Finding Sustainable Solutions for Situ Babakan

A preventive approach towards slum forming in kampong peripheries in Jakarta

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The issue of slum areas in Jakarta has never been one that people talk about in their daily life in Jakarta. Even though I was born and raised in Jakarta, I only know several areas in the city that relates to where I live, where my school is, and where to go out and get some food, which is an activity that is typical to most inhabitants of Jakarta, rich or poor. Kampons are the words that we used for areas where poor people live in, where the criminals came from, where there are no hygiene and sanitation. As a middle class society living in Jakarta, we try to distantiate ourselves to the matters related to slum areas.

When exploring this matter during the research phase of this project, I've encountered many aspects that helps me understand why it has become what it is now, and also the complexity of the matter that is not only the problem of this specific class of the society, but actually the problem of the city as a whole. This is because the problems that they are facing affects other aspects in the city, including other social classes that do not seem to have any relation whatsoever with the slum areas.

In order to get to know my country and culture better and to relate it also with my passion and background, I choose to do a graduation project with the topic of preventing the forming slum area using architecture for my Master degree at the Faculty of Architecture of the Delft Technical University in the Netherlands. During this past year that I have done this research project, I have learnt so many things that has very little to do with the field of architecture, but has so much to do with my development as a person. This is mainly because I've come to understand many of the reasons why my country is the way it is now, and therefore I come understand myself more. These are very valuable experiences that I've got from the many conversations that I've had, not only with scholars and experts on fields that I am interested in, but I've also learnt a lot from the locals, the kampong inhabitants. Therefore I would like to thank everybody who has been involved with me so far that I finally managed to finish my study with it.
Knowing that I cannot mention everyone who has helped me this past year, I would still like to mention several people that mean a lot to this graduation project. First of all I would like to thank my parents, without whom I wouldn’t be able to finish my study in the Netherlands. I also would like to thank my supervisors, Hein de Haan, Andy van den Dobbelsteen and Andrea Peresthu for their help during the research process. I would also like to thank Dr. Jo Santoso who had guided and helped me with my research in Jakarta. Also I would like to thank everyone else who had helped me finish this thesis with the time that they spared to make conversations with me on this subject. A special thanks to the inhabitants of Situ Babakan who had spared some time to help me understand better how kampongs work.

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Within the last 50 years, Jakarta has grown from a small port city with several hundred thousands of inhabitants into a metropolitan with millions of inhabitants. The inhabitants population was increased from 554,000 in 1941 to 2,907,000 in 1961. One of the causes of this wave of urbanisation is the unrest in the countryside caused by the Dutch effort to win Indonesia back into their hands. (Ter Weel, 1979)

Sukarno built Kebayoran Baru as a new satellite city for the higher society in 1949. New infrastructure (such as Thamrin/Jendral Sudirman, and Jembatan Semanggi), shopping centre Sarinah, sport complex Senayan, and other new buildings and monuments was built during this period. Expansions to new living areas such as Tomang, Grogol, and Tebet are made. (Ter Weel, 1979) The building timeline stretch much longer than those of the need of an expanding city such as Jakarta. Even though there are a lot of plans of expansions that are implemented quickly in Jakarta during the regime of Sukarno, this do not deny the fact that the city is not ready for the quick development of population growth. There are many informal settlement areas that called 'kampong' which are formed within the city that corresponds to the traditional way of living of the Indonesians. Since there are no attention being paid to these areas, they quickly turn into slum areas. Therefore, the word kampong are often associated with slum areas when treated in the context of a city such as Jakarta.
1. Introduction
Within the last 50 years, Jakarta has grown from a small port city with several hundred thousands of inhabitants into a metropolitan with millions of inhabitants. The inhabitants population increase exponentially from 554,000 in 1941 to 2,907,000 in 1961, to around 8 million nowadays (Jakarta’s Central Statistic Office website). This without taking into account the unregistered and inhabitants living in the satellite cities, which would lead the number of inhabitants into almost twice as much.

To cope with this vast population growth, there were development plans being implemented in a short time during the early years of independence. Sukarno (the first president of Indonesia) built Kebayoran Baru as a new satellite city for the higher society in 1949. New infrastructure (such as Thamrin/Jendral Sudirman, and Jembatan Semanggi), shopping centre Sarinah, sport complex Senayan, and other new buildings and monuments was also introduced during his regime. Expansions to new living areas such as Tomang, Grogol, and Tebet are made. (Ter Weel, 1979)

Even though there were many expansion plans being realized in Jakarta during the governance of Soekarno, this do not solve the problem of the really fast population growth of the city. Many areas in the city were not properly planned, and many are left unplanned, giving space for the growth of the informal settlement areas which often associated with the name ‘kampong’, referring to traditional living quarter for the Indonesians. Since there are no attention being paid to the development of these areas, they quickly turn into
Development of Jakarta

Source: RUTP 2005

- 1940s
  - 1942–1945 Japanese Occupation
  - 1945 Indonesian Independence

- 1950s
  - G-30-S PKI
  - 1965 First Masterplan Jakarta

- 1960s
  - 1966 RUTP 2005 (Second Masterplan)
  - 1968 Tsunami
  - 1970 Cultural Revolution
  - 1980s
  - 1985 RUTP 2005 (Second Masterplan)
  - 1988 Economic Crisis

- 1990s
  - 1998 Tsunami

- 2000s
  - 2002 First Bali Bombing
  - 2004 Second Bali Bombing
  - 2005 RUTP 2005 (Third Masterplan)
  - 2007 Tsunami

- 2010s
  - 2010s Jakarta Flood

Other Key Events:
- 1949 Kebayoran Baru
- 1970 Cultuur Stelsel
- 1980s Etchic Policy
- 1990s World Depression

Historical Context:
- 1622 Batavia founded by VOC
- 1799 Fall VOC, Batavia under the Netherlands kingdom
- 1830 Cultuur Stelsel
- 1901 British Interim
- 1942–1945 Japanese Occupation
- 1945 Indonesian Independence
- 1966 RUTP 2005 (Second Masterplan)
- 1968 Tsunami

Development Timeline:
- 1333 Sunda Kelapa
- 1527 Jayakarta kingdom
- 1529 Fall VOC, Batavia under the Netherlands kingdom
- 1622 Batavia founded by VOC
- 1811–1816 British Interim
- 1901 British Interim
- 1909 Cultural Revolution
- 1965 First Masterplan Jakarta
- 1985 RUTP 2005 (Second Masterplan)
- 1998 Economic Crisis
slum areas. Therefore, the word kampong are often associated with slum areas when treated in the context of a city such as Jakarta even though this is not the appropriate meaning for this term. (see chapter 3)

Almost 60% of the inhabitants of the city live in a kampong area which most of these areas are slum areas. There are a lot of projects which are done in order to rehabilitate the kampongs where the living condition is worse than the minimum living standard. These projects are done by the government and NGOs usually with involvement of foreign development programs. The objective of these projects are usually only restricted in looking for direct solution to existing problems areas that

![Map of Jakarta's poor areas](poor areas in Jakarta. Source: Kompas, July 13th 2007)
is often solved by building some facilities on the spot. Many of these projects have generic solutions that often does not respond to the culture and tradition.

The point of interest of this research lies mainly in the phenomenon of kampongs that turns into slum areas. The goal of this thesis would be to produce preventive solutions for kampongs from deteriorating its’ condition and make it a settlement area that can cope with problems of the metropolitan. Therefore, a kampong that still have good living condition are the main focus of this research. These kampongs are usually found in the periphery area of the city. The main goal is to search what a kampong periphery needs (in relation to the study field) in order to be able to survive in a city like Jakarta.

In the next chapter, the parameters and focus of this thesis will be elaborated. The third chapter is a supporting chapter for the parameters that elaborates the background problem and different notions that are used in this thesis. When this is clear, a specific site analysis of the chosen kampong Situ Babakan is discussed in the fourth chapter to give a concrete understanding of the matter. The fifth chapter mainly discuss the earlier solutions that already existed in this field of interest. Having discussed all of the above, the design parameter and its result is elaborated in the subsequent chapter. A general conclusion and recommendation will be treated in the last chapter of this thesis.
2. Parameters
As mentioned earlier, the main focus of this research lies in looking for preventive solutions to slum forming of kampongs in Jakarta. Therefore, the research is limited in areas that are believed to be threatened to become slum areas. These are kampongs that are situated on the city periphery where the areas have low density. Knowing that every kampong is different according to its context and own problems, a specific kampong called Situ Babakan which is located in the southern part of Jakarta is chosen.

Location of Situ Babakan in Jakarta
Looking at the development of Jakarta, the city expands quickly since the Indonesia celebrates her independence. Spatially, the city spreads out to the south, east and west. At the moment, these areas have their own districts which functions as urban areas that supports the settlement need of the city. These areas are slowly merging with the city forming a conurbation.

The first kampongs in Jakarta emerged when the non-Europeans needed living quarters which are situated outside the city. These living quarters have different characteristics since the inhabitants of the kampongs have different backgrounds. As the city expands, the kampongs which are situated around the first city centre, Batavia, merge with the city, becoming part of the urban layer in the city. Within the development of the city, there are very little attention put into the kampong matters. The inhabitants have minimum strength to support themselves and also to improve their living conditions. That is why many of these kampongs turn into slum areas.

This thesis will elaborate a research that is done on kampong peripheries in Jakarta. The kampongs which are chosen for case studies are kampong peripheries because the author believe that these kampongs are the ones who has strength to support and improve their own living condition. The kampongs in the city centre which already
become slum areas are not the main focus of this research since there are extremely difficult social aspects which are related to it that are too complex to solve only by using architectural medium.

*Development of spreading of kampongs in Jakarta*
2.2. Problem Statement

The problem statement which answer will be elaborated in the thesis is:

How can Situ Babakan become a sustainable kampong while taking into account the available local resources in the context of Jakarta?

The answer to this question, several questions are made to answer separate issues that the problem statement consists of. These questions are:

What is kampong Situ Babakan?
What is the definition of sustainable kampong?
What are the local resources of Situ Babakan that can support its’ livability?
What is the relationship of the kampong to the city of Jakarta?

All of these sub questions are going to be answered in the following chapters, followed by several design recommendation and reflection in the last chapter.
2.3. Research methods and approaches

The methods used for this research are literature study, case studies analysis, and interviews. The preliminary research is mainly done by doing interviews and literature studies. The site analysis is done based on interviews, and available documents that could be found around the subject through literature studies, internet, field trips to the location and other establishments in Jakarta. Some theories on sustainability are treated using literature study. The notion of a sustainable kampong is developed especially using the DCBA method.

The result of these studies will then become the base on forming the design parameters, which will resulted in different scenarios and strategies for the chosen site. The site analysis is done using SWOT method. First of all, different aspects within the site will be analyzed by its strength, weakness, opportunities and threats. Based on the result of this analysis, there are different scenarios and strategies develop for the site. When this is done, further analysis on the different scenarios and strategies are compared and tested again in the site with cooperation of the inhabitants. Before that, an analysis on the same aspects of the different scenarios are analyzed and divided into aspects that should be maintained, improved, alternate, and minimize. The result of this analysis are then tested on the second field trip research that is done in February 2008 in Jakarta. During the second field trip, the analysis that
resulted in the form of several hypothesis are tested by means of interview with different establishments including the municipality, university, architects and the inhabitants themselves. The result is a definite program of requirements which forms the base for the design project that consists out of strategies on the urban level and a design of a Neighbourhood Business Centre on architectural level.
Visit Jakarta:
- Duri Kepa
- Muara Baru
- Kapuk Muara
- Petak Sembilan
- Situ Babakan

How can Situ Babakan become a sustainable kampong while taking into account the available local resources in the context of Jakarta
How can Situ Babakan become a sustainable kampong while taking into account the available local resources in the context of Jakarta?

Understanding the context of the problem

Define parameters for testing

Research field trip to Jakarta, testing the feasibility of the strategies and hypothesis

Research field trip results:
- Literature study
- Interviews

Design parameters and strategies of intervention

- Water
- Infrastructure
- Greenery
- Built area
- Waste

Neighbourhood Business Centre area

Methods

Analysis

Parameters

Masterplan

Architectural Intervention
3. Notions
In this chapter most of the terminology that relates to the problem statement will be first elaborated. The understanding of a ‘kampong’ and its’ characteristics will be made clear. This is important to give an understanding on what the author comprehends of the concept of ‘sustainable kampong Situ Babakan’, which is the goal of this thesis. This understanding is elaborated in the last paragraph of this chapter.
3.1. Glossary

**Kampong**¹

1. Johan Silas: a kampong is settlement which has been transformed from rural village into urban village with minimum but directly available infrastructure and provision (Silas, 1983)
2. Kampong in the city cannot be separated from the understanding of tradition of living of its society (Karsten, 1986)
3. Kampong is a traditional environment which is typical Indonesian, marked by a very tight family bound living environment. (Herbasuki, 1984)
4. Kampong for its inhabitants is a living area where harmony grows. Besides as a living area, a kampong also functions as a place of economical activity, prayer, etc. (Silas, 1983)
5. In a kampong generally there are small open spaces where social activities happens. Also a kampong usually has gardens where people plant their own food. (Jayadinata, 1996)

According to the Batavia als Handels-, Industrie- en Woonstad in 1937, kampongs are defined as living areas where the less fortunate society is settled. This society consists of de native population, a small amount of Europeans (mostly Indo-European) society, as well as Chinese (mostly warong owners) and Arabic society. In the reality it is really difficult to show the boundaries between a kampong and other areas. (Vletter, et al. 1997)

¹ Kampong definitions are taken from Setyaningrum, 2005 and translated by author.
Lake

A traditional carriage drawn by a horse

A three wheeled transportation where the carried biked the customer in a covered compartment.

Warong is a small shop selling basic daily needs in a kampong. This shop is usually a part of the house that is converted into a shop.

Work together in a community in order to achieve a common goal.

Small fish ponds

Small mosque

Abbreviation of Rencana Pembangunan Lima Tahun; Five Year Development Program. In the Orde Baru (New Order) of Suharto, the development program is planned for each five years.
3.2. Kampong in Jakarta

The development of kampons in Jakarta has many different facets in relation to the development of the metropolitan itself which has a high complexity. It is extremely difficult to make a kampong typology since each of them are strongly influenced by the local context. It is also the different background on how a kampong came to existence that especially leads into many differentiation in the kampongs.

In its original rural version, the word kampong literally means ‘village’, usually the home village or birthplace of an individual. In the context of city like Jakarta, it has also come to mean a poorer neighbourhood contained within a city. It is important to remember that a kampong is not synonymous with the term ‘slum’. Most kampons actually contain a mix of lower and lower-middle class society. There are even some middle class families that live in permanent dwellings living in a kampong. (McCarthy, 2003)

In this paragraph the different origins of how the kampongs came into existence in Jakarta will be elaborated. These different origins also belong to certain period of time during the development of Jakarta as a city. It is therefore important to remember that these different origins of kampongs cannot be compared parallel next to each other.
The first inhabitants of Jakarta are skilled seafarers who came from other parts of Asia and started settling down in the plains of Jakarta between 3,000 and 1,000 B.C. (Warmansjah, 1976 - cited in Bianpoen 1983)

It was not until the era of Taruma Negara in the 5th century A.D. was permanent settlers reported living in the area. Very little was known about these people. The next written report appeared in the 16th century, which tells about a harbour called Sunda Kelapa. This is a seaport town in the Hindu kingdom of Pajajaran. (Bianpoen, 1983)

The strategic position of the port which lies in the junction of trading line between the eastern part of the archipelago and the west make the port really desirable for many traders.
When Sunda Kelapa was finally taken over by Fatmahillah Khan in 1527, he named the new kingdom Jayakarta, which means the city of the complete victory. The assumed day of the takeover, which was June 22, 1527, is still commemorated as the anniversary of Jakarta.

Unlike the Portuguese attempts to win over the port cities by taking over power from the ruling kingdoms, the VOC have different approach by offering alliance in trading. This is why they were allowed to built warehouses and a fort at the end of the river Ciliwung. After a long and complicated war in the beginning of the 17th century involving the Bantenese (native folk of West Java), English, Jayakartans and the Dutch themselves, the VOC took over Jayakarta under the direction of Jan Pieterszoon Coen. The first castle was built, and the city name was changed into Batavia. (Diessen, 1989)

Jayakarta kingdom
Source: van Diessen, 1989
p. 16
In the beginning, kampong is understood as living quarters in the outskirts of Batavia that is given by the VOC as settlements for non-Dutch foreigners who came to Batavia for expedition purposes. The foreign traders during the colonialism period come mainly from Chinese, Arabic, Malayan, Balinese, Ambones, Bugis and the Moors (South India) origin.

During the development of Jakarta, the inhabitants of these kampongs live in the given area, adding density to the given space as the population grows. The people of a certain kampong are usually of the same origin, keeping most of their own tradition, while in the same time adjusting
Bad living condition results in a high death rate in Batavia during the 19th century.

Source:
Right: Hoek, taken from Tillema, 1916 deel 2, p.10
themselves with the local culture. Due to the low level of health condition in Batavia, especially during the 18th century, there has been a continued population supply coming from outside the area to keep the population in Batavia. This process explains why certain society group diminished quickly when there are no new population supply imported to the city. Therefore, the VOC brought in slaves coming from South Asia such as Malabar, Arakan and Bengal. Only after they surrendered the VOC base in Arakan, they bring slaves coming from the archipelago. Slaves are coming from all around Indonesia, but most of them come from Bali and South Sulawesi. (Cas-tels, 2007)

The map shows the location of ethnic kampongs around Batavia between 1619-1800. Source: Diessen, 2007. p. 65
The non-slave community in Batavia that have different ethnic origins are allotted to certain quarters which are provided by the government. They live under the protection of the head of a kampong which is usually called the Major or Captain. This military title are based on the fact that every kampong or ethnic group can provide a militant army. The effectiveness of each militant group are different according to the ethnicity and the period during which the group is formed.

It is important to remember that this separation process is not a significant factor that influenced the assimilation process of the population in Jakarta. This could be seen through circumstances such as when a military group is not big enough to form a force, this will be joined randomly with other group from different ethnic background. Within the 19th century most of the inhabitants have adopted many Javanese cultures and customs. Naturally not every ethnic group has experienced the same mixing process.

The improvement of communication and transportation at the end of the 19th century also promotes the immigration of women from abroad, which resulted to the decreasing amount of interracial marriages. The result of this situation is that some communities consist only of pure blooded ethnic group while others have a mixed cultural background.

These people played an important role in defining the Batavia population in the 17th and 18th century. At the end of the 19th century, these people who has a mixed ethnic background formed a new
native culture, which is called the Betawi people. The cultural background that has the strongest influence on the new group is the Islam and the bahasa Melayu (Malayan language), which came from the West of Indonesia. (Castels, 2007)

Post independence, Indonesia comprise an economical centralization system. Java has a problem of land shortage and high population density caused by migration. Java is the administrative, economic, and educational core function of Indonesia, which exerts a great attraction on migrants from other islands. Since the 1970s there has been an increasing amount of circular migration into the city. This is because there are a lot of people who cannot afford to stay in the village where there are no work to be found. On the other hand, they cannot afford to live in the city either because the living costs are much too expensive. These people who work in the city, have to either commute, live with their family, or squat an area informally in the city. This situation cause especially increasing density problems in the kampongs, turning them quickly into a slum area.
Circular migrants return to their place of birth regularly (for funerals, marriages, and religious feasts) and often send money home. Both of the social network in the town or village of origin is highly important for the survival of the migrant. (Nas, 2002)
Development of kampons in Jakarta
Up: Beginning of 20th century
Source: Dr. Terburgh, taken from Tillema, 1916 deel 2, p.35
Middle: In the early 1970s
Source: Dorléans, 1972
Bottom: kampong nowadays
Source: author
Looking back at several definitions of kampongs from the glossary (Paragraph 3.1), Setyaningrum concluded that a kampong is a typical Indonesian settlement in the city with the following characteristics:

1. Located in the city but has an atmosphere of a village
2. Inhabited by low income society
3. Has minimum facility
4. Has high adaptation capability towards the future
5. The inhabitants has a high solidarity even though they come from different social backgrounds.

(Setyaningrum, 2005 - translated by author)

The social relationship between kampong inhabitants is very strong. This results to a different way of dealing with private and public space that is commonly known in a residential area. In an individual dwelling, a house is limited by a fence and walls on four sides to show the boundary which also clarify land ownership. The public space stop at the fence. Everything behind the fence is considered as a private space.

In the case of a kampong, there are many in-between zones amid the public and the private space. In a privacy zone study done in a kampong called Tunjungan in Surabaya, Machiel van Dorst defined the zoning typology of a kampong in Indonesia as follows:

![Different zoning in a kampong.](source: van Dorst, 2005, p.125)
1. Bedroom

This zone is the most private one. Only the users of the room are allowed in and no other family members. Sometimes the bedroom is the minimum possible size and in some cases it is just an area cordoned off with a curtain. In all cases, users know that other members of the household will not disturb them in their bedroom.

2. Family room

This room is shared by those living in the house. Very good friends may occasionally be admitted, but only when invited. The family room, therefore, is more the domain of the family than a Western living room. Here the family consists of the nuclear family, sometimes with the addition of other live-in relatives.

3. Guest room

This is where family and guests meet. If one family member receives a guest, the rest of the family can stay in the family room. The family room is visible from the gang (alley), from where acquaintances can attract the attention of family members, who may then invite them in. The view out onto the gang also allows social control over the gang from the home.

4. Veranda

This has a more public function than the guest room because it is not inside the home. The veranda is also visible from the street and therefore more approachable. Occupants may invite passers-by into this space (even strangers).

5. Front yard or bench in front of the house

A member of the household sitting here may be addressed by any passer-by, whether they know them or not. The initiative for social contact does
not lie with the occupant of the house. However, the number of strangers they see is very limited because the gangs are used mainly by residents, visitors, food vendors, and seldom by people just passing through.

The gang delineates a social unit. The residents of a gang jointly maintain the outside areas. In some cases the gang has a washing area which is shared by the residents. Cooperation in a gang is formalized in an official administrative unit, the RT (Rukun Tetangga). The chair of the RT is the contact person for the gang and reminds residents of their neighbourhood duties and obligations.

In these meeting places residents can actively seek social contact and meet people from other parts of the kampong. They can easily leave this zone if they want to end the contact. This is also the zone where kampong activities organized by the kampong leader or a mosque are held. These centres of activity are also used by kampong residents who want to meet someone separately from other members of the live-in family. Social control here is exercised by other kampong residents.

This is where the residents of the kampong as a group meet people from the outside world. Visitors from outside cannot enter the kampong unseen; they are always asked for the purpose of their visit and, if necessary, a kampong resident will accompany them to their destination. Residents may pass the time near the entrance out of curiosity. The entrance is also guarded by residents in the
evening and at night so that this informal meeting place can function undisturbed for 24 hours a day.

The main public urban spaces are situated directly outside the kampong, where strangers form the majority. The kampong residents can experience the anonymity of the city just 200 metres from their homes.

(Van Dorst, 2005)

The social control that occurs in the kampong is the utopia of every urban designer. This is because the spatial arrangements promote activities that requires social contact between the inhabitants.

The downside of this condition is that in most kampongs there are insufficient hygiene and sanitation facilities. The reason is because the inhabitants of the kampong are accustomed to fulfill their sanitary needs by using the river only. Many of the kampong dweller still do their needs on the river, where they also use the same water to drink, cook and wash themselves. This is a natural custom that worked well several centuries ago when the population was sparse. Unfortunately, this habit continues until the present where nature can no longer deal with the amount of waste that are disposed to the surrounding. This condition has caused the spreading of diseases and thus the deterioration of the inhabitants’ health condition. This is a reoccurring problem that even the kampongs nowadays still have to face.
Toilets hanging above the river in Batavia
Source: Dir. Gem. Werken en rooimeester van Batavia - taken from Tillema, 1916 - deel 2, p. 175

Collective garbage dump.
Source: Tillema, 1916 - deel2, p.176
The position of kampong periphery in Jakarta

In the colonialist city planning, the kampong was defined as non built-up areas or ‘niet bebouwde kom’. (Santoso, 2006)
The kampong is seen as ‘reserve areas’ for the later planned expansion of the modern city, the ‘bebouwde kom’. This term is used by the Dutch because the kampong is not normally included in the regional city administration. In old city maps of Jakarta, a built kampong is always shown as green areas which is situated behind existing buildings/houses which are stretched out along important roads. This even though the areas are built. The ‘green’ function which is given in the map marks the function of the kampong then, which is as non-urban area, implying that these areas are reserved for city expansion.

Based on the setting, kampongs can be divided into two condition:

- The first one being kampong outside the city or in the periphery.
In the early days of Batavia, this type of kampong is distinguished as villages amidst palm plantations as mentioned on the map of Jakarta around 1844 kept in the Rijksarchief ’s-Gravenhage Holland. This map shows extended areas which had become residential. They were called “kampong areas with palm plantation”. Subsequently, the town developed through the centuries and around covered a built up area including the kampongs outside the city.
During the development of Jakarta in the last two centuries, the condition of the kampongs has also gradually shifted from kampong periphery into kampong in the city. What used to be a kampong with coconut plantations in the 19th century has become kampongs in the middle of the city in 1900. (Bianpoen, 1983)

- The second setting is kampong in the middle of the city
The kampongs in the middle of the city function as accommodation provider for migrants coming from the rural community. This relates with the increasing need of employee in the city itself. The strategic location of the kampong form an ideal living environment for the migrants considering the social, economical and cultural environment in the kampong strongly relates with their rural identity. Meanwhile, the migration means new economical opportunities for the present kampong inhabitants. They can rent, sell houses or land good, or provide other types of service. The dynamic of the kampong parallel with the population growth results in a socially and economically heterogenic development. There are markets, warongs, services such as blacksmith, small industry activities, labours and employees of lower education are settled in these kampongs.

Together with the population growth, the city also expands itself to the south, east and west. This
Structure kampong in the city
Source: Airial photo, Mapping Office DKI Jakarta, taken from Bianpoen, 1983, p. 54

Structure kampong periphery
Source: Airial photo, Mapping Office DKI Jakarta, taken from Bianpoen, 1983, p. 54
process gains acceleration by changing the structure of kampongs in the periphery from semi-rural into urban. The first step is the integration of the kampong dwellings into the city infrastructure, followed by investment activities within the connection between the areas. The development of the area slowly adjusted itself to urban structure as a whole, becoming a part of the city. An area with this kind of development will become attractive to investors and migrants. The kampongs in the periphery grow along the main roads and in the service areas. This is typical for kampongs in the periphery. (Santoso, 2006 - trans. by author)

The two types of kampongs shifted in function as the city grows. What used to be a kampong periphery became a kampong in the city. At the same time, the kampong periphery are the new kampongs that emerges at the outskirts of the city. This pattern continued since the very first expansion of Batavia towards the south.

The kampongs that have to face most deterioration problems are the ones that are situated within the city parameters. Usually, these are also kampongs that has become slum areas since the kampong cannot deal with expansion. On the other hand, the government consider these areas as ‘reserve areas’, waiting for investors to free the land and build on them. This situation means that the existence of kampong inhabitants in the city is not guaranteed by the government. They are let to live in these areas until better plans for the area
Growth of Jakarta

Sources: RUTP 2005, p.9; Pemda Jakarta, 1972, p.9
- reconstructed by author

During the development of the city, the kampongs which originally situated on the outskirts of the city have merged into the urban layer of the city.
is made without taking them into account. Many has strive to improve this condition with different aid programs through NGOs, government, etc. Unfortunately, the land also have to face the common problem of corruption that has rooted in the system, making it very difficult for the help to get through.

Instead of only using top-down approach, one should also pay attention on bottom-up approach because without involvement of the kampong inhabitants, no project will be able to sustain.

In kampong periphery, the inhabitants still have the strength to support a bottom-up approach. Many of the inhabitants have the ability to maintain the living condition which are significantly better than kampong in the city centre. Jakarta is becoming a conurbation at the moment together with the sub-urban areas around it. The kampong peripheries which are situated in the city outskirts at the moment will soon become part of the middle of the city. This threatens the well being of the kampong in the periphery of Jakarta. Unless there are preventive intervention planned for these areas, they will soon have to deal with the worsening condition such as the previous kampong peripheries experienced.
Budiwarjo explained several characteristics of an ethnic kampong:
1. An ethnic kampong is inhabited by a certain tribe
2. It has unique architectural forms at certain facades of its’ dwellings which illustrate the existence of the culture that inhabit the area
3. It has a typical environmental setting
4. It has a historical development that relates to the development of the city
5. It has a distinctive social cultural setting
6. It has areal esthetic value that can be perceived through experiencing the area
(Budiwarjo, 1993 - cited in Setyaningrum, 2005 - trans. by author)

Based on spatial arrangement, ethnic kampongs can be divided into: of an ethnic kampong, divided these into:
1. Kampong along the beach
2. Kampong centralized
3. Kampong linear at a lowlands
4. Kampong that surrounds certain facilities
These kampongs has particular patterns which is mainly influenced by the landscape;
Along the street, along the river, radial, spread out, along the beach or along the railway.
(Daldjoeni, 1998 - cited in Setyaningrum, 2005 - trans. by author)
In a Betawi kampong, there are no certain rules in planning the development of the houses in the kampong because this development took place based on individual ownership instead of communal such as in other traditional settlements in Indonesia. There are only customs that is more related to practical and technological ability that one possess. (Harun, 1991 - cited in Setyaningrum, 2005 - trans. by author)

In planning a kampong, there are certain orientations that can be applied to regulate the spatial arrangements:
1. In relation with social relationship, people want to live close to each other so that they can live with the ‘gotong-royong’ principle
2. In relation with economical relationship, people want to live close to where they work
3. In relation with accessibility to the social economical facilities, people want to live close to the street, mosque or other religious supporting places, school, market, etc.
(Jayadinata, 1996 - cited in Setyaningrum, 2005 - trans. by author)

The land exploitation pattern of a Betawi kampong can be divided into two; namely settlements in the city that is dominated by agricultural-rural atmosphere, and settlements along the coastal area of Jakarta which is characterized by fishermen villages.
The village-like settlements are dominated with vegetated areas consisting mainly of orchards,
which also illustrates the daily activity of the community; farming.
Along important streets, the settlements are grouped and have only small yards. The owners of these houses often have big piece of land further away from the street.
Away from the streets, the houses are more spread out and set in the middle of a land that is owned by the locals through generations. This type of kampongs can be found in the Southern and Eastern part of Jakarta such as Condet, Kebun Jeruk, Sukabumi Ilir, Lenteng Agung.

The landscape features of the fishermen village is dominated by swamps and fish ponds called empang. The dwellings are concentrated on areas near water (rivers or sea) so that it is easily accessible by boats.
In the lowlands, there are no high vegetation. Therefore, most of the living area have an open ambiance with several low trees, where the dwellings are grouped facing the land and its’ back facing the rivers. The typical characteristics of these kampongs is the presence of fishing tools that can be found in front of the house. This type of kampong can be found in Marundo Pulo and Marunda Besar.
Set up kampong Betawi in the inner city - kampong Condet
Dwellings
Empang (Small fish ponds)
River
Street

Set up kampong Betawi along the coast - kampong Marunda
Source: M. Yuwono, 1983 in Rumah Tradisional Betawi, 1991 p. 20
The existence of the Betawi people in Jakarta tends to shift gradually towards the outskirts of the city. Being the native dwellers of Jakarta, the Betawi population used to own land in the centre of the city. As the city grows, the land they own become sought after due to the strategic location in the city and therefore they became expensive. Living in a land where food grows out of the ground with minimum effort, the natives are not used to hard work. When the land got more and more occupied, it can no longer fulfill the daily need of the inhabitants. So, to earn money, they sell their possession which are land goods, and move towards the outskirts of the city. Within certain periods, considering the vast development of the city Jakarta, the outskirts of the city has become once again part of the city centre. The next generation of Betawi people sell this property and move towards the new outskirts of the city. This is a process that repeatedly occurs during the development of the city. (k. inhabitants interview 2007)
3.3. SUSTAINABLE SITU BABAkan

In this paragraph, the notion of sustainable Situ Babakan will be elaborated. This is to help define the understanding of the statement Sustainable Situ Babakan for author. In order to do this, first of all a general introduction on kampong Situ Babakan is going to be elaborated. After that, the notion of sustainability which is very broad, is going to be elaborated relating to the context of this research. This in order to give a clear overview on the authors point of view of the research question and what kind of results to be achieved from this research.
Introduction on Situ Babakan

**Facts:**
Situ Babakan is geographically located at 106° 49’ 50” E and 6° 20’ 23” S (Virky, 2002). This Situ (lake) is naturally a very potential water retention area. The surface area of the lake is around 23 ha with 3-5 m depth. This will be rehabilitated and developed into 32 ha. (Nugroho, 2002). Situ Babakan is situated at 54-64 m above sea level with uneven topographical condition. (Virky, 2002).
The total surface area of Situ Babakan is 165 ha with the land use for housing (46.73%), green area (26.19%), swamp (12.05%), and public facilities (5.1%). (Virky, 2002).

The kampong at this moment is a green area with low density inhabitants (17,726 inhabitants in an area of 298 ha). 67.5% of the inhabitants are the Betawi people. The rest of the people are migrants who come to Jakarta, from Java or other islands in Indonesia. These people are usually the renters of the small houses which are rented out by the Betawi people. The majority of the religion in Situ Babakan is Muslim (91%), as it is the traditional religion of the Betawi people. The rest are divided into Christian (8%), Hindu (0.6%), Buddhist (0.4%).
The economy of the inhabitants are mainly still dependant on the products of the land. Therefore farming and fisheries is still an important income source for most people. Due to the promotion of tourism in the area, there are many different types of home industrial activities found in Situ Babakan. The more educated people and migrants who do not own land to work on usually work outside the area as employees. (Chotimah, 2007).
Situ Babakan is one of the many Situ’s (= lake) in the Southern area of Jakarta. There are more than 40 situ’s in Jakarta which is meant for water retention for water coming from the mountain which is located on the south.

The condition at the moment is that many of these situ’s are no longer exist, or do not have direct connection with significant rivers in Jakarta. Many of the situ’s are dried up and exploited as an extra open space.

Since the ground condition of the southern part of Jakarta is better in comparison to the rest of the municipalities, this area is most desired for housing. Most of the areas have low density, good micro climate and also clear ground water.

The Betawi people, since they originated from the area, have large area of land goods. These lands, which they inherited to the next generation, always got divided when given as heritage to the children. Land is also seen as source of income in Situ Babakan. It is either rented out or sold to migrants. Nowadays, there are many new dwellings being built in the area without taking into account what the consequences are for the future.

Even though the area is no longer as densely
planted as it used to be, it is still in very good condition. A lot of different trees which are typical in a Betawi landscape are planted in the originally forest-like area. The trees give coolness during the day, and protect the people from the sun. This is why people from outside the area come and visit the area along the coast of the lake to sit around or enjoy the traditional food supplied by the local food stalls.

This area is protected by the government as a Betawi cultural preservation area. Unfortunately, nobody practice the rules that are handed to them by the government.

During the weekend, there are a lot of people coming from other places in Jakarta to enjoy also some of the traditional Betawi attraction, or play on the lake.
One of the main problem in the city development of Jakarta is that planning is never implemented in practice. The government planning is always known as ‘adjustable’ according to how much money one can spent. Rules are not made to be followed, and therefore building development is only focused on giving benefit to the investors.

In terms of kampongs, the projects known to people is one that comes from NGOs or a government improvement program. No initiative is being taken by the inhabitants themselves to go beyond their own comfort zone and improve their own living condition. This way of thinking that whoever comes from a low society will never be able to make any difference has been implemented throughout generations, and therefore creates a society with norms and values that is passive to changes and taking own initiatives are considered out of the question. If no help is offered, then no changes are made. Since it is not beneficiary for investors to improve the living condition of the low income society, help is being given on a minimum level. This leads to a condition where one can not improve the living condition in slum areas to meet a minimum requirements. These areas are considered as hopeless cases where people just have to move away from or tear them down all the way and create something new, which is not affordable for the slum inhabitants.
The notion of sustainability in this thesis is crucial because this is the central point of discussion on how to solve the problems of kampons independently without having to have NGOs and governmental institutions helping and telling the inhabitants what to do all the time.
To elaborate further, first of all some existing notions on sustainability in the study field of architecture will be elaborated.

According to Brundtland, sustainable development is development that meets the needs of the present without compromising the ability of future generation to meet their own needs. (Brundtland Commission 1987)
In the field of architecture, the notion of sustainable development are further divided into many different aspects relating to building.
One of the many interpretation of the aspects covered in the notion of sustainable development is the following:

- **environment** - not only direct environmental effect but also indirect effects; a physical environment can also generate environmental involvement
- **social** - the physical environment contributes directly to the livability of a certain area.
- **economy** - the built environment should always be usable for different purposes in time.
- **spatial** - besides good for the environment, it is also good to have spatial qualities that contributes to sustainable use.
- **process** - the process of sustainable development can generate involvement and contribute to infor-
mal management or self management. (van Dorst, 2005, p.46 - trans. by author)

In relation to the result that is to be expected on architectural scale, first the general definition of ‘sustainable building’ is given: Sustainable building results in buildings that are designed and constructed with high ecological standards (especially in minimizing waste and negative environmental impacts, and efficient use of energy, water and material resources), that are within the economic means of the occupants and promote their well-being.

In her dissertation on Sustainable Housing in Indonesia, Dwinita Larasati derived the aspects that are related with the notion sustainable building in Indonesia as the following:
- Energy
- Materials
- Water
- Indoor environment
- Surrounding environment
- Economy
- Culture/Society
(Larasati, D. 2006)

The goal for kampong Situ Babakan which is currently still in good condition is to be able to maintain all of the good qualities that it has independently. In many cases, the independency of the kampong inhabitants is not taken into account as a subject that needs to be brought up. One would suggest that the kampong inhabitants are naturally willing to work the extra mile in order to
achieve a better result. This is often not the case. People are more perceptive towards changes, especially to ones where they do not feel they can gain something directly out of it.

In the case of kampong periphery, the main issue is to generate strategies to maintain the good living condition by focusing on cooperation between the government and inhabitants. The strategies should be attractive for government and investors while in the same time stimulates kampong inhabitants to solve their problems independently.

As a concluding remark, the notion on a sustainable kampong Situ Babakan according to author is made the following:

A kampong that can cope independently with the development of the city by using its’ resources wisely while maintaining the present identities, values and qualities.

The different aspects in sustainable building is further developed in this paragraph using the DCBA methods. The DCBA methods is used to determine the level of sustainability of this kampong among other similar kampongs in Jakarta. This list of aspects is made using the DCBA method for Sustainable housing in Indonesia by Dwinita Larasati with certain adjustments made on several variables in relation to the kampong problems. The following is the DCBA list for the kampong Situ Babakan, with D being the aspect that is commonly used and A being the ideal situation that one would like to achieve. The Indonesian DCBA methods on sustainable housing is elaborated in annex IV.
<table>
<thead>
<tr>
<th>Aspect</th>
<th>D</th>
<th>C</th>
</tr>
</thead>
<tbody>
<tr>
<td>Neighbourhood relationships</td>
<td>You know the names of your neighbours, but make no further contact</td>
<td>You have social contacts under special circumstances (such as birth, death and marriage)</td>
</tr>
<tr>
<td>Inhabitants involvement</td>
<td>Nobody is interested to be involved</td>
<td>A few people are willing to participate in communal activities</td>
</tr>
<tr>
<td>'Gotong royong'</td>
<td>No 'gotong royong' activities</td>
<td>'Gotong royong' activities only when an emergency occurs</td>
</tr>
<tr>
<td>Neighbourhood activities</td>
<td>No communal activities</td>
<td>Neighbourhood activities such as night-watch (ronda) gatherings (arisan) and periodic cleaning (kerja bakti)</td>
</tr>
<tr>
<td>Initiators</td>
<td>There is no person in the community who leads, motivates or initiates neighbourhood activities</td>
<td>There is a group of people in the community who motivate and initiate neighbourhood activities</td>
</tr>
<tr>
<td>Spill-over effect</td>
<td>Lack of discipline of inhabitants, which has a negative effect on neighbouring areas, such as throwing garbage into sewers</td>
<td>Domestic activities of a housing project having no effect on neighbouring areas</td>
</tr>
<tr>
<td>Drinking water accessibility</td>
<td>Difficult access to water source</td>
<td>Have the drinking water delivered to your house</td>
</tr>
<tr>
<td>Accessibility of public facilities &amp; services</td>
<td>Lack of or only basic public facilities and services</td>
<td>Primary public facilities and services are available</td>
</tr>
<tr>
<td>Public space</td>
<td>Lack of minimum-sized multi-purpose, public space</td>
<td>Minimum-sized public space for basic needs such as passage</td>
</tr>
<tr>
<td>Yard &amp; garden</td>
<td>The house does not have a yard or garden</td>
<td>The house has a small yard or garden</td>
</tr>
<tr>
<td><strong>Community</strong></td>
<td><strong>Outside the house</strong></td>
<td></td>
</tr>
<tr>
<td>----------------</td>
<td>-----------------------</td>
<td></td>
</tr>
<tr>
<td><strong>You also have social contacts under casual circumstances (nightwatch, social gatherings, etc.). communal facilities, such as a guard house, should be provided</strong></td>
<td><strong>Social contacts happen every day and everybody knows everyone. The consequences are for the inhabitants themselves.</strong></td>
<td></td>
</tr>
<tr>
<td><strong>A majority of inhabitants are willing to participate in communal activities</strong></td>
<td><strong>All inhabitants are involved in communal activities</strong></td>
<td></td>
</tr>
<tr>
<td><strong>Occasional ‘gotong royong’ activities</strong></td>
<td><strong>Routine ‘gotong royong’ activities</strong></td>
<td></td>
</tr>
<tr>
<td><strong>More neighbourhood collaboration, possibly profit-oriented.</strong></td>
<td><strong>Initiating, managing and conducting more complicated communal activities and facilities, having positive influence on the surrounding areas.</strong></td>
<td></td>
</tr>
<tr>
<td><strong>Initiators in a community succeed in encouraging a majority of their fellow inhabitants to participate in neighbourhood activities</strong></td>
<td><strong>Initiators are capable of giving trainings and workshops to their fellow inhabitants and people from other areas as well, who will become their apprentices</strong></td>
<td></td>
</tr>
<tr>
<td><strong>Domestic activities in a housing project having a positive effect on neighbouring areas</strong></td>
<td><strong>Domestic activities in a housing project having positive effects and are exemplary for neighbouring areas</strong></td>
<td></td>
</tr>
<tr>
<td><strong>Water from household pump of from your own well</strong></td>
<td><strong>Use of communal pump</strong></td>
<td></td>
</tr>
<tr>
<td><strong>Primary public facilities and services are available and easily accessible</strong></td>
<td><strong>All public facilities and services are available and within walking distance</strong></td>
<td></td>
</tr>
<tr>
<td><strong>Multi-functional public space also for secondary needs such as a greenery and a playground</strong></td>
<td><strong>Enough public space for various purposes</strong></td>
<td></td>
</tr>
<tr>
<td><strong>The house has enough yard for its inhabitants to conduct outdoor activities such as gardening and playing</strong></td>
<td><strong>The house has a wide garden that allows parking space, gardening, terrace, etc.</strong></td>
<td></td>
</tr>
<tr>
<td>Aspect</td>
<td>D</td>
<td>C</td>
</tr>
<tr>
<td>----------------------</td>
<td>----------------------------------------</td>
<td>----------------------------------------</td>
</tr>
<tr>
<td>Building expansion</td>
<td>No planning and no space for house</td>
<td>Providing specific space for house</td>
</tr>
<tr>
<td></td>
<td>expansion</td>
<td>expansion</td>
</tr>
<tr>
<td>Space</td>
<td>Less than minimum standard size (9 m²</td>
<td>Fulfilling minimum standard size: a</td>
</tr>
<tr>
<td></td>
<td>per person)</td>
<td>moderate sizes house with fixed interior</td>
</tr>
<tr>
<td>Lighting</td>
<td>Use conventional light bulbs, need most lights on both day and night</td>
<td>Sensible use of conventional light bulbs during the day and night</td>
</tr>
<tr>
<td>Cooling</td>
<td>No effort to create cool indoor condi-</td>
<td>Use appliances to help cool the indoor</td>
</tr>
<tr>
<td></td>
<td>tions</td>
<td>environment</td>
</tr>
<tr>
<td>Air and noise pollution</td>
<td>No specific effort against air and noise pollution</td>
<td>Minimize use of household appliances that cause air &amp; noise pollution</td>
</tr>
<tr>
<td>Water &amp; electricity facilities</td>
<td>No access to water and electricity grids</td>
<td>Water and electricity facilities are provided after the housing is ready</td>
</tr>
<tr>
<td>Foundation</td>
<td>Concrete foundation</td>
<td>Concrete blocks, which are more practical and use less resources compared to concrete</td>
</tr>
<tr>
<td>Walls</td>
<td>Use concrete blocks</td>
<td>Use red bricks or industrially produces board with formaldehyde glue</td>
</tr>
<tr>
<td>Building frame</td>
<td>No building frame. Brick walls or con-</td>
<td>Use mix materials between timber &amp; concrete, without taking into account where the materials come from</td>
</tr>
<tr>
<td></td>
<td>crete walls without frame</td>
<td></td>
</tr>
<tr>
<td>Roof</td>
<td>Use corrugated asbestos sheet or cor-</td>
<td>Use ferrocement or concrete roof tiles</td>
</tr>
<tr>
<td></td>
<td>rugated iron/zinc sheet</td>
<td></td>
</tr>
<tr>
<td>Material sources</td>
<td>Exploiting local resources for own need of building materials without taking into account the consequences for others</td>
<td>Buy conventional building materials from common suppliers</td>
</tr>
</tbody>
</table>
| A | Inside the house
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Providing high flexibility for house expansion</td>
<td>Separate rooms for different activities: a big house with one room for each activity</td>
</tr>
<tr>
<td>Flexible room arrangement: a moderate size house with multi-purpose rooms</td>
<td>No electricity used for lighting; during night time only use renewable electrical resources when needed</td>
</tr>
<tr>
<td>Efficient use of light and only use natural (sun) light during the day</td>
<td>Adequate ventilation, the house is designed with taking into account the sun angle and shadow falls of the surrounding elements</td>
</tr>
<tr>
<td>Adequate ventilation in the house</td>
<td>Enough ventilation to circulate air, especially in the kitchen area</td>
</tr>
<tr>
<td>Water and electricity facilities are already integrated during the building process</td>
<td>Provide a separate room for noisy and air-polluting activities and using building materials that absorb noise</td>
</tr>
<tr>
<td>Generate your own electricity and use your own closed water system</td>
<td>River stones, requiring even less concrete</td>
</tr>
<tr>
<td>Compressed earth blocks, or timber for a stage house</td>
<td>Use eco-labelled wooden or bamboo boards</td>
</tr>
<tr>
<td>Use sustainable and organic materials such as woven bamboo, coconut fibre and clay composite</td>
<td>Local resource timber without taking into account replanting the area</td>
</tr>
<tr>
<td>Use local timber from the surrounding area that provide replanting</td>
<td>Use ceramic tiles</td>
</tr>
<tr>
<td>Use locally-made ceramic roof tiles, high recycled content clay or thatches (straw, reeds, etc)</td>
<td>Grow or make your own building materials</td>
</tr>
<tr>
<td>Recycle/reuse existing materials that can be found from surrounding area + buy alternative, eco-labelled building materials from local suppliers</td>
<td>Sources</td>
</tr>
<tr>
<td>Use eco-labelled wooden or bamboo boards</td>
<td>Materials</td>
</tr>
<tr>
<td>Use sustainable and organic materials such as woven bamboo, coconut fibre and clay composite</td>
<td></td>
</tr>
<tr>
<td>Aspect</td>
<td>D</td>
</tr>
<tr>
<td>----------------------------</td>
<td>-------------------------------------------------------------------</td>
</tr>
<tr>
<td>Energy sources</td>
<td>Tap from conventional energy sources, use this energy source abundantly</td>
</tr>
<tr>
<td>Water sources</td>
<td>no direct water connection to the house (water taken from river, MCK, bought from vendors, etc)</td>
</tr>
<tr>
<td>Waste water</td>
<td>Throw waste water directly to sewers/rivers and let rain-water directly fall into sewers</td>
</tr>
<tr>
<td>Household waste</td>
<td>Self burn all of the mixed garbage disposed in an open space in the kampong</td>
</tr>
<tr>
<td>Garbage disposal</td>
<td>No garbage disposal system. Existing garbage is thrown away in sewers/rivers/other areas without any further treatment</td>
</tr>
<tr>
<td>Cleaning agents</td>
<td>Use commercial, chemical cleaning agents</td>
</tr>
<tr>
<td>Financial matters</td>
<td>Rental house</td>
</tr>
<tr>
<td>Certification</td>
<td>Illegal land use (squatters) with no right whatsoever. The inhabitants can be kicked out of the kampong anytime the government feels needed.</td>
</tr>
<tr>
<td>Energy costs</td>
<td>Ordinary energy-consuming household</td>
</tr>
<tr>
<td>The house as production unit</td>
<td>Ordinary household</td>
</tr>
<tr>
<td>B</td>
<td>A</td>
</tr>
<tr>
<td>---</td>
<td>---</td>
</tr>
<tr>
<td>Use alternative energy sources; use solar energy to purify water, etc</td>
<td>Only use alternative energy without depending on other sources</td>
</tr>
<tr>
<td>Water from own well</td>
<td>Abundant source of soil water from own well, added by purified soil or rain water</td>
</tr>
<tr>
<td>Filter grey water for household purposes, other than drinking orcookingsible or minimize waste water and use water efficiently to reduce waste water</td>
<td>Cut the use of water as much as possible or minimize waste water</td>
</tr>
<tr>
<td>Reuse and recycle packages and products, separate household waste such as bio-waste, paper, plastic, etc.</td>
<td>Also make income out of reused and recycled household waste</td>
</tr>
<tr>
<td>Separated waste containers, to be collected by municipality or to be partially self processed</td>
<td>Self-process all types of waste for new purposes</td>
</tr>
<tr>
<td>Use only natural, bio-degradable cleaning agents</td>
<td>Self-produce and use natural cleaning agents</td>
</tr>
<tr>
<td>Partially financially self-supportive and build some parts of the house yourself, with the ‘gotong royong’ system and using your own money</td>
<td>Having the right amount of money to purchase or build a new house</td>
</tr>
<tr>
<td>Certification through heritage/from others (hak pakai/hak girik) which is usually past the time span to use the land</td>
<td>Attain legality of land tenure from government. Valid certification is acquired without any complications.</td>
</tr>
<tr>
<td>Efficient house design that does not have to use energy for ventilation or electricity during the day, and rain water retention for reuse in the household.</td>
<td>Money-generating household: housing as a production unit by producing energy with a solar electricity generator</td>
</tr>
<tr>
<td>Shop house or an establishment that functions both as a shop and a residence</td>
<td>Household and cottage industry</td>
</tr>
</tbody>
</table>
4. Site Analysis
In this chapter, the different aspects that can be found in Situ Babakan will be elaborated. The themes water, infrastructure, green and built up area are firstly elaborated. The organization of this chapter is that every aspect are elaborated from the scale of Jakarta in general, and then a more specific environment in South Jakarta, to the scale of the neighbourhood of the kampong. This last scale is analyzed using the SWOT methods.
4.1. Water

Water is a very important aspect in life. One cannot live without water. In Indonesia, people get clean water only by digging a hole in the ground and connecting a pump to it. Within a few metres depth one can find clean water for daily use. This is a trusted method to get clean water on one’s own land.

If this is done by more than the 11 million of inhabitants of Jakarta everyday, this causes the drying up of the ground water. Jakarta has a low rise high density built structure which means that there are not many areas to plant trees to hold the ground water. It is also situated next to the sea, at the low ground where water flow from the south from higher grounds. Together with the rising of the sea level, the city is surrounded by water problems. During the rainy season it has always flooded because there is not enough capacity to retain water that is coming from the mountains. Lately, due to the fact that the city is sinking because of the weight pressure and depletion of ground water, flood is also coming from the sea.

Unfortunately, this is a problem that is only acknowledged, but still has no solution. To make matters worse, people still use water abundantly because they got it from their own land, hence they do not have to take into consideration how much water they use everyday.
Waterscape Jakarta

Jakarta is situated in an area which is prone to flooding. Pre-history goes back to the time when 3 volcanoes in West Java; Salak, Pangrango and Gede, were still active and laid the foundations of the ever prevailing danger that hangs over Jakarta during the rainy season. The lava from these volcanoes formed debris that took the shape of a fan, opening to the North with waterways spreading in all directions.
Some 5000 years ago the mud carried by these waterways gradually formed the lowland plan of Jakarta, which is why this area is prone to flooding by the rivers. (Verstappen 1953 - Bianpoen)

The water flows from the South where the mountain is, to the sea which is situated at the northern part of the city. There are thirteen important rivers that carries the water from the mountain into the sea, with Ciliwung river as the biggest one. These rivers are surrounded with built up areas, and in many parts of the rivers there are illegally built houses found on the embankment of the rivers. These situations causes clogging to the water flow, next to the fact that people are also throwing away their garbage in the river. In the 60s, there are planning made to channel the water into two. This project is called the Banjir Kanal Barat (Western River Canal) which was finished during the 70s. Unfortunately, the Eastern River Canal cannot be built until this moment due to the high cost of the land price. The project means buy-
ing away land owned by private parties that live on the canal area. The city is still busy doing this until this very moment, but there are not enough resources to do so. Other solutions should be searched for this problem because apparently this solution cannot be solved only by executing the Eastern River Canal project which was made when the city was only half the size it is now.

In the southern part of Jakarta, towards the mountain, there are a lot of water retention areas, which is planned to be used as water retention area by the government. These areas include 43 small lakes such as the one that Situ Babakan has. These areas should be improved as water
retention area to help control the water that is coming into the city and cause flooding. Some of these areas are already converted for water saving purposes such as a part of the Situ Babakan, the water surface in the Ragunan Zoo, etc. Unfortunately, the tendency at this moment is that these lakes are being dried up to provide more building areas to support development on South Jakarta. The government should act more strictly to deal with the water problem on the southern area.
The hydrology system of Situ Babakan is an open system with inlet and outlet for the water. The water inlet comes from several different streams which are Situ ISTN, Kali Tengah, water outlet from Perumnas Depok and Kali Baru. The water outlet flows to the Kali Cabang Tengah. There is also a water source (mata air) in the middle of the Situ, but the exact location of it has not been found yet. (Virky, 2002)

The water volume range between +/- 1,755,000 m³ during dry season and +/- 2,025,000 m³ during rainy season (Nugroho, 2002). The rainfall in Situ Babakan is around 20155 mm/year with humidity of 82%. (Virky, 2002)
Water tourism

Water tourism in the kampong is divided within the two Situ’s. At the Situ Babakan, the activities are mainly focused for people coming from outside the area. These activities are water biking, fishing using nets and also some types of water sports such as canoe or other types of boats. For the locals, the tourism is more focused in the area of Situ Mangga Bolong. The relaxing activity at Situ Mangga Bolong mainly consists of local people fishing in the area, pick up some plants in the surrounding where they will eat it with the fish that they caught at the end of the day. (Gusti, 2006)
Fish farms is an activity that can be improved to improve the economy activity. Only the development at the moment is that not many people are still interested in doing so because of the high number of fish theft and the fact that there are not a lot of money to be earn from this activity. Most people only do this activity as a hobby nowadays. The tendency that can be seen in the dwelling area where people used to have ‘empang’s’ (small fish ponds) is that this is now used for garbage dump. When the garbage fills the ground, then there can be a building built on it, and then rented out/sold to migrants. This activity causes deterioration in the ground condition and also to the ground water condition.
One of the fish farms in Situ Babakan
Photo: Author

Fishing as hobby
Photo: Author
SWOT analysis

Strength

- Good water quality (pH 7); good water ecosystem.
- The areas around the lake are already treated with a sloping around the whole lake. This area is meant to deal with flooding when there are too much water coming into the lake during the rainy season.
Weakness

- The water flowing from the south has to get through a fragmented fish farm firstly before flowing into the lake. This means that water flow is slow down by the fish farms, making the lake unusable for water retention area.
- The flowing of the dirt from Ciliwung are taken are making the bottom of the lake shallow, creating less space to save water in the lake.
- There are also some areas around the lake which are less high than the rest of the area. This area is prone to flooding whenever the ring area is going to be used as temporary water retention to help regulate flooding.
Opportunities

- There is enough area to make a channel to improve water flow to the lake without having to take away the fish farms.
- There are enough area available around the lake to make a flood aware area; an area that can be flooded during rainy season and dried during dry season.
- The water retention can be used to provide a good micro climate condition for the kampong. It could also be used as a reserve from pumping ground water.
- Introduce flood-sensitive solutions into the area; buildings on poles, floating building,
Threats

- Flood on the water inlet area.
- The lake only is not enough to help prevent flooding into the city, as many might expect it to be.
- Sporadic waste throwing into the fish farms and water will deteriorate the water quality and ecosystem quickly.
4.2. INFRASTRUCTURE

The main connections in Jakarta connect the city on the south-north and east-west axis. The highway in the city is built in a circular form and connects the main streets with a different way. The Inner Ring Road in Jakarta was finished in 1996. The Outer Ring Road is still under construction. The infrastructure in Jakarta is always insufficient due to the fact that there are also a lot of street space are used for small economical activity such as stalls, or parking of private owned public transport.

These activities causes clogs in the traffic and causes traffic jams. There are no certain areas where these activities are centralized, and therefore traffic jam cannot be avoided in the whole main access of the city. In the morning the traffic comes from outside the city going into the city centre. While in the afternoon it goes the other way around.

Typical issue in Jakarta: some of the street lanes are taken to park public transportation and trade. Photo: Author
Situ Babakan is reachable from the city centre through the outer ring road or the train. Even though it is situated at the periphery of the city, the area is quite accessible due to existing tourism such as Ragunan which is situated quite close from Situ Babakan. More on this subject is elaborated in the following paragraph.
The kampong itself is limited by the main streets that are crossing on the north-south axis that are surrounding it.

Limit of the kampong Situ Babakan based on the situation of the main infrastructure (source DTK)

The limits of the kampong are:
West & North: Jl. Moh. Kahfi II
South: Jl. Serengseng Sawah
East: Jl. Desa Putra

The street is a very important aspect in the structure forming of the kampong. Houses on kampong periphery are built according to the position of the streets.
The order of the street-built up structure is as follows:
- The main street is firstly built
- The houses are built sporadically around it
- As density increases, the depth of the built up area from the main street also increases
- New subsidiary streets come to existence, formed following the rest of open space around the houses
Source: Kota Tanpa Warga (Santoso, 2005 - trans. by author)

Following the growing of the dwellings, the streets are built informally and came to existence based on the need of the inhabitants with no planning.

The informal streets in the kampong are mainly from earth and rocky. These inner streets are
mainly used to get into one's house and has no significant connective purposes in the kampong, as the ownership of a land does not automatically give the right of keeping others off the property. It is hard to differentiate the street from an open public space since they are mostly from the same materials. However, this does not form any problem for most of the inhabitants since the social contact between them are very strong anyway. Strangers who pass by the inner streets will be directly recognized and asked what the purpose is of their walking through the area. Therefore, there are different type of division between public and private space within the parameters of the kampong. A public space does not stop at the small street in front of the house but at the entrance from the main street coming into the kampong area.
Even though Situ Babakan is situated at the periphery of Jakarta, the kampong is quite easily accessible for people who do not come from the area. The main streets around Situ Babakan are easily accessible from important areas in South Jakarta.

Public transportation are abundantly available in this area. These are mainly dominated by small car-buses which are usually private owned, showing strong character of informality of the area. This type of transportation is commonly used by the inhabitants to go to the market, school and work nearby. Bus connection is also available, but this do not support the short distance connection very well.
Connectivity main streets of Situ Babakan
Ragunan and TMII, two of Jakarta’s most prominent touristic attraction are accessible within 45 minutes travelling time on a regular day, which is really close in the case of Jakarta.

Around the kampong there are many important research institutes and universities, among which the University of Indonesia, which is one of the biggest university in the country.

Unfortunately, there are no parking area within the parameters of Situ Babakan, which limited the possibility of attracting tourists with private-owned cars.

Connectivity public transportation around Situ Babakan.
Source: DTK - reconstructed by author.
SWOT analysis

Strength

- Good accessibility into the area
- The streets are only build when necessary
- Strong social control in the kampong area.
Weakness

- There is no direct access to the cultural centre/food stalls; centre of tourism activities.
- The existing access are not car-friendly. They are covered with earth and rocks. This makes it difficult for cars to pass by during rainy season.
- There are no public transportation to visit touristic areas in the kampong.
Opportunities

- The kampong has a low density and space to create sufficient connection within.
- The government is supporting fully the creating of access into the touristic area.
Threats

- The paved streets have insufficient facility such as drainage, etc since they are built sporadically. This can cause local flooding in some areas during the rainy season.
- The water that is not discharged will be the source of mosquitoes larva and cause sickness.
In Jakarta, the green space that are available is correlated to the public space. The green areas of Jakarta consists mainly out touristic attraction and golf fields. The northern part of Jakarta is the space with the less green space because of the high density. The southern part, the area with the lowest density in Jakarta is greener than the rest. The residual space that are not built yet consists usually out of an untouched natural green space. Therefore the micro climate condition in South Jakarta is the best among others. Since the condition of South Jakarta is the best compared with the rest of Jakarta, there are many people who want to live there. The development
at the moment for South Jakarta is to turn it into residential area, which threatens the existence of residual green space that is typical of the area. In South Jakarta, the designated green areas have functions such as a golf course or tourism area such as the Ragunan Zoo and the TMII (Taman Mini Indonesia Indah).

The natural environment of South Jakarta is green area where people built on gradually, turning the green space that into a marker that imply green area as a ‘reserve area’ or the ‘not-yet built’ areas.

The kampong area has significantly more vegetation compare with other areas. Together with the lake, the green area that is filled with tropical trees provide a good micro climate through the
water vaporisation and shadows from the trees. Unfortunately, the development of the kampong at the moment is also the same as that of South Jakarta in general; to develop the area into a dwelling area. This means that the existence of the green area is left unprotected. To maintain the good micro climate condition, there should be planning made to the green space.

Golf course as one of the very few green spaces in Jakarta
Source: http://www.cengkarenggolfclub.com/images/gambar_golfcourse.jpg
The inhabitants of Situ Babakan are used to cultivate plants. This is highly related to the Betawi culture and the fact that trees grow very easily in this area. This is why the inhabitants are also quite selective with the types of trees that are growing in their kampong. Trees from which one do not get any benefit are considered as useless and therefore has no value. On the other hand, the people are very acceptant to the fact of planting trees that produces fruit or can be sold for money. Some of the existing green space in Situ Babakan is used to cultivate fruit plants such as star fruit and banana trees. Other trees grow wild between the houses such as rambutan (Niphleium lappaceum), melinjo (Gnetum gnemon), durian (Durio zibethinus) and star fruit (Averrhoa carambola) which are typical Betawi fruit (Virky, 2002). Several sorts of decorative plants are also cultivated for economical purposes. Some of these are kuping gajah, palem, soka, anggrek, etc. At this moment, the activity of agro tourism is happening at the private yards of the local inhabitants. There are no specific place to cultivate the plants. Therefore, the agro tourism activity is very limited to a home production scale. (Gusti, 2006)

The different types of plants in Situ Babakan also serve different purposes. The Betawi landscape in kampong periphery is very much decided with the existence of fruit plants. Other types of plants that are strong and durable are usually used for other
purposes such as deciding the boundary of a land. Instead of making fences, people in the kampong use trees to mark their properties. In appendix V the different types of plants and their use is elaborated. (Malahayani, 2004)
Green function

The green space in Situ Babakan can only work when there is a specific function being given to the place. Some functions that work as a green preservation area are cemetery and orchards. There are also wakaf, a traditional cemetery that can be found at the back garden of the house.
SWOT analysis

Strength

- There are a lot of different kinds of traditional plants growing in Situ Babakan at the moment, which stimulates: agro tourism, keep ground water, improve micro climate condition.
- The plants around the houses improve the social relationship since they provide for a lot of shadows during the day, improving social contacts when people are sitting outside.
- The plants provide a sense of security/boundary between neighbours. There are no forced social contacts since many of the houses are situated far from each other with a lot of trees in between.
- There are many concentrated green areas in Situ Babakan that have specific characteristics; wakaf (traditional cemetery), garden, orchard, etc.
Weakness

- The planted areas are a mark for reserve, not-yet built area. These areas will be replaced by new buildings easily as the kampong is developing.
- There are some areas in Situ Babakan that is already densely built that there are not many space left for greenery. In these areas the micro climate quality are already inferior than the green areas.
Opportunities

- Specification of plants for agro tourism in Jakarta. There is need for space and there are some places available near the lake.
- Sustainable orchard exploitation for agro tourism.
- Introduce replanting system for every plant that is going to be taken off for build area.
- Protect the existing concentrated green space by giving a specific function to it. If the space is needed for certain purposes, the role of green space as ‘reserve area’ will no longer exist; hence maintaining the existence of the green space.
Threats

- Growing of the built area towards the green area are happening rapidly. Situ Babakan will experience the declining of the good micro climate condition before long.
Jakarta has a low rise high density. The high density in the city is caused to the fact that the city inhabitants prefers to live closer to the ground. High rise buildings in the city are concentrated in areas where economical activities took place. This is mainly located in the Central Jakarta area and other Central Business Districts. The high rise are also concentrated along the main streets of the city.

As mentioned before, the development of South Jakarta concentrates mainly on dwellings and the ancillary facilities. This development includes the sectors of entertainment, education and also ser-
vices such as local market, etc. The area is distinctive as the best place to live in Jakarta. Since it is located on the higher part of the city which is closer to the mountain, it has better ground water condition, and a lower density than other areas in Jakarta. This makes Southern Jakarta popular for living area. Several important point of interest in this area is the Ragunan Zoo and TMII (little Indonesia). The University of Indonesia is also located at the periphery and has its’ own small forest. (see p. 89)
Density

The population density of the Southern area of Jakarta is one of the less dense in the city. The average density of the inhabitants of Jakarta is more or less 12,000 persons/km².

The area analyzed around the Situ Babakan is a meeting point of different districts in the conurbation of and around Jakarta.

These districts are: South Jakarta, East Jakarta, Depok, Tangerang, Bekasi

The population gets denser the closer an area is situated to the city centre (to the north).

Even though the morphology situation around Situ Babakan are of the same characteristics, there are much less inhabitants in Limo and Cimanggis.

When the area around Situ Babakan cannot take the pressure of population growth anymore, these two districts are the closest area that can cope the best with the pressure of the growth.

<table>
<thead>
<tr>
<th>AREA</th>
<th>POPULATION</th>
<th>r %</th>
</tr>
</thead>
<tbody>
<tr>
<td>DKI</td>
<td>7.616.175</td>
<td>7.712.571</td>
</tr>
<tr>
<td>JAKSEL</td>
<td>1.907.914</td>
<td>1.949.628</td>
</tr>
<tr>
<td>JAGAKARSA</td>
<td>170.898</td>
<td>177.480</td>
</tr>
<tr>
<td>SR. SAWAH</td>
<td>35.722</td>
<td>37.481</td>
</tr>
<tr>
<td>SITU BABAKAN</td>
<td>10.478</td>
<td>17.144</td>
</tr>
</tbody>
</table>

Population growth from the city scale to that of Situ Babakan.
Source: originally taken from Masterplan 2000-2010, Jakarta; DTK Jakarta, Analisis 3 p. 8
Population density Jagakarsa district on 2001
Source: DTK Jakarta
Functions

Different functions in and around Situ Babakan
Source: Setyaningrum, 2005, p. 68 - translated and reconstructed by author

Elementary School  Gas station
Building condition

Characteristics of different areas of settlement in Situ Babakan.
Source: Setyaningrum, 2005, p. 68 - translated and reconstructed by author
In this kampong, there are different characteristics that can be found based on the location of where one lives. Based on the division of the RWs, the general condition of the kampong are elaborated as follows:

**RW 06**
Majority inhabitants mixed, good income, new buildings, no garden, no traditional buildings.

**RW 07**
Majority inhabitants mixed, good income, green space for orchard is around 25% of the total area, relatively dense.

**RW 08**
Majority native inhabitants (Betawi), good income, orchard space around 75% of the total area, low density, a lot of traditional houses.

(Setyaningrum, 2005; p. 89)

Based on a survey done by Setyaningrum in 2004, the building condition in Situ Babakan is elaborated as follows:
Since the government has decided to make Situ Babakan as a Betawi culture preservation centre, most inhabitants in RW 08 has renovated their houses to have Betawi characteristics. Forty five per cent of the inhabitants questioned have accepted government subsidy. The rest of the inhabitants paid for their own renovation. Ninety five per cent of the dwellings in Situ Babakan consists of permanent buildings. In the case of Jakarta this would mean that the walls are constructed from bricks of different kinds. Most people use ceramic tiles (67.5%) for their floors and 30% use teraso tiles and 2.5% only use
plaster. The roofs are made using wood (30%), triplex (25%), asbestos (25%), bamboo (15%) and other materials (5%).

The buildings in Situ Babakan are built in an incremental structure. From the morphology analysis of the area, the grains of the buildings are divided into the following:

- Dwellings along main street with dimension of the buildings ranging from 10 x 15m to 20 x 15m. Most of the dwellings have more or less 180 m2 of surface area and they are usually situated with some distance from each other.

- Kampong dwellings which are located behind the main streets have the smallest dimension. They are also situated very close from one another. The dimension of the buildings range from 6 x 7m to 12 x 9m with surface area ranging from 50 m2 to 100 m2.

- Function buildings consisting mainly of schools and hospitals. These are large buildings, usually in a rectangular form with length from 30m - 50m and width > 10m - 15m
Development of a Betawi kampong

Pattern of the houses in the environment
The development of Betawi settlement in the kampong came to existence due to the individual development of the houses. Since the land has individual ownership, there can be no planning planned for the area. The development is dependent on each individual. In order to elaborate more the development system of the dwellings in a Betawi kampong, an example of development of a small area in Situ Babakan based on the interview in February 2008 are going to be elaborated.

The first house in this area belongs the a kampong elder named Haji Pungut. He inherited a large piece of land that he divided to his children and then sell some of the land also to have money. Within the last twenty years this area has changed from a private owned land to a complex of dwellings with most land owner being migrants who bought some of the land, turning them into quite luxurious private houses. Besides selling them, Haji Pungut also built some houses that he rented out to migrants with less income. The small houses are rented out with a price range between 4-500,000 rupiahs a month (around 35 euros). One house consists of a bedroom, common room, kitchen and bathroom at the back.

Being a kampong elder, Haji Pungut also contribute to the area by building a mushola (small mosque). This is normally done by people who are important in the society of the kampong. In 1983, his house is the first permanent house in this area. Following are the houses that he built for his children.
Location of study of kampong development.

Condition of kampong in 1983
House of Haji Pungut

Garden next to the house

One of the rental houses

Mushola

Kramat

New built houses
In general the room arrangement in a Betawi house can be divided into front room, middle room and back room. The front room function as a veranda because of the openness of it. The front room has a function as a guest room and therefore has the balai-balai and chairs and table to receive the guest. The middle room is called the inside room and is the main part of a Betawi house that consists the bedroom, pantry and dining room. The backroom is a place to cook (kitchen) and storage room for the farming attributes. In a Betawi house, the bedroom has a more abstract understanding since it does not has separating walls sometimes. This room is also usually mixed with other function such as dining room. The bedroom at the middle part of the house which is directly bordered to the front room is usually meant for the daughter of the house. This is so that the girl can communicate with men who come to meet them and have conversation through the window (jendela bujang). This way the girl and boy can communicate with each other under tight supervision because she is still inside the house while the boy is outside the house. In the Betawi culture, the girl and boy are not allowed to go together outside the house if they are not married yet.

In the mean time, the son of the house do not have a specific place to sleep. They are considered stronger and can sleep anywhere, and therefore they used to sleep at the balai-balai at the veran-
da or at the local mosque.
Looking at the spatial arrangement of the different functions of a Betawi house, they tend to have a symmetrical arrangement. This can be seen from the situated main doors, which all lies in the same axis. The Betawi architecture has taken a lot of Javanese influences in it.

Based on the spatial arrangements and the form of the building, traditional Betawi architecture in South and East Jakarta can be grouped into the following, (Harun, 1991)
1. Rumah Gudang
The Gudang house has a rectangular form with the opening lies on the longer axis. It has a gabled roof, which consists out of wooden structure. This structural system cannot be found elders in traditional housing in Indonesia. Presumably, this system is taken over from the Dutch building system in Indonesia. In front of the house there is an extra roof placed which is called topi (hat) that functions to protect the veranda from the sun and rain. This roof is supported by wooden or steel support.

2. Rumah Joglo
As the name Joglo is derived from the traditional Javanese building, this type of house has direct influence from the Joglo house from middle Java. Only in the Betawi Joglo house, the integration between the plan, load bearing structure and the roof is not tangible. In a Javanese Joglo house, the load bearing structure is the main aspect that
direct the division of the space on the plan. The structural system is also different since the Betawi Joglo use the Western structural system that was introduced by the Dutch. The plan for of a Betawi Joglo is quadrilateral. This is inclusive the veranda that is an open room in front of the house with an extension of the roof.

3. Rumah Bapang/Kebaya
In principal, the roof form of the Bapang house is also a gabled roof. The difference with rumah Gudang is that the roof is not fully made since at both ends of the roofs there are extensions added. The structure system which is used for this roof is the Eastern system.

During its development, the Betawi architecture has received a lot of different influences from outside. Some examples are the use of different roof supporting systems such as the Tou Kung con-

Left to right: Rumah Gudang, Rumah Joglo, Rumah Kebaya. Source:Dinas Kebudayaan, p. 29-31
struction (Chinese) or support from steel (European style). The basic structure of a Betawi house is a wooden structure which are filled in with wood from nangka tree or bamboo. The use of brick walls happens after the it got influenced by the Dutch. Also the use of tiles as floor instead of earth is a development that was influenced by the Dutch. Meanwhile, the development of ornamental use in combination with the architecture is mainly influenced by the Arabic culture.

The non-structural ornaments are functional as well as decorative. The use of langkan is mainly to maintain privacy since there are no hard boundaries of ownership in a Betawi kampong such as fences around the house. This langkan is seen as the fence of the front room so that people cannot see directly into the house. Other decorative elements are usually also combined in the façade as an integration with the natural ventilation.

The vernacular architecture of the Betawi tradition can mainly be seen in the Perkampungan Budaya Betawi (Cultural centre) which is situated next to the lake. The PBB consists out of 3 buildings and a stage. The three buildings in the PBB are a gallery, a residence (wisma) and a typical Betawi house. The residence is used by the organization and rented out to public for example family parties, meetings, etc. During weekdays it costs Rp 150,000.00 / day (12 Euros) and during weekends it costs Rp 200,000.00/day (16 Euros) and has a capacity of +/- 65 people in the building. The gallery which is meant for displaying certain Betawi artifacts such as traditional clothes, musi-
Areal plan of PBB (Betawi Cultural Centre)
Source: Setyaningrum, 2005, p. 83
Main Entrance

Betawi house

Open air theatre

Guest reception/administration

Open air plaza

Typical Betawi furniture
ical instruments, etc. has not function well enough to actually maintain its’ existence. Therefore, it is also often rented out with the same price as the residence for public. The gallery have a capacity of +/- 100 people because it also has an open space surrounded with trees in front of it that can also be used by the renters. (Gusti, 2006)

In the traditional Betawi house there lived a Betawi family, which lived there for many generations. This family is the actual land owner of the PBB. They have a contract of Rp. 20,000.00/day for the government to use the whole space as the cultural centre. In return, they have their house built and repaired into a modern Betawi house. (using tiles and concrete instead of bamboo and earth floors). The veranda of this house are also sometime rented out to people coming to the area for the same rate as the other spaces in the PBB. (interview, feb 2008)

The stage which is an open air podium is usually used to present traditional Betawi attraction such as Betawi music, dances or drama. The local inhabitants are very involved with these activities. Many of the young children get dancing lessons after school, others get music lessons, etc. The dance and music group do a weekly performance and usually in the weekends. Only when there are requests coming from visitors they will also give performances during the week.
Another building that is built using the traditional Betawi values is the mosque Baitul Makmur. This mosque has the capacity of +/- 1,000 people. The Betawi values can mainly be seen from the use of the lisplank. Besides being used as a place of prayer, this mosque is also used as a resting place for people who come from far away because of the openness of it creates an airy situation. (Gusti, 2006)
The Betawi tradition is mainly seen through the use of architectural ornaments in the kampong. This activity is supported by the government to give a uniformity in the kampong Situ Babakan. The ornaments which are mainly used in the kampong is lisplank and langkan. When new houses are being built in Situ Babakan, the government subsidise and provide these houses with Betawi ornaments to give uniformity to the whole area.
Some of the houses are being ‘given’ the ornaments to maintain the Betawi atmosphere in the kampong
SWOT analysis

Strength

- The kampong has a low density. There are areas available for expansion.
- The building condition is within living standards. It does not take complete redesigning to improve the living qualities of the people.
Weakness

- Not enough facilities within the kampong to support certain activities
- Too much focus and influence from outside that the vernacular building methods which promotes tropical architecture are forgotten.
- Certain areas are already developing into a dense area which looses the good air quality from being shadowed by the trees.
Opportunities

- Improve living qualities and condition by introducing sanitation and hygiene for each individual houses; arranging facilities within the built up structure
- New solutions that combine modernity of the city with vernacular architecture to get the best of both aspects.

An area with a lot of potential. At the moment only being used for garbage dump.
Threats

- Uncontrolled area development with no account for green space and other facilities in the areas that are in still good condition.
4.5. CONCLUSION SITE ANALYSIS

As a kampong periphery in Jakarta, Situ Babakan has a lot of different interesting aspects within it that can support its’ existence. These aspects that are analyzed on four different themes shows that the environmental condition and living quality in Situ Babakan is one of the best among most of the places in Jakarta, and therefore it needs to be preserved.

However, there are also aspects that needs to be improved such as the accessibility, living quality, facilities and the ground quality to reserve water.

Luckily, the potentials that are found in Situ Babakan can be improved by substantial interventions. Being a Betawi kampong that is ‘made’ by the government, gives Situ Babakan a strong reason to exist. Based on the interview and research that is done on the City Planning, the government is ready and willing to improve this area to enhance its’ tourism capacity and facilities.

A good planning and strategy is needed in order to create a sustainable kampong Situ Babakan. Looking at the fragmented composition of the kampong
where the different RWs are separated by a strong spatial element such as lake, cemetery or main streets, Situ Babakan as a kampong needs to be united, physically and also in spirit.

Therefore one should not forget to involve the kampong inhabitants in planning the future of this kampong. There should be cooperation between the government and the kampong inhabitants in terms of combining a top-down and bottom-up approach to achieve sustainable Situ Babakan.

In the following chapter, several different examples of approaches concerning the improvement of Situ Babakan are elaborated.
5. Approaches
existing solution
5.1. Solutions in relation to settlements

Many problems on informal settlement starts from the dwellings because these settlements are made without planning. Therefore, many facilities etc are not included from the very beginning and therefore there are many problems that could be found in this matter.
Social housing in Indonesia is regulated by the Department of Dwelling and Facility in the Neighbourhood in the “Pedoman Umum Rumah Sederhana Sehat” (General guidance for a modest and healthy house)

Rumah Sederhana Sehat (Healthy modest house) is a house that is built using the most modest construction and materials but still fulfil the minimum requirements of different aspects such as health, safety and comfort by using local potentials. The target group of this program are low-income society. The execution of this program still face many problems mainly concerning the financial feasibility of the low-income society. Therefore, the design for the house is made very basic but flexible so that it can grow into a Rumah Sederhana Sehat. This basic design is called a Rumah Inti Tumbuh (Growing Core House) and has the criteria of the following:

• RIT has a closed space, a covered open space and an MCK facility (bathroom)
• RIT has a roof form that anticipated changes that will be done on the surrounding space.
• Natural ventilation on RIT use openings that allow cross ventilation and direct sunlight into the room.

The minimum space requirements for an RIT is:
1. 1 (one) Sleeping room with closed partition and roof and sufficient lighting and natural ventilation that protects from the weather. This part of the house is a finished room that corresponds with the
RIT development pattern into becoming a Rumah Sederhana Sehat at an expensive land price condition. The minimum width of the land is 6 m with effective surface area of 72 m² and ideal surface area of 200 m². (source pedoman umum)
main function. A minimum measurement for this room is 3 x 3 m
2. 1 (one) utility room that supports family interaction and other activities. This room is formed by columns, floor and roof without partition elements, and therefore is a covered open space that can still be improved but already functional. The minimum requirements for this space is 3 x 3 m
3. 1 (one) bathroom/toilet that serves the sanitary activity of the house. The minimum requirements of this space is 1.2 x 1.5 m

In the area of DKI Jakarta the minimum needs are elaborated in the following:
1. Minimum area requirements
   The minimum area requirements per person is 9 m² with average space height of 2.80 m. This measurements are used as a basic conception for deciding the minimum surface area for a RIT which is 21 m² as a minimum requirement. When the inhabitants has more ability, this houses can be developed even into an international standard.

Table of the total surface area of the house in relation with effective total surface area of the site. This is calculated with the minimum space requirements and modular coordination so that an effective surface area of the site is between 72 m² and 90 m². (source: pedoman umum)
2. Health and comfort requirements
A house as a living space needs to fulfil the health and comfort requirements by taking into account the following three aspects; lighting, ventilation and temperature inside the room.

The effective sunlight that can be earned in Jakarta is between 8.00 o’clock in the morning until 16.00 o’clock in the afternoon. The sunlight has to enter the room for a minimum of 1 (one) hour every day. The room opening should be at least 10% of the surface area and the effective height opening is between 70-80 cm from the floor. In order to have good natural ventilation, the opening should be at least 5% (five per cent) of the total floor surface area. Service rooms such and kitchen and bathroom have to have direct ventilation to the outside.

In a healthy and comfortable house the temperature should correspond to the normal body temperature. There should be a balance between the air volume that is coming and going out of the room.
3. Minimum building safety requirements
The following is the minimum requirements of building structure of a Rumah Inti Tumbuh (Basic house requirements that can grow into a Rumah Sederhana Sehat):
- **Foundation**
The foundation should be adjusted to the local situation using natural stone or in situ concrete under the column that is placed in a raster pattern.
- **Wall**
The materials which are used for the RIT wall is conblock, wooden board or half conblock and half wooden board.
- **Structure**
The wall structure is made from concrete or from wooden structure. A stage house is usually built using wooden structure.
- **Roof structure**
The roof is from gabled roof using wooden structure. This is done in combination with the vernacular architecture. The roof angle should be minimal 200 in order to achieve room comfort.

The challenge of the regulations concerning minimum requirements of housing in Indonesia is that it is never used in practice because of the cost of making such buildings are much higher than the people can afford. The implementation of these regulations can be seen through government development programs which are very pragmatic and do not have contextual solutions in the architectural sense that respond to the need of kampong inhabitants.
It was in the report series of H.F. Tillema in 1913 concerning the hygiene of public housing that the discussion on Kampong Improvement first emerge. Because of this report Batavia became the first municipality in the Netherlands-Indie that is engaged with this matter.

It was a common problem in most cities in the Netherlands-Indie that death rates are increasing in the cities. Due to terrible sanitation and hygiene facilities, many native inhabitants died because of spread diseases such as cholera, typhus and dysentery. It was a time of fear, since the Dutch in Indonesia had to live next to each other with the natives. They’ve realized that there are improvements needed in the field of sanitation and hygiene, especially in aspects related to water hygiene. During the time that Tillema did his study on the living behaviour of the natives, people use water from the rivers to fulfil their daily needs. The river was used as a bathing place, a source of drinking water, while in the mean time it is also used as waste disposal. The water in the Ciliwung (the main river of Jakarta) and other rivers got polluted and diseases spread quickly among the inhabitants.

After the independence, the Kampong Improvement Program began in 1969 during the governance of Ali Sadikin, the governor of Jakarta at the time.
In the second Repelita (see glossary) this program is elaborated and continued with cooperation with the World Bank program to help the urban poor. (Weel 1979) The main goal of the projects is: The improvement of physical living conditions for a large part of the population and the provision of substantial employment opportunities. The target groups of this program are kampongs with high density which are inhabited by the poor. The program consists of improvement and renewing the buildings for social facilities and services. Streets and pavements, drainage gutters, water ducts, sanitary services, garbage disposal system, health care centre and lower school are the aspects that the KIP program is especially busy with. The main aspects of improvement are still the same as those proposed by Tillema.

In his dissertation, Ter Weel claims that the execution of the Kampong Improvement Program does not have a direct influence considering that the interventions do not have any direct positive effect to the living condition of the inhabitants. The only thing that resulted to this program is the declining amount of green space in the kampong. The KIP helps only the deforestation process while building the different interventions in the kampongs. The situation does not favour the micro climate in the kampong since there are no longer elements that brings shadow and absorbs warmth in the dense kampong area. The implementation of paving in concrete also take away the possibilities of planting trees along
<table>
<thead>
<tr>
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</tr>
</thead>
<tbody>
<tr>
<td>1. Vehicle road</td>
<td>75 m long per ha</td>
<td>All houses situated at a maximum distance of 100m from a one-way road and 300 m from a two-way road.</td>
</tr>
<tr>
<td>2. Footpath</td>
<td>132 m long per ha</td>
<td>All houses situated at a maximum distance of 20m from footpath, if not situated along motor road.</td>
</tr>
<tr>
<td>3. Drainage</td>
<td>Secondary drainage along streets and primary drainage according to need.</td>
<td>Same as standards for 1974-1976.</td>
</tr>
<tr>
<td>4. Water</td>
<td>Connection to PAM® network, possibly 1 hydrant per ha.</td>
<td>Connection to PAM network, possibly 1 hydrant per 5 ha in North Jakarta; 1 hydrant per 20 ha in South Jakarta and East Jakarta, 1 hydrant per 8 ha in West Jakarta, 1 hydrant per 3 ha in Central Jakarta.</td>
</tr>
<tr>
<td>5. Toilet</td>
<td>Public toilet (capacity of 12 persons) and washing facilities every 11ha.</td>
<td>Possibly 1 toilet to each house.</td>
</tr>
<tr>
<td>7. Schools</td>
<td>Construction of 98 Primary School units in 2 years</td>
<td>Construction of 90 Primary School units in 3 years.</td>
</tr>
<tr>
<td>8. Puskesmas</td>
<td>42 units in 2 years</td>
<td>45 units and 30 health stations in 3 years.</td>
</tr>
</tbody>
</table>

Aspects treated with the KIP program
Source: BAPPEM MHT project (Bianpoen, 1983, p. 98)
Section of gutters
Left: Traditional gutters
Right: Concrete gutter implemented through the program
Source: Ter Weel, 1979, p. 55
Areas in Jakarta that have been treated with KIP program
Source: PPPL - DKI Jakarta, executive body of KIP.
taken from Bianpoen, 1983, p. 56
the sidewalks to improve the living condition of the inhabitants. (Weel 1979)

Even though it does not support the micro climate of the kampongs, Santoso (2005) argues that the KIP program lasted until now and is always supported by the inhabitants due to the following reasons;
- The inhabitants do not have to pay for the interventions
- The projects are done for the people instead of forcing them to move out. This gives a sense of security for the inhabitants even though the program is not meant to give land rights nor ownership registration to the kampong inhabitants.
- There are no significant changes in the land use which is a mixing place of living and working.
The KIP program won the Aga Khan Award since it is considered to have help improve a lot of living condition of most of the kampong inhabitants. It is now even a part of a program called IUIDP (Integrated Urban Infrastructure Development Program), which is a program to improve infrastructure of already developed area. (Santoso 2006)

The implementation of the KIP program has not changed a lot since the first time it was founded by Tillema. The main focus of the improvement program is health condition and therefore infrastructure of the waterways and streets are the first aspects to be treated in a kampong. This was most necessary in order to stop diseases spreading through bad sanitation. It is believed that when one has better education on sanitation and
hygiene, one will implement this also in their daily life; i.e. improvement on the housing level by oneself. The downside of this approach is that it is a top-down approach from the government. The standardized rules that are implemented in the individual kampons do not take into account the context of the kampong itself. Since the inhabitants are not involved in the process of implementing the KIP program in their kampons, they do not have a sense of belonging and therefore use the given facilities wisely. If there is better link between the top-down approach to the involvement of the kampong dwellers, these interventions could be better implemented because it also adjusts to the social context of the kampong.

Untreated walkways
Source: Dorléans, 1972

Walkways treated with KIP (2007)

Toilets made out of panels, while in the same time being used for bathing
Source: Dorléans, 1972

Toilets and showers with clean water taken from the fire hydrant connection (2007)
Study cases

As mentioned earlier in the chapter, the disadvantages of a standardized improvement program is that there are very little relation to the different context of living in an informal settlement area.

In this paragraph, several specific projects which responds to contextual problems will be elaborated. These projects are dealing with different problems and therefore have particular solutions related to it.
Manangkasila, Bangkok

City: 6.3 million inhabitants
Manangkasila: 197 households
Lot size: 20 or 40 m²
Organizations involved: Asian coalition for Housing Rights;
National Housing Authority
Architect involved: Somsook Boonyabancha
Theme: Land sharing

The area of Manangkasila was a waste ground settled in informally by numbers of people from the 1970s since it was not an interested piece of land. Since the development of the Thai economy, this place suddenly became lucrative to sell for project development. This means kicking out the existing inhabitants to find somewhere else to live. But these people with low income cannot survive if moved to the countryside because then they will be separated to far from their source of economical income, which is earning in the informal sector.

The improvement of the place is to give a more compact structure on the existing incremental one which is a characteristic of traditional dwellings in Asia. This was done so that the people can still live in the area by renting forty percent of the land at a price below the market value while in the same time let the project developer built a commercial project with dwellings and workshops on the other sixty percent. Even though this means increasing the density of the neighbourhood substantially, this does not lower the quality of the plan.

The dwellings are organized in such a way that they could only be entered on the ground floor.
Each household was given a plot of twenty or forty square metres. Each type has three floors, but if so desired the inhabitants could exchange the first floor for a half-mezzanine, so that the space at the front of the ground floor become extra high. Also there are spaces provided to ensure economical activity such as a ‘shophouse’ which is very important for the inhabitants.

This project shows that the interests of investors and those who squat land do not necessarily have to collide with each other. With good planning most of the positive elements of informal settlement can also be brought into a more densified solution without loosing the social contact that is characteristic to this area.

Drawings on the dwellings
Source: Duijvestein, 1994, p. 74-75

Impression main street Manangkasila
Source: Duijvestein, 1994, p. 75
The illegal settlement along the riverbanks forms often tension between the dwellers and the government. On the one hand, the government do not want these people to live at a what is supposed to be a water catchment area, while on the other hand, the dwellers has already lived there for so long that they already have a sense of ownership. There have been many cases of eviction, which ended with more people coming to live in the area again afterwards. When Romo Mangun came and help these people, he helped them not only by giving a place to live, but also increase their quality of living. Besides giving these people a better place to live, he also give them self respect through many articles and press releases where he shows the importance of rubbish gatherers and their contribution in recycling raw materials. Romo Mangun used not only elements and materials of the vernacular architecture in the form of attractive architecture where he got help from students from the art school who did the paintings as finishing of the buildings. The buildings are designed adjusting to the existing landscape of the riverbank and gives many group-wise solutions.

This project is a successful project because of the one man who worked and dedicated the rest of his life into it. As long as Romo Mangun, the architect who initiated this project was still alive, this proj-
ect maintained its existence very well. He lived in the Kali Code for the rest years of his life. Unfortunately, in order for more similar projects as this to work, there as many dedicated architects as Romo Mangun needed for each kampong to improve the living condition of the people. When he passed away, people started to lose interest and just went on selling the houses which now has much more value than before. Also when this project was finished, there were many people squatting the Kali Code area along the river in the hope that they might receive the same kind of help as the people from the project, which causes more density on the river banks of Yogya.

Bottom-up approaches in these sorts of projects should come from the inhabitants themselves. It should not be a one-man project. The role of architect should only be that of a planner (this of course without implying that architects should not be passionate on their projects).

*Central well for clean water*
Source: Duijvestein, 1994, p. 95

*Drawings of the residential buildings*
Source: Duijvestein, 1994, p. 93
The greater Santos Area: 1.2 million inhabitants
Favela Do Dique: 9,000 households
Surface area per dwelling 40 m²
Organizations involved: Diagonal Consultores Cohad Santista
Architect involved: Maria de Jezus de Britto Leite Dzelme

The project is a development program coming from the municipality. They believed that in an urban development policy attention to informal housing is essential and must be included in the total social and economic policy.

The site is along the embankment of a small, but broad tidal river called the Bugre. When the settlement became so densely populated, the people began to build houses on poles in the river. On one side of the river there is also a big rubbish dump which seriously pollutes the river water.

The neighbourhood has an open sewerage and a provisional, usually leaking drinking water supply which at high tide comes into contact with the river water.

The planning proposal was to clean up the river, cover the rubbish dump and make it into a park. This in the long term should also turn the natural ecosystem which is a mangrove forest. In order to stop flooding, the houses have to be brought to dry land. To regain dry land, the river is canalized.

The characteristics of the original neighbourhood are to be retained by means of the public space. Where possible, the usual routes are retained, squares are laid out along the river and lines of sight have to restore the relation of the river to the city.

Access to the neighbourhood is based on the origi-
nal jetty structure into which the neighbourhood was divided. About 480 jetties with tiny squares, which provide access to an entire group of pole dwellings, served as semi-public spaces. This division is brought back into the plan using the same division.

The interesting approach about this project is the realization that not all houses in a slum area are in bad condition. When designing projects like this, many people just tear down the whole area and built new ones. By preserving some of the houses, the typical characteristic of the settlement can be maintained while in the mean time improve the living qualities of the people. The context of the area which illustrate strongly living on water is in this project used as a parameter that is brought back into the design.

Old situation before intervention
Source: Duijvestein, 1994, p. 85

Situation before and after intervention
Source: Duijvestein, 1994, p. 83
Bidara Cina was adopted as a pilot project for the Integrated Urban and River Management project. This project concerns informal settlements along the riverbank of the Ciliwung, which is one of the biggest river in Jakarta that flows the water from the mountain to the sea. Encroaching of the river by newly developed housing and slums results in an ever decreasing wet perimeter of the river, and an increase of floods. It consists of nine different subprojects encompasses aspects like socialization and housing, community building, social awareness, spatial planning, kampong improvement, economic strengthening of the local community, and others. This project contains only an urban spatial planning that involves relocating some existing dwellings to an area nearby, increasing the density in an already densely built-up area. This was compensated by better quality of the local infrastructure and environment; the multifunctional building, the parkway and the playground.

Due to the vastness of this project and the many
interference of different groups, the planning and execution of the project spans over several years. This project is funded by the Dutch government in collaboration with the Indonesian government and local NGOs and works integrally with each other. The complexity of the numerous amount of involved parties prevents it to be executed efficiently, which resulted mostly into guidelines and reports.

It is thus really important that the scale of intervention of such projects should not be too large because it averts the efficiency and involvement of the people for whom this projects are actually intended to.
5.2. Solutions concerning Situ Babakan

Without elaborating any further on the process, this paragraph will only discuss the Masterplan made by the government for Situ Babakan.

The Masterplan from the government is to improve Situ Babakan as a water retention area for the area of Southern part of Jakarta. This is not yet connected with other areas where there are also Situ’s in South Jakarta which can also be used to retain water coming from the mountains. The main element that increase intensely within the area is the infrastructure planning, which at this moment do not exist quite well, and also the idea of compartmenting certain dwellings with others that might not have a certain relation is quite a threat to the existence of the traditional values of a kampong Betawi. On the other hand, the ground values also increases the land value, which the people can profit from. This situation will result on the same happenings as Condet, the old Betawi kampong.

Considering that within 10 years time the improvement made on Situ Babakan has only gone for as much as 30% of it (interview), this means that by the time that all of the improvement are done, there will be new problems rise that is not yet thought of at the moment.
Together with the Situ Mangga Bolong, Situ Babakan become an important water catchment area. The function of tourism will also play an important role in the design of Situ Babakan. Situ Babakan will mainly be used for water tourism, while Situ Mangga Bolong is mainly used for improving the economy of the local inhabitants, namely for fishing and fish farms. Clean water for in-house use will be provided through the national water network. This will be done by putting pipe connections to the living area together with the putting of drainage system.

The connection is improved inside the kampong by connecting existing streets, increasing the street dimension, and creating new entrances around the area. Also as supporting facilities, extra type of transportation is added on the program.
The space around the water area (Situ Babakan and Situ Mangga Bolong) are used to facilitate different tourism activities, such as providing to piers, food stalls, etc which is can be reached by use of sado.

The existence of green area are to be preserved by maintaining the maximum density regulation which is 20% for the whole area. This is important if the area is to be used as a water preservation area.
The buildings to be built in the area of Situ Babakan should show the traditional values of architecture. This can be shown by use of ornaments and traditional ways of building houses.

Besides dwellings, there are also improvement in the tourism area, there should be new touristic attraction based on the existing themes in Situ Babakan being improved. The following are some ideas on the improvement of tourism.
Impressions of different facility improvements
Source: DTK
Reflection on the government plan

The Masterplan that is proposed by the government corresponds to many aspects of the analysis that is done earlier. The focus of the government plan on tourism has many risk since this will be the only answer to the development of Situ Babakan. If this do not succeed in the future, the kampong will face an even more bigger problem than it is now. Another problem for this type of intervention is that it does not involve the community, which means that this intervention need total funding in all aspects and a top down approach. Looking at the development of Situ Babakan until the present, the government has spent the last twenty years in the lake rehabilitation project which consists of land protection and adding lake capacity. Based on the interview with people at the City Planning on February 2008, the government is not planning to put the development of Situ Babakan as a central issue, which means that there would not be any funding in the short future to bring the plans into action.

Having done the analysis on the development of Situ Babakan, the kampong needs immediate intervention for it to be able to maintain the good condition that can still be found there. To achieve solutions in a short term, community involvement is essential. Therefore, interventions should be done in both ways, top down and also bottom up.
5.3. Solutions in relation with tropical climate

Since civilization began as written throughout history, man has learned to protect his shelter against harmful climatic influences, while on the other hand using in the benefit manner the favourable and advantageous conditions. Particularly in Indonesia with its hot climate and high humidity, besides the need to considered such as air temperature and comfort, ventilation, orientation, heat penetration, reflection of light and choice of building materials used, there is also a problem as evading glare. This paragraph will elaborate these aspects specially in relation with design. After that some examples will be given as its solution.
Indonesia lies on the equator and therefore has a humid tropical climate condition. The land consists of an archipelago with five main islands. The temperature is always hot with some exception on the higher areas. In Indonesia men know only two seasons, the rainy season and the dry season. Some characteristic of this condition is (Amirudin, 1966):
- High level of humidity during the rainy season as well as during the dry season (average of 80%/year)
- High amount of rainfall (average of 1809 mm/year)
- A large temperature difference during the day and the night.
- The temperature ranges between lower than body temperature but often also higher

Since Indonesia lies on the equator, the sun angle are often generalized as if there were no inclinations. It is often considered that the sun rises in the east, stays vertically above our heads during the day and sets up in the west.
In fact, within the period of one year that the earth surrounds the sun, the sun angle in Indonesia shifted from the north to the south, creating opposite shadow falls every half a year period.
Until the sun reaches the angle of $23\frac{1}{2}^\circ$ Northern Latitude (Tropic of Cancer) at 21st and 22nd of June (Summer Solstice), the sun shines slightly from the north, causing shadow fall on the south
between June and March. While between March and September, before the sun reaches the point of 23 ½° Southern Latitude (Tropic of Capricorn) on the 21st of 22nd of December (Winter Solstice), the sun shines slightly from the south, causing shadow to fall on the north.

The principal of body comfort comes from constant cooling to the human skin surface which comes from the wind movement. Having a tropical climate condition means that the main enemy of men in this area is the high temperature. Therefore it is extremely important that one take natural ventilation into account in order to have a comfortable living environment.

The wind direction in Indonesia changes mainly because of the season change in Indonesia. Of course, there are also other factors such as the temperature differences between Asia and Aus-
The wind direction during the year

Source: Climate of the East Asia islands and South East Asia - Dr. C. Braak - taken from Amirudin, 1966, p. 10- reconstructed by author
tralia, or the location of high and low lands that causes different pressure.

Next to the natural orientation of Indonesia, there is another aspect that also determines the comfort level of a building. The material that is used in a building also plays an important role in absorbing and reflecting solar radiation. If the material absorbs too much radiation, this will cause heating inside the building. But if it reflects the radiation, it could also cause problems such as glare for the surroundings.

<table>
<thead>
<tr>
<th>Material</th>
<th>Heat reflection (%)</th>
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<tbody>
<tr>
<td>White calc</td>
<td>80</td>
</tr>
<tr>
<td>White tin paint</td>
<td>71</td>
</tr>
<tr>
<td>Asbestos cement</td>
<td>60</td>
</tr>
<tr>
<td>White marble</td>
<td>54</td>
</tr>
<tr>
<td>Roof tile (orange)</td>
<td>53</td>
</tr>
<tr>
<td>Calc bricks, white sand</td>
<td>20-59</td>
</tr>
<tr>
<td>Aluminium</td>
<td>47</td>
</tr>
<tr>
<td>Calc stone</td>
<td>43</td>
</tr>
<tr>
<td>Corrugated zinc</td>
<td>36</td>
</tr>
<tr>
<td>Cement roof (grey)</td>
<td>35</td>
</tr>
<tr>
<td>Asbestos cement (1 year old)</td>
<td>29</td>
</tr>
<tr>
<td>Red bricks</td>
<td>23-30</td>
</tr>
<tr>
<td>Green leaves</td>
<td>21-29</td>
</tr>
<tr>
<td>Corrugated zinc (old)</td>
<td>10</td>
</tr>
</tbody>
</table>

*Performance and properties of materials in hot climate*
*Source: arsitektur en iklim; taken from Insinjir Indonesia no. 5, 1954*
Aside from the reflectivity, materials can also store heat within it. Depending on the materials, porosity, wall thickness and the temperature coefficient, this should also be taken into account. For example, a brick wall need long time to become warm through radiation that the maximum temperature is achieved during the night when the sun stops shining, and the minimum temperature is achieved in the afternoon where the outside temperature is maximum. On the contrary, a glass wall changes temperature very quickly. Therefore, it is more suitable for rooms which are used during the night time.

Based on this, it is recommended that massive construction is used for rooms that are used during the day while light construction is more suitable for rooms that are used during the night.
Design strategies

One of the main problem in living in a tropical climate is not the heat from the sun, but the humidity. It is a very important aspect in Indonesia. It can cause different diseases, reduce insulation capacity, deteriorating building materials, etc.

Humidity in buildings comes from:
- Infiltration of rain water into the walls and roofs.
- Capillarity of rain water through doors, windows and other connections that is not closed.
- Diffusion through building material (from ground through foundation, from lower to upper wall, etc). (Mangunwijaya, 1994)

This is why most of the vernacular architecture in Indonesia has the houses built on poles.

Protection from humidity has to be included in all sides of the buildings. The following are some aspects where one should take into account when designing a building:

In a tropical climate condition where there is high amount of rainfall, the protection should come from many different facets. The walls should have a water tight protection, and on top of that, the wall should also be protected by an overhanging roof.

The wall protection can be seen as a ‘clothing’ to the wall using other material such as wooden panels, aluminium, or even watertight plaster. The wall should also be able to ‘breathe’ so that there are no fungus or other microscopic things grow on it. Therefore there should always be some space designated for the ventilation.
Walls with a gap in between is not recommended for this situation considering the empty spaces will be easily lived in by insects or any other unwanted creatures.
Some practical notes on humidity on the outer wall of buildings:

a. Massive wall
When detailing a massive wall, one should always remember that water gets absorbed to materials with smaller pores. The porosity of the wall material should be bigger on the outer side of the wall to prevent them from being absorbed inside the house.
However, with bigger porosity on the outer side of the wall, this means that capillarity on wind pressure are stronger. This is why these walls should not be used in areas with strong wind and rainfall.

b. Hollow wall
This type of wall consists principally out of two layers of walls with an airy space in between. The basic form of this type of wall is made with two brick walls with some distance in between. Nowadays, there is a special brick that is called ‘hollow brick’ to be used in the building construction. This type of wall allows water not to infiltrate through wind pressure. The important aspect when using hollow brick is that condensation should always be made possible in order for the water to be exhausted.

c. Water tight wall
This type of wall can be achieved by using water tight materials such as porcelain or watertight concrete. A water tight surface does not allow the possibility of condensation and therefore the ‘breathing’ of the wall. If there are cracks on the wall, the condense will get into the wall but not be able to get out of it. The same if there are condensation inside, the water cannot get through the wall but will stay inside the room, causing wet walls.
d. Waterproof coated wall
Coating is a method that can be applied only when needed. The materials that can be used for these purposes are paraffin, cement or silicon or asphalt.
In Indonesia, the main aspects in relation with the wind that should be taken into account when designing a building is the wind pressure and suction. Some ideas to help reduce these pressures are:

a. The use of shield

To reduce the pressure of wind that is coming into the building, this can be done by creating protection outside the house, for example by using trees to catch the wind. Another way is to use the landscape for protection, for example by placing the building in the protection of a hill/slope. The unevenness of the land or existing bushes can also be used to reduce the velocity of the wind.

b. Construction

In strong wind areas, the building should not be very high, and the construction should be adjusted to where the wind pressure and suction comes from. This can be adjusted with the design of the construction.

c. Window locations

Cross-ventilation is so effective because air flows from strong positive pressure to strong negative-pressure areas located on opposite walls. Ventilation from windows on adjacent walls can be either good or bad, depending on the pressure distribution, which varies with wind direction.
Earthquake

Indonesia is an area where there are significant amount of earthquakes happens. Therefore this aspect should also be taken into account in designing a building.

a. Building structure
Wooden structure is generally used in Indonesia because it is strong but has a good elasticity. Buildings from bricks and other natural stone have to have a binding structure to hold the material together.

b. Centre of gravity
When the centre of gravity of a building lies on the lower part of it, this helps maintain the stability of the building toward unwanted movement. A light roof is also more convenient because it reduces the load that for the lower part of the building.

c. Spatial arrangements
Symmetrical arrangements makes the building more stable to shake. Avoid also large openings on the façade area. When large openings are included in the design, there should be extra support for the walls. Complex design units are better if they are reduced/separated to several simple building units.

d. Foundation
All building foundation should be made on top of hard ground and in the same depth around the whole building.

e. Reinforcing
To improve the stability, the structure can be bounded with each other using reinforced concrete on the sides of the walls.

Central of gravity; it is best to keep it as low as possible. Source: Mangunwijaya, 1994, p. 83

Symmetrical arrangement is more stable. Source: Mangunwijaya, 1994, p. 84

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Even though sunlight is needed in order for men to be able to survive, it this is too much then it will be experienced more as annoyance. Therefore, people need protection from sunlight. This can be done in many different ways;

a. covering from- or filtering the sunlight.
To cover from sunlight one uses a roof extension. This can be done as well inside as outside the house. The same system is also used by humans who wear hats to protect their eyes from glare. A clip-on solution to the building such as window cover, the use of plants or second façade can also be used to help covering from sunlight. To filter sunlight arranged panels, rooster, or overhangs are usually used. There are also the principal of filtering through reflection which could be done from grass or water surface.

b. reflection
As mentioned earlier in the earlier paragraph, the use of material and its colour decides how the sunlight is reflected or absorbed. Even though the materials for the building itself should absorb as few solar radiation as possible, the outside element of the building should be those that absorbs light and heat. The same use of reflecting material will only give disadvantage to the user of the building.

c. Trees
Trees are very important element in tropical architecture because it absorbs heat and provide protection. However, planting the trees too close
to the building can also bring some disadvantages such as the roots ruining the foundation, covering the house too much that it does not get any sunlight at all inside, etc.

Examples of shading devices
Source: Lechner, 2001, p. 214
The aspects of ideal design is:
- The roof ends quite widely
- Light coloured roof
- Good ventilation
- Open view from inside to outside
- Roof and wall spaces get enough shadow
- Direct sun radiation is blocked
- Avoid glare
Ideal building in Indonesia
Source: Amirudin, 1966, p. 19
- reconstructed by author
6. Program of Requirements
This chapter will especially elaborate the results of the analysis in relation with the design project. After the analysis is done, some future vision on Situ Babakan are made in order to see where the plus and minus points of certain areas in the kampong. These visions are made in different scenarios and strategies that are made from different themes. After further analysis on these strategies, they were tested in a field research trip in Jakarta (see appendix for full report) 
All this resulted in a program of requirements consisting strategies on how to reach the goal; creating a Sustainable Situ Babakan. The programs are then translated into a design vision for the kampong, on which this design is the final result of the graduation project.
6.1. Future vision(s) Situ Babakan

Based on the analysis on and around Situ Babakan, the ideas on Situ Babakan and what kind of interventions could be made to it is created. First, before the field trip to Jakarta, there are scenario and strategies made based on different themes. This will firstly be elaborated and then further analysed to check whether the SWOT analysis correspond well to the implementation.
This concept is to maintain the kampong periphery character with as minimum intervention as possible. Differentiation in the areas are made clearer than the existing situation, but changes are kept to the minimum. The weaknesses are improved to the maximum.
**Water**
Densified fish farms with flowing water through it to the lake (better for fish breeding)

**Infrastructure**
Paved, good condition drainage system

**Green**
Maintain existing green by introducing replanting system

**Built up**
Moderate amount of houses, maintaining kampong character
Maintain

Water
- Water quality
- Fish farms character

Infrastructur
Kampong character

Green
High density green areas

Built up
Kampong character

Improve

Water
Connection water flow to the lake

Infrastructur
Streets that abruptly stops

Green
Built area within the green zone

Built up
Existing dense area
Alternative

- Protect flood prone areas
- Better water channel (wider and deeper)

Minimize

Flooding around the lake and the fish farms

New improved connection with existing old infrastructure

Improvement infrastructure into the green area will lead to more buildings in that area

Protect the non-built green area

Smaller green area

Move to new built area to reduce pressure on the existing area; new building alternatives

Expansion built area into the green area
The green area is used as flood buffer and water retention area. There are no car access to the dwelling areas which has new dense characteristics together with the adjusted fish farms and water channeling system.
Channel through park and fish farms (new character)

Boundary between built & non-built area

Concentrated green is easier to preserve than sporadic

High density, new type, new character buildings, except the preserved cultural area
**Maintain**

**Water**
- Water buffer area to retain flooding
- Flood prone area

**Infrastructur**
- Boundary between dwellings & park
- Inefficient infrastructure; too close

**Green**
- Hard boundary insure existence
- Losing green area

**Built up**
- Hard boundary ensures the spatial division
- Relation between high density - low rise buildings
Alternative

- Create new type of water buffer; Integrated water management system with fish farms
- Separation pedestrian and cars
- New type water buffer
- Existing high rise from Rumah susun to apartments

Minimize

- Flooding threats
- Pedestrian route becoming car route; losing park character
- Fragmentation green area
- Build up in the park area
Tourism is the central theme of this strategy. More programs are added for the area while differentiation on the activities are also made so that each area in the kampong has a specific type of tourism.
Water

Water is especially used for tourism

Infrastructure

Special route for pedestrian to visit each attraction, and separate route for cars, parking spaces, etc.

Green

Different types of green areas; food stalls, agro tourism, village-like hotels

Built up

Different areas with different characteristics
Maintain

Water

Fish farms character

Improve

Protect Betawi dwellings; hub water-infra

Infrastructur

4-ways hub within the kampong; good accessibility

Areas surrounded by infrastructure

Green

Concentrated green areas within dwelling areas

Relation built up-green; different characters

Built up

Different function different characters

Relation tourism - dwellings
Alternative

Minimize

New development water-infra

Flood by the inlet and outlet

One infrastructure with same character for cars and pedestrians

Confusion on different street functions

Clear distinguished boundary; green - buildings

Lose green functions to buildings

3 different characters:
Living - Tourism
Living - Agro
Living - shops

Switching functions, building in tourism areas, touristic facilities in dwelling areas
6.2. Strategies for a Sustainable Situ Babakan

After testing the future visions on Situ Babakan during the field trip research in February 2008, there are clearer parameters that is formulated in order to find Sustainable Situ Babakan. This will be elaborated in the following:

The strategies to obtain a sustainable Situ Babakan should be executed in two different phases; approaches with focus on a short term improvement and improvement in the long term. These strategies should be carried out on four aspects related to earlier research; built up, green, water and infrastructure. For both phases of improvement the centre of attention of the strategic implementation are different.

In the short term improvement the emphasis of the improvement lies mainly in the economical improvement. This in order to bring involvement of the kampong inhabitants and in the end turn this intervention to be a bottom up intervention. In a city like Jakarta that holds on a capitalistic idealism, people are only interested in joining the improvement program if they can experience the direct benefit of it.

In the long term approach, the emphasis of the approach lies on education. During the time that the results of improvements are gained through the short term intervention, people can learn about the prospects and how to sustain their good living condition for the future generation while in the mean time develop themselves during this process.
Built up

Short term:
- Extensification of the existing functions that supports tourism; food stalls, and cultural centre. Improvement of tourism in scale, decentralizing the different functions to support involvement of the inhabitants that live in other areas.
- Introducing new functions; biogas plant, Neighbourhood Business Centre; These are functions the economical activity of the area besides tourism. Provide facilities for economical activities.
- Introducing functions/programs where the kampong can be independent in fulfilling the needs of the inhabitants.

Long term:
- Education on how to optimize the use of land for earning money, introducing link to the market, while in the same time preventing full building of the area (preserve the good micro climate).
- Education to improve self abilities through vocational courses, etc. that is given at the Neighbourhood Business Centre.

Infrastructure

Short term:
- Improve accessibility to Situ Babakan, taking into account the decentralization of the different functions.
- Smart parking that is enough for the capacity of the area but in the same time can also be used for other purposes. This is important to save land use.

Long term:
- Education on improving sewer/drainage in relation to health in existing infrastructure
- The importance of kampong street structure that promotes social contact (minimum street, in
combination with green and use materials that is permeable for rain water.

Short term:
- Introducing new functions that at the same time provide working opportunities; orchards and farms with types of plants that suited the area.
- Maintaining green elements that existed in the area by giving the spaces intended purposes while connecting it to the economical activity. The planned green area should not only function for earning money, but also to preserve the cultural values and therefore support tourism of the Be-Tawi culture preservation.

Long term:
- Shifting of the meaning of green space from something to earn money to something to guard the micro climate condition
- The landscape of green might change from natural into agricultural by promoting agro tourism

Short term:
- Touristic attraction with suited function with the lake to promotes also water tourism
- Improve the water qualities by regulating the water inlets; prevent deterioration on water condition through uncontrolled waste discharge

Long term:
- Water preservation area that can help protect from flooding. If this is also implemented in other situ’s in the area this might help prevent flooding of the whole city.
- Education on water use/water cascade through the Neighbourhood Business Centre.
6.3. Masterplan for Situ Babakan

The strategies that are developed earlier are translated into a proposal of programs that can improve the economical improvement for Situ Babakan. The programs that are made for the kampong cover different aspects of sustainability; in this case using the 4P of Duijvestein. The program concerns not only the aspects that are the main focus of the research earlier, but also bring up some other aspects such as waste that has not been elaborated in the research analysis.

The programs for Situ Babakan are then transformed into proposals of design intervention in the scale of the kampong, and also architecturally.
Improving the economy of Situ Babakan

Tourism
- Built up
  - PBB (Cultural Centre)
    - Traditional shows; dances, music, fashion
    - Traditional customs; marriage, customs
    - Workshops; dancing, music, art making
    - Pictures with traditional clothing
  - NBC (Neighbourhood Business Centre)
    - Vocational courses for service providing activities; baby-sitter, on-call chauffeurs
    - Home industry activity; souvenirs, clothing, etc.
    - Exotic fruit centre; exotic plants, fruit market
    - Network provider, link to the existing market
  - Food Centre
    - Cooking programs; classes, workshops; catering services; parties, working people, students living in the neighbourhood
  - Rental Housing
    - Tourists hotel, hostels, apartment
    - Student housing for universities
    - Middle class rentals; appartments, houses
  - Recreational Water
    - Water skiing
    - Swimming
    - Fishing
  - Flood Control and purification
    - Water Catchment Area
    - Maintain ground water condition and micro-climate using the Site (lake)
    - Water purification system
  - Agro Tourism
    - Exotic fruit market
    - Educational farms on traditional herbs and plants
    - Exotic plants
  - Garbage processing
    - Waste separation; organic-anorganic; illegals plantation
  - Accessibility
    - More capacity on the main roads
    - Access in the touristic area; strolling, parking, etc.
    - Maintain the character of Kampung access; low speed, social contact, etc.

Environment
- Water
- Green area
- Waste
- Infrastructure
The water coming into Situ Babakan should be improved by placing a natural water purification system before the inlet to the lake. This water purification system uses a cascading method where the water is purified using water plants. There is also an improved channel to let water flow directly into the lake when needed. This in order to prevent over capacity of water flowing into the water purification area. The sludge from the water purification system can be used to feed the Biogas plant and produce energy.

Some of the characteristics of Situ Babakan such as fishing should also be maintained so that it does not lose all of the traditional values altogether.

The lake is used for various purposes such as water recreation, to maintain the micro climate condition and also as water retention area during rainy season that can be flooded to a certain level.
There are at the moment no waste processing system in Situ Babakan. The waste produced from the houses in the kampong are usually thrown away on existing green space which is not yet used in Situ Babakan. Some other families bury their waste in what used to be the fish pond behind the house.

If this waste is separated into organic and an-organic waste, the organic waste can be further used to make biogas, which can be used by the people for cooking purposes. The residue of this process can be used as a good fertilizer for the exotic fruit farms.
The connection capacity into Situ Babakan should be improved since there are an increasing amount of traffic around the area is happening at the moment. This is because the road Moh, Kafi is used to connect South Jakarta and Depok. There should be more entrance access added to reach the different functions in the area.

In the mean time, the infrastructure within the dwelling area of Situ Babakan has sufficient dimension for access while in the same time maintain the social contact and activities such as children playing on the streets when there are not many cars passing by. This infrastructure should be improved to promote promenade activity in the kampong area. This not only for tourism purposes but also for the inhabitants themselves. The design intervention is done by lying a pedestrian route using trees to provide shadows and protect from the rain. This route also promotes the different functions that are introduced in the area to support tourism of the Betawi preservation culture. This is not the same route where cars can also pass by.

Parking for public visitors are done along the lake area. This is a flood prone area that can be used for circulation during the dry season, but also can be flooded to add the capacity of the lake during rainy season.
To maintain the existence of the green area in Situ Babakan, these areas should be given certain purposes, so that it does not seem as an empty space that can be used in the future. This is the same reason why kampong development turned into an inferior condition because the space is considered inhabitable and therefore free to be used as one wish.

The use of the green area should bring advantages to the people, not only through micro climate condition but also to improve their economical situation.

In kampong Situ Babakan, the design intervention is done by transforming the green space into orchards to cultivate exotic fruits that are typical for the Betawi culture such as sawo, rambutan, duku, etc.

Wakaf (=family cemetery) which are often found at the backyards of a Betawi house show the Betawi culture while in the same time maintain the green condition of the backyards of the kampong inhabitants.

These interventions are not only applied at the backyards of the inhabitants’ houses, but also in a bigger scale. The orchards of this scale can also be used for research in agro culture. It can function as a practice field for researcher coming from the UI or ISTN which is located very near from the kampong.
The Cultural Centre (Perkampungan Budaya Betawi) is the only facility in Situ Babakan which is already working at the moment. The working of the cultural centre at the moment is highly dependent on the seasonal condition in Situ Babakan. This is mainly due to the design of the PBB which is very open and consists of different pavilions with different functions. During the rainy season, the PBB does not function very well. Since the PBB is the only tourism facility for the whole kampong, it is used for different activities which need more support than what it can provide. The PBB should only serve the purpose of being the cultural centre and other activities should be provided with other facility if the tourism in Situ Babakan are going to be improved.
The existing food stalls in Situ Babakan is located along the Situ on a space that is used for water retention area. These food stalls has no facility and built sporadically. Food is a very important aspect to consider if tourism in Situ Babakan is to be improved. Therefore, there should be better facilities provided for these purposes that does not interfere with the original purpose of the use area itself, which is to retain water in case the water level increases.
Rental Housing

Rental housing is seen as an important way to gain money in Situ Babakan. This point of view of the people really influence the increasing of density in Situ Babakan because there are a large amount of new buildings are being built in Situ Babakan at the moment, which leads into the deterioration of the micro climate condition of the area.

If the houses are seen as a source of income, than the main goal should be to earn as much money as possible with the least amount of pressure to the natural condition. In this case, new rental market such as student housing, offices or middle class inhabitants can be introduced in the program.
The Neighbourhood Business Centre should provide space to learn, network, work, and inform people who are living in the area as well as people who are coming to the area. There should be a facilitating building that gives not only an approach to maintain the economical condition of the kampong, but also to give a high added value of the kampong itself.

There are many different programs that is introduced to the NBC that supports many different improvements that should suited the various types of inhabitants in the kampong. In order to achieve involvement from the inhabitants, the different programs are needed for this kampong.

Responding to the first strategy, in order to achieve economical improvement together with the involvement of the kampong inhabitants, the theme that arise for Situ Babakan is tourism. Therefore, the NBC should provide programs that supports the improvement of existing program and create new ones that has not yet exited in the kampong.

While improving the economical activity in the kampong, the NBC also provides facilities that supports the development of living condition through education. This responds to the long term strategies for Situ Babakan. Combining these two strategies and program, also with cooperation from the government, the NBC can act as the architectural intervention responding to the strategies that are previously elaborated.
<table>
<thead>
<tr>
<th>Job opportunities</th>
<th>Low education no skills</th>
<th>Low education skilled</th>
<th>High education</th>
</tr>
</thead>
<tbody>
<tr>
<td>- Clerks</td>
<td>- Farmers</td>
<td>- Botanist; specialize on cultivating the plants</td>
<td></td>
</tr>
<tr>
<td>- Employees</td>
<td>- Traditional ornament makers</td>
<td>- Manager</td>
<td></td>
</tr>
<tr>
<td>- Salesmen/women</td>
<td>- Souvenir makers</td>
<td>- Teachers</td>
<td></td>
</tr>
<tr>
<td>- Chauffeers and coolie</td>
<td></td>
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<td></td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>Link to the market</th>
<th>Trustworthy service provider for the area; private chauffeurs, baby sitter</th>
<th>Fruit/exotic plant market</th>
<th>Information centre on plants</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>- Local tourist guide</td>
<td>National/international market for ornaments and souvenirs</td>
<td>- Network and advertisement to the international market; link to sponsors; and investors</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>- Research centres such as ISTN and UI</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Program</th>
<th>Vocational courses for local service provider</th>
<th>Local fruit market</th>
<th>Research space</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>- Basic foreign language courses</td>
<td>Stores ornament and souvenirs</td>
<td>Library</td>
</tr>
<tr>
<td></td>
<td>- Courses for tourism supporting activities; waitressing, traditional transport, tourist guide</td>
<td>Eco-tourism; plant education</td>
<td>Information centre</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Supporting organization within the area</td>
<td>Exhibition/auditorium</td>
</tr>
</tbody>
</table>
**Public**

**Auditorium**
To be rented out to public for different activities. Lectures, presentations on the Betawi culture and activities are regularly given here for tourists.

**Café**
Resting and enjoying the nature and the view. The café serves food that is typical Betawi and fishes from the lake. For big occasions it also provides catering from the Food Centre, which has a more extensive service for traditional Betawi cuisine.

**Workshop space**
Different workshop on Betawi activities; the making of bir pletok, traditional cooking, dancing, etc.

**Exposition**
Space for permanent presentation on the Betawi culture. Flexible space to be rented out to public for different purposes.

**Tourist information centre**
Provides information on different activities in Situ Babakan. It gives explanation and guide tourists to enjoy the different programs that Situ Babakan has to offer.

**Market**
Sells typical products made in the kampong. It offers various types of products depending on what the kampong produces. Example: Traditional fruit market, souvenirs, wooden ornaments for building, cakes/bir pletok, traditional clothing, headcloth, bags, etc.

**Parking**
Besides providing space for car park, sado and becak for connection between functions in Situ Babakan. Boats and water bikes are also available for those who are more interested in water transportation. There are different points in the kampong where these types of transportation can be found.

**Wedding/banquet hall**
Combining different services that Situ Babakan has to offer. Rental space, food catering, clothing, decorations, etc. All of these activities are supported by the programs in Situ Babakan.

**Research space**
For researcher/students who are studying and needs information on agroculture, Betawi culture, water preservation, etc. Link from ISTN or UI especially to the orchard and plantation.

**Library**
Central of information concerning Situ Babakan and its’ different aspects. Supported by the universities and institutes that often do research in this kampong.

**Vocational courses**
Service courses: Baby sitting, chauffeur
Tourism: waitressing, basic English course, becak and sado driver with minimum English, tour guide
Small economy: making souvenirs, bags, etc.
Farming: Basic courses on soil cultivation
Basic: Reading and writing, fight illiteracy level of the kampong.

**Offices**
Managerial that links the available service supporting activities, such as baby sitter, chauffeur, etc.
Managerial to link and market the products that is made in Situ Babakan to local, national and even international market.
Managerial that rents out space and available activities that can be done in the NBC.

**Herb garden and orchard**
Linked with the research space, a place for practice research. This learning centre distributes knowledge from highly educated people (researchers from different universities) and bring it into practice (cooperation with farmers). In this centre tourists can also learn basic knowledge on plants. Suited for school trips program, etc.

**Program of different activities proposed for NBC**
Neighbourhood Business Centre; program into design

Impression of classrooms and research space

Market impression
Impression of Library

Auditorium impression

Impression of classrooms

Impression of auditorium
Impression of building details

Impression of market

Impression of NBC complex
7. Conclusion & Recommendation
In order to achieve a sustainable Situ Babakan and prevent it from becoming a slum area such as the case of other kampongs in Jakarta, an action plan on different scale is needed.

In the scale of the kampong as a whole, there are strategies to improve the different aspects in the kampong that will ensure the existence of elements that needs to be preserved. This are elaborated in approaches in the short term with central point in the development of tourism, which will lead to the development of the economical situation and therefore the prosperity of the kampong inhabitants. This is needed in order to get involvement and interest from the kampong inhabitants. In the mean time, it also provides benefit for investors to help develop this kampong. This way this could ensure the realization of the plan.

While this is developing, the kampong should also provide facilities to improve the level of education and the awareness of the inhabitants. This is a process that takes generations to implement. The social awareness that can be learned through self improvement by learning on the informal educational facilities that is provided in the NBC should teach people to learn about the advantage and disadvantages of individuality in a big city, which brings one back to the old concept of a kampong as a closed community. And also for people to be proud to their own culture, and that cultural modernity can also exist and that it is also good to have this awareness.
Through the design of the buildings, environmental awareness should be stimulated. One can learn about water saving, energy gain, wind, building methods, etc. through the different aspects that can be found in the buildings. With the architectural intervention, one should see the implementation of traditional aspects does not only show the old and traditional building, but that this cultural signature can also evolve within time. What it needs is people that would like to test and try these different possibilities in order to ensure the existence of a traditional Betawi culture, and give it its’ own history.

In the scale of the city, the idea of economical improvement of the kampong to maintain and even improve its’ quality should be used according to the context of the different kampong itself. One should look for the high added value that can be found in a specific kampong, and use this in the parameters of spatial planning and design. This way can be implemented in a general way to get involvement and in the same time improve the prosperity of the people.
Appendix
During the preliminary research, several visits to different kampongs in Jakarta was done in order to understand the general characteristics of the different kampongs. The kampongs that were visited besides Situ Babakan are kampongs with distinctive characters. Most of these kampongs lies in the city centre and have inhabitants with different level of incomes. This paragraph will elaborate the situation and condition of the different kampongs when they were visited.
Kampong Muara Baru is situated at the coast of Jakarta. All of its inhabitants, consisting of around 6000 population comes from outside the city. The inhabitants living before the river on the ground usually come from Middle Java. Further than the river, there are migrants coming from outside Java, mostly from Makassar live on houses built on bamboo poles hanging on each other. The men of the kampong usually do labour work at the harbour. They go daily to the harbour and ask around for jobs. When there is work available, they got paid between Rp25000 – Rp30000 per day (around 2 euros). The women do different kinds of work, from small economy activities to cleaning houses in apartments which are located near the area. The family interviewed in this kampong comes from Middle Java. The father has no permanent job. He goes everyday to the harbour to see if there is somebody who needs his service. Within one week he only gets one or two days job. The wife works in four different apartments where she comes once a week to do the laundry. She earns around Rp 150000 per month. The couple has two children of 14 and 17 years old. The younger one is still in secondary school and the oldest wants to go to high school. Although the parents are still not sure whether they will have enough money to pay for the children’s education. The living costs per month consists of house rent.
Rp 60000 per month (5 euros). The house consists only out of wooden box. There is MCK (see abbreviation list) that costs Rp 500-1000 per use. Taking clean water costs Rp 5000. There are no water connection to the kampong. The MCK are usually built on a fire hydrant by a certain person illegally. This person will then rent the MCK to use for toilet and shower facilities, and taking clean water for cooking and drinking. It is also possible to buy water from jerry cans. This cost Rp 2000 per 4 jerry cans (the amount of water used per day for cooking and drinking).

The RT and the RW of the kampong do not do much for the people. They tell people not to throw away the garbage into the water, but they do not do anything about it either. This is while the people actually want to clean the water together. Since there is no initiative taken, the condition of the kampong stays unimproved.
Kampong Kapuk Muara is situated along the river. Because of the thickness of the build up area, the river can no longer be seen from the street. The inhabitants of the kampong consists of a small amount of Betawi people. Most of the kampong population are migrants from Sumatra. The inhabitants of the kampong work in convection sector, since there are some convection factories which are situated in the area. The family interviewed in this kampong is the RT. Each kampong street is represented by one RT.

There are better organization for sanitation in this kampong. There is also water and electricity connection for almost every household. Each household has to pay every month Rp2000 for street cleaning fee. The people also do kerja bakti (see notion list) on the weekends to clean the river. Most of the houses are built from bricks, and some are built from wood. Because there are not many space to built, most of the houses consist of two storeys.

The kampong has help from the Mercy Corps, an international NGO that works based on incentive. Each household has around 30 pots of plants. Each month, the NGO will come by to see which houses has the plants. The houses that has at least 30 pots of plants has right to rice or oil for cooking.
This is a kampong where Chinese Betawi people live for generations. The inhabitants know each other very well. Since the colonial time, the structure of the kampong is never improved. Even though the density of the kampong in this area is really high, the background of the inhabitants are quite easy to distinguish from each other. Each petak (block) has usually a natural boundary such as a river. This boundary discern people with different origins. For example; the people living in Sawah Lio are usually of native Indonesian origin while the people in Petak Sembilan which is situated exactly next to it consists of Chinese Betawi people.

Since the density in this area is really high, the streets are used as meeting place between the inhabitants. Sometimes, there are also social facility such as public garden that functions as the local meeting spot at the end of the day.
This is a kampong that started with the Betawi family that expands and rent their land to people looking for place to live in Jakarta. This kampong has mostly bricks buildings and more open space. The streets profile can fit cars and angkot (small public transportation). The kampong started as a Betawi family divides their land to their children. To earn money, they sell pieces of land or rent it out to newcomers. The lurah of the kampong, is chosen by the oldest son of the Betawi family. The boundaries between the kampong and the housing complex which is situated around it cannot be distinguished even by the buildings. The rental houses, since it is made out of bricks and has water and electricity connection, cost around Rp300000 (25 euros) per month. There are also spaces for small warung (small shop) which is rented for Rp 6 million per year.
II. Diary field trip Jakarta, Feb 2008

When visiting Jakarta for the second time in order to finalize the analysis that was made earlier in Holland, a report in the form of a diary was made concerning what aspects that helped the author formed the opinion and therefore made the choices for the masterplan and the final program for the design project.

Week 1 (18 Feb - 24 Feb)
MONDAY
First visit to Situ Babakan. Exploring the possibilities by interacting as much as possible with the local inhabitants and their activities. The questions asked to the inhabitants are taken from the survey and there are also some collages on different building materials shown to the locals to see their reaction. Quite surprisingly, everyone is very resilient towards the idea of using bamboo in their houses. Even though the collage of building using bamboo is from a very luxurious house, they rejected the idea thoroughly.

From day one interview
Young boy:
Finished STM (technical academy) but did not do very well at school. Age around 18-19, and help his father at the soto betawi (typical Betawi soup dish) stall. Does not do anything else except fishing and hang around with friends. When asked whether he would like to participate with the communal activity, he was quite resilient and said that he was too lazy to help out. He’d rather stay at home, watch TV and do as free as possible. The father did not seem to be very happy about him not working and just hang around in the area.

Baba Anin:
Is one of the kampong eldest. His house and piece of land are taken over by the PEMDA for the cultural centre of the kampong (the PBB). He has land for more than 4000 m² and being rented by the government.
for only 600.000 rupiah per month. In return, the government built the stage, information office, Baba’s house was renovated into brick walls and tiled floors with wooden panels and Betawi ornaments are being implemented around the house. There are also some buildings which are rented to public within the parameter of the land. According to Baba Anin, there are only 0.8% of the plan are being realized at the moment.

Visitor 1:
Live in Jagakarsa, same district, but other kampong. He was waiting for his wife doing PKK (women community) activity. He was quite satisfied with the place where he live, and knows kampong Situ Babakan quite well. He visited the kampong many times before as there are many big activities are held in the PBB (cultural centre). He claimed that he thought it was really important to maintain the environmental quality such as cleanliness, etc. but at the same time threw his finished cigarette butt on the streets.

Visitor 2:
A member of the PKK community was at the cultural centre for a general rehearsal of a show for the next day. She was quite happy with the questions and answered all of them quite fondly. She was also quite enthusiastic with some of the ideas to make a facilitating building for the PKK activity. As SB is considered the centre of the Betawi preservation culture in the area, it would be the perfect opportunity to do it there. She also named different programs of the PKK that could even form the program of the building (if it were going to be a facilitating programme; this should be determined later out of more interviews). She is in the board of organization of the PKK activity.

1st impression on visit 1
• The people in the cultural centre area are used to tourism and selling Situ Babakan as a Betawi preservation culture, but they don’t seem to really ‘do’ what they say they should do.
• The men thinks that the best way to earn money is through kontrakan (rental houses). From small houses around 10 m2, one can easily earn 300-350 thousand rupiah (around 30 euro’s) per month.
• The people works together quite a lot. They also always help each oth-
er when there are events, building houses, etc. They are most interested in proposals on making money, but do not seem to be quite acceptant to the fact of living really close to one another. The idea of strategy 2 is totally rejected by them.

- Building vertically is discouraged not because people are used to living to the ground, but more because the building permit is much more expensive when this is done. They don’t accept this idea really well.
- The women works together a lot in different activities. They accept certain changes easier. They also have the time and love doing activities together.

**Conclusion day one:** probably the best way is to provide facilitating building instead of housing. Because housing has to do with legal ownership, which is already owned by the locals. The people already understand really well the rules to create a good living condition, but they don’t seem to embrace it in their daily life. According to Baba Anin, this is because they aren’t always involved at different activity planning. Things got shoved up to them from the authorities with little involvement from the people.

**TUESDAY:**
From visit to Dinas Tata Kota (City Planning Office), and after reading the report given from them, it seemed that the planning made earlier in Holland correspond quite well to the one from TK. Some information which are still missing has gotten clearer. The planning suited plan for scenario 1 and strategy 3. But said nothing about rumah kontrakan. Which was more suited for strategy 2.

A ‘disneyfied’ Betawi house could be made as a program for architectural intervention. But facilitating women activity seemed to be more interesting at the moment.

Still missing topography map.

**WEDNESDAY**
Dr. Jo Santoso is the Head of Graduate Program for Urban Planning at
the University of Tarumanagara, Jakarta. I learned to know him during the preliminary research in June 2007 and he has been helping me with my thesis ever since.

Visit Pak Jo:
Justified earlier ideas on improving the economical activities to improve the living condition in the kampong. The existing solution for kampong in the cities which has become slum areas (KIP program) are to intervene and improve the living condition of the kampong inhabitants by providing facilities for basic needs such as sanitation, education, and health. It is a common perception that by doing so, people would have better living condition. There are not so much done on the condition of the house itself as this is a private belonging of someone. Pak Jo suggested that by improving the economical supporting activity, the economy will improve by itself and the people of the kampong will have the ability to improve their living condition when the economy is improved. This suggestion is called a Neighbourhood Business Centre (see Trialog 85 text also). The architectural intervention could be a building that facilitates people to improve the economical condition according to their abilities. For example: a central to provide services for the surrounding that could be trusted such as chauffeurs, cleaning lady, etc., or working place where there could be micro economical activity for example making traditional bags, accessories, or souvenirs that can have high added value; or breeding domestic animal such as beo and perkutut (types of birds that can be sold to hundreds of euro’s each because they make beautiful sounds), or plants that have high added value, and can be sell for a lot of money. It is important to remember that there should be link to the existing market to make sure that the economical development is supported without having to built everything from the start.

There are also discussion on the use of bamboo as ground material in Indonesia. This is related to the history of kampongs in Jakarta (see history thesis) where bamboos were used as main material of poor people housing. When one speaks about bamboo, it reminded people of the days when there were sickness spread through the whole city such
as cholera, typhus, etc. where it took hundreds of thousands of lives. (elaborated in Kromoblanda by Tillema, some information can also be found in History Thesis, Kampong Development in Jakarta). Not only was bamboo a symbol of poverty, but it is also an icon of the bad living condition of a slum area. Therefore, for those who are considered as people with better living condition should have houses made from other materials, among which bricks.

This is called a diachronic happening (Levi Strauss); an occurrence that change a certain culture. As an example, the Tsunami that happened in 2004. Before, Indonesia was trying to embrace living with water, as flooding has become an annual occurrence in Jakarta. There were a lot of waterfront projects being built along the coastline in North Jakarta. These projects stopped after the Tsunami. Some of the projects that are still running failed disastrously because the perspective of the society has changed into fear for living at the waterfront.

- I started to think about the Netherlands and the history of water. First, the Dutch fight to protect the country from being washed off by the sea. Many unfortunate occurrences happened, where people are used to fight water over and over again. It is not until recently that this perception changed into one that tries to embrace it instead of protecting themselves from it. There are many projects on living with/in water being developed at the Faculty at the moment. I think that Indonesia is in a stage right now where the people are still fighting against water. As a country that is situated above the ground, we never had to fight water continuously as the Dutch do. We run away from threats related with water to higher grounds. We are gaining experience at the moment to start fighting against water. But it would be a nice gesture to start showing how the Dutch has done it so that we can learn a lot from it. □ idea for design: detailed solution that shows people how to deal with water.
- Bamboo is taken off the possible material list for buildings in Jakarta. On the other hand, hardwood (meranti, jati) is a material that is wanted by a lot of people because it gives a more friendly appeal than concrete. Brick walls are the cheapest and easiest material to use.
- Pak Jo offered some working space at Untar, which I received gladly
since there are not much working facilities at home. Also there is access to the library where I’ve found lots of information on the Betawi ornamental for houses, etc.

Went to Dinas Pemetaan (Map Centre of Jakarta):
Got a blueprint on Situ Babakan. The guy offered me digital maps, which are quite expensive and I didn’t have enough money to buy them. The printed maps cost 150.000, with topographical lines, etc from 1994 (the latest version).

Meet Arlene
An old high school friend who works as an architect at a company in Jakarta. She gave me quick basic course on detailing and construction methods in Indonesia, which was quite different than what I’m used to in Holland. She also helped me translate and understand several terminologies on different documents found on Indonesian architecture which I didn’t understood.

There are also some discussions on materials where she pointed out that reusing certain materials such as kratingdaeng bottle (energy drink) which is from brown glass, can make nice facades, which also reduce the heat coming through normal glass façade, making the room temperature somewhat cooler inside. (Same idea as the Heineken brick bottles)
• Idea: why not fill it with water. Than it would definitely cool some more.

Try to find out what kinds of activities are done in SB and what materials can’t be used there.

THURSDAY
Visit Situ Babakan
Looking for the organizer of the cultural centre. He was not there.
Found some thesis from others that are also there. Many new information, but did not have enough time to copy them. Next week will come again there and spend more time on making copies, and more pictures.
Interviewed 2 women at a warong (food stall). They rejected the idea that Ibu PKK are the representatives of what women of the kampong is
all about as these women who organize the activities do not encourage others to be involved in all of the different activities of PKK. They are only involved at arisan (an activity where women meet each other once a month in one of the houses. They will all collect an amount of money among each other. There will be tickets drawn and the name that comes out pointed the one that can take the total amount of money home. This will happen every month until everybody has bring back the same amount of money home).

They explained the economy system of building in a kampong. It’s called by arisan rumah which is to borrow materials such as sand, bricks, etc when one is building a house. This turns the other way around when others are building house, one has to contribute materials to the neighbour who is building the house.

The earlier suggested location for intervention cannot be used since it is a local cemetery which holds many traditional values. So, the site of intervention is still not yet decided.

FRIDAY
Went to Untar to find some more literature on building using the Indonesian methods, which is specialized for tropical climates. Also building details and material use.
Work the whole day at a given place provided by pak Jo on ideas for Situ Babakan.
• The library catalogue has a database that doesn’t work really well since many of the books are not placed in the right place. But, the library employee is the living catalogues there. People don’t tend to use the digital catalogue, but asked the bapak (man who work there) for some books of reference that they needed, and he seemed to know where each book lies and what’s in it.

WEEKEND
Map analysis on chosen location for intervention. This also in combination with the analysis for the government planning, making a masterplan for the area. Prepare maps and notes for field trip at Situ Babakan for
Week 2 (25 Feb - 2 Mar)
MONDAY
Work at Untar. Get letter of reference from Pak Jo, which was needed for getting detailed information with organisation at SB. Take copies for different books found at the university.
Meet Untar student, Edward. He was introduced to me by Pak Jo to help doing the survey and discuss the analysis.

TUESDAY
Visit Situ Babakan. Meet Pak Indra, the leader of the organisation of the PBB (Perkampungan Budaya Betawi), which is located on the land of Baba Anin.
Discussing the matter with Pak Indra, he has total understanding on the matter and also quite modern point of view. He understood instantly what the problems are and receives the idea of a Neighbourhood Business Centre quite enthusiastically, but also aware of the problems to be foreseen. He agrees that to improve the living condition of the people, first the economical situation of the kampong has to be improved. The inhabitants of the kampong are also always quite acceptant of new ideas, as long as there are people who organise the activity. Pak Indra also point out the fact that bottom up approach will not succeed if one only relies on the social awareness of the society, because of the low level of education of the inhabitants in general. But it is also wrong to generalize the idea that everyone in the kampong are low educated. Therefore, when thinking of new intervention to the kampong, one should also realise the fact that for every activity, there are also hierarchy of actors that should have specific task in order for a certain intervention to work.
For example, if agro tourism specializing for exotic fruit is going to be expand in the kampong, there are different actors that needs different
trainings; an example for agro tourism activity:
- There should be older people who understands how to work the soil and have certain farming experiences. They will teach others to do the practical work.
- There are higher educated people who understands the management of the whole process, where to get the seeds from, where to plant the seeds, and make planning where to put certain types of plants and combine them with new/different ones.
- There should be chauffeurs who transport all of the seeds and the plants from ISTN or other institute that has the seeds.
- There should be people from marketing who arrange and plan how to attract customers with different purposes; i.e. for tourists to visit the area. Also to plan market for people who are only interested in buying certain types of exotic plants, also for people who are only interested on buying certain types of fruits.
- Assistant for these people, marketing, services, maintenance, etc.
- To buy the fruits, there could also be new market for packaging, where these packaging are made by people from PKK, etc. creating new job opportunities for women of the kampong.

For location analysis, Pak Indra also pointed out that the easiest way to take a piece of land which is owned by Pemda, and use this to make the intervention. He also have some suggestion on the Masterplan on how to maintain the good water quality on the Situ. Water at Situ Mangga Bolong has much better quality since the Situ is situated with some distances from the dwellings around it. Also these dwellings already have a drainage system where excess water do not flow into the Situ. In the case of Situ Babakan, the drainage water goes directly into the lake, causing deterioration on the water condition. The location he showed me is a very interesting one that do not only handle the matter of improving the economy, but also touch the problems of water system, tourism, fisheries, and accessibility.

The other location that I have chosen earlier, he said it is owned by 3
private owners, and he did not agree that there should be new buildings built on the rest of existing green/water catchment area since these are the areas that should be preserved instead of built on. Therefore I directly agree with his proposition to take the suggested location, as there will be changes made on that specific piece of land anyway.

Other green spaces are mostly used for wakaf; a piece of land given by the owner to bury those who passed away in the family. This wakaf has a different system from a cemetery because it is only meant for family. And these small pieces of burial ground can be found in many places within the kampong as they tend to bury people within their own ground. That’s why when new houses are built and the owner didn’t understand very well, they usually found human skeleton in the ground that is going to be built. This system is still being used a lot in the kampong since the people don’t have to pay rent like in the local cemetery.

After meeting with Pak Indra, I went on to do the spatial analysis on how the kampong expand and densify a certain territory. An area within the kampong, formerly owned by a Betawi man called Engkong Pungut, is used as a case study. First, I spoke to Bu Lina, who already live there since 1994. She lives in a rental house, the kontrakan belong to Engkong. He used to own a large piece of land with a lot of gardens and green space. Only in the past few years the place become attractive to people from out of the island (Java) and they started moving in, buying the land that engkong owns, making it really dense.

About Bu Lina:
She came from West Java, and her husband from Kalimantan. They have a daughter together and she knows almost everybody living in the area. She rents her place for 400.000 per month (40 euro’s) incl. everything. This is quite a good price in that area because her place is quite an old building. Other people who stays in new building has to pay much more (around 5-600.000)
She was very kind and open, she invited me into her house as the tropical rain was pouring really hard and I have no place to shelter. Her next door neighbour, sell mie ayam (traditional Indonesian dish transported in carts), that I tried and ate them all. It was really nice. She also offered drinks and snacks, introduced me to her daughter and we talked for hours.

After the rain stops I went to see other kontrakan and met Marwan. He is member of Karang Taruna (community for young people). He knows a lot of people in the kampong and also has a small warung along the Situ. He also knows which piece of land are going to be sold and for which price (he also does a business on being a land broker). He took me around and show me which house belongs to whom, and then we visited the house of his sister, who also bought 50m2 from engkong. She lives in front of a kramat, which is a sacred place for the people there. They believe that there are spirits on those places guarding the place. Those who plan to move the kramat will have bad luck and may even die.

WEDNESDAY
Site intervention visit
During the location analysis for the building, especially the area of the fish farms at the moment looks very different than the one around the tourism centre. Most of the empty areas are used for garbage dumpster. The garbage is not processed any further and are left just like that in the area. If this area are going to be used for new purposes, there should be a garbage processing system for the area. (there is a small area found that is used for garbage collecting. This has potential to be expand further than what it is now)

The location itself has a lot of potential such as very good quality of water since they ran through different kinds of water plants that functions as a water filter for the area. There are also many different types of plants (traditionally used for medicine and as vegetables or fruit plants) which are used by the people to supply food. Looking at the vastness of the area combined with the 11 ha land for the farm, this location is ap-
appropriate to be used for the centre of fresh local fruit providing industry in the area.
The people I met around there who took me around the location seemed to have a lot of understanding on the types of plants that can be found growing around Situ Babakan. These people are with lower education but they know a lot about plants that they learned from their ancestors. Furthermore on the southern part of the area, there are many different fish farms which are converted into a fishing place for tourists to go there and fish. The system is that the owner let out a kilo of fish for each person who come there to fish and they have to pay 15000 for a day fishing.
Next to these fishing areas, is the local TPU (cemetery). Which is situated on a nice and hilly location. There are different classes for the different cemeteries, from VIP to the 3rd class. (The VIPs have more space and are located closer to the parking space) These qualities in the area do not need a lot of changes. Only some improvement here and there and also the connection is a very important thing since there aren’t any in the area.

THURSDAY
Work at Untar some more. Looking for more books and references at the library.

FRIDAY
Free time

SATURDAY
Visit Situ Mangga Bolong, to see what it looks like at the moment. There are a lot of plants growing on the water called genjer. These plants are usually eaten as lalapan (similar to salad) with the fishes that are caught in the lake. This is the hobby of the people from the area. Because of these plants, the water quality on Situ Mangga Bolong is good. Also considering the fact that the sewer system around Situ Mangga Bolong are already well treated, there are no significant amount of waste com-
ing into the situ form the houses around it. This is a different case with Situ Babakan. All of the waste from the houses went from the empang’s (fish ponds) directly into the lake water. There should be water treat-
ment system made for the lake. At the moment it is not very clear that
the lake water is of bad quality, but this will soon change if no action are
going to be taken for the Situ.

Last visit to Situ Babakan. Take last information and some of the ques-
tionnaires that were left there. Say goodbye to the people who had
helped during the visit. There was a visit from school of Al Azhar and
short films were made for some different activities in SB showing what
kinds of activities are done at the PBB.

SUNDAY
Meet with two architect friends. Talk about some projects and references
and what the market looks like in Indonesia. There aren’t many projects
in Indonesia that is quite similar to the Situ Babakan project. So, there
are no references on this kind of intervention at the moment. But they
taught me some basic things about buildings in Indonesia and what the
preferences are on material use, where to get them, etc.

Week 3 (3 Mar - 5 Mar)
MONDAY
Goodbye’s at Untar. Switching pictures and giving some files to Edward
who had helped me collecting information during the last weeks. He
might be interested to do this project also for his Bachelor degree. It
would be interesting to see what comes out of both our projects in the
end for SB.

TUESDAY
Went to the Dinas Pemetaan (city map office) for more detailed map on
the chosen location. Goodbye’s to friends and family.
WEDNESDAY
Back to Holland.
During the second visit to Situ Babakan, a questionnaire was also made in order to test some of the hypothesis made earlier based on the analysis. These questions are made in order to see if the importance of certain aspects treated in the analysis corresponds to that of the inhabitants. In the questionnaire, there are also some questions in relation to the first design scenario and strategies (see paragraph 6.1). These questions are made to see the feasibility of introducing certain elements that the author learned in the Netherlands.

There were 15 respondents to this questionnaire. Most of them are people who live in Situ Babakan, but there are also some people who are only visiting the area. The result that are not shown in this appendix are already worked out together in the interviews that are used as a base for further design choices.
1. Identity
   Name
   Age
   Sex
   Origin; how long have you stayed in Situ Babakan?
   Where do you live in Situ Babakan?
   .......... 
   Is the Betawi culture important for you? If so, why?
   .......... 

2. Housing
   How satisfied are you with your living condition at the moment?
   \textit{Very dissatisfied – dissatisfied – neutral – satisfied – very satisfied}
   Is there still anything missing or could be improved from your living situation at the moment?
   .......... 
   Would you consider moving out of your current house?
   Yes \quad No 
   If yes, where would you like to live?
   \textit{In Situ Babakan
   Other living area in the vicinity
   Not in Jakarta}
   In what kind of house would you then prefer to live?
   \textit{Betawi house
   Bamboo/wooden house
   Bricks/concrete house}
Why?

How well do you know your neighbours?  
Not at all – hardly – little – well – like my own family

How well do you know people in the kampong?  
-I don’t know anybody here besides people in my house  
-Only the people live around me  
-I’m close with people in the whole kampong  
-I know people from the other side of the lake

What do you think about the ‘kerja bakti’ (community work) quality in this kampong?  
Very bad – bad – neutral – good – very good

Is this activity done often enough?  
Never – sometimes – often – regularly (every week)  
– too often

What kind of activities do you do in the community?  
- Clean the gutters/ streets  
- PKK work (home economy)  
- Karang Taruna  
- Other........

Is there any specific place to do certain communal activities?  
Yes No

If yes, where?  
.............
If no, how important do you think it is to have a space for these activities?

Very unimportant – Unimportant – neutral – important – very important

Specify what kind of space and what it is for:

........

4. Tourism

How important is tourism in Situ Babakan?

Very unimportant – Unimportant – neutral – important – very important

Do you think the role of tourism in Situ Babakan should be improved?

Yes

No

What kind of improvements does the cultural centre in Situ Babakan need?

- More space
- Lighting
- Toilets
- Street
- Garbage system
- Water connection
- Security control
- Other........

5. Greenery

How important is it to maintain the existence of the trees in Situ Babakan?

Very unimportant – Unimportant – neutral – important – very important
How important is it for somebody to replant the trees that they cut off for making a building?  
*Very unimportant – Unimportant – neutral – important – very important*

Do you have other ideas to maintain the good micro climate condition from the trees?  
..............

How important is the lake for you?  
*Very unimportant – Unimportant – neutral – important – very important*

How important is the fish farm for you?  
*Very unimportant – Unimportant – neutral – important – very important*

What do you think about the water quality of Situ Babakan?  
......

If people still moving into this area, there will be density problems. On the other hand, probably this will improve the economy. What is your position about it?  
*Less inhabitants is better for environment*  
*Density is better for economy*

If your house is prone to flooding, what would you do?  
*Move away*  
*Build houses on poles*  
*Build new level on present house*  
*Other solution......*
Compact building for different purposes is cheaper than building each individual houses/buildings. Would you invest your money/time on building this with other people in the kampong?

Yes  No

If yes, what would you prefer you invest on?
- Rental shops
- Rental house
- Sell house/apartments
- Use for own economy activity such as selling food/bags, etc
- Other ...

If no, what do you think as a good way to earn money in the kampong through property?
- Sell piece of land without building
- Build house and sell with piece of land
- Build house and rent to people
- Rent building (from government) and create small economy activity in it
- Other...

If I say that using ground water pump is bad for the ground water condition of the kampong. Would you consider using other sources of water?

Yes  No

If yes, which kinds of other sources would you use:

Rain water
Lake water
Other.....

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Is there anything else in the kampong that you wish that it exist? For ex. Market, more schools, etc.

What do you think that you could contribute to Situ Babakan??

Would you like to be involved in this objective?

What is the most important thing that should be preserved?? Why?

Do you have personal ideas about the future of Situ Babakan? What should be established, in your view?

Other comments
Questionnaire result:

Satisfaction to current living condition
- Very satisfied: 13%
- Satisfied: 33%
- Quite satisfied: 7%
- Neutral: 27%

Ideal house
- Betawi house: 14%
- Concrete: 13%
- Not answered: 73%

Know thy neighbour
- Like family: 40%
- Well: 40%
- A little bit: 20%

Importance maintaining a good living condition
- Very important: 67%
- Important: 33%

Importance of replanting
- Very important: 7%
- Important: 53%
- Neutral: 40%

Importance of water resources
- Very important: 6%
- Important: 27%

Importance of fish farms
- Very important: 22%
- Important: 14%
- Neutral: 36%
- Unimportant: 14%

Water quality
- Very good: 27%
- Good: 6%
- Sufficient: 27%
- Bad: 40%
### IV. DCBA Sustainable Housing in Indonesia

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<thead>
<tr>
<th>Aspects</th>
<th>D Common usage</th>
<th>C Slightly improved</th>
<th>B Substantially improved</th>
<th>A Ideal Situation</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>1. Energy</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>1.1 Energy Sources</strong></td>
<td>No sustainable energy</td>
<td>Saving energy</td>
<td>Smart usage</td>
<td>Only sustainable energy</td>
</tr>
<tr>
<td><strong>1.2 Cooling</strong></td>
<td>Conventional energy sources (i.e. state-owned electricity grids and Liquid Petroleum Gas/ LPG)</td>
<td>Also use alternative energy sources</td>
<td>Use only alternative energy sources</td>
<td>Use only alternative energy sources and generate own energy from direct resources</td>
</tr>
<tr>
<td><strong>1.3 Lighting</strong></td>
<td>No effort to create cool indoor condition</td>
<td>Use air conditioners which are harmful for the ozone layer</td>
<td>Use energy-efficient, eco-friendly air conditioner</td>
<td>Cool the interior by providing adequate ventilation that allows air flow - no air conditioning</td>
</tr>
<tr>
<td><strong>2. Materials</strong></td>
<td>Use conventional light bulbs</td>
<td>Use energy-saving light bulbs</td>
<td>Only use natural light in the day time; efficient use of lights at night</td>
<td>Use natural light in the day time and solar-powered lights in the night time</td>
</tr>
<tr>
<td><strong>2.1 Foundation</strong></td>
<td>Investment-based choice (cheapest &amp; easiest to acquire)</td>
<td>Minimizing use</td>
<td>Local and renewable materials</td>
<td>Technologically &amp; environmentally advanced materials</td>
</tr>
<tr>
<td><strong>2.2 Frame</strong></td>
<td>Solid concrete foundation</td>
<td>Concrete blocks</td>
<td>River stones</td>
<td>Compressed earth blocks or timber for a stage house</td>
</tr>
<tr>
<td><strong>2.3 Walls</strong></td>
<td>Concrete or steel</td>
<td>Reduce the amount of concrete and use industrial timber</td>
<td>Use eco-labelled timber</td>
<td>Use local timber from forests that provide re-planting</td>
</tr>
<tr>
<td></td>
<td>Use red bricks or industrially produced board with formaldehyde glue</td>
<td>Use eco-labelled wooden or bamboo boards</td>
<td>Use sustainable and organic materials such as woven bamboo, coconut fiber and clay composite</td>
<td></td>
</tr>
</tbody>
</table>

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<table>
<thead>
<tr>
<th>Aspects</th>
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</tr>
</thead>
<tbody>
<tr>
<td>2.4. Roof</td>
<td>Use corrugated asbestos sheet or corrugated iron/zinc sheet</td>
<td>Use ferrocement or concrete roof tiles</td>
<td>Use ceramic tiles</td>
<td>Use locally made ceramic roof tiles, high recycles content clay or concrete roof tiles</td>
</tr>
<tr>
<td>2.5. Resources</td>
<td>Conventional commercial building materials from common suppliers</td>
<td>Alternative, locally grown or produced building materials from local suppliers</td>
<td>Eco-labelled building materials from environmentally conscious suppliers (i.e. coconut fiber, coconut wood, bamboo chips/composite)</td>
<td>Self-grown and self-produced building materials (i.e. local bamboo plantation)</td>
</tr>
<tr>
<td>3. Water</td>
<td>Direct disposal system</td>
<td>Water-saving use</td>
<td>Efficient water use</td>
<td>Self-supplying system</td>
</tr>
<tr>
<td>3.1. Resource</td>
<td>Conventional (tap water) state-owned water company or drilling own well</td>
<td>Add collected rain water for household purposes other than drinking/cooking</td>
<td>Add collected and purified (soil/rain) water</td>
<td>Own water well, added by purified (soil/rain) water</td>
</tr>
</tbody>
</table>
| 3.2. Waste water | - Throw waste water directly to sewers through water draining pipes  
                  - Let rain-water directly falls into sewers through drainage pipes | Directly re-using grey water (e.g. for watering plants/gardening, washing bikes/cars) | Filtering grey water for household purposes, other than drinking/cooking | Eliminating waste water by cutting out use (i.e. dry toilet)                     |
| 3.3. Drinking water | No or difficult access to drinking water          | - Moderate access to drinking water (i.e. communal pump)  
                                 - Conventional water pipes and taps | Easy access to drinking water (household pump)                | Also harvest and purify rain-water and soil water up to drinking quality          |
<p>| 4. Indoor Environment | No attention to indoor comfort/health            | Fulfilling the healthy house (minimum) standard               | Attention to indoor health                                    | Indoor health as a priority                                                      |</p>
<table>
<thead>
<tr>
<th>Aspects</th>
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</tr>
</thead>
<tbody>
<tr>
<td>4.1. Space</td>
<td>Less than minimum standard size (9m² per person)</td>
<td>Fulfilling minimum standard size (a moderate size house with fixed interior)</td>
<td>Flexible room arrangement (a moderate size house with multi-purpose rooms)</td>
<td>Separate rooms for different activities (a big house with one room for each activity)</td>
</tr>
<tr>
<td>4.2. Air &amp; noise pollution</td>
<td>No specific efforts against air &amp; noise pollution</td>
<td>Minimize use of household appliances that cause air &amp; noise pollution (temporary solution)</td>
<td>Enough ventilation to circulate the air against indoor pollution, especially in the kitchen area (permanent solution)</td>
<td>Provide a separate room for noisy and air-polluting activities and using building materials that absorb noise (permanent solution)</td>
</tr>
<tr>
<td>4.3. Cleaning agents</td>
<td>Use commercial, chemical cleaning agents</td>
<td>Minimize the use of commercial cleaning agents</td>
<td>Use only natural, bio-degradable cleaning agents</td>
<td>Self-produce and use natural cleaning agents</td>
</tr>
<tr>
<td>4.4. Household waste</td>
<td>- Directly dispose used packages/products</td>
<td>- Re-use packages/products</td>
<td>- Re-use and recycle disposables for personal/household use</td>
<td>Also make income out of re-used and recycled household waste</td>
</tr>
<tr>
<td></td>
<td>- Mix all kinds of waste in a bin</td>
<td>- Separate bio-waste from the rest of the garbage</td>
<td>- Separate household waste more precisely (bio-waste, paper, plastic, etc)</td>
<td></td>
</tr>
<tr>
<td>5. Surrounding environment</td>
<td>No attention to infrastructure/spontaneous settlement</td>
<td>Standard infrastructure</td>
<td>Improved (partial attention to) infrastructure</td>
<td>Fully planned infrastructure</td>
</tr>
<tr>
<td>5.1. Garbage disposal</td>
<td>Conventional garbage container (for mixed waste) for each or a</td>
<td>- Separated container for different types of garbage (bio-waste, paper,</td>
<td>- Separated containers for different types of garbage</td>
<td>Self-process all types of waste: - Recycle bio-waste into compost/fertilizer</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Partly to be</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Aspects</td>
<td>D: Common usage</td>
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<td>A: Ideal Situation</td>
</tr>
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<td>-------------------------------------------------------------------------------------------</td>
<td>------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>5.2. Facilities</td>
<td>No access to water and electricity grids</td>
<td>Water and electricity facilities are provided after the housing is ready</td>
<td>Water and electricity facilities are already integrated during the building process</td>
<td>- Generating own electricity</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Providing specific space for house expansion</td>
<td>Providing possibilities for house expansion (to grow either horizontally or vertically)</td>
<td>- Applying own water cycle/systems (resource, use, recycle, disposal)</td>
</tr>
<tr>
<td>5.3. Building expansion</td>
<td>No planning/space for house expansion</td>
<td>Minimum-sized public space for basic needs (i.e. passage)</td>
<td>Multi-functional public space also for secondary needs (i.e. playground/leisure, greeneries)</td>
<td>Provide high flexibility for house expansion</td>
</tr>
<tr>
<td>5.4. Public space</td>
<td>Lack or minimum sized, multi-purpose public space</td>
<td>Primary public facilities and services are available</td>
<td>Primary public facilities and services are easily accessible</td>
<td>Enough public space for various purposed, which can accommodate all inhabitants’ demands: leisure, gardening/food &amp; herbs, greeneries/clean &amp; fresh air</td>
</tr>
<tr>
<td>5.5. Public facilities &amp; services</td>
<td>Lack of basic level of public facilities and services</td>
<td>Ordinary neighbourhood</td>
<td>Make extra income</td>
<td>All public facilities and services are accessible, within walking distance</td>
</tr>
<tr>
<td>6. Economic</td>
<td>Conventional mortgage; ordinary interest system with a bank</td>
<td>- Partially financially self-supportive</td>
<td>Special loans/soft credit for housing with a housing cooperation</td>
<td>Production unit</td>
</tr>
<tr>
<td>6.1. Building finance</td>
<td></td>
<td>- Partially self-built</td>
<td></td>
<td>Having the right amount of money to purchase a new house</td>
</tr>
<tr>
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<td>A Ideal Situation</td>
</tr>
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<td>---------------------------------------------</td>
<td>------------------------------------------------------</td>
<td>----------------------------------------------------------</td>
<td>----------------------------------------------------------</td>
<td>--------------------------------------------------------------</td>
</tr>
<tr>
<td>6.2. Money-generating household</td>
<td>Ordinary housing Energy-consumptive</td>
<td>- Reduce energy consumption</td>
<td>- Effective energy use (i.e. a control panel for energy and water consumption)</td>
<td>- Money-generating environment (housing as a production unit)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- Use energy-saving home appliances</td>
<td>- Partially energy productive (i.e. solar water heater)</td>
<td>- Energy-productive (i.e. solar electricity generator)</td>
</tr>
<tr>
<td>6.3. Certifications</td>
<td>A time-consuming, expensive and complicated process to acquire certificates</td>
<td>A time-consuming and complicated process to acquire certificates, within reasonable expenses</td>
<td>A complicated process to acquire certificates, within reasonable expenses and time span</td>
<td>A fast, practical process without complications in acquiring complete and valid certificates</td>
</tr>
<tr>
<td>7. Social-cultural</td>
<td>No or lack of interactions among the inhabitants</td>
<td>Ordinary relationships among the inhabitants</td>
<td>Several communal activities exist</td>
<td>Solid cooperations in forms of communal projects and activities</td>
</tr>
<tr>
<td>7.1. Neighbourhood relationships</td>
<td>- Moderate; individual lifestyle</td>
<td>Social interactions exist under special circumstances (i.e. birth, death, wedding); semi-individual lifestyle</td>
<td>Also make social contacts under casual circumstances (i.e. social gathering, nightwatch); communal lifestyle</td>
<td>- Constant social contacts</td>
</tr>
<tr>
<td></td>
<td>- No further contact than knowing neighbours' names</td>
<td></td>
<td></td>
<td>- Total involvement from the majority of the residences</td>
</tr>
<tr>
<td>7.2. Neighbourhood activities</td>
<td>- No communal activities</td>
<td>Neighbourhood activities: night-watch (ronda), gathering (arisan), periodic cleaning (kerja bakti)</td>
<td>More neighbourhood collaborations, possibly profit-oriented i.e. co-operation (koperasi), a communal garbage processor and recycling centre, a neighbourhood kiosk</td>
<td>- Initiating, managing and conducting more complicated communal activities and facilities</td>
</tr>
<tr>
<td></td>
<td>- Communal needs (i.e. garbage collecting and neighbourhood patrol) are taken care of by a committee without direct involvement (other than obligatory fee) from residences</td>
<td></td>
<td></td>
<td>- Have a positive influence on neighbouring housing/villages</td>
</tr>
</tbody>
</table>

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<table>
<thead>
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</thead>
<tbody>
<tr>
<td>7.3. <strong>Gotong royong</strong></td>
<td>No <em>Gotong Royong</em> activities</td>
<td><em>Gotong Royong</em> activities only when emergency occurs</td>
<td>Occasional <em>Gotong Royong</em> activities</td>
<td>Routine <em>Gotong Royong</em> activities</td>
</tr>
<tr>
<td>(communal activities)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7.4. Spill-over effects</td>
<td>Lack of discipline of inhabitants in a neighbourhood has negative effect on its neighbourhood areas (i.e. throwing garbage into sewers)</td>
<td>Domestic activities have no effect on neighbouring areas</td>
<td>Domestic activities have positive effects to neighbouring areas</td>
<td>Domestic activities have positive effects and are exemplary for neighbouring areas</td>
</tr>
<tr>
<td>7.5. Initiators</td>
<td>There is no person in the community who leads, motivates and initiates neighbourhood activities</td>
<td>There is a group of people in the community who motivates and initiates neighbourhood activities</td>
<td>The initiators of a community succeeded in encouraging a majority of their fellow inhabitants to participate in the (local) neighbourhood activities</td>
<td>The initiators are capable of giving trainings &amp; workshops to their fellow inhabitants and people from other areas as well, who will become their apprentices</td>
</tr>
</tbody>
</table>

*DCBA Sustainable Housing in Indonesia*
*by Dwinita Larasati*
*Dissertation Sustainable Housing in Indonesia p.75-79*
## V. Types of Plants Found in Situ Babakan

<table>
<thead>
<tr>
<th>Local Name</th>
<th>Species</th>
<th>Where to be found in SB</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Front/</td>
</tr>
<tr>
<td></td>
<td></td>
<td>backyard</td>
</tr>
<tr>
<td>Andong</td>
<td><em>Cordyline fruticosa linn</em></td>
<td>*</td>
</tr>
<tr>
<td>Anting-anting</td>
<td><em>Acalypha australis L</em></td>
<td>*</td>
</tr>
<tr>
<td>Asem</td>
<td><em>Tamarindus indica</em></td>
<td>*</td>
</tr>
<tr>
<td>Bangle</td>
<td><em>Zingiber purpureum</em></td>
<td>*</td>
</tr>
<tr>
<td>Bambu</td>
<td><em>Bambusa sp</em></td>
<td></td>
</tr>
<tr>
<td>Belimbing wuluh</td>
<td><em>Averhoa bilimba L</em></td>
<td></td>
</tr>
<tr>
<td>Belimbing manis</td>
<td><em>Baverhoa carambola L</em></td>
<td>*</td>
</tr>
<tr>
<td>Brotowali</td>
<td><em>Tinospora crispa</em></td>
<td></td>
</tr>
<tr>
<td>Bunga kenop</td>
<td><em>Gomphrena globosa</em></td>
<td></td>
</tr>
<tr>
<td>Bunga teleng</td>
<td><em>Clitoria tematea</em></td>
<td></td>
</tr>
<tr>
<td>buni</td>
<td><em>Antidesma bunius</em></td>
<td></td>
</tr>
<tr>
<td>Buah nona</td>
<td><em>Annona reticulata</em></td>
<td></td>
</tr>
<tr>
<td>Bisbol</td>
<td><em>Diospyros philipensis</em></td>
<td></td>
</tr>
<tr>
<td>Cabe jawa</td>
<td><em>Piper refractum Vahl</em></td>
<td></td>
</tr>
<tr>
<td>Cakar ayam</td>
<td><em>Selaginella doederlinii</em></td>
<td></td>
</tr>
<tr>
<td>Calincing</td>
<td><em>Oxalis corniculata</em></td>
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</tr>
<tr>
<td>Cincau</td>
<td><em>Cyclea barbata</em></td>
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<tr>
<td>Ciplukan</td>
<td><em>Phisais peruviana L</em></td>
<td></td>
</tr>
<tr>
<td>Duku kondet</td>
<td><em>Lansium domesticum</em></td>
<td></td>
</tr>
<tr>
<td>Durian sitokong</td>
<td><em>Durio zibetinus</em></td>
<td></td>
</tr>
<tr>
<td>Daun cengkaruk</td>
<td></td>
<td></td>
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<tr>
<td>Daun dewa</td>
<td><em>Gynura segetum</em></td>
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</tr>
<tr>
<td>Daun jinten</td>
<td><em>Coleus amboinicus Lour</em></td>
<td></td>
</tr>
<tr>
<td>Daun katuk</td>
<td><em>Sauropis anchoginus L</em></td>
<td></td>
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<tr>
<td>Daun kelor</td>
<td></td>
<td></td>
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<tr>
<td>Daun mangkoking</td>
<td><em>Nothopana pseutellarium</em></td>
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<tr>
<td>Daun pandan</td>
<td><em>Pandanum amaryllifolium</em></td>
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<tr>
<td>Daun reumatik</td>
<td><em>Plumbago zeylanica Linn</em></td>
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<tr>
<td>Daun salam</td>
<td><em>Eugenia operculata</em></td>
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<tr>
<td>Daun sendok</td>
<td><em>Plantago mayar</em></td>
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<tr>
<td>Daun suji</td>
<td><em>Pleomele angustifolia</em></td>
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<td>Daung wungu</td>
<td><em>Graphtophyllum pictum</em></td>
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<tr>
<td>Daruju</td>
<td><em>Acanthhus ilicifolius Linn</em></td>
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<td>Ganda rusa</td>
<td><em>Justicea gendarussa</em></td>
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<tr>
<td>Gendolo</td>
<td><em>Bosella rubra Linn</em></td>
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</tr>
<tr>
<td>Jahe merah</td>
<td><em>Zingiber officinale</em></td>
<td></td>
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<tr>
<td>Jeruk nipsis</td>
<td><em>Citrus aurantifolia</em></td>
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<tr>
<td>Jeruk purut</td>
<td></td>
<td></td>
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<tr>
<td>Jamblang</td>
<td><em>Eugenia cuminii</em></td>
<td></td>
</tr>
<tr>
<td>Local Name</td>
<td>Species</td>
<td>Where to be found in SB</td>
</tr>
<tr>
<td>-------------------</td>
<td>---------------------------------------------------</td>
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</tr>
<tr>
<td></td>
<td></td>
<td>Front / backyard</td>
</tr>
<tr>
<td>Jambu mawar</td>
<td>Eugenia jambos</td>
<td>*</td>
</tr>
<tr>
<td>Jambu biji</td>
<td>Psidium guajava</td>
<td>*</td>
</tr>
<tr>
<td>Jambu bol</td>
<td>Eugenia malaccencis L</td>
<td>*</td>
</tr>
<tr>
<td>Jarak</td>
<td>Jatropha multifida</td>
<td>*</td>
</tr>
<tr>
<td>Jengkol</td>
<td>Pithecolobium jiringa</td>
<td>*</td>
</tr>
<tr>
<td>Kawista batu</td>
<td>Feronia limonia</td>
<td>*</td>
</tr>
<tr>
<td>Kara</td>
<td></td>
<td>*</td>
</tr>
<tr>
<td>Kaca piring</td>
<td>Gardenia sp</td>
<td>*</td>
</tr>
<tr>
<td>Kembang sepatu</td>
<td>Hibiscus rosasinensis</td>
<td>*</td>
</tr>
<tr>
<td>Kembang pukul empat</td>
<td></td>
<td>*</td>
</tr>
<tr>
<td>Kemuning</td>
<td>Murray paniculata</td>
<td>*</td>
</tr>
<tr>
<td>Kencur</td>
<td>Kaempferia galanga</td>
<td>*</td>
</tr>
<tr>
<td>Kimpul</td>
<td></td>
<td>*</td>
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<tr>
<td>Ki tolod</td>
<td>Isotoma longiflora</td>
<td>*</td>
</tr>
<tr>
<td>Kenanga</td>
<td>Canangium odoratum</td>
<td>*</td>
</tr>
<tr>
<td>Kumis kucing</td>
<td>Orthociphor aristatus</td>
<td>*</td>
</tr>
<tr>
<td>Karet kebo</td>
<td>Ficus elastica Roxb.</td>
<td>*</td>
</tr>
<tr>
<td>Keji beling</td>
<td>Strobilantes crispus</td>
<td>*</td>
</tr>
<tr>
<td>Kembang coklat</td>
<td>Zephyranthes candida</td>
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<td>Kweni</td>
<td>Mangifera odorata</td>
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<td>Piper albi</td>
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<td>Lempuyang</td>
<td>Zingiber americans</td>
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<td>Lidad buaya</td>
<td>Aloe vera</td>
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<td>Lengkuas</td>
<td>Alpina galanga</td>
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<td>Sansiviera trifasciata</td>
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<td>Melinjo</td>
<td>Gnetum gnemon</td>
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<td>Baccaria raesemosa</td>
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<td>Matoa</td>
<td>Pometia pinnata</td>
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</tr>
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<td>Mengkudu</td>
<td>Morinda citrifolia</td>
<td>*</td>
</tr>
<tr>
<td>Melati</td>
<td>Jasminum sambac</td>
<td>*</td>
</tr>
<tr>
<td>Miana</td>
<td>Coleus scutellarioides</td>
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This appendix is made to give an overview on the richness of the agro-culture in Situ Babakan. When designing green area, one should be careful in choosing the types of plants that is used because this might have different meaning for the inhabitants and their customs.

Sources
Literature


inhabitants, kampong, interviewed by Fransiska Surya. Interview with kampong inhabitants of Jakarta (June 2007).

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WEBSITE

Jakarta’s Central Office of Statistics http://bps.jakarta.go.id
Official website of the city: http://www.jakarta.go.id
Southern Jakarta official website: http://selatan.jakarta.go.id
Guidelines of minimum requirements of a house: http://kprid.files.wordpress.com/2008/01/lamp1-kepmen403_02.pdf

FIGURES

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* Several photo’s that are taken from website is searched using search engine www.google.com and www.flickr.com
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