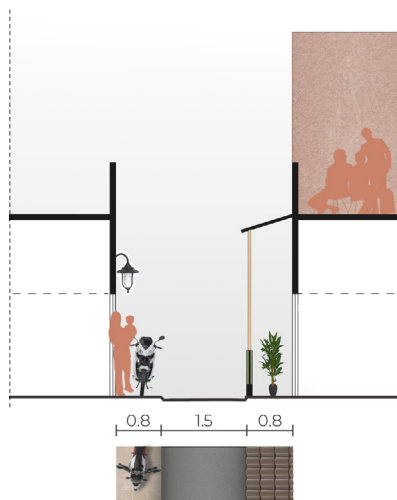
Primary street



Secondary street



Tertiary street





Img 09.12 - Impression of a street during the daytime
(Source: Authors own)





Img 09.13 - Impression of a street during the evening
(Source: Authors own)



Infrastructure

The current kampung neighborhood is lacking efficient infrastructure such as a sewage systems or a connection the water network. The electricity in the current situation is illegally tapped from the central electricity network. These infrastructural systems are currently causing serious health issues, such as unsafe constructions and dangerous connections or the potential diseases hiding in the open sewage canals.

Therefore, the new kampung neighborhood will have more efficient, safer and healthy infrastructure networks. The new kampung neighborhood will be connected to the central clean water network by the PDAM, will have it's own decentralized sewage network (as the steep slope makes it difficult to be connected to the centralized system, en will be replying on self produced electricity.

The new connection to the new water network will put an end to the use of self-made wells. The Kampung will be connected as a branch from the head-pipe running through the eastern Jalan Tamansari. From this point, the connection will make use of the natural slopes, to make the water reach every individual household.

The newly proposed Water network can be seen in Image 09.16 where the main lines will be entering the neighborhood from the highest positioned entrance to the neighborhood, and will thereafter use the axis crossing the neighborhood. From this main axis, side branches will be realized that bring the clean water to the different individual kampung blocks.

The newly proposed sewage system will be realized as a decentralized system, meaning that the system is not connected to the central network, but therefore is also obliged to dealing with it's own waste residue's. In the current situation, all the sewage water is being dumped into the Chikapundung, but this , of course, is causing serious pollution to the river.

The proposed Eco-district plan, in which the river setback has been prioritized, is scheduling on creating septic tanks along the riverbank, to store the human waste instead of directly emptying this into the river. The problem with this solution is that the Septic tanks will need to be, occasionally, emptied by trucks. The accessibility of these Septic tanks therefore hinds towards the implementation of a road along the river-bank. The problem with this proposed solution is that the kampung

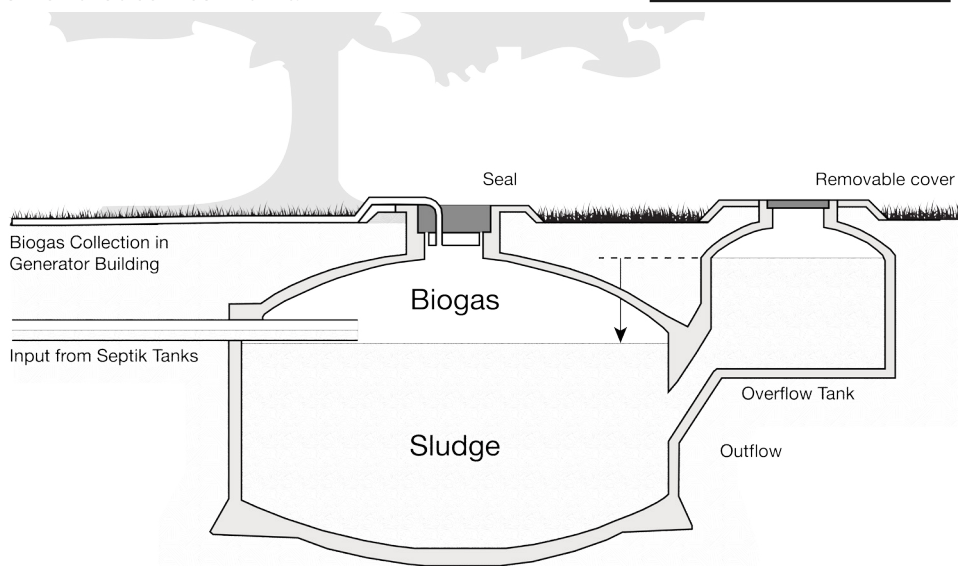
neighborhood will thereby lose its identity as a quiet and friendly living environment, and the neighborhood will lose its connection to the river.

The proposed sewage network is building upon the Eco-district proposal, by connecting the Septic tanks to a central biodigester. This biodigester is able to turn the human waste into a combination of sludge and biogas. The sludge, when treated, can be used as fertilizer for the public green in the neighborhood or for the urban farming projects throughout the area. The biogas can be generated into a combination of electricity, heat and gas to cook upon. The generation of the biogas will be happening inside of the RW-office, which is located directly next to the biodigester.

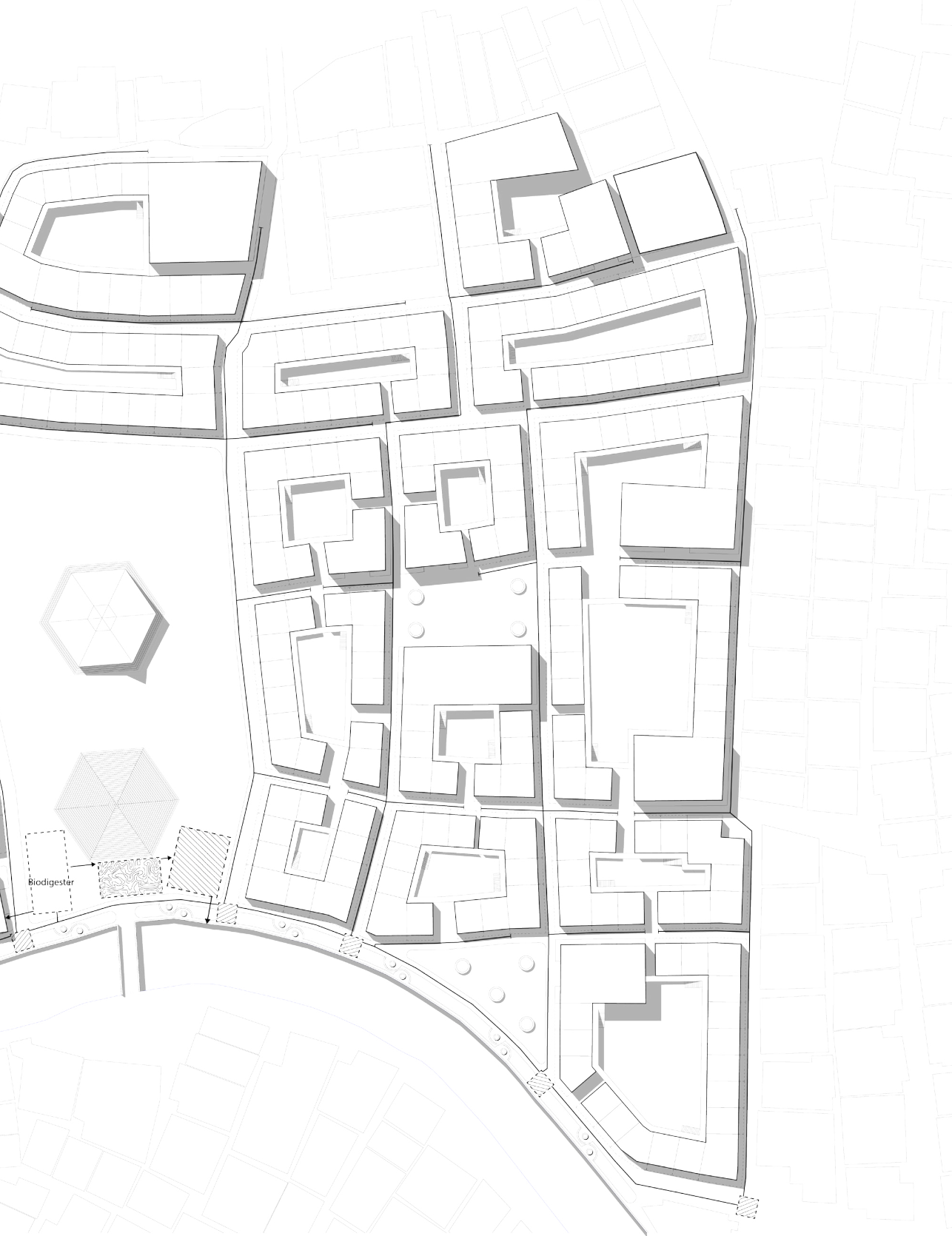
The different sewage lines are using the natural slope of the area to connect the different household towards the Septic tanks, positioned along the river edge. Through an overflow system, the different Septic tanks will be connected to the centrally positioned biodigester, making it possible for the biodigester to function without the use of mechanical interventions.

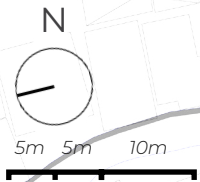
The biodigester will be realized underneath the bottom part of the central park, making it possible to still make use of the space the biodigester will need. The choice into using one central biodigester instead of multiple smaller biodigesters has to do with the machinery needed for producing the resulting end products, combined with the accompanied smell that comes with it.

Img 09.14 - Section of the biodigester (Source: Authors own)





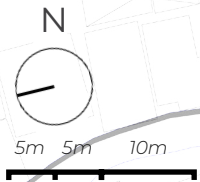




Img 09.16 - The proposed water supply plan (Source: Authors own)

- Legend:**
- Primary water line
 - Secondary water line
 - Tertiary water line

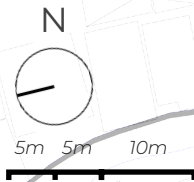




Img 09.17 - The proposed
roofwater storage plan (Source:
Authors own)

- Legend:**
- Rainwater drainage
 - ▨ Underground water tank





Img 09.18 - The proposed stormwater storage plan
(Source: Authors own)

Legend:

- Covered drain
- Open drain
- ▣ Water tank with Sand-gavel filter
- ➔ Potential exess point



The design on the infrastructural system is based on the street pattern and the underlying topography. The slopes of the topography are making it possible for the infrastructure to fully run on gravity, but it is also limiting the design possibilities.

The sewage proposal is based on the proposed plans of the 'Eco-district' by the (local) government, which is focusing on catching the sewage lines into Septic tanks along the riverbank. In the Eco-district proposal, the Septic tanks had to be emptied by trucks, which meant that the boulevard had to be made accessible for trucks. The new proposal will guide the waste from the Septic tanks to a centrally positioned Biodigester, which will be able to create water, fertilizer and biogas from the waste.

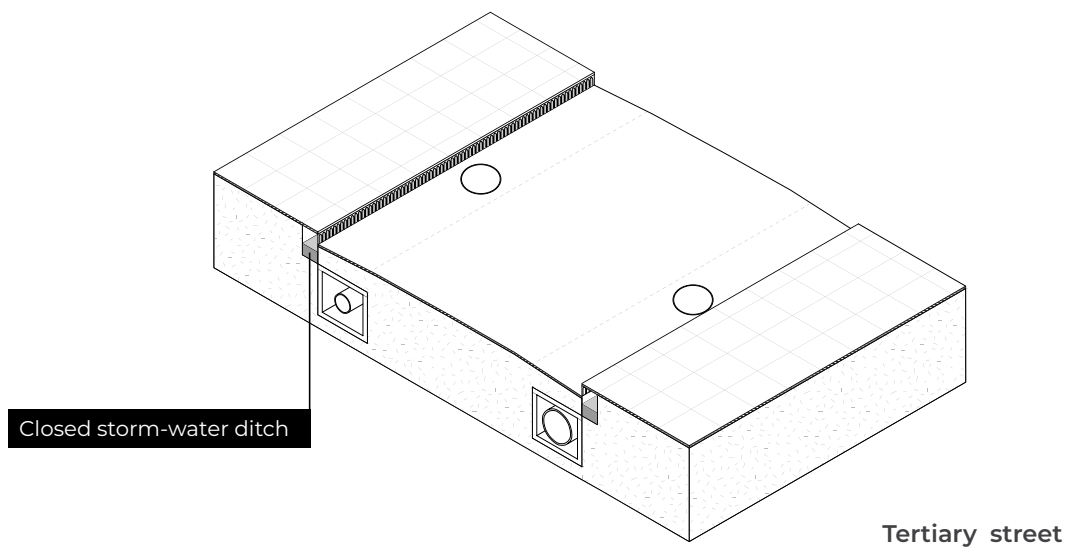
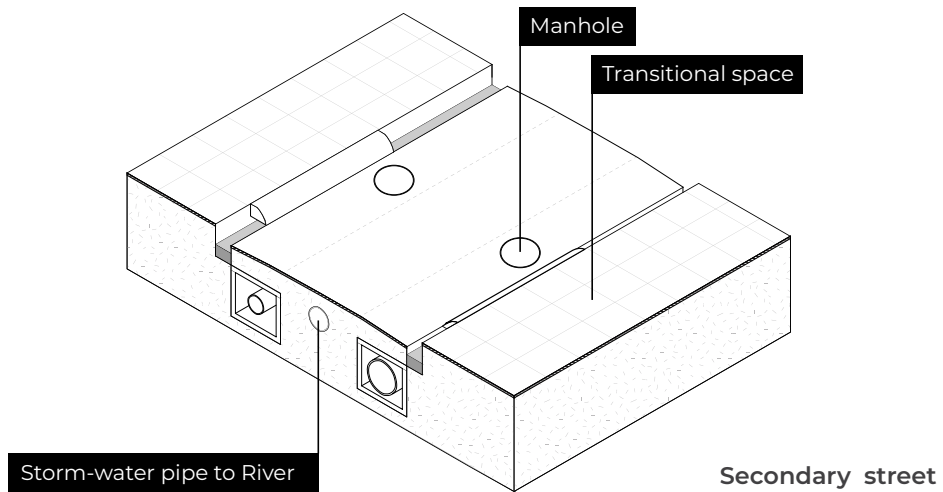
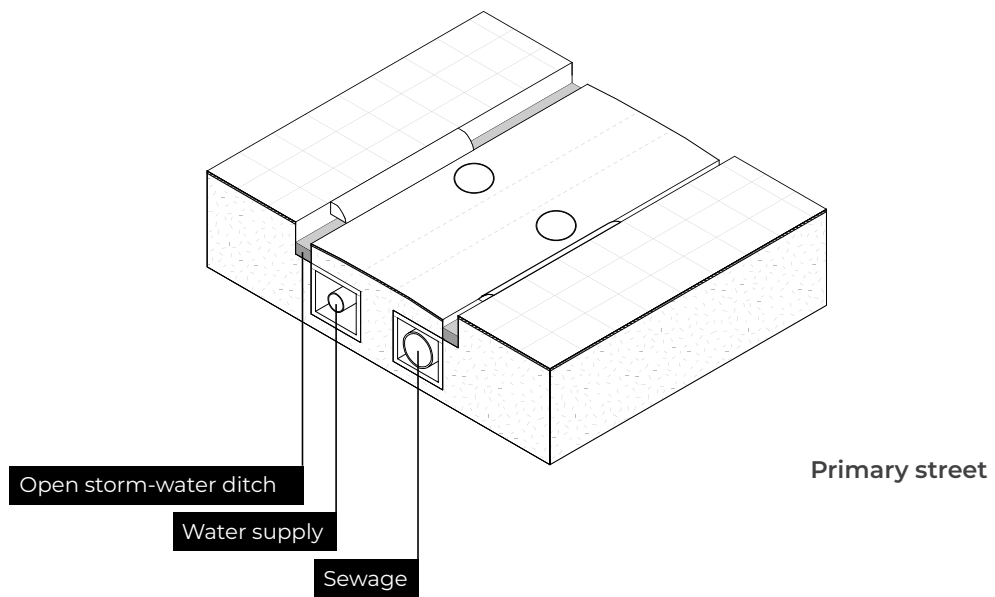
The water supply is also realized according to the underlying topography. Different from all the other systems, this system is connected to the central water supply line of the Jalan Tamansari. As the water lines need to be reconnected to the central line again, as they can not stop in a dead end, the proposed lines will also run through the southern positioned 'formal' pocket of the kampung, and give them the opportunity to get reconnected to the water network.

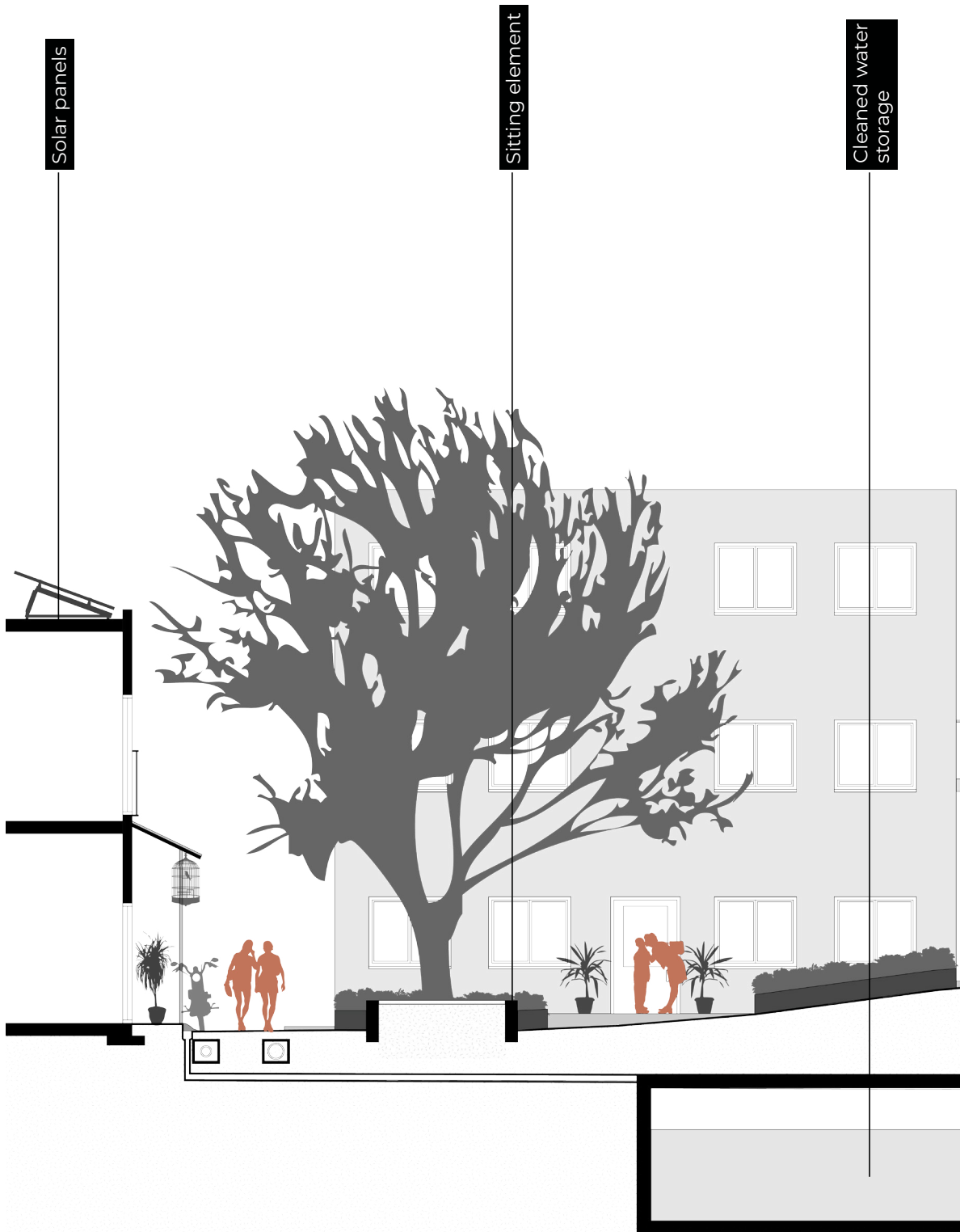
The roof-water will be collected and made available for the grey water network of the urban blocks. The water will be stored in the green roofs on the top, and in the central water tank positioned underneath the courtyard. The water will later on be used in for flushing the toilets and for washing.

The storm-water, will be collected in the ditches along the streets, and will be redirected to central water storage tanks, positioned underneath the RT-squares and other central positions. Before the storm-water will be able to access the water storage tank, it will be filtered through a sand-gravel filter. The now clean water will thereafter be connected to the water tank. The water can be used for the maintenance of the public greenery, as the central pocket park and the green patches along the boulevard.

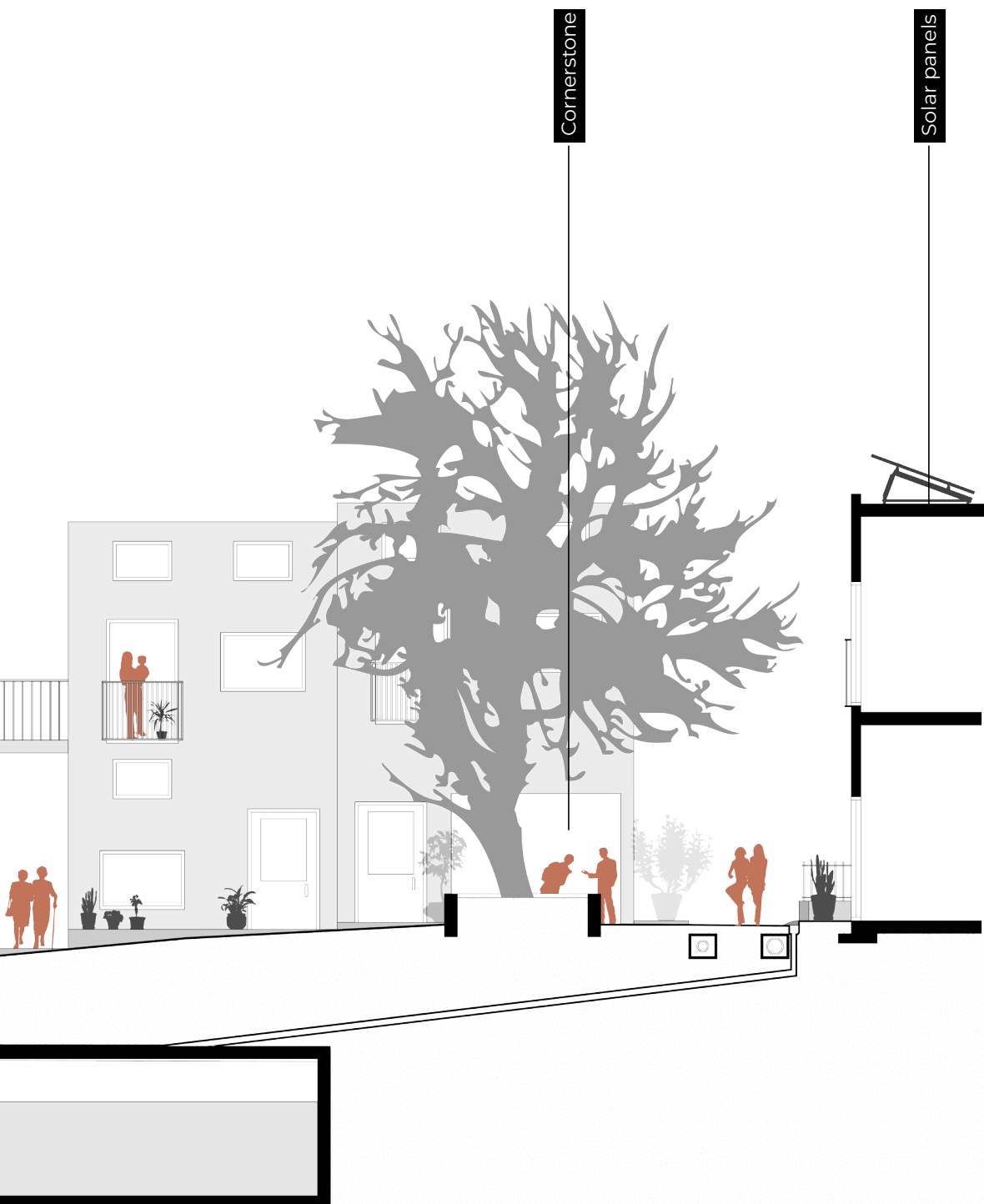
In case of heavy rainfall, the water of the storm-water-tanks is connected to the river-edge or the central pocket park, where the clean water will be disposed, to make room for the clearance of more new polluted water.

Img 09.19 - Street sections of the different street hierarchies, with the underlying infrastructure (Source: Authors own)



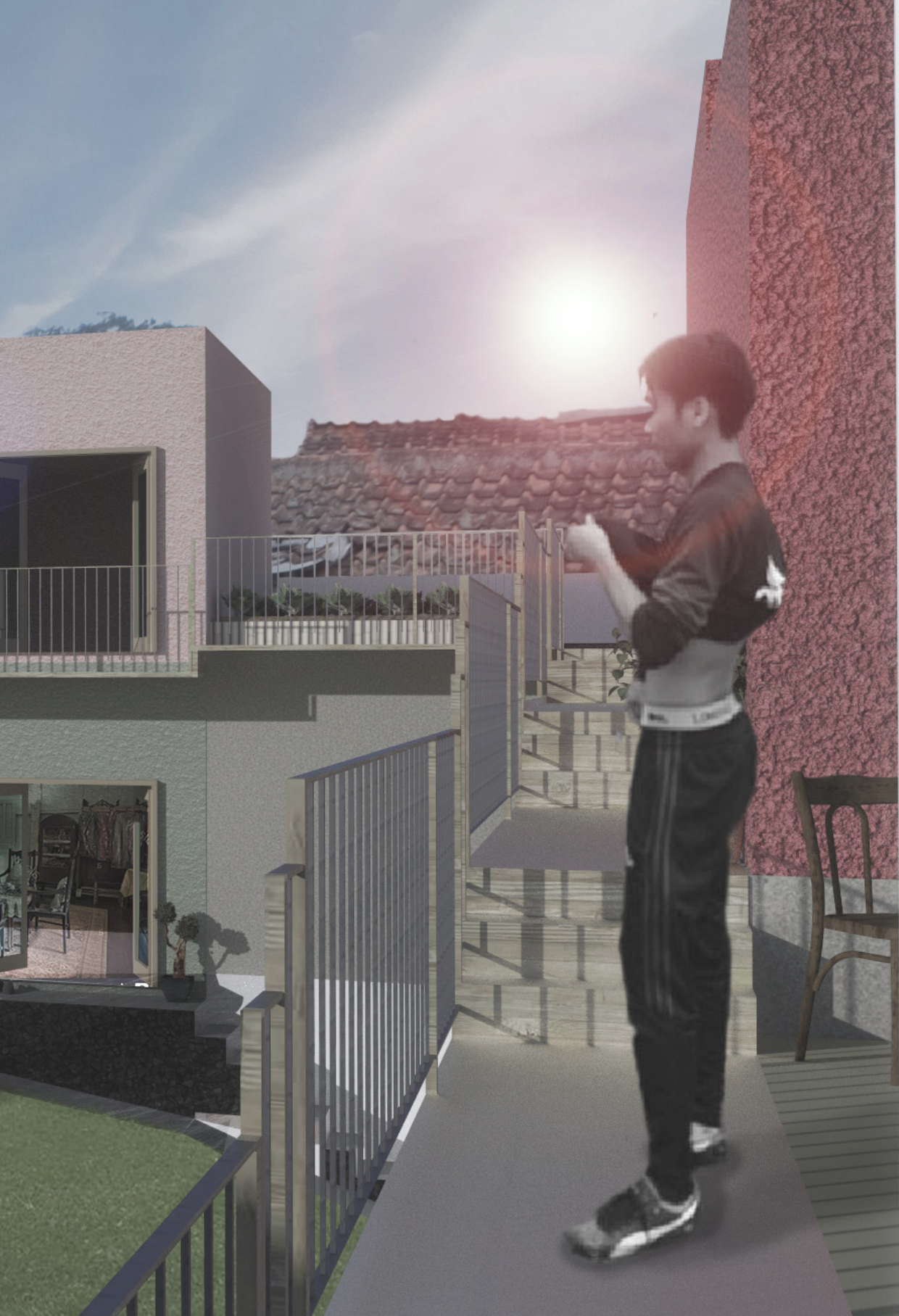


Img 09.20 - Section of RT-square
of RT 04, with underlying
infrastructure (Source: Authors
own)





010 0203 - Visualization of a
possible street for the proposed
public domain authors' work



Sustainability

As been previously described, the new kampung neighborhood is aiming to have a sustainable identity, by implementing a circular waste system. The overall functioning of the system can be seen in diagram of image 09.22.

In this diagram, we can see the rainwater harvesting and how this captured rainwater will be put to use, as it can be introduced as a grey-water network. This grey water network is intending on using the harvested rainwater for water the plants or for flushing the vacuum toilets. The water reservoir, in which the water will be stores, will make sure that the process can continue to function even in times of a long lasting drought.

The water provided by the PDAM is drinkable, and therefore usable for both drinking as cleaning purposes. The remaining water after the washing usage, is being integrated into the water from the grey water network, and can be used for the flushing of the toilets.

This toilet water will be connected to the Septic tanks and later on to the biodigester. In here the biodigester will turn the human waste in combination with added food waste, into a combination of fertilizer, gas to cook on, heath and electricity. The amount of electricity which is produced will be added upon by the solar panels on each block.

These different end-products of the biodigester will result in the end-user: the kampung household. In here, the different provided elements will be turned into a three flows of waste: Human waste (which will come back into the system in the vacuum toilets), the food waste (which will be put directly back into the system through the biodigester) and the rest waste (the 'normal' waste a household will produce). This Rest waste will be picked up by the informal waste-men, which go around the kampung collecting the household waste, and bring these to a central collection point along the Jalan Tamansari. These informal waste-men earn their money from tips the local inhabitants pay them to collect the kampung's trash. From here, the garbage trucks will take the household waste into the waste management cycle of the city of Bandung.

Img 09.22 - Diagram showing
the circularity processes
(Source: Authors own)



09.2 STAKEHOLDER ANALYSIS

Stakeholder management is mentioned by Jepsen (2008) as an important issue in project management as a project can be seen as a temporary collaboration of stakeholders to create something together. In literature the definition of a stakeholder is vague. In this report we refer to stakeholders as a person or a group of people, who are influenced by, or able to, influence the project (Freeman, 1984; Andersen, 2005). This includes stakeholders that can be affected, but may not have a direct power. McElroy and Mills (2003) see stakeholder management as 'the continuing development of relationships with stakeholders for the purpose of achieving a successful project outcome'.

In the realization of the new kampung neighborhood, there are a series of stakeholders involved. The two main stakeholders are the kampung inhabitants (and their social entities such as the RT and the RW) and the local government. In the current situation the link between these two stakeholders is missing, resulting in clashing interests into a shared beneficial result. This chapter will explain the roles of the different parties before, during and after the realization of the neighborhood.

As the main body of the new buildings will be made available through a social housing system, the neighborhood will be realized through a funding through public investment by the local government. This public investment will also include the infrastructure networks which will need to be realized by the PDAM (the water supply company). The kampung inhabitants will cooperate during the realization of the kampung neighborhood. The kampung inhabitants are, for example, involved into the construction of the new dwellings, and will be made responsible for the maintenance of the new neighborhood.

The (local) government

The local government is playing the biggest role in the realization of the project. This is because the government is fulfilling multiple roles within the realization and maintenance process. It will function as the client, the party who is the final owner of the project and the initiator of the project. Besides this, they also possess of a budget especially for the housing sector, which will be used in order to finance the project. Finally, the local government will also be the supervising party after the realization, as the most powerful party in making sure the development regulations are followed.

The tenants

Img 09.23 - Diagram showing how to engage with the different parties (Source: Authors own)

The tenants are the final users of the project, and in this case also the current inhabitants. Therefore it is important to keep them satisfied during the process.

The designer

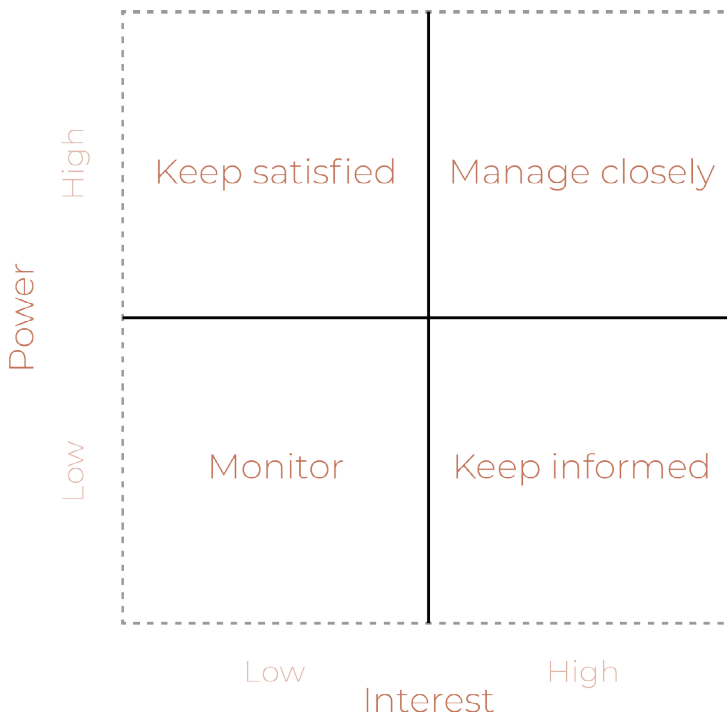
Me, the designing party, is responsible for the realization of the design. Different from other projects is that this project is initiated by the designer itself, instead of being a subcontractor of the main client.

The contractor

The contractor will be functioned under the local government, and will be responsible for the demolition and realization of the project. They will be more focused on the financial aspects than about the potential final result, as they will only contribute during the realization, afterwards they will slowly fade to the background.

The subcontractors

The subcontractors are the different parties who will be responsible for the different aspects, that are out of the governments hands, such as for example to PDAM being responsible for the implementation and maintenance of the water network.



Initiative phase

The initiative phase is focusing on the realization of the project itself. As the project is a proposal, which has not been brought forward by the financing party, The designer has a higher interest and power then in most 'normal' projects.

The local government, which has been subdivided as the client, the financier and the develop, has an overall high amount of power; due to both the strong power it has in the decision making and the financial power. The interest is more divided, as the different bodies all have different interests.

The tenants, the current inhabitants of the project area, and the local citizens in the surrounding kampung areas, have a higher interest, but of course, has a lower amount of power, as the kampung has been realized in an informal way, and the ground is not their own possession, but instead belongs to the (local) government.

Img 09.24 - Power/interest matrix of the initiative phase (Source: Authors own)

Design and development phase

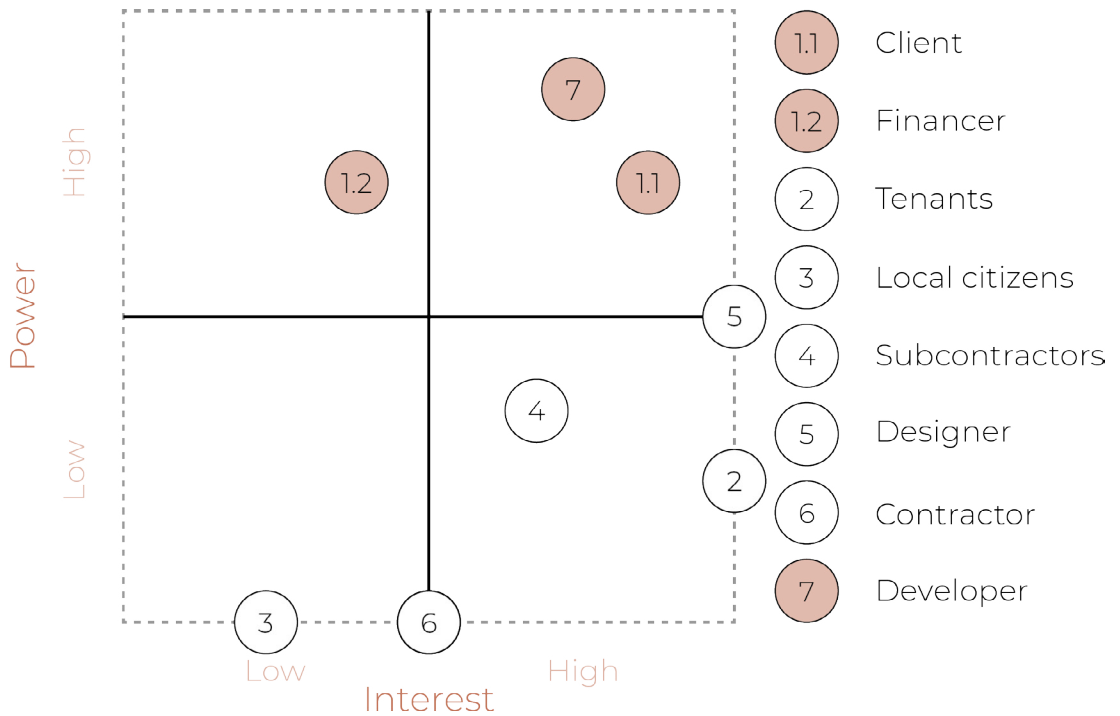
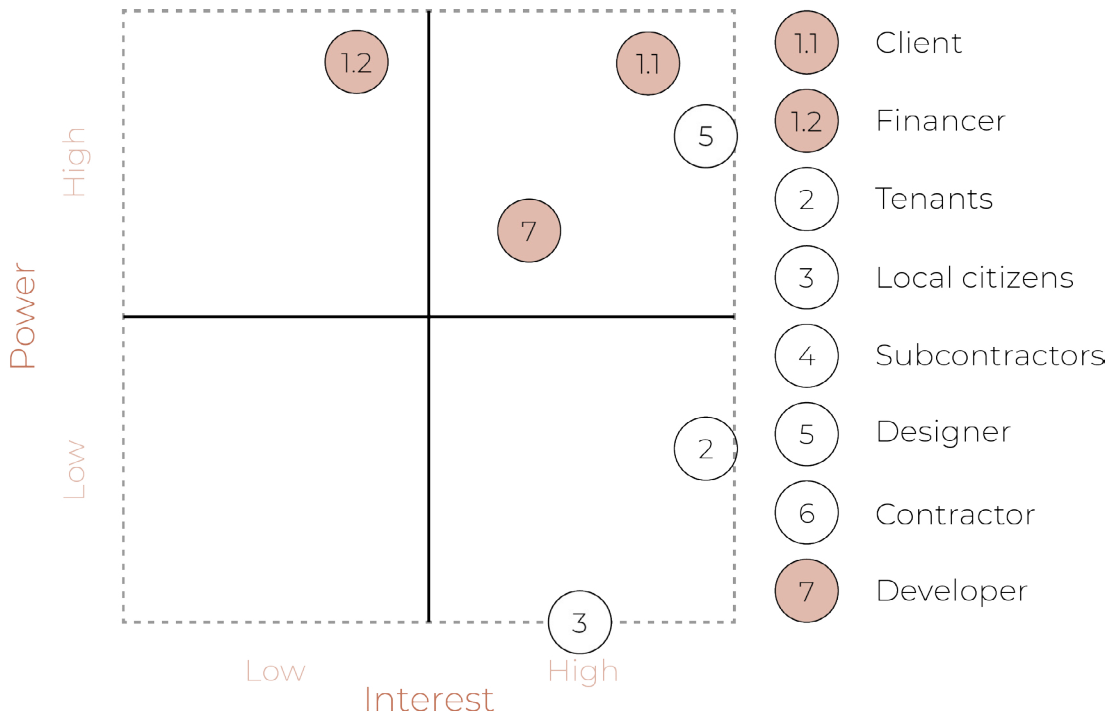
The design phase will focus on the realization of the plan itself. Therefore, the designer has the highest amount of interest into the project, but only has medium power, as they are not the final client and therefore will need to meet the guidelines as proposed by the client.

The local government has a lower amount of power as during the initiative phase, as they will lay their power into the hands of the designing party. As explained, they will still have a higher power then the designing party.

The tenants, or the kampung community, also has the highest possible interest as they want to have the most beneficial outcome, but, as they are inhabiting ground that officially belongs to the (local) government, they don't have any legal rights.

This stage is also the stage where the contractors and subcontractors come into the picture, but both have a medium interest and only a low amount of power, as they won't have a big voice in the decision making process.

Img 09.25 - Power/interest matrix of the design and development phase (Source: Authors own)



Demolition and construction phase

The phase of the demolition and construction is addressing the actual process of realizing the project. Because of this, there are big shifts within the power/interest matrix.

The power of the government is decreasing in this stage, as all the decision making has been done, and they are only responsible for the financial part and the hiring to the contractors and subcontractors.

As the contractors and subcontractors are the main responsible parties for the demolition and construction process, they both gain a lot more power and interest.

The tenants also gain a lot of power, as they are the people that will have to move along with the process, and also are expected to contribute in the construction process.

The designer has lost most of its power, as the plans are not (mostly) out of its hands.

Img 09.26 - Power/interest matrix of the demolition and construction phase (Source: Authors own)

Use and operate phase

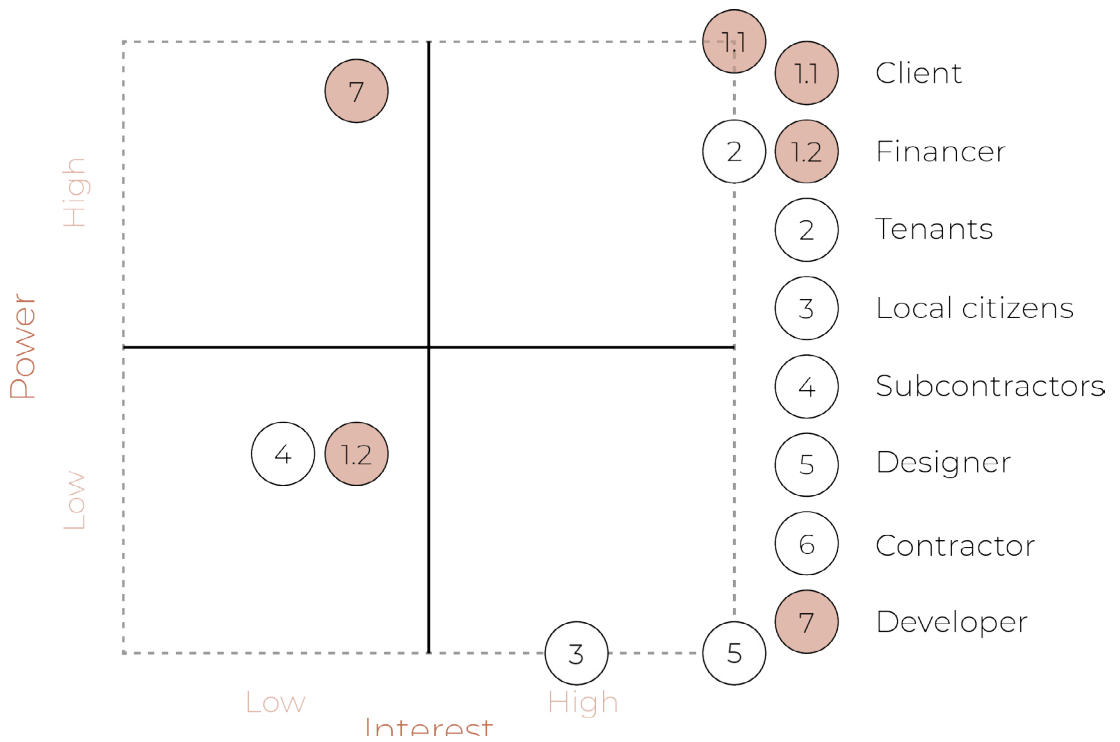
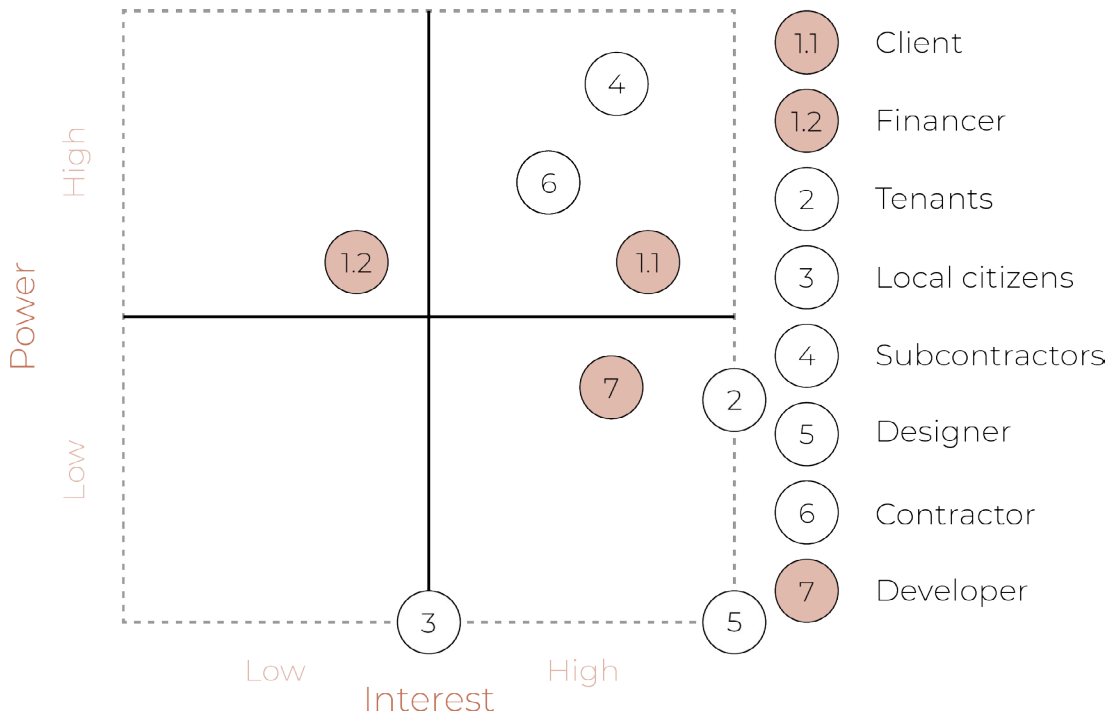
The use and operate is the final phase, but also the longest lasting phase, as this phase is showing the power and interest of the different parties after the realization of the project.

We can see how the local government, as a client, and developer (supervisor) has a higher amount of power in this phase, as they are the responsible party to make sure that the future development guidelines are being followed. This will mostly happen through the smaller social bodies such as the Kelurahan and RW, which will make sure that the guidelines are being lived up to.

The subcontractors are losing a lot of power and interest, as they are at this stage only responsible for the maintenance of their own installations and constructions.

The local citizens in the surrounding kampung areas will have a greater interest, as this centrally positioned development project will also improve the greater Tamansari area.

Img 09.27 - Power/interest matrix of the use and operate phase (Source: Authors own)



09.3 PHASING

The phasing chapter will give an insight into how to reach to desirable goal in the long run. It is showing the interference and responsibilities of the different stakeholders and is linking these to certain actions that need to be taking. It will give an insight into how the life of the kampung will remain functioning during the realization of the new interventions. Each of the phases will give an overview of the newly constructed building, the destroyed buildings and the total surplus of dwellings.

The importance of the phasing

The phasing will give us an insight in how to get from the current stage to the desired stage in the long run. Because the sense of space and the sense of belonging are two very important aspects in the functionality of the plan, it is of huge importance that the plans can be realized in a gradual way which is embracing the life in the kampung, rather than slowly changing and restructuring it.

The plans and the phasing

The plan, as has been presented in the chapter on the neighborhood design, is different from the average master plan. Different from a master plan, the plan is not a final result to the development, but rather a spatial framework in which the development of the kampung neighborhood is meant to happen. For example, the proposed design of the neighborhood has been aligned with the existing street- and building structure, and is therefore giving the possibility for a lot of building to stay within the new urban fabric.

The fact that the final plan is not a master plan, is leaving a certain freedom into the interpretation and desires of the kampung inhabitants. It is for example a possibility that in the upcoming 20-30 years, a certain selection of building will remain for a longer time, whilst other buildings, which also fit into the new framework, will be removed within the first years. This decision making is a collaborative task for the inhabitants of the dwelling in questions with the RT and the block inhabitants, as they together work towards a common desirable future.

The Phasing criteria

The phasing of a project can normally be depending on a variety of different criteria. In a private investment, it is often prioritized to make the investment back in order to start the development of the next stage. In this phasing, the focus is more laying on use of the kampung during the construction period. The perception of space and the recognition of 'their neighborhood' are important criteria during the phasing.

In order to make sure that the kampung inhabitants can at all time relate to the space they are inhabiting, the changes between the different phases won't be too rigid. In this way, the inhabitants can have the time to get used to the one change before the second change will happen. In this time between the different changes, the kampung inhabitants can personalize the new spaces and thereby maintain the sense of belonging of the neighborhood. It is of huge importance that the kampung keeps the feeling of 'their' neighborhood instead of a neighborhood they will have to inhabit.



Phase 1

+50 / -70

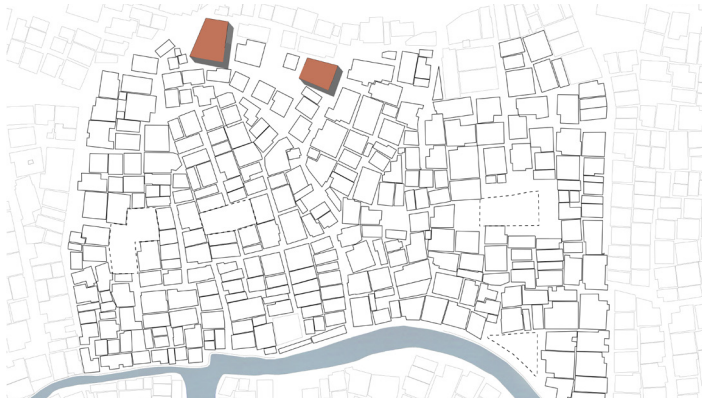
Surplus +43

The first phase will focus on the realization of the housing blocks in which the kampung inhabitants will take place during the time between the embellishment and the realization of their new dwelling. The new

housing blocks will be realized as Kos Kosan (Boarding Housing), which offer multiple small rooms. Afterwards the buildings will be made available as student housing.

Involved parties:

- Local Government
- Existing house owners



Phase 2

+0 / -25

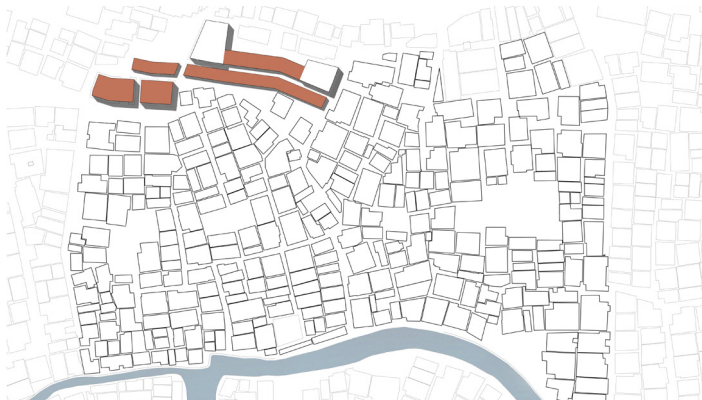
Surplus +18

The new RT's will each be centered around a newly introduced RT-square. These small pocket squares will function as shared, flexible spaces for community, in which the daily life can take place. The realization of the square will happen

through the destruction of 25 buildings. The new available spaces will be made available to the kampung inhabitants, making it able for them to personalize the space, and create a personal connection.

Involved parties:

- Kampung community
- Existing house owners



Phase 3

+67 / -35

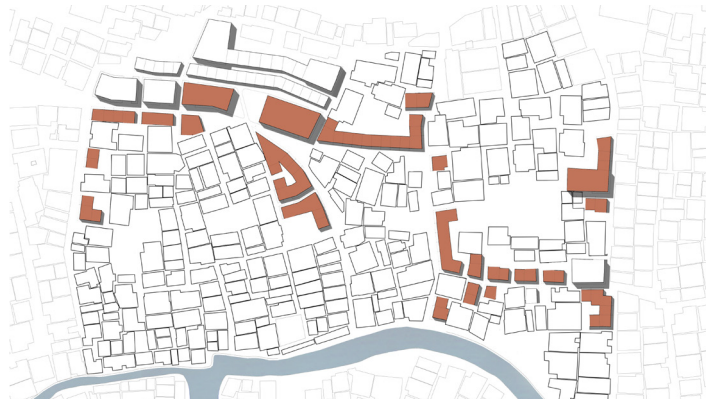
Surplus +50

In order for the river setback of phase 4 to take place, it is first necessary to realize a higher surplus of available dwellings, to make sure that the inhabitants of the dwellings along the river can remain in the same neighborhood.

In this phase, RT 01 will be finalized. This RT consist of larger housing units, 2 more Kos Kosan buildings and a workplace for the prefabricated building materials. This workplace is the center of further development.

Involved parties:

- Local government
- Existing house owners
- PDAM
- Kampung Community



Phase 4

+114 / -69

Surplus +95

Phase 4 will mainly focus on the realization of the primary and secondary pathways of the neighborhood, and thereby also implementing the new infrastructure networks (like the sewage and water network). The

dwelling along these primary and secondary roads will only be developed upon the plot where no buildings are positioned. Existing building that fit within the new structure are able to remain where they are.

Involved parties:

- Local government
- Existing house owners
- PDAM
- Kampung Community



Phase 5

+72 / -56

Surplus +111

The set-back of the Chikapundung river is part of the Eco-district plan by the government. As this plan is already under the beginning stages of the construction, an early implementation is necessary. In creating a

4 meter set-back, a total of 56 dwellings will get lost. In return for this, the existing daycare in this part will be directly rebuild in the new open space, so the everyday life of the kampung wont be interfered with.

Involved parties:

- Local government
- Existing house owners
- PDAM
- Kampung Community



Phase 6

+184 / -38

Surplus +257

After the realization of the river-setback, the edges of the RT-squares will be developed. The buildings around the squares are a variation of different typologies, which will be both realized by contractors from the local government

as by the kampung inhabitants themselves. The early access to the square would create an emotional connection to the space.

Involved parties:

- Local government
- Existing house owners
- PDAM
- Kampung Community



Phase 7

+0 / -29

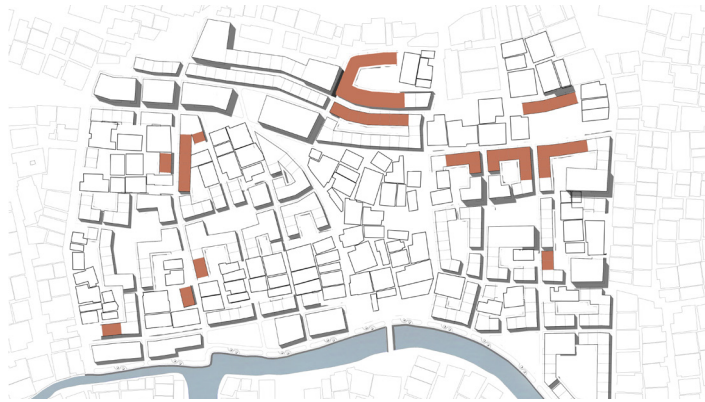
Surplus +228

This stage of the phasing is focusing on the realization of the new central pocket park as the new center of the kampung. The plot will be released of any remaining dwellings. The park identity and the included social facilities,

like the community space and the market square, will be realized. These developments will be funded by the local government but being constructed by the local community.

Involved parties:

- Local government
- Existing house owners
- Kampung Community



Phase 8

+60 / -21

Surplus +267

After the realization of the primary streets, the RT-squares and the park, the secondary streets will be realized. These streets have a less importance then the primary ones, which makes the need for implementation less necessary. The streets

will connect the different primary street with one another. The buildings along these streets know a varying typology.

Involved parties:

- Local government
- Existing house owners
- PDAM
- Kampung Community



Phase 9

+70 / -34

Surplus +303

After the realization of the new RT-squares, primary- and secondary street networks, it is at this stage time to finalize the street structure by redeveloping the remaining pathways of the kampung. Once again, the existing

buildings which fit into the new structure can remain, and the other plots will be gradually redeveloped by both contractors by the locals government as the kampung community.

Involved parties:

- Local government
- Existing house owners
- PDAM
- Kampung Community

09.4 THE URBAN BLOCKS

The proposed plan for the east-bank of Kampung Tamansari consists of a total of 25 urban block units. All of these urban blocks have different shapes and dimensions, as they are shaped by the new street layout. These block units are the main elements that shape the new formal kampung neighborhood. This chapter will give insight into why the urban block is the future of the kampung, and how these can function to create a greater profit for the block inhabitants themselves.

The block design

The block is set up by a surrounding line of buildings, leaving open a center in the middle. The size central of this central courtyard is depending on the surrounding street network, which is also the key factor in the wide variation in different block sizes and shapes.

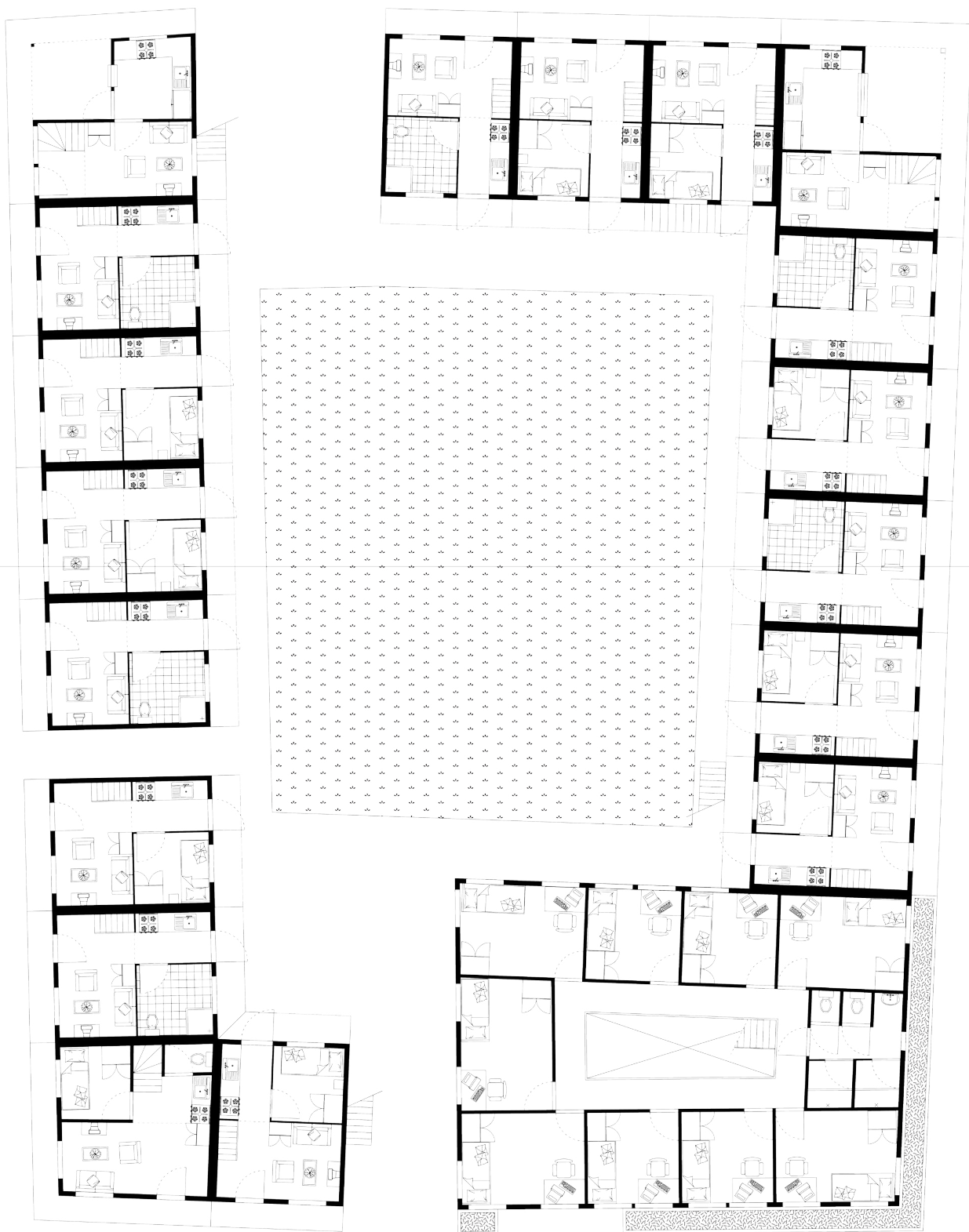
The blocks are partially permeable through small entrances which align with the openings of the neighboring urban block, creating a inner block network.

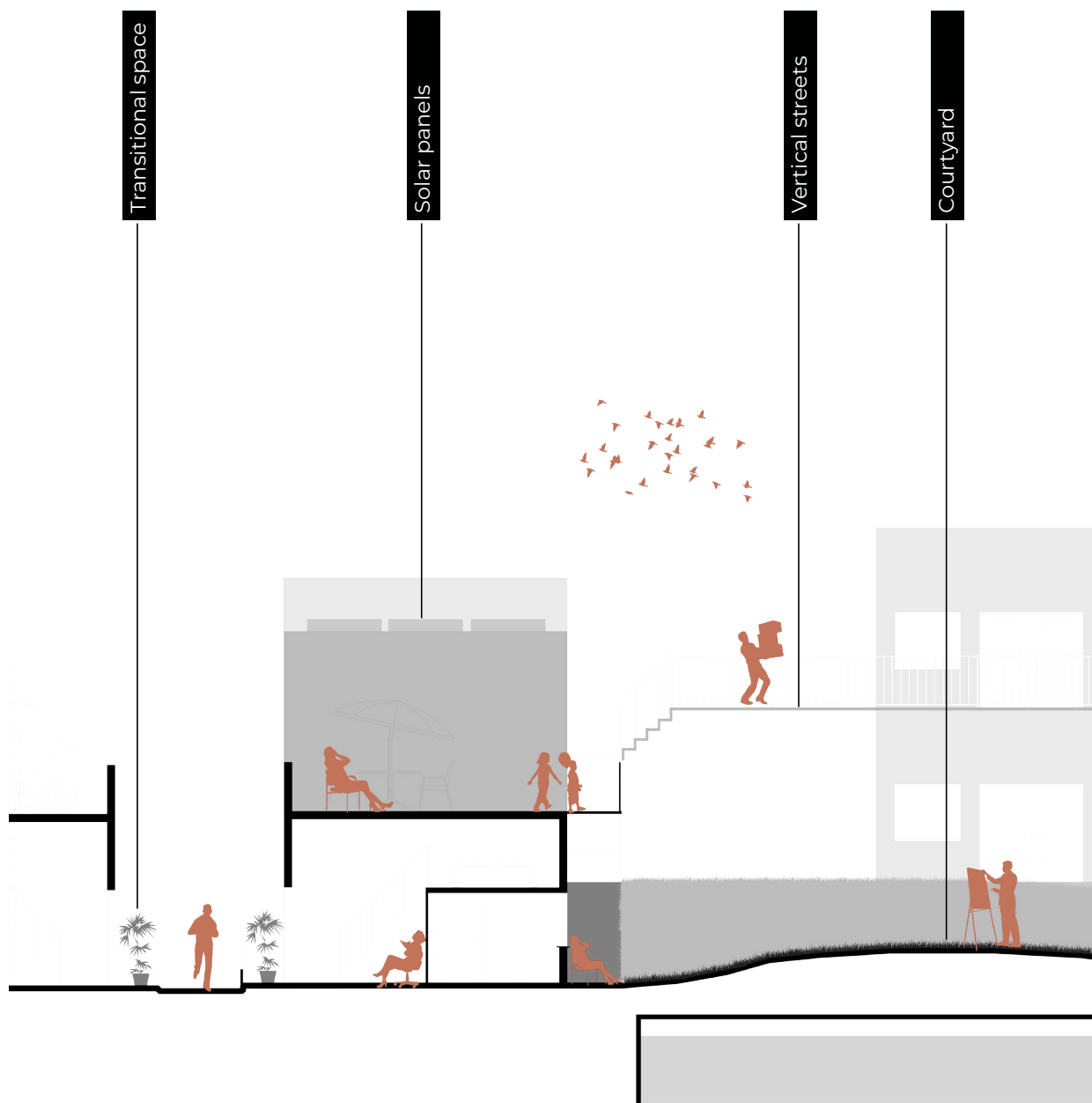
The blocks are created by a series of different typologies, as can be seen in image 09.28. In this example, the block is a clustering of the basic housing elements, corner plots which give the opportunity to realize small warungs (family restaurants) or slightly bigger dwellings. In the zoom-in on the block in Image 09.28 we can also see the inclusion of a Kos Kosan (boarding housing) building. Together these different typologies are creating a richer composition of people.

Each block consist of a shared motorbike parking garage, a laundry area and shared toilets and bathrooms. These facilities will make sure that each household has access to bathroom and toilets, even for those who are not able to afford to rent one in their own dwelling. The facilities will be under the responsibility of the inhabitants of the block, such as cleaning and maintenance. Possible repair work and/or replacement of the facilities will be saved from the monthly paid rent.

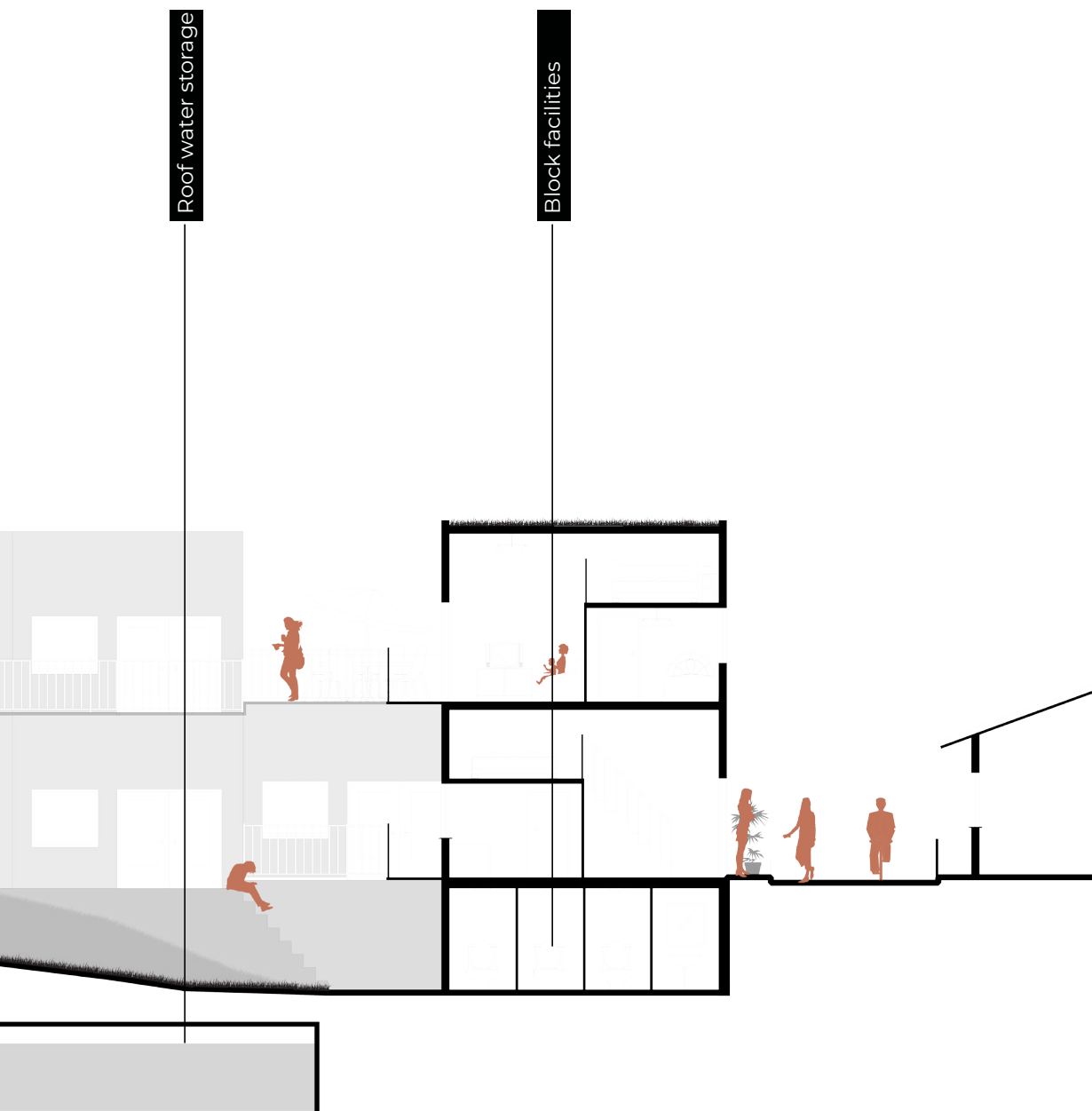
The facilities will be realized underneath the housing elements, by utilizing the height difference between the two sides of the block. As can be seen in the section in Image 09.29, the block facilities are positioned underneath the housing elements at the right side of the block, by using the space of the courtyard to realize a gentle slope towards these facilities.

Img 09.28 - Block plan (Source: Authors own)





Img 09.29 - Block section
showing all the different facets
(Source: Authors own)



Transitional space

Playground rooftop

Solar panels

Kos Kosan

Recreational rooftop





Img 09.30 - Block overview
(Source: Authors own)

The courtyards

The central courtyard consist of central green space, a pathway around the block and a small line of transitional spaces in-between these pathways and the dwellings.

The central green space will function as the communal public space. These spaces can be used as a green space to recreate, but can, for example, also be used for urban farming. The infill of the courtyard in under supervision by the RT, and will force the inhabitants to cooperatively come up with a final result.

The pathways around the courtyard will function for both the accessibility of the different dwellings, but also for the accessibility of the lower motorcycle garage. The pathways will have an average of about 1,00 m, to make it possible for motorcycles to cross one another.

The transitional spaces around the courtyard will, in contrast to the transitional spaces on the front side, need to remain open from any constructions. These spaces will mainly be used for the accessibility of the dwelling, and the use the spaces for daily activities, such as hanging the laundry to dry.

Roof-use

The newly realized roofscapes, on top of the housing elements, can be used in a variety of different ways. The idea of these roofscapes came from the simple comparison between the lack of public space in the kampung neighborhoods and the conflicting landscape 1 story dwellings with sloped roofs. By utilizing the spaces on top of the different houses, we can give an answer to the shortage of public space, but also create traffic-free and more secluded semi-public spaces will answer a different demand of space then, for example, the RT-squares.

Within a block, there will a varying amount of available roof spaces, as the block really differ in size. With the availability to realize a second layer of dwellings, the height difference between the different roofscapes, also creates the opportunity for a more diverse use of the space.

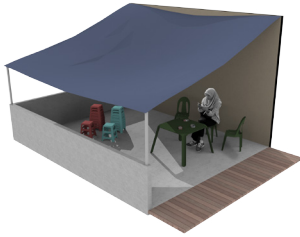
Preferably, the roof spaces on top of the second layer, which will be less accessible because of the height difference, will be used for the implementation of solar panels and green roofs. These functions are less user-friendly, but are more rewarding then the other functions, and also play an important factor in the functioning of the urban block.

The vertical streets

The vertical street network is an important feature of the new kampung proposal. The vertical network utilizes the neighborhood's height difference and is making sure that newly realized dwelling on the second floor, are having the same possibilities as the older dwellings on the ground floor. Part of these 'possibilities' are focused on the informal economies, such as selling food from your household, or starting a small shop. Whenever there would be no vertical street network, there would be a physical and functional separation between the different layers.

The vertical streets around the central courtyards have a width of 0,8m, and are bridging the small height differences through a series of steps. The vertical streets are not only connecting the different dwellings with one another, but are also making

Img 09.31 - Potential roofscape infills (Source: Authors own)



Recreational

As the roofspaces are no private property, they can be used for communal gathering spaces.



Play area

The roofspaces can also be used as a safe playing area for little children, as it is safe from motorized vehicles.



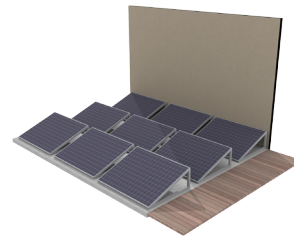
Urban Farming

A more beneficial use of the roofscape is urban farming, as the space can be used to produce self-grown food.



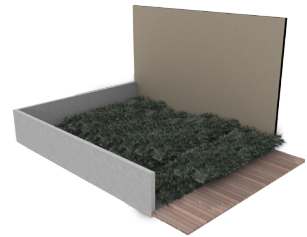
Sport activities

The roofscapes can even be used for small-scale sport activities, as they're safe from traffic on the ground floor.



Solar Panels

The roofscapes also give to possibility for solar panels, which will make it possible for the Kampung to legally generate electricity.



Green Roof

Green roofs help with both cooling and for the storage of rainwater, which later on can be used in the grey-water network.

the roofscapes accessible for the inhabitants of the ground floor.

With the vertical streets being positioned on the inside of the building block, it will also have its influence on the orientation of the housing elements. As been discussed in the chapter on the housing element, the Indonesian houses are designed within a gradation from public to private, with the street being the most public element. As the street-side is, changing its position towards the dwelling, this will also mean that the orientation of the housing element will flip along. The alignment between the stacked housing elements can be seen in the section in image 09.32, on the next page.

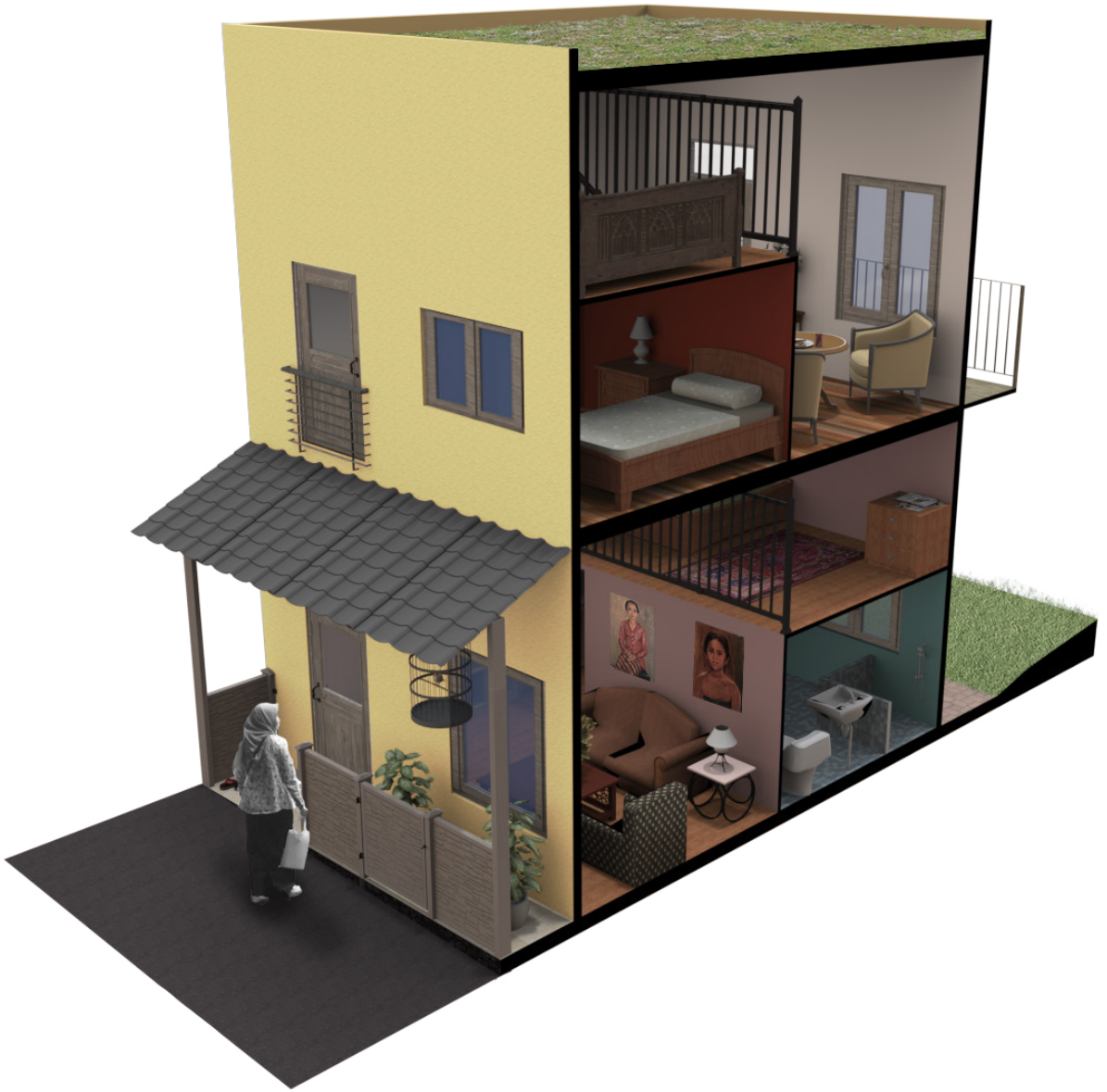
To be able to create an actual street network, and not just an average gallery, the concept of choice is key. Where a gallery is just present to make it able to go from A to B, a street network gives you a different set of choices and possibilities to get from A to B. This same concept will be seen back in the design, where bridging element will connect the different block with one another, making it possible the realize the different options to get from A to B. These bridges will be connecting from the roof of one of the housing elements to the housing element to the opposite side of the street. The Housing element on which the bridging element has been realized, will not be open for further development of the block, as the connections need to remain in tact.

Sustainability

The aim is to make each block a self-sustaining unit, with no connection to, for example, electricity lines and the central sewage system. The second layer of the roofspaces will be used for the implementation of green roofs and solar panels. These solar panels should generate enough electricity supply for the whole block. Not only is this solution a sustainable one, it is also a safe and legal one, compared to the current nests of wires which tap off electricity from the central electricity network.

Underneath the solar panels, the rood will be topped with a green water storage system. The rainwater will be stored on top of the room, or in the plastic water containers in the central courtyard. The stored rainwater will used within the grey water system, supplying the water for toilets and the watering of the plants during the dry season. All the toilets in the new kampung neighborhood will be vacuum-toilets, to further reduce the water usage and making it possible to store enough rainwater for the dry season.

Img 09.32 - Housing section
(Source: Authors own)



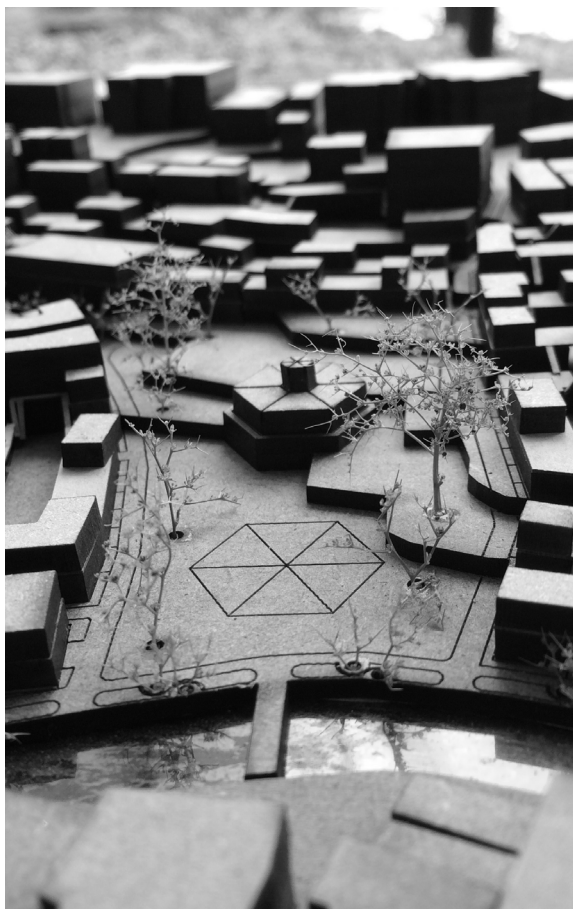
Guidelines for further development of the block

Within the incremental development strategy, there is, of course, not fixed or finalized element. The block unit is no different, and there will never been a finalized block unit. Therefore it is important to frame the possible development of the urban blocks, to keep them in line with the overall vision, and make sure that the development strategy is also sustainable over a longer period of time.

For the further development of the block, it is only allowed to create a second layer of dwellings, except for the *kos-kosan* and apartment buildings. This is mainly because the human relation between street and building, which would get lost whenever a third layer would be realized. The staggered facade is one of the key element in the street layout of the new *kampung* neighborhood.

As already been described in during the explanation of the vertical street network, it won't be allowed to build a housing element on the plot which is giving access to the neighboring urban block. In this way, we can guarantee that the vertical street network will always be able to remain functioning, without surprise dead-ends within your journey from A to B.

It is also the responsibility of both the RT's, the RW and the Kelurahan to make sure that these guidelines are being followed. It is also the responsibility of these social structures to make sure that there will only be build on the designated locations, and not within the central courtyards, to give an example. Whenever the guidelines have been damaged, the local government will have to give financial sanctions to the RW, as it is the responsibility of these organizations to make sure that the guidelines will be followed. If these guidelines will not be followed, this can lead to a downwards spiral, resulting in similar situations as where the *kampung* neighborhood is currently in. This can for example be unhealthy and unsafe living circumstances. Therefore, the financial sanctions will need to make sure that the public investment by the government won't go to waste.



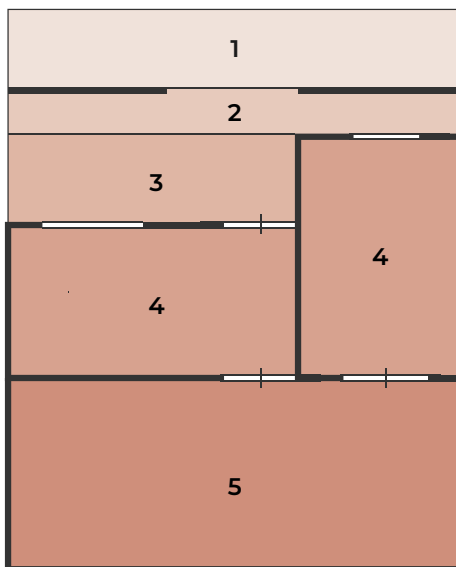
09.5 THE HOUSING ELEMENT

In the incremental development strategy, it is key to have a cheap and quick to construct housing element. This housing element will function as the main element of which the neighborhood plan will be build upon, and will therefore be the most common typology in the new design. This chapter will describe the role of the housing element in detail, within the incremental development strategy and will give an idea on the possible use and realization of the housing element.

The design

The housing element has a total floor space of 21,8 m² (5,2 x 4,2 x 3,2m), which comes from the minimum dwelling size of what is considered a 'healthy house' on Java. With an average household size of 3,79 people per household, the 21,8 m² dwelling also offers 5,75 m² per person. If we compare this to the minimum requirement for the island of Java, which is 5,25 m² per person, we can see that it meets the minimum requirement, and even is comparable with the kampung's average of 5,98 m² per person.

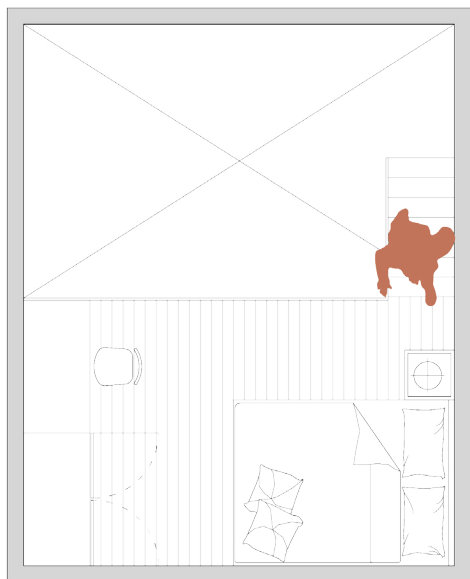
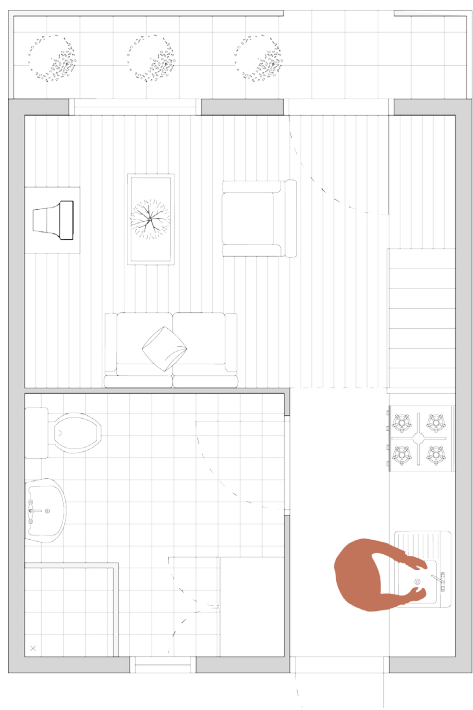
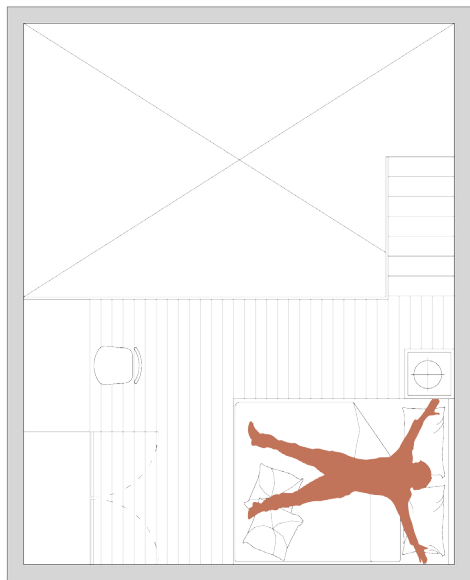
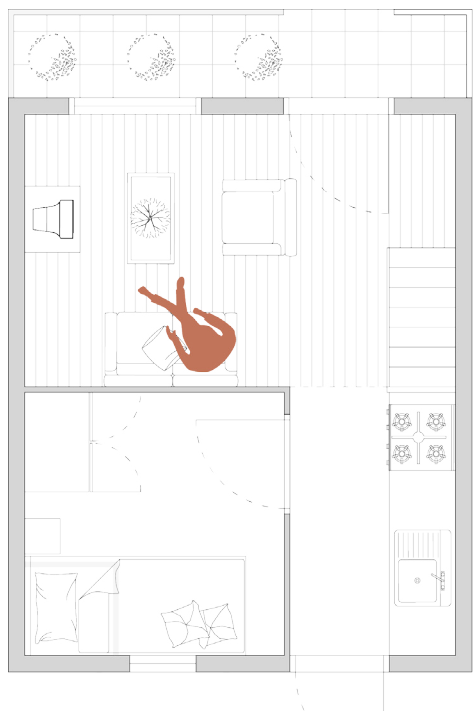
The housing element actually has the ability to offer an even higher amount of floor space, without having the need to expand the building itself. The housing element comes with a set height of 3,2 meters, which gives the ability to create a split level infill of the element. The proposed housing element plan



1. Gang (alleyway) 2. Front yard 3. Veranda or porch 4. Guest room and kitchen 5. Bedrooms

Img 09.34 - Schematic plan of hierarchy of privacy (Source: Authors own)

Img 09.35 - Potential housing plans for the housing elements (Source: Authors own)



is based on the 22m2 apartment realized in Taipei, Taiwan, by the office 'A little design' (Archdaily, 2016).

In this refurbishment of an existing 22m2 apartment, they tried to cluster all the apartment's user functions together, to create a bigger living space in the small apartment. Just as A Little Design their 22m2 Apartment, The housing element's kitchen, possible bathroom or bedroom and the master bedroom have been clustered, to leave half of the space open for the living room. This smart infill of a restricted space, gives the possibility to create the most out of the accessible space.

In the Indonesian culture, the house always has a certain graduation from public to more private functions, as shown in image 09.34. The 'gang' or pathway is the most public element, after which the transitional space at the front side of the house is bridging the public and private spaces. At the front side of the house, you will find the most public function, in this example the living room. This is followed up by the kitchen, as the next gradation of privacy, finished by the bed- and bathrooms, which are mostly secluded from temporary visitors.

The elevated bedroom is accessible through a stair-element which will also be functioning as storage space for the apartment, and will function as part of the living room.

The transitional space

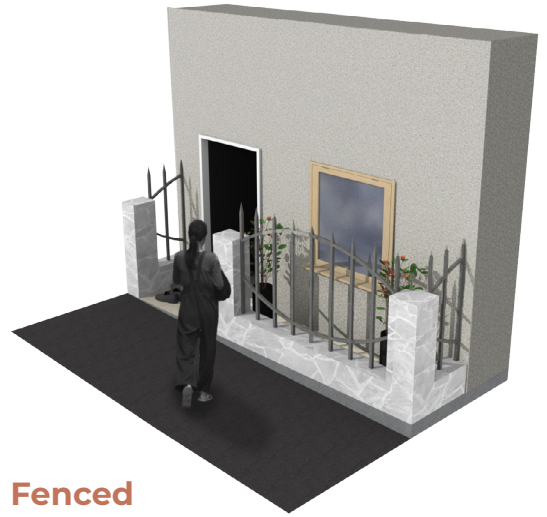
The transitional spaces, which bridge the private and public elements from one another, will be appointed to the inhabitants of the relevant inhabitants. This space is not just meant to bridge the public and private function from each other, but also to create a more varying street view. The varying buildings with bright contrasting colors is one of the main recognitional element of the kampung neighborhood. The amount of variation that can be realized within these 0,8 - 1,0 meter transitional spaces can recreate these typical kampung street views.

The transitional space can be given infill through four different possibilities. When combined, it will create an even wider range of potential outcomes. The space can be left open, and be for example used to park a motorcycle. The second option is to create fences around the space, which can then be used to place belongings. In the current situation, the fence is often the element which shows the plot that a family has claimed to be theirs, and is therefore a frequently seen element. The third possibility is to create a slightly sloped roof above the space. The

**Img 09.36 - Different potential
infills of the transitional spaces**
(Source: Authors own)



No infill



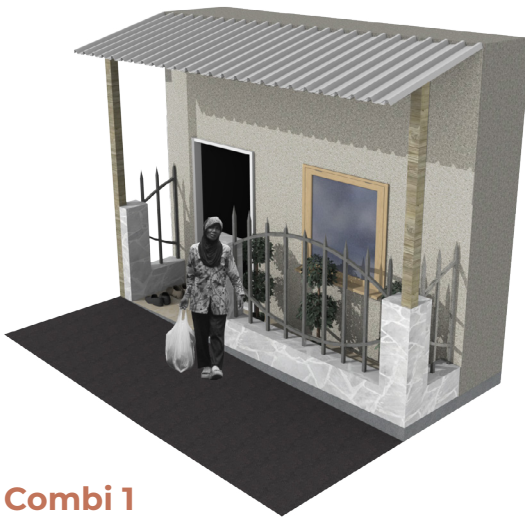
Fenced



Roofed



Build



Combi 1



Combi 2

roof can be, for example, used to protect drying laundry against rain, or to make sure that the sunbeams don't make it into the living room. The last possibility is to extend the housing element. The profit from doing this is a larger living space, but the counter argument is that there is no bridging between public and private. Combinations between these four different possibilities can create a wide variation in different infill of the transitional space.

Pay-as-you-fetch-method

Research by H. Kano on the income of kampung inhabitants, tells us that the average kampung household earn between Rp. 250.000 and 1.000.000 (Average of Rp. 625.000) (Winayanti, 2004). This average of Rp. 625.000 (\$43,92 or €38,75) comes down to an average of \$1,46 per day (or €1,29 per day), which is underneath the UN-poverty line of \$1,90 per day (or €1,68 per day)(UN, unknown).

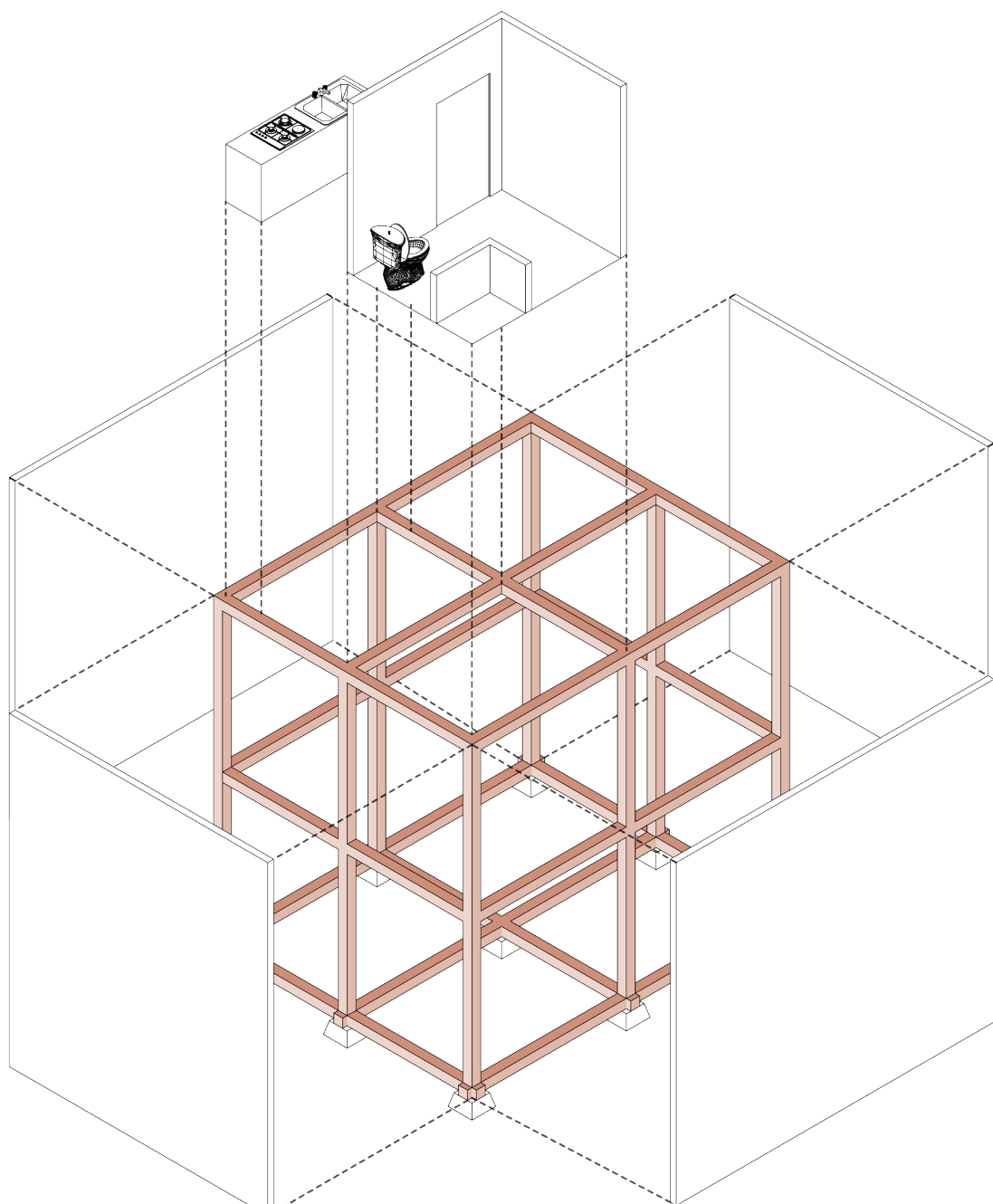
Further research by Cohen, shows us that the average slum-inhabitant is only able to spend 15 - 20% of their income on housing and infrastructural costs (Wakely & Riley, 2011). With the average monthly income of Rp. 625.000, this would mean that the average kampung family is only able to spend a maximum of Rp. 125.000 (\$8,78 or €7,75) on rent and infrastructure.

The new to realize vertical kampung project in Kampung Tamansari will offer social rental apartments for a monthly fee of around Rp. 300.000 (\$21,00 or €18,60). Even though this is a relatively low rental fee, it is still around 48% of a kampung inhabitant's monthly income, 28% more of what the average slum-inhabitant is able to spend on rent.

The proposed solution therefore is a rent-as-you-fetch method. This method will align the housing layout to the amount which the kampung household is willing to spend on rent. Instead of renting a fully realized apartment, the rent will be based on the amount of element which are included in the housing element (See image 09.37).

For example, if we take the average of Rp. 300.000 as monthly rent (as in the vertical kampung project), it would be possible to reduce the monthly rent by making a rental price for the minimal requirements of what a healthy, livable housing element should consist of; a safe structure with a legal connection to the neighborhood's infrastructure. In this example, it is up to the renter to provide their own facade for the rented bamboo construction.

Img 09.37 - Different potential infills of the transitional spaces
(Source: Authors own)



For people with a more stable income, it would be possible to rent more facilities with their minimum construction and use of the infrastructure. This would be a facade made of laminated bamboo, A kitchen, or a private bathroom, with or without toilet.

Through this system, it would be possible to create a more fair and equal provision of new rental apartments. Since there are still a lot of kampung neighborhoods in the city, a high rent will presumably lead to households moving to other kampungs where they will still be able to live for free.

Social housing project

The housing elements will be made available as social housing. The re-development of the area needs to be realized through a public investment by the local government, to reclaim their lost land. The investment in the ground will make sure that the land comes back into possession of the local government, with respect to the current inhabitants of the area. The investment by the government will be earned back over a wider range of time, since the low rent will not generate a income that will quickly re-pay it costs. The project will become profitable over a longer time-span.

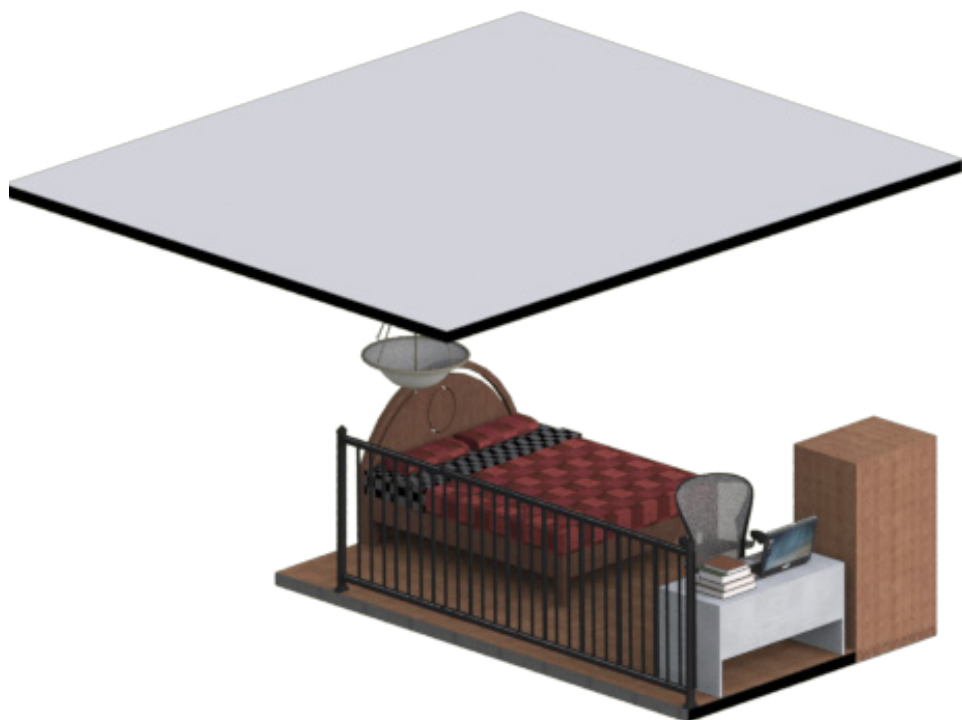
In order to create a higher amount of sense of belonging, and investment into both the blocks and housing elements, there will be a possibility to gain ownership over the housing element. Kampung inhabitants with a higher income will get the opportunity to buy their housing element. This should lead to a wider variation in the housing stock.

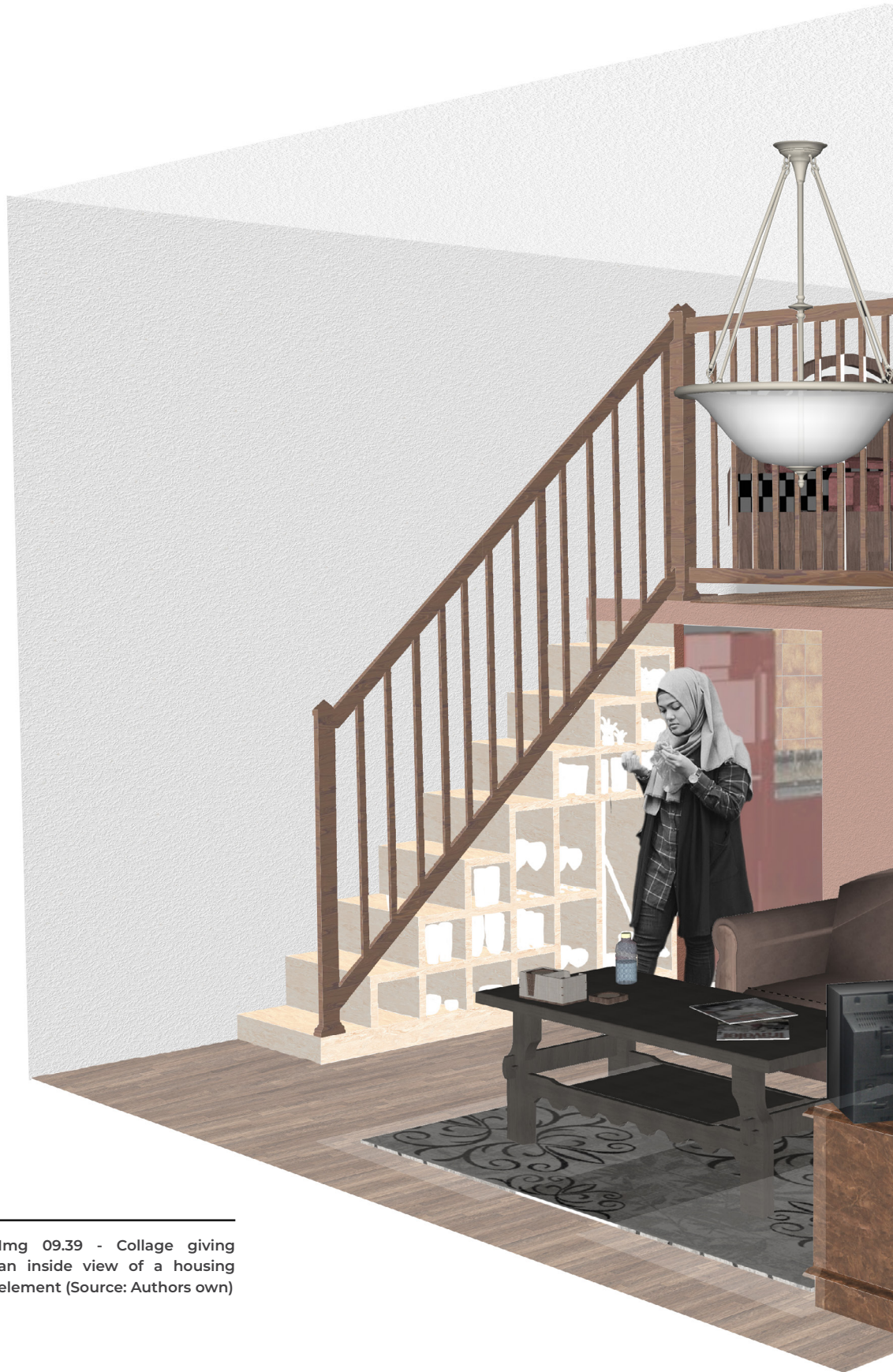
As in the vertical kampung project in Tamansari, where the first 2 years will be free of rent for the inhabitants to invest into their new to inhabit apartment. The first 2 years of rent will only consist of 50% of the total rent, which will go the RW. This rent can from here be decided over the 7 different RT's, to invest in the development of the block. This money can for example be used for the implementation of urban farming projects or other community projects.

Materialization

The housing element will be realized from locally produced materials. The construction of the element will be made out of laminated bamboo, a product which can be both grown and produced locally in the city. The to-rent facade will also consist of plastered laminated bamboo, which can be painted into the preferred color. Through the pay-as-you-fetch method, it is also possible to provide your own facade, to release the monthly rent.

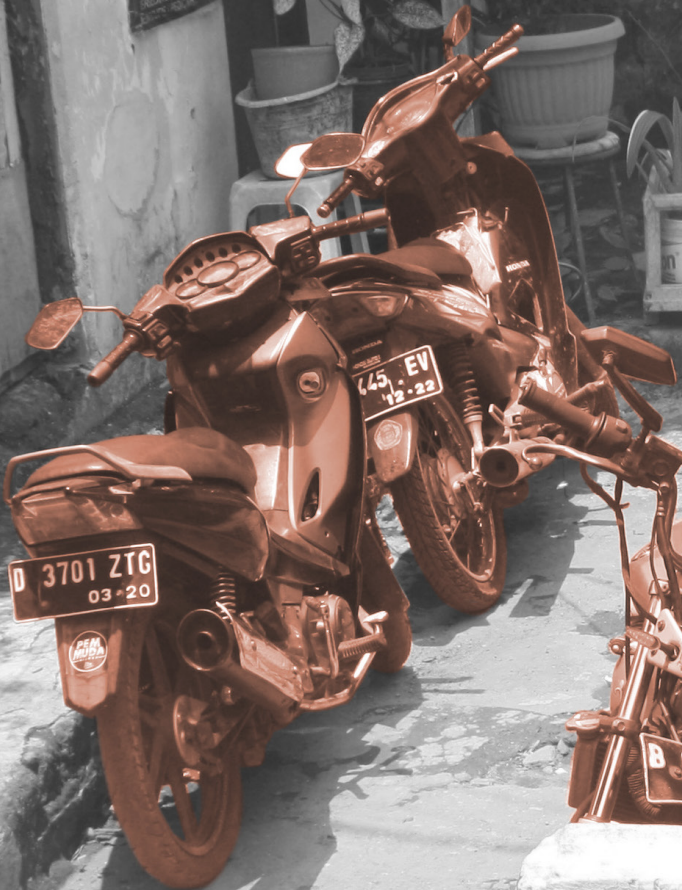
Img 09.38 - Exploded isometric view of a housing element
(Source: Authors own)





Img 09.39 - Collage giving
an inside view of a housing
element (Source: Authors own)







10 REFLECTION

This chapter will reflect back to both the theoretical and the empirical research from before the design proposal, and look at the alignment between the 'problems' and the new proposals. The 5 public health components will be looked back upon, and the comparison between the old and new will be made in order to understand how the different problems have been addressed.

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Img 10.1 - Street in the 'maze'
area of the kampung (Source:
Authors own)

10.1 REFLECTION

After the assessment of the public health and livability of the kampung, and the introduction of the new proposal for the area, this chapter will focus on the link between the research and the design practices that have taken place. The design has been realized as a result of the research on the public health, and this chapter will create an insight into how the actual public health conditions have been improved.

10.2 THE BUILT ENVIRONMENT

The build environment, as “the human-made space in which people live, work, and recreate on a day-to-day basis” (K, Roof. N, Oleru. 2008), as it has been described is a umbrella term for a lot of different aspects that together create what the build environment is. For this research, the term ‘build environment’ has been broken down into the topics: buildings, functions and public space.

Buildings

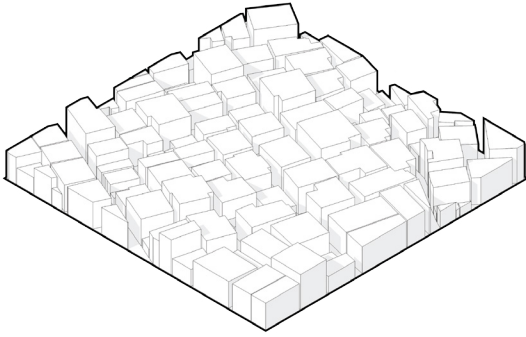
The building in the current state of the kampung are having a wide variety in different shapes, structures and materials. The problems within the current building supply lays mainly within the construction aspect. All of the buildings have been constructed by the kampung community themselves, as the kampung was developed informally. This has, over the years lead to really unstable structures. The uncertainties about the ownership of land, is causing that a lot of the informal constructions have extended onto the ‘gangen’ (alleyways) of the kampung.

The new proposal has given an answer to these problems, by offering a safe construction as the basis of the new buildings, from the transitional space can be used for the possible extension of the dwelling units. By doing so, it is making sure that all the buildings have a stable, safe construction with the possible for extensions, if there are meeting the needs of the household.

Functions

Whilst the current situation of the kampung is a rather mono-functional neighborhood, with the exception of a mosque, a daycare and a handful of warungs. This change in functions between the ‘maze’ area and the more formal pockets is due to the chaotic street structure, which is reducing the amount of people passing through the alleyways.

Img 10.2 - Difference in built environment (Source: Authors own)



100 x 100 m 'Maze area'

Floor Space Index

2,24

Ground Space Index

0,77

Open space Ratio

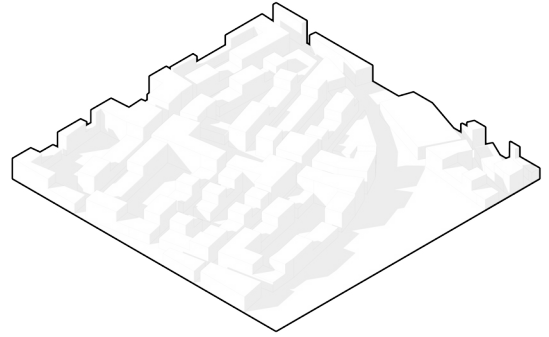
0,10

Average Amount of Layers

2,24

Average Street Width *

2,19 m



100 x 100 m New proposal

Floor Space Index

0,56

Ground Space Index

0,43

Open space Ratio

1,00

Average Amount of Layers

1,34

Average Street Width *

3,52 m

* = Street width is measuring the distance from building to building, and is including the transitional spaces in front of the dwellings.

The new kampung design is giving more space for the implementation of new functions for the kampung community. The new neighborhood will introduce new social and economical functions as a construction workplace, a community center with a library and working places, a RW-office which has a double function as a generator-building, and the introduction of more warungs and shop-houses into the area.

The new functions will revitalize the street life of the central kampung area, which will have beneficial effects of the mental health of the inhabitants.

Public Space

The current 'maze'-area is a dense, chaotic structure of small alleyways, of which most are dead-ended. The dense amount of streets, and small widths of the alleyways make it difficult for outsiders to navigate themselves through the area. The narrow alleyways, in combination with the motorcycles running through these same alleyways, are creating unpleasant spaces. The fact that there are no alternatives within the 'maze' area, in sense of public space, is not giving the community the opportunity to meet, socialize and interact with one another in a designated area. The lack of public space is not only affecting the mental status of the community, but is also affecting the moving space of the people, as there is not space for sports or other activities.

The new design is aiming at proving a wide array of different public spaces, which will all have their specific use. The new neighborhood is offering a central pocket park for recreation and sport activities, RT-squares for social interaction within the community, Roofscapes as semi-public spaces for the block inhabitants which can be used in a variety of ways, and inner courtyards will give the ability for leisure.

10.3 SPATIAL PATTERN

The pattern of a specific neighborhood is not only a structural element which has its influence on the organization and management of an area, but is also a key-element within the perception of space of a specific location. The kampung is a really typical living environment, and is now really characterized by a specific spatial pattern. "A spatial pattern is a perceptual structure, placement, or arrangement of objects on Earth. It also includes the space in between those objects. Patterns may be recognized because of their arrangement; maybe in a line or by a clustering of points" (L, Keys-Mathews, 2003). The analysis on the existing situation has been key into understanding on what is making the kampung and how we can utilize these components in order to improve upon the existing structure.

The chaotic structure

The chaotic structure of the 'maze' area is a result of an unplanned development on top of a problematic topographical composition. The 'maze' part can also be seen as the transitional part in-between the two formal pockets, as the surrounding structures are gradually being intertwined. The part where these two gradually changing spatial patterns are coming together, is showing the incapability of dealing with these kind of issues in a informal development method.

The new block structure

The new block structure is aiming to realize a better understanding of the different entities in the kampung, with the urban block being the new RT communities which together will have their shared responsibilities. The new block structure is a easy pattern when it comes to relation between the streets network and the infill of the remaining plots. Because of this, it was possible to reconnect the broken structures of the formal pockets, and make them meet in the middle around the new pocket park. This pocket is also located of the current position of the most problematic part; the part where the river comes most inwards, the slope is the steepest and where the two different spatial patterns will need to be connected with one another.

Description of current situation

As can be seen in the drawings, which isolate the different components of the spatial patters from one another, the structure of this specific part is

hard to identify or name. There is a visible east-west orientation, which is coming from the location of the slope towards the river, but within this main orientation, the street network is not showing a similar orientation.

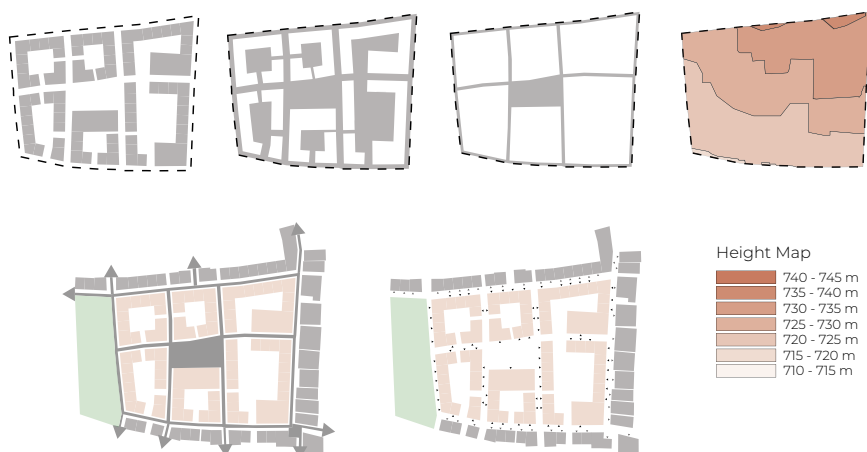
The streets in the area are positioned chaotically, without a clear hierarchy or structure, and are all of a particular small width (all underneath 1,5 meter). Because of this unclear street network, there is also a very unclear orientation of the different dwellings. Where in the formal pockets, the buildings have been realized in a back-to-back system, we can here witness how the systems is slowly diverting into a less organized structure.

Description of new situation

The new situation can be clearly recognized as a block patterns, with an open courtyard in the center of the different urban blocks. We can see how the streets have a very clear north-south orientation with branches going in the opposite direction. The zone is being centered by a newly introduced RT-square, which is creating a middle point to where the different alleyways are ending.

As can be seen in the bottom right diagram, there is a really clear orientation of the different dwellings, also showing that all of the blocks are oriented outwards.

Img 10.3 - Comparison between
the new and old spatial
patterns (Source: Authors own)



10.4 NEIGHBORHOOD CONFIGURATION

The Neighborhood configuration, or “The topological relation between different spatial objects or complex volumes” (T, Chen, M, Schneider, 2011), is focusing on the extend to which the natural surroundings and topography of the area are reflected into the urban tissue of the area.

In the current situation, the topography is one of the main factors into why the structure of the kampung is so ‘maze’-like. The central part of Tamansari on the eastern bank of the Chikapunding, the project area, is located right in-between the topographical

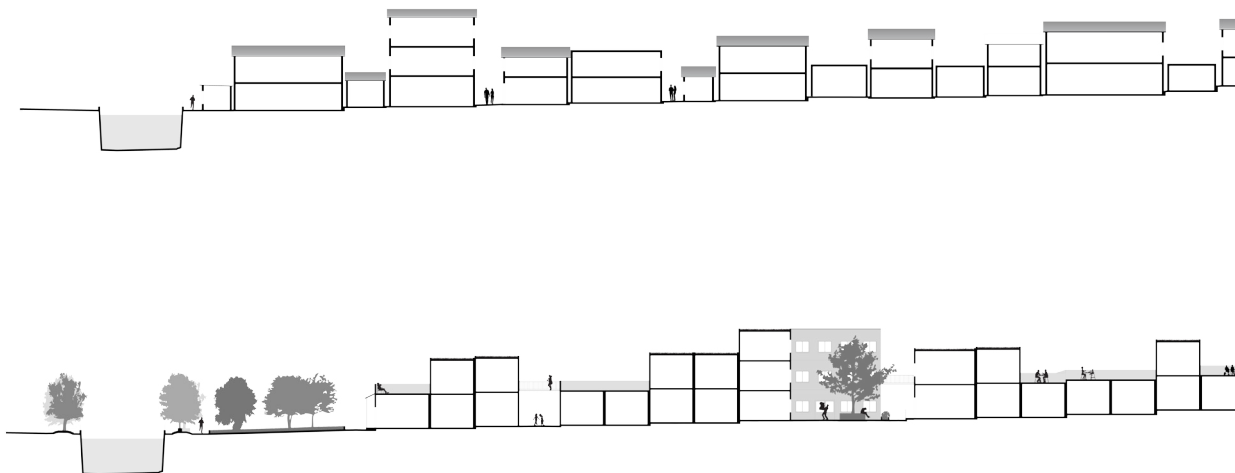
bottleneck of the area. This meaning that the most problematic part of the kampung is realized on the part where the steepness of the slope is closest to the inwards meandering of the river. This topographical bottleneck has resulted into a break into the surrounding urban structures, as it seemed impossible to join the two urban tissues in the middle.

Other problems concerning the use of the slope can be seen in the bottom section of the current condition of the project area. In this section we can see how the buildings are getting more spreaded

from one-another as the slope is gradually getting steeper. This is showing how the slope is being conceived as a negative aspect towards the spatial development of the kampung.

The new kampung proposal is better utilizing the steepness of slope, by introducing an elevated street network, which makes it possible for inhabitants to access their home through a wider variety of options. The vertical street network is, for example, free of motorcycles, and therefore a more walkable option.

Besides the implementation of the



vertical street network, the kampung is also utilizing the steepness of the slope in order to make the infrastructural networks function through the use of gravity. This same method was already present in the existing situation, where the slope of the hill was being used to lead the sewage lines to the Chikapundung river.

Chikapundung river

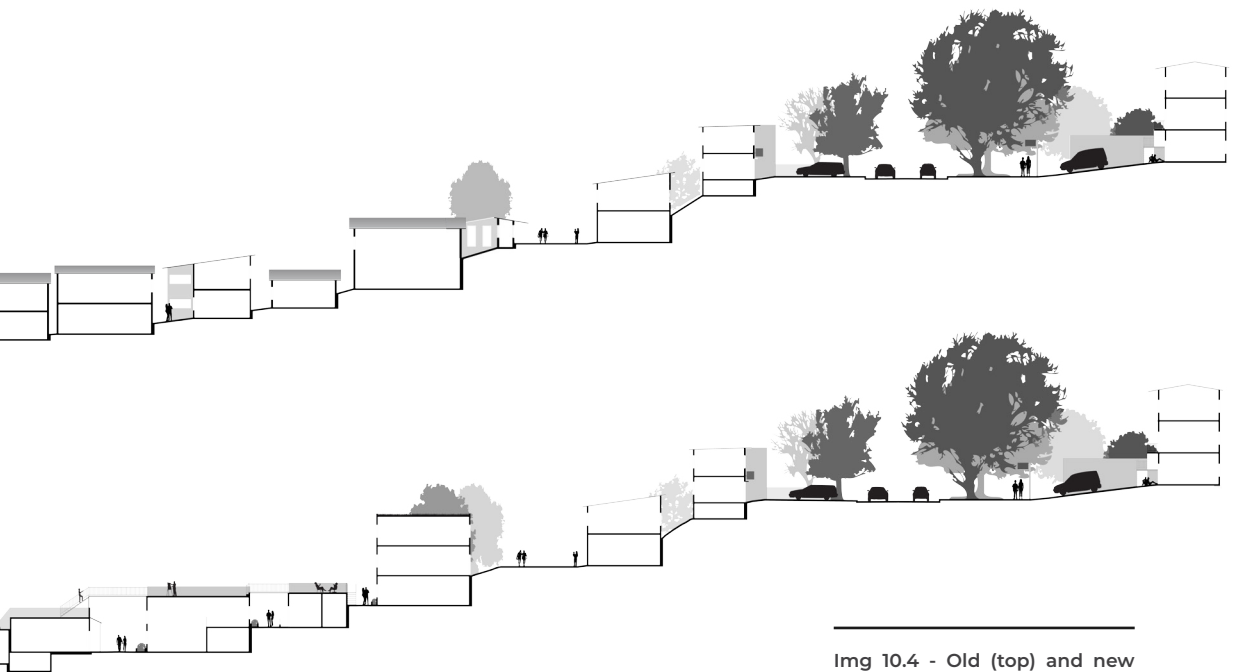
The current kampung is only using the Chikapundung river as a big open sewage system. The buildings all have their backs turned to it, and only the newly realized pathway is giving a hint into the

potential of what the river can mean for the kampung.

The new kampung is building on from the river-edge boulevard proposal from the Eco-district plan. This boulevard will be realized along all of the river-edges in the area, and will give a new facade to the kampung.

This new boulevard is also the main catalyst for the new development along the river-edge. The new design is proposing different community-based facilities and functions along the river, such as mosques, playground, squares and the RW office. The realization of these

functions along the river are aiming at healing the historical relation between the kampung and the Chikapundung river.



Img 10.4 - Old (top) and new (bottom) neighborhood sections (Source: Authors own)

10.5 POPULATION DENSITY

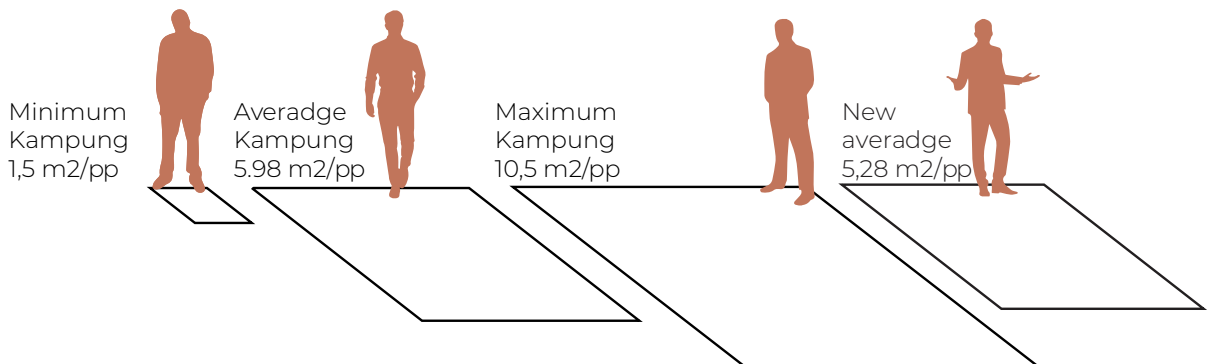
The population density in Indonesia's kampung neighborhoods is a ever-growing problem, as the city population is expanding rapidly. With the majority of these new population being rural immigrants who are heading towards the city for a brighter future, these low-income people can be expected to end up in the informal kampung neighborhoods of Bandung.

An important indicator for the population density, is the amount of square meters every person has to its possession. As can be seen in image 10.5, the current kampung is having a wide variation in amounts of square meters per person, varying from just 1,5 m² in the smallest dwellings to 10,5 m² in the largest one. The average square meters per person are slightly underneath 6 m² per person.

The Indonesian government has implemented a law, setting a minimum square meters per person for newly realized dwellings. Before, there used to be a national minimum floor size of 9 square meters per person. Until a few years ago, the perception of what would be a healthy house for Javanese standards has seen a change in the minimum required square meters for dwellings realized in higher inhabited island of Java. The new amount of square meters per person is 5,25 square meters per person, with the minimum floor size of 'Javanese healthy house' being 21,5 m².

In the new proposal, a basic housing element with a minimal of 21,5 m² has been introduced. This housing element is giving the possibility to expand the amount of square meters to a total of 32,25 m², through realized a split level inside of the unit. This will result into an minimum (average) square

Img 10.5 - New average square meters per person (right) compared to the existing (left three) (Source: Authors own)



meters per person of 5,28 m², which is meeting the minimum requirements of a Javanese healthy home.

With a total amount of 665 dwellings in the newly proposed plan, the population density of the RW shifted from 40.403 inh/km² to double the amount in 83.803 inh/km². This new density has been calculated through the total amount of 665 dwellings, the average amount of 1,32 layers and the average household size of 3,79. The RW, with a total size of 3,70 Ha (0,0397 km²) is staying the same size as it is in the current situation.

Because of the option for a incremental growth during the upcoming years, the density in the area will increase to an even higher number, and is expected to reach the density of that of RW 12, by reaching over a 100.000 inh/km².

These two changes; the minimum square meters per person and the increasing neighborhood density is making the most out of the density and overcrowding aspects. Through realizing smaller dwellings, as the inhabitants will need to start paying rent over their dwellings, an higher number of dwellings could be realized in the RW. This is balancing the growing density whilst also keeping the overcrowding into their own hands.

10.6 INFRASTRUCTURE

The infrastructure might be the most important health-related intervention topics when it comes to the redevelopment of the area. Throughout history, the improvements in city's infrastructure, such as the sewage system, have proven to be most efficient way to improve the life span of the community. This shows us that improvements in the infrastructure is of huge importance to the overall well-being of the inhabitants

Research by Stillwaggon is confronting us with the shocking numbers, when it comes to death rates related to unhealthy infrastructure networks. According to her studies, every day illnesses related to water supply, waste disposal and garbage kill 30,000 people and constitute 75 percent of the illnesses that afflict humanity (StillWaggon, 1998).

Sewage system

The current sewage system is a (semi) open sewage system leading the human waste of the kampung community into the river. The chaotic streets structure of the neighborhood is also having its affects on the sewage networks, as steep angels are accumulating waste flows in vulnerable locations. The sewage lines are, wherever possible, realized in-between the back sides of the two buildings. The chaotic street structure is also influencing this, well designed, principle, as the back-to-back structure has gone missing in large parts of the kampung.

Img 10.6 - Existing sewage structure (Source: Authors own)



In the newly proposed sewage network, the main sewage lines will make use of the natural slope, and bringing the collected waste through the primary and secondary streets into Septic tanks along the river-bank. Through an overflow system, these Septic tanks will be connected to the central biodigester. This biodigester will turn the human- and food waste into electricity, heat, gas and fertilizer. This new system is making the human waste flow circular, and is solving the pollution of the river. As the new structure will also be realized underneath the ground level, in enclosed pipes, the health hazard of the sewage lines are also solved.

Water network

As the kampung neighborhood has been informally developed, the neighborhood has not been connected to the centralized water network. Instead, the inhabitants depend on bottled water and the self-dug wells, which are spreaded throughout the area. The water from these wells is rather clean, but not drinkable. In order to fully clean the water, the water first needs to be filtered and cooked.

The new kampung neighborhood will be connected to the central water system from the PDAM. This also means that the kampung inhabitants will need to start to pay taxes over the new water supply, and this amount will therefore be included in the rent of the relevant dwelling.

Img 10.7 - proposed sewage structure (Source: Authors own)



10.7 DISCUSSION

The concept of 'kampung improvement' is one that has been present for years, as it was already introduced during the era of the Dutch Indies, mainly in the 1920's and 30's. The kampung improvement projects were mainly focused on improving the hygienic qualities of the neighborhoods, but were top-down planned construction which did not connect with the existing kampung structure. Because of these problems, there was a growing criticism on the way how the Dutch Indies dealt with these improvement projects.

Nowadays, about 90 to 100 years after the kampung improvement project of the Dutch Indies, we can see a growth in kampung improvement projects with a similar character. The unhealthy and dangerous living environments of the slum-neighborhoods are enough reason for the government to invest into rehousing this kampung population. The kampung population often gets relocated into social housing projects in the outskirts of the city, leading to debts, loss of social circle and even a loss of the kampung's social qualities.

Just as with the kampung improvement projects of the 1920's and 30's, the current shift in kampung development projects are top-down plans which show no respect to the social characteristics and qualities of the kampung neighborhoods. Therefore, the projects are simply solving the health problems, but are creating a new set of problems through these 'solutions'.

This kampung development proposal has been realized through a mutual improvement in both the livability and the public health. Through theoretical research, we have managed to get an understanding of how these concepts can be manipulated into realizing an improved perception. Because of the combination of these two concept, the solutions to the health problems will not be creating new, social problems, as they have been taken into account in the new proposed development strategy.

The development strategy 'an incremental tamansari' is proposing a development framework, which guarantee that the public health requirements will be met, and still give the opportunity to the kampung community to create their 'own' homes and neighborhood. Besides these qualities, the kampung development strategy has also included aspects as; heritage, demographic pressure and economical incapacabilities. All together, it is offering a tailor-made proposal for both the (local) government and the kampung community.

The kampung development system 'An incremental Tamansari, is, as the name suggests, based on the context of the kampung of Tamansari in Bandung. This does not mean that the development system will only function on this exact location. Of course, some of the design guidelines and decisions have been specified to the surrounding and underlying context, but the main concept behind the 'incremental development' and the translation of this concept into a block structure which can be developed vertically, can function as a prototype for more kampung development projects. This has also been highlighted as the development proposal is an alternative development system to the existing social housing projects in the outskirts of the city.

The design, as it is being proposed, is a spatial translation of the development system, and is tailor-made for the kampung of Tamansari. This, though, does not mean that this specific design is the only possible design outcome. The Incremental Tamansari results are a solution on how to deal with the problems in the kampung neighborhood. The design is therefore not functioning as a detailed master-plan, which has to be developed up to the last millimeter, but rather as a spatial translation of the incremental development system, showing us how the guidelines and frameworks can be used to realized a new 'formal' kampung neighborhood.

And, as the 'Incremental Tamansari' design is not the only possible and perfectionized way to deal with the problems, further research into the redevelopment of the kampung neighborhoods is needed. In this research, certain research limitations had to be set, as the top five public health determinants. Further research into the determinants of public health in relation to the kampung environment can help enlighten the problems. Besides this, another research limitation has been the lack of statistics and numeric data, which could've helped us with created a more objective understanding in the current perception of both livability and public health. As long as there is no 'perfect', kampung redevelopment structure, further research is needing to make sure that even Indonesia's urban poor can live in humane living environments.





11 PERSONAL REFLECTION

This final chapter will look back onto the research process, the problems statement and the research conducted. It will highlight different topics which are important to reflect back onto, to understand the design process, and for example my position as the designer within the strategy.

Img 11.1 - People drying their washed clothes in the public space, as here besides the riverbank (Source: Authors own)

Personal motivation and project overview

The project has been part of two different graduation studio's and -lab's. After my bachelor graduation-project, conducted at the Hogeschool van Amsterdam, was already focusing on informal urbanization practices as a result of the collapse of the Yugoslavian empire. This research had triggered a new personal interest in the informal urbanization. Being in born and raised in the Netherlands, one of the most planned and organized countries in the world, the concept of an informal neighborhood is something only seen in movies and books. Because these kind of living environments are so different from that what I am used to see around, exploring these neighborhoods has raised a whole new awareness and perception of satisfaction of my own personal surroundings.

I was given the possibility to further expand research into this concept in the graduation project of the master track, when the graduation lab 'Shared Heritage' introduced their interests, which involved a focus on 'kampung improvement' in the city of Bandung. This resulted into a perfect match between my personal interest and a scientific and societal need for further research into this topic. The graduation lab of 'Shared Heritage' has been conducted under the wing of the 'History and Heritage' studio, which offered me the freedom to work on the Bandung-project within the studio.

The graduation project 'An Incremental Tamansari' is proposing a new livable, healthy, feasible and sustainable development model for the re-development of Indonesia's slum neighborhoods. The project has compared the fields of knowledge on livability and public health to the current components of the kampung neighborhoods, to get an understanding of how unhealthy and unlivable the kampung currently actually is. The proposed development model has given answer into these problems through the process of an incremental development model, which offer the possibility for a feasible solution towards the rapidly growing population numbers.

Relation between topic and graduation studio

The graduation studio of History and Heritage had the aim the get to understand the relation between how past forms can create the base for future sustainable futures. The focus in here was to get to understand what the 'identity' is of the specific area.

The urban kampung had to be seen as a specific living entity which has gained its identity through the different historical events that together lead to the development as it is. Since the neighborhood has been developed informally, the perceptive relation between the newly urbanized situation and the historical function of the space had gone missing. The neighborhood has been realized on the former green backbone of the city, running along the Chikapundung River, and the flow of rural immigrants saw these open spaces within the city fabric as the potential area's to create shelter. This area had specific characteristics which made this location a 'good' location to settle. The relation between these specific characteristics and the dense kampung neighborhood had gone missing, since the demographic pressure on the neighborhood as a living entity, outgrew the importance of the area as an infrastructure of the city. It was therefore important to aim to repair the relation between that what was, and that was is, as it can help creating a more sustainable design for the future.

The involvement of Heritage in the project, as a result from the focus of both the graduation studio as the graduation lab, helped me to better understand the identity of the place. It helped me to understand that the build environment as we see it, is not a fixed entity, but is rather a freeze-frame of an ever expanding process. The concept of seeing the project area not as a problematic end-result of a finished process, but rather as a temporary frame within the historical narrative of the place, has helped me with identifying the position of my proposal within a wider historical framework. Doing research into the physical, social narrative of the development of the place, were key elements in the further decision making in the design process.

Relation between the research and the design

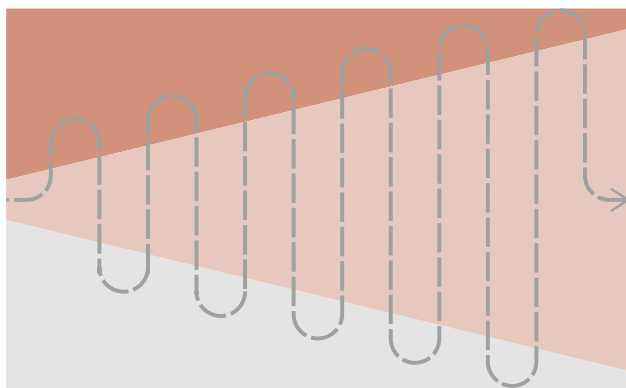
Where the methodology chapter had already framed the research to be conducted, this reflection will focus on the alignment between that what was planned to be researched, and the actual performed research. It will give insight into the relation between the research and the design processes, and showcase how they have interconnected with one another.

The research, as it was framed in the methodology, was aiming at a 'research and design' method, where the substantial part of the design was to be highlighted. As an addition to the research and

design, a third component in the shape of 'location' had been added into the spectrum. The context of the kampung is thus specific, that also this will influence the research as the design. Seeing the location as a component of the research aspect, would create an unconscious relation between the different aspects, where the conscious overlap between these three topics are important to lead to a smoother research and design process.

The two main components, that together are forming the main body of the scientific research are; livability and public health. These two components both consist of a strong subjective assessment, as the objective components are not directly influencing the perception of health of livability. The phenomenological approach is aiming to better understand the role of the people, and is therefore the needed research method in dealing with such subjective terms (Babbie & Mouton, 2008). The research is aiming at understanding the values that people attach to these subjective phenomena (Collis & Hussey, 2009, Rubin & Babbie, 2010).

After finishing the research, it is now possible to reflect on the alignment between that what was meant to be done, and that what has actually been researched and highlighted. The subjective assessments that come with the amount in which the aspects livability and public health are being perceived, has made it difficult to actually create a list of research guidelines on how make a livable and healthy neighborhood. For topics such as the physical health of the body, it was easier to target the threats that had to be tackled in order to create a healthier living environment. More problematic were the components that were less



- Research
- Design
- Location

Img 11.2 - Graph showing how 'location' will play an integral part in the researchby design
(Source: Authors own)

directly influencing the physical health, but were more aiming at improving the mental aspects of livability and health. Since the assessment of these components is determining on the state of mind of an individual, it is more difficult to directly influence the perception. In the end, by reflecting the final results of the new design to the criteria to which the current kampung had been assessed, I managed to better communicate on how the different health components have been influencing the new design. Preferably, the research would have produced a set of design guidelines, which would form the new livable and healthy kampung neighborhood. Throughout the research process, it became clear that it would be impossible to frame such a list of guidelines, as the whole concept of the perception of livability and health was too complex to fully research. So instead, we method where the qualitative aspects of the concepts are feeding the decision-making process was introduced.

The research approach in relation to the methodology of the graduation studio

With the graduation studio aiming to create an understanding of the 'identity' of a specific place, and understanding the historical narrative of the place, this gave the project a specific research approach. Through doing historical research it became possible to understand the historical narrative of the project location. The influence from the colonial past of the city, was a key-element in creating the place as it was before the informal kampung neighborhood was present. The independence of Indonesia, turned out to be a key-element in the development process of the country. Every different element can be related back to 'before' or 'after' the colonial era, showing also the importance of the specific heritage of the place. Before the independence of Indonesia, under the Dutch empire, the place had its function as the green backbone of the city, with the plan to turn the place into a city park. The independence of Indonesia in 1945 changed all of these plans, and a process of rapid urbanization started to occur. This was the main reason of the change in the narrative of the place. The green infrastructure was all of a sudden forced to be functioning as an urbanized neighborhood.

Doing empirical research on the status of the current 'freeze-frame' in the development process of the kampung managed to give us an understanding of what are the current problems in the kampung, and understand what the current perception of the identity of the kampung is. This kampung 'identity' has been further researched by case studies of other

kampung neighborhood throughout the island of Java. Having an understanding on what the 'identity' of the kampung is and what the 'kampung way of life' looks like, is key in understanding the needs of the target group of the design approach.

My personal role within the field

The idea that a slum, as kampung Tamansari, is in need of a healthier living environment, is not something which is hard to imagine. Therefore, understanding what my role is and why these changes would be happening when I propose them, are key in making difference between making a good looking design or making an actual result that can be realized in the practice. There currently is a mismatch between the interests of the two main stakeholders involved in the process; the local government and the kampung community. Where the local government has an interest in the area, as they are the legal owners of the ground, over which they can generate money. Besides this, the local government is in the end all held accountable for the slum-forming in their city. The kampung community has an interest in creating a more livable and healthy living environment, as the current conditions are causing a serious threat to the well-being of the people. The problem with this stakeholder is that they are current squatting the ground, and are staying there free of rent and taxes. The financial incapacibilities make it problematic for themselves to make things happen by themselves.

My role is as the catalyst between these two stakeholders. The local government has the financial capabilities and land ownership and the kampung community is looking for a better quality of life. The main interest of the local government is, of course, generating an income out of their land. By introducing a solution where the local government is making a public investment in the area, making it possible to improve the current living conditions, the kampung will need to be formalized, through which the local government has the ability to re-generate their investment back over a longer amount of time. Without me, as a catalyst, in the middle of these two stakeholders, the local government will presumably demolish the current kampung neighborhood, and replace this for low quality apartment buildings. By offering an alternative proposal, which also needs a relative low investment, but do is meeting the interests of the kampung community, we can manage to satisfy both the main stakeholders in the development process.

Societal relevance

After the independence of Indonesia in 1945, the country entered a period of rapid urbanization, as people started moving towards the urban regions. This spurt of urbanization caused the city of Bandung to grow from a total of 250.000 inhabitants in 1945, to more than 2,5 million in 2018 (World Population Review, 2018). By 2040, the city is expected to reach a total of 4,1 million inhabitants, which means that the city will grow with 1,6 million inhabitants in the next 20 years.

The prompt growth of population in the city of Bandung also resulted a high amount of informal urbanization. There wasn't a sufficient housing supply available to meet the demands of this population growth and therefore, the new migrants started to take matters into their own hands and started creating their own shelters. This process of this rapid- and informal urbanization has lead to more than 50% of Bandung's neighborhoods containing slum areas. The informal neighborhoods, or slums, lack hygienic living conditions. Slums are often characterized by overcrowding, poor-quality housing, lack of basic infrastructure and poverty (Scovronick, 2015). These different factors are what make the slum-neighborhoods unhealthy living environments. Illnesses related to the water supply, waste disposal, and garbage kill 30,000 people per day and constitute of 75 percent of the illnesses that afflict humanity (Stillwagon, 1998). The digestive-tract diseases arising from poor sanitation and the pollution of drinking water are the leading cause of death in the world (Thapar, 2004). Therefore, this research is aiming to provide healthy living environments for the kampung inhabitants.

Scientific relevance

By 2030, it is expected that almost one in seven people will be living in informal settlements, or slums (PSUP Nairobi, 2016). This means that the informal settlements will become a more important way of housing, which explains the need for a greater body of knowledge of these unknown areas.

There are a lot of studies done on slums and informal enclaves; on how they came into existence, on similarities between slums in general and even on how to improve the living conditions in these slums. In trying to find solutions to improve slums, organization often generalize slums, and look for generic solutions. For example, we can see that the government of Indonesia is looking for a solution on a national scale with the Kampung

Improvement Projects or the United Nations with a solution on a global scale. But every slum or informal neighborhood is created by a different context and a different set of variables. The UN's household-based definition of slums lacks emphasis on the locational aspects, and mainly focuses on aspects as infrastructure and basic services (Olthuis 2015).

This project is aiming to bridge the gap between the scale differences between the proposed solutions and the exact specific problems on the neighborhood scale. Each problem will need a tailor-made solution, as just providing the physical requirements, without showing respect to the existing social and economical structures, is not a solution creating new dilemmas.

Ethical considerations

The project is proposing a better alternative to the current slum development model of the government. The idea is to go along with the governments 'zero slums' policy, but providing an alternative way of re-constructing the neighborhood in a more (socially) sustainable way. Since I am an outsider, looking at everything from a western perspective, it is important to find the right balance between setting restrictions, to make sure that it won't result in the same problems in 20 years time, and giving the people the freedom to collaborate and give infill into their own needs.

It is important that I don't shape the way these people will need to live, through my understanding of what life in the Indonesian kampungs is like. Of course, through the field research, I managed to get an understanding of what the kampung life looks like, but within a study of 2 weeks, it is never possible to get a clear understanding of all the different aspects of the kampung-way-of-life. Finding the right balance between the restrictions, to make sure that the new kampung neighborhood will remain as a healthy and livable living environment, and the freedom to let the kampung community shape their living environment in such a way, that it is meeting their personal needs.

Img 10.6 - The Sustainable Development Goals (SDG's) which are being met (Source: UN, 2015)



12 LITERATURE

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