In-Formality

Public spaces, social housing and sanitation in Smokey Mountain, Manila

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Al mio babbo.

Alla mia mamma.

A Claudio.

Contents

Introduction

> L'inferno dei viventi non è qualcosa che sarà; se ce n'è uno, è quello che è già qui, l'inferno che abitiamo tutti i giorni, che formiamo stando insieme. Due modi ci sono per non soffrirne. Il primo riesce facile a molti: accettare l'inferno e diventarne parte fino al punto di non vederlo più. Il secondo è rischioso ed esige attenzione e apprendimento continui: cercare e saper riconoscere chi e cosa, in mezzo all'inferno, non è inferno, e farlo durare, e dargli spazio.[1]
>
> *Le città invisibili*
> Italo Calvino

In 2016, for the first time in history, the majority of the earth's circa seven billion inhabitants are living in urban areas. This phenomenon is not showing any sign of decrease – and it most probably will not, unless major development of rural provinces are planned and actually implemented.

Almost one billion people live in informal settlements, known as slums or squatter settlements. This number is foreseen to double by 2030, pushing beyond the capacity of many local institutions and national governments.

The largest and most pressing increase in urban population is in the Asia and Pacific region, inhabited by the 60% of the world's total population (4.3 billion) and the 55% of its urban dwellers. This makes it undoubtedly difficult to find cities without slums, with safe streets and public spaces. In 2014, 17 out of 28 megacities (i.e. urban areas exceeding 10 millions inhabitants) in the world were located in the Asia and Pacific region.

The Philippines is a representative case study of the situation: a rapidly growing economy, with a constantly increasing migration from poor rural areas to unplanned expanding

cities, lacking in proper housing structures and with very little available land.

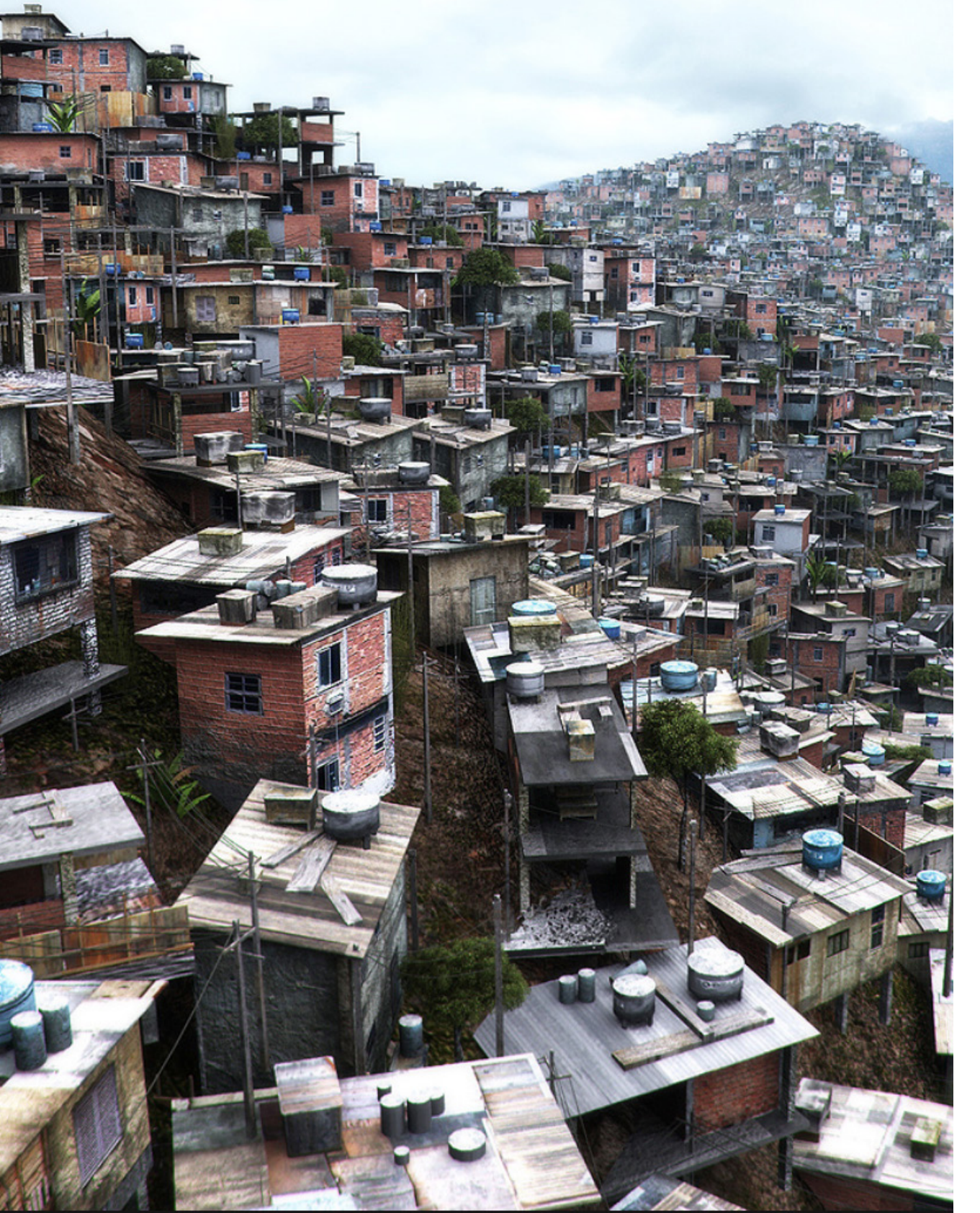
Metro Manila is the rural migrants' most common choice, with its shiny promises for economical opportunities. Its critical housing situation has not been ignored by the authorities – even dictator Marcos addressed the issue back in the 1970's, and all the previous and following democratic governments have tried to give an answer, together with international institutions, but, despite this, the spread of informal settlements in the Philippines has become endemic and pervades each and every small piece of land available, often in dangerous prone areas (river sides, rail tracks, shores, dump-sites).

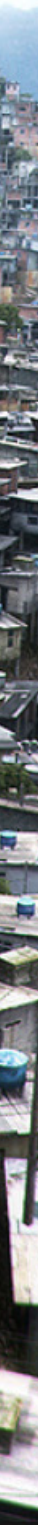
This work focuses on a specific case study, the Smokey Mountain area in Tondo (Manila), which will be presented with its urban, socio-economical, architectural features, and, in the end, it will present one of the many possible solutions to the given issue, which may be utopian, but, still, could be a first step to raise awareness about the living conditions of so many people.

The main reason why it was chosen to address the problem of the poorest of the poor's living condition is ethical: designers of all kind – architects, engineers, urban planners – should be aware that this profession can not only influence, but improve these people's lives, now more than ever.

Notes

1"The inferno of the living is not something that will be; if there is one, it is what is already here, the inferno where we live every day, that we form by being together. There are two ways to escape suffering it. The first is easy for many: accept the inferno and become such a part of it that you can no longer see it. The second is risky and demands constant vigilance and apprehension: seek and learn to recognize who and what, in the midst of inferno, are not inferno, then make them endure, give them space." *Invisible cities* by Italo Calvino, English translation by William Weaver.





Slums

People and numbers

Is a general definition possible?

The word *slum* first made its appearance in the early 19th century in British English: it was used to identify the poorest quality housing and the most unsanitary conditions; a refuge for marginal activities, including crime, 'vice' and drug abuse, and a likely source for many epidemics that ravaged urban areas – a place apart from all that was decent.

The definition of *slum* from The Oxford English Dictionary reminds us of Dickens' scenarios in the 19th century London:

> A street, alley, court, situated in a crowded district of a town or city and inhabited by people of a low class or by the very poor; a number of these streets or courts forming a thickly populated neighbourhood or district where the houses and the conditions of life are of a squalid and wretched character… a foul back street of a city, especially one filled with a poor, dirty, degraded and often vicious population; any low neighbourhood or dark retreat.

Today, the catch-all term *slum* is loose and deprecatory – it has many connotations and meanings, and is banned from many of the more sensitive and politically correct lexicons. It can also vary considerably in what it describes in different parts of the world, or even in different parts of the same city.

In developing countries, the term *slum*, if used, usually lacks the pejorative and divisive original connotation, and simply refers to lower-quality or informal housing.

Large, visible tracts of squatter or informal housing have become intimately connected with perceptions of poverty, lack of access to basic services and insecurity. Terms such as *slum, shanty, squatter settlement, informal housing* and *low income community* are used almost interchangeably by agencies and authorities.

It is difficult to give a scientific definition of slums; many general definitions that meet the common perception of what a slum is could be given; yet, they are not associated with operational definitions that would enable one to be certain whether or not a particular area is a slum.

In practice, what has happened when it has been necessary to operationalize the concept is that areas have been designated specifically as slums, usually by planners making surveys or following popular usage. This was the case during the Housing Reform in the UK, and subsequently in many other countries.

More recently, definitions developed in 1993 in India use housing conditions and availability of facilities as the main basis for defining areas as slums – areas with dense, poorly built or mostly temporary housing, with inadequate sanitary and

Fig. 1 – (previous page) A *favela* in Rio de Janeiro (www.habitatni.co.uk)

Fig. 2 – A typical alley of an informal settlement (UN-Habitat)

drinking water facilities.

It would obviously be very useful to have a universal and objective definition of what a slum is, but efforts to propose a more 'quantitative' definition of slums have been started only recently. The difficulty in finding a universal definition of slum lays in the many characteristics of these settlements:

- slums are too complex to define according to one single parameter;
- slums are a relative concept and what is considered as a slum in one city could be regarded as adequate in another country or city;
- local variations among slums are too wide to define universally applicable criteria;
- slums change too fast to render any criterion valid for a reasonably long period of time;
- the spatial nature of slums means that the size of particular slum areas is vulnerable to changes in jurisdiction or spatial aggregation.

However, even if a definition cannot be found yet, the UN Habitat has produced a fundamental research about the issue (T*he Challenge of Slums,* 2003), and has succeeded in summing up the fundamental aspects of slum areas taken into consideration by national and local governments, statistical offices, institutions, which show common features. This study is the result of the collaboration between more than one hundred researchers, and is extremely important – although 13 years have passed since its publication – for three main reasons: it is based on case-studies of poverty, slum conditions and housing policy in 34 metropolises; it uses a unique com-

parative database for 237 cities worldwide; it incorporates global data, that include China and the ex-Soviet block, that had never been included in previous researches. [1]

The Challenge of Slums presents these following fundamental characteristics of slums:

- **lack of basic services** is one of the most frequently mentioned characteristics of slum definitions worldwide. Lack of access to sanitation facilities and safe water sources is the most important feature, sometimes supplemented by absence of waste collection systems, electricity supply, surfaced roads and footpaths, street lighting and rainwater drainage;

- **sub-standard housing or illegal and inadequate building structures**: many cities have building standards that set minimum requirements for residential buildings. Slum areas are associated with a high number of substandard housing structures, often built with non-permanent materials, unsuitable for housing given local conditions of climate and location. Factors contributing to a structure being considered substandard are, for example, earthen floors, mud-and-wattle walls or straw roofs. Various space and dwelling placement laws may also be extensively violated;

- **overcrowding** is associated with a low space per person, high occupancy rates, cohabitation by different families and a high number of single-room units. Many slum dwelling units are overcrowded, with five and more people sharing a one-room unit, used for cooking, sleeping and living;

- **unhealthy living conditions and hazardous locations** are the result of a lack of basic services, with visible, open sewers, lack of pathways, uncontrolled dumping of waste, polluted environments, etc. Houses may be built on hazardous locations or land unsuitable for settlement, such as floodplains, in proximity to industrial plants with toxic emissions or waste disposal sites, and on areas subject to landslip. The layout of the settlement may be hazardous because of a lack of access ways and high densities of decaying structures;

- **insecure tenure and irregular or informal settlements**: a number of definitions consider lack of security of tenure as a central characteristic of slums, and regard lack of any formal document entitling the occupant to occupy the land or structure as an evidence of illegality and slum occupation. Informal or unplanned settlements are often regarded as synonymous with slums. Many definitions emphasize both informality of occupation and the non-compliance of settlements with land-use plans. The main factors contributing to non-compliance are settlements built on land reserved for non-residential purposes, or which are invasions of non-urban land;

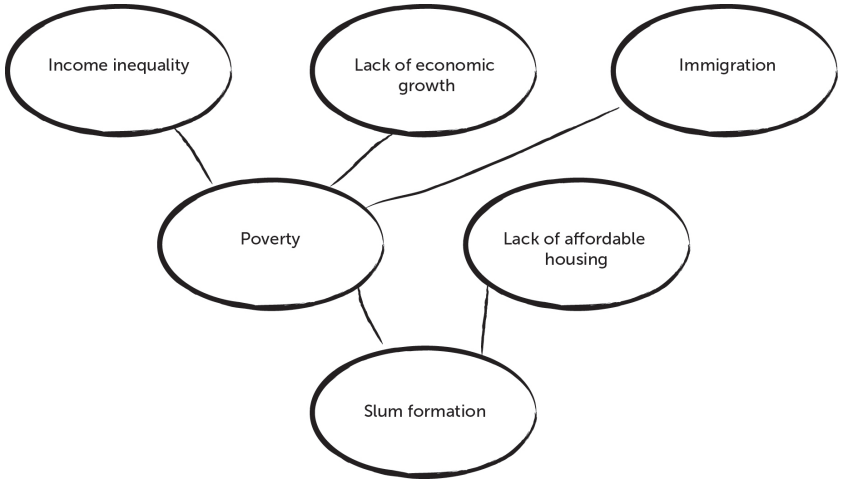


Fig. 3 – Inequality, poverty and slum formation

- **poverty and social exclusion:** low income is considered, with some exceptions, as a central characteristic of slum areas. It is not seen as an inherent characteristic of slums, but as a cause (and also a consequence) of slum conditions. Slum conditions are physical manifestations that create barriers to human and social development. Furthermore, slums are areas of social exclusion that are often perceived to have high levels of crime. In some definitions, such areas are associated with certain vulnerable groups of population, such as recent immigrants, internally displaced people or ethnic minorities;

- **minimum settlement size:** many slum definitions also require some minimum settlement size for an area to be considered a slum, so that the slum constitutes a distinct precinct and is not a single dwelling. Examples are the municipal slum definition of Kolkata that requires a minimum of 700 square metres to be occupied by huts, or the Indian census definition, which requires at least 300 people or 60 households living in a settlement cluster. [2]

In conclusion, the answer to the question in the title would be *no*; anyway, common characteristics can be found, and this can help pointing out slums areas, which would present the features seen, to various extents.

Socio-economic inequality

Slums result from a combination of poverty or low incomes with inadequacies in the housing provision system, so that poor people are forced to look for affordable accommodation and land that become increasingly inadequate.

The numbers of urban people in poverty are outside the control of city governments, and are swelled by a combination of economic stagnation, increasing inequality and population growth, especially growth through immigration from abroad or, in the case of developing countries, from the rural areas (see Fig. 4).

Developing countries have been relying for decades on the capacity of urban areas to generate income and economic growth; for example, in the Philippines, people would leave the provinces in order to seek a better future (read: a job) in the city (read: Metro Manila), because all investments efforts have been made in the Metro area since the end of WW2.

Demographic changes

The common imagine we all picture in our minds when thinking about slums is an image of sprawling areas with crowded substandard housing and no facilities or sanitation, with numbers continually augmented by a hopeless stream of immigrants from depressed rural areas, who expect very little and receive even less, building makeshift shelters on the edges of the city or along rivers and trying to eke out a living, as we have read in the more scientific words by UN Habitat.

This is generally the truth – although there are many cases of people who have actually found a new life thanks to the opportunities found in the city, and are able to make an acceptable income and obtain an education while enjoying a better standard of living, at a considerably lower risk of death and starvation than their rural counterparts.

The main contribution to the urban demographic growth is the net birthrate, but immigration from rural areas is also a fundamental aspect of the issue.

Population growth was the main demographic issue of the 20th century and it continues to be the focus of attention in the developing world. This growth is largely due to the extraordinary success of modern medicine in raising life expectancies by 40% over the century.

Growth continues at a high but diminishing rate, as stated by the UN-Habitat in the *The Challenge of Slums* report. The projections show that the rural population will remain stable (or decrease) while the population growth will be absorbed by urban areas, both in the Western countries and in the developing world. Other data presented in the report show us a rather startling future: they imply that the world has a maximum number of rural dwellers who can be supported, and that number has almost been reached. The trends also imply that world urban populations will increase by the equivalent of 33 new cities of 2 million people per year for 30 years, or by 6 megacities per year, for the next 30 years (see Fig. 4).[3]

Urbanization is perhaps the only enduring trend in human history. The high rate of urbanization that is now occurring

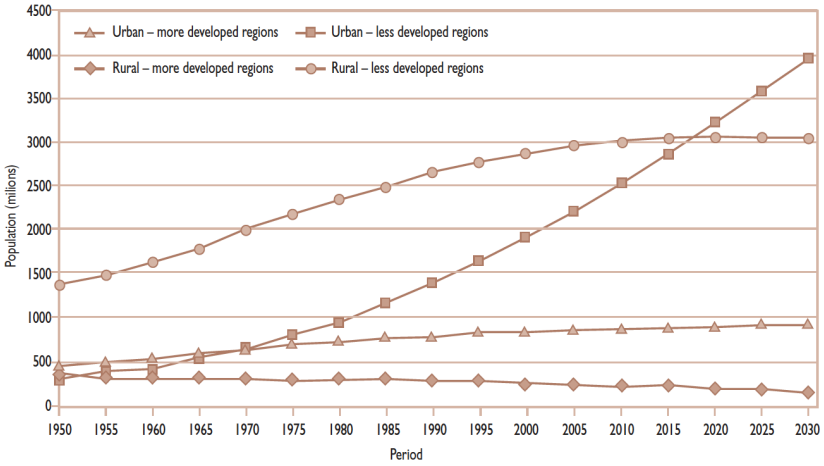


Fig. 4 – Urban and rural populations in more and less developed regions, 1950 to 2030 (*The Challenge of Slums* UN-Habitat, 2003)

throughout the developing world parallels that which occurred in England and other European countries during their industrial revolutions in the 18th and 19th centuries. What is different now is that urbanization is not being accompanied by adequate economic growth in many developing countries.

Contemporary urbanization has been driven by:

- political factors: instability, civil wars and repression;
- economic, environmental and social factors.

These factors are both pushing (form the rural area) and pulling (to the urban area). The pushing factors are related to the decrease of available jobs in the rural provinces, mainly due to the use of improved technologies, which does not involve subdivision and share-cropping, that would support more families on the existing fixed supply of arable land, but actually involve enclosure of common lands or the creation of bigger estates for export-oriented crops. Projects that improve productivity per person also mean that less and less labour is required in rural areas. Consequently, labourers are displaced, as are children of farmers, who go to seek work in the city.

But still, the question "why do people keep on migrating to the cities" remains, since there are apparently no jobs for them and they have to live in slums with what might appear to be a lower quality of life, in a vulnerable situation and separated from everything they know. The 'bright lights' syndrome is usually the answer – there just seems to be a lot more going on in the city. In rural areas, there are few opportunities

and little new arable land that can be developed, especially for women, who are often excluded from land occupancy upon death of, or divorce from, the husband.

In the end, the general opinion is that only cities are able to create jobs, and if the formal sector does not have enough, the informal sector will come up with something.

In cities, sanitation is generally better than in the rural areas; medical and social services are more readily available; life expectancy is higher; food availability is less dependent on the good health of working animals and the condition of crops, and less subject to the weather.

Famines are largely a rural phenomenon since it is fairly easy for aid agencies to ship supplies into cities, where it is in the interests of elites to ensure that they are distributed, and where levels of monitoring from well-informed and local action groups and the support agencies themselves are much higher. In rural areas or smaller urban areas, however, distribution channels are poor and there are many intervening opportunities for humanitarian aid to go astray.

Cities are, in the end, a more controlled environment, even though we would not say an urban life is less risky than a rural one: crime rate is usually very high and slums are often controlled by gangs, whom one should pay in order to get protection and access to water and electricity, often with the collaboration of corrupted policemen and local politicians.

Other two important factors, besides birthrate and rural-urban flow, are international migration and the evacuation of inner cities by the wealthy, who left the ruins behind to whomever was ready to inhabit them.

New immigrants tend to join their own ethnic communities for support and advice, partly because they will often have networks of family and friends, partly because they will be able to communicate and operate in familiar languages, partly because they will have access to religious and retail facilities that meet their needs, but mostly because they will be welcomed without suspicion. The tendency to form ethnic neighbourhoods can, however, be part of the slum formation process, and if immigrants have few resources they may find themselves congregated in the poorer parts of town with few opportunities to join the wider community.

Examples of such ethnical slums can be found anywhere: Harlem in New York, for black people and Puerto Ricans; the various China towns and Little Italies all around the world; the Palestinian refugee camps in Amman, Jordan; and so on.

Poverty and slums

Slums and poverty are closely related, but the relationship is not always direct.

On the one hand, slum dwellers are not a homogeneous population, and some people of reasonable incomes choose to live within, or on, the edges of slum communities. Even though most slum dwellers work in the informal economy, it is not unusual for them to have incomes that exceed the earnings of formal-sector employees.

On the other hand, in many cities, there

are more poor outside slum areas than within them. Slums are designated areas where it is easier to see poor people in the highest concentrations and the worst conditions; but even the most exclusive and expensive areas will have some low-income inhabitants.

Slum conditions are caused by poverty and inadequate housing responses, which are mutually reinforcing, to some extent. It is not surprising that the characteristics of the settlement or housing is often confused with the characteristics of the people living in them.

The issues of living conditions, poverty and poor people's management of their own situation are amalgamated, and cause and effect relationships are confused. This presents a policy and delivery problem for programmes aimed at addressing slum conditions as part of an overall poverty reduction agenda. The converse is the case for non-housing poverty reduction programmes, which sometimes presume that their activities will result in improvements in housing, infrastructure and service delivery in slum areas – but 'trickle through' to housing may be extremely slow or non-existent unless the income improvements are substantial and sustained.

Although urban poverty is in constant increase, the urban poor is usually more able to help himself in some way, than his rural equivalent. Differentiations amongst the poor are needed: women, children and the elderly are the most vulnerable ones, and they are the ones who suffer most from environmental degradation and inadequate service provision, which characterizes slum areas.

Just like slums, poverty is a concept we think we could all distinguish; in reality, it is actually difficult to define in a universal way. Poverty is not only related to the amount of money that a family has access to (income); the UN Habitat defines the aspects of urban poverty as follows:

1. **scarce income**, and thus inadequate consumption of necessities including food and safe and sufficient water; problems of indebtedness, with debt repayments significantly reducing income available for necessities;
2. **inadequate, unstable or risky asset base** (non-material and material including education and housing) for individuals, households or communities;
3. **inadequate shelter,** typically poor quality, overcrowded and insecure;
4. **lack of 'public' infrastructure** (e.g. piped water, sanitation, drainage, roads, footpaths) which increases the health burden and often the work burden;
5. **no provision for basic services** such as day care, schools, vocational training, health care, emergency services, public transport, communications, law enforcement;
6. **limited or no safety net** to ensure basic consumption can be maintained when income falls; also to ensure access to shelter and health care when these can no longer be paid for;
7. **deficient protection of poorer groups' rights** through the operation of the law, including laws and regulations regarding civil and political rights, occupational health and safety, pollution control, en-

vironmental health, protection from violence and other crimes, protection from discrimination and exploitation;

8. **voicelessness and powerlessness** within political systems and bureaucratic structures, leading to little or no possibility of receiving entitlements; of organizing, making demands and getting a fair response; or of receiving support for developing their own initiatives. Also, no means of ensuring accountability from aid agencies, NGOs, public agencies and private utilities or being able to participate in the definition and implementation of their urban poverty programmes.[4]

The right to the city

Data, figures, graphics and projections are a fundamental aspect of the studies about informal settlements and urban poverty, but what must not be forgotten is that these numbers and charts represent real people, moving to the city (or remaining there) in search for a better life, despite all the difficulties and danger it might cause them.

This leads us to a very important topic: the right to the city. This concept was first introduced by Henri Lefebvre in 1968, as the right of the people to command the whole urban process, a demand for a transformed and renewed access to urban life. David Harvey has re-proposed and deepened this concept:

> The right to the city is far more than the individual liberty to access urban resources: it is a right to change ourselves by changing the city. It is, moreover, a common rather than an individual right since this transformation inevitably depends upon the exercise of a collective power to reshape the processes of urbanization. The freedom to make and remake our cities and ourselves is, I want to argue, one of the most precious yet most neglected of our human rights.[5]

Harvey says that the right to the city is not only about having access to the city (which is essential), but, mostly, it is about having the possibility to change the city in order to be able to change ourselves. This is what people should be guaranteed when migrating from rural areas to the shiny lights of the city.

Since people are the main protagonists of the whole dissertations, some stories of real slummers have been collected and are presented in the next few pages.[6]

Gaditano Family[7]

Jesu and Imelda, arrived in Manila from Samar (an island in the central part of the Philippines) 30 years ago, looking for ways to survive.

In Samar, they ran a small lumber business, but, due to wild deforestation, it became impossible for them to support their family on a few pesos a day.

Once in Manila, they couldn't find a proper job, and they eventually ended up collecting garbage from rich households. They tried to go back to Samar to raise their children, but that did not work, so they came back to Manila.

Fig. 5 – A girl buying *pag-pag* from Rosie (*Meal of the Day* a documentary by Giselle Santos)

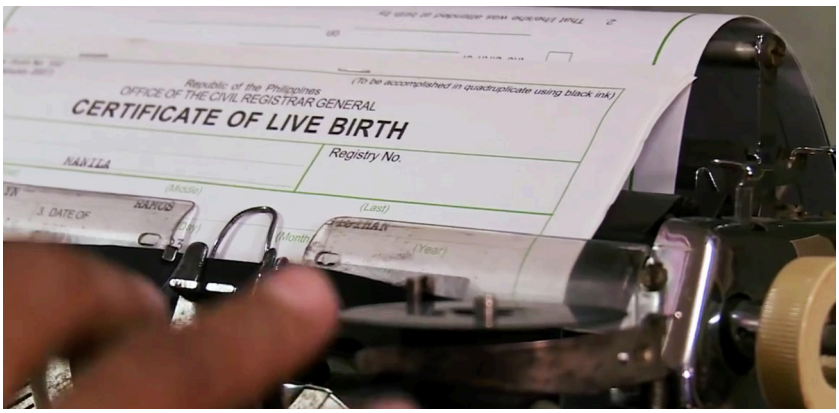


Fig. 6 – Remy also takes care of the registration of newborns (*The slum - Deliverance* Al Jazeera English documentary)

Fig. 7 – The Baseco compound in Manila, where Hernan and Lorna live (*The slum - Deliverance* Al Jazeera English documentary)

Imelda was then hired at the Canossians' seminary to do the laundry of the seminarians and stopped going to the dump site. Jesu usually takes care of the children at home.

They have four children. The eldest son, 18-year-old Edward, has a special talent for drawing. He wants to study arts at a university but, unable to get a scholarship, is now working as a volunteer with an NGO. The eldest girl, 17- year-old Idalyn, wants to take the university entrance test after graduating from high school but, since she is not included in the family register documents, she cannot take the exam. The two youngest boys, Christian (15 years old) and Cretian (14 years old) are still in primary school. They entered primary school late because Jesu and Imelda did not have enough money to pay for it.

Rosie[8]

"I sell *pag-pag* for a living, and I earn about 150 PP a day (2€). As long as there is some meat left and it is barely touched – that's *pag-pag*. We also sort the recyclables such as plastic bags, water bottles, cups and paper.

Pag-pag is leftover food from restaurants. We throw it away if it's really gone bad, or if it is just all bones. If the leftovers have meat left, we keep them to sell. You can tell it's gone bad by the smell, or sometimes we taste it.

Eating *pag-pag* saves us money – we don't have to buy food. *Pag-pag* is our meal."

Remy Permitez[9]

Remy is a self-taught midwife who lives in a tenement apartment in Tondo, Manila. She helps and takes care of pregnant women in her tenement (Paradise Heights) and in the neighbouring slums, like Aroma or Happyland.

Remy is deeply catholic and this makes it hard for her to help young girls have abortions, but she does it anyway. She has started training in a family planning program run by an NGO in her area.

Remy didn't aspire to become a midwife at first, because she has to deal with a lot of dirt, but she felt she needed to use the gift God gave her.

Pagtabunan Family[10]

Hernan is a fisherman. He has lived and worked in Baseco's slum in Manila for more than 20 years. He sometimes takes his youngest children on his boat. He has other eight children.

Hernan says that in the first years he was in Baseco, there were many fishes, but now they are running out. He has saved money for many years in order to buy a motorboat so he can get further out at sea, away from the rubbish of the harbour.

His wife, Lorna, tries to supplement their income selling food and vegetables from the front of their tiny shack.

Six of their children live with them, while the elder three are married.

Lorna says that, although her children have

all grown up, they are useless and only rely on her.

Lorna is worried because Hernan has not been able to catch any fish for some days, even if he would stay out at sea for at least 10 hours a day.

Filipino informal patterns

An essential, interdisciplinary publication has been thoroughly consulted to study the peculiarities of informal settlements in the Philippines: "*Lungsod Iskwater* – The Evolution of Informality as a Pattern in Philippine Cities", by Paulo Alcazaren (architect), Luis Ferrer (architect and environment planner), Benvenuto Icamina (economist).

Philippine urban informal settlement form patterns on the land that reflect the social situation of their inhabitants, as well as their physical location. Five major types of informal settlements can be pointed out:

- *tabing-ilog* (by the riverside)
- *tabing-dagat* (by the seaside)
- along the *riles* (by the train tracks)
- *barangay basura* (by the dump)
- *gillage* (around exclusive villages)[11]

The first three typologies of slums find their origins along transit ways.

The *barangay basura* is a dump-site that provides people an income and a home: people can save a lot on transports living on their very source of money.

The word *gillage* is a contraction between "village" and the colloquial *gilid* ("side"), and indicates the settlements near rich households in the suburbs where servants would move, in order to live near their employers. Villages and *gillages* are easy to recognize from orthophotos: the difference in their morphologies is evident, with the contrast between the villages' larger layouts of streets and open spaces, and the *gillages*' smaller, denser structure, deriving from a more organic growth process.

More generally speaking, informal settlements in the Philippines, as in other parts of the world, are not visible from the city's modern skyline; slums are to be found in the interstices of the formal urban fabric: underneath bridges, on the sides of drainage canals, abandoned constructions sites, and behind the tall walls that often encircle the gated villages of the middle and upper classes.

The architecture of informal settlements addresses the basic needs for shelter from the weather elements, with the minimum of technology, materials and space. The internal spaces of Filipino slums are necessarily multifunctional and, surprisingly, they are often clean and tidy, despite obvious constraints. Whatever lacks in amenities and comfort is partly relieved by outdoor spaces (which is where life is mostly spent) an extension of the indoors, be it an alley or a (very small) square.
This brings to hybrid spaces, since there is no real difference between private and public areas.

Both outdoors and indoors do not have fixed functions: the use of a space varies depending on the hour of the day, the seasons, the day of the week, and so on.

This flexibility in the use of spaces is essential and necessary when dealing with scarcity of available land, and derives from

Fig. 8 – A village *tabing-dagat* (© Neal Oshima)

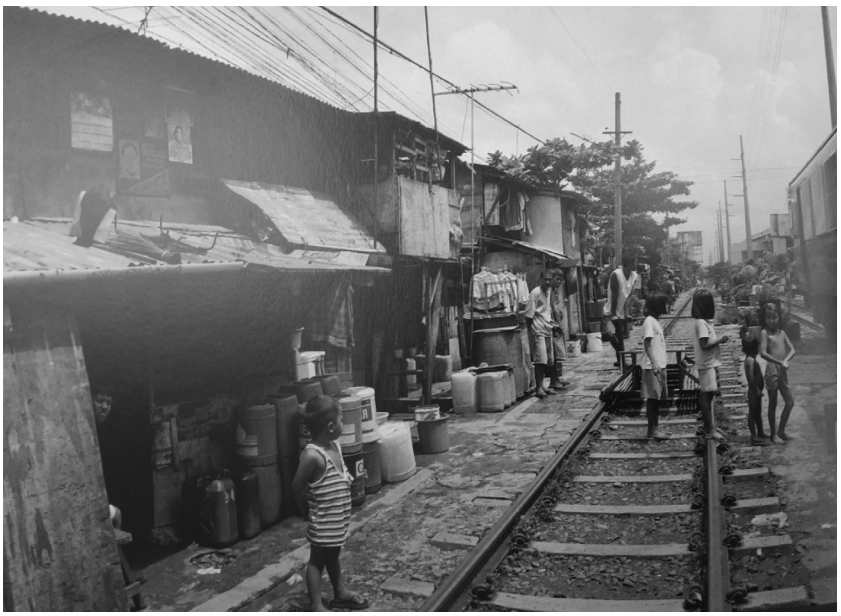


Fig. 9 – A village along the *riles* (© Neal Oshima)

Fig. 10 – A *barangay basura* (© Neal Oshima)

Fig. 11 – A traditional *bahay kubo* (*nipa* hut) on the shore (© Neal Oshima)

the traditional *bahay kubo* (or *nipa* hut), the archetypal model of informal settlements: light materials, raised floor, multifunctional spaces occupied by the nuclear family.

The aggregation of more *nipa* huts would generally represent the extended family, where each nuclear family would occupy one hut, and they would all share the outdoor spaces.

The *nipa* hut always presents these features, in order to efficiently respond to the elements, with as less material as possible: it is raised on stilts, to prevent animals getting inside and to face occasional floodings; it is made of lightweight materials, to prevent the structure from storing heath and to reduce damages and losses in case of disruptive earthquakes; screened big openings, to allow for natural cross ventilation also during rainfalls; pitched roof with large overhangs, to face heavy monsoon rains; a small veranda as a transitional space between private indoors and public or shared outdoors.

Many people in the rural provinces still live in *nipa* huts today, and this is what informal settlers try to reproduce in the urban environment, with the salvaged materials they can afford. Flexibility is what make most of the informal settlers prefer living in slums, rather than in proper buildings, where they are confined in predetermined and, most of all, insufficient spaces and have to face additional costs for electricity and running water.

Notes

1 Davies, M. *Planet of Slums* Verso, London, 2006

2 *The Challenge of Slums* UN Habitat, 2003

3 *Ibid.*

4 *Ibid.*

5 Harvey, D. *The right to the city* New Left Review 53, September-October 2003

6 Fictional names have been used.

7 Katayanagi, H. *Forgotten slums: The Smokey Mountain*

8 From *Meal of the Day* a documentary by Giselle Santos

9 *The slum - Deliverance* Al Jazeera English documentary

10 *Ibid.*

11 Alcazaren, P. Ferrer, L., Icamina, b. *Lungsod Iskwater – The evolution of informality as a predominant pattern in Philippine cities* Anvil Publishing, Inc., Manila 2013


Metro Manila

Territories

A description of the Philippines islands

It is essential for the reader to get acquainted with the geographical, historical and social background of this country, so a brief fundamental description of the Philippines is following.

History's political and economical implications have had a key role on how the Metro region area has developed so far.

Geography

The Philippines are located in the Pacific Ocean, north of Indonesia and south east of China. It consists of 7.107 islands, of which only about 900 are inhabited.

The total area of the Philippines is 294.554 km^2, with a total coastal length of 36.289 km. The largest island is Luzon (north), which is also the most populated, with an estimated 2/3 of the total population living there. The two other main islands are Visayas (centre) and Mindanao (south).

Population

There are about 102 million inhabitants in the Philippines, which thus rank number 12 in the list of countries by population. The density is 343 inhabitants per km^2, making the Philippines not only one of the most populated countries in the world, but also one of the most densely populated[1]. Metro Manila (also called National Capital Region) includes 16 cities and one municipality; Quezon City is the largest city, while Manila ranks second. Metro Manila has a total population of 12,8 million people, as from the 2014 census; projections show that the expected population in 2020 is of 14 millions people, which will likely get to 17 millions by 2030 if the growth rate keeps constant[2].

Climate

The Filipino climate is warm humid and tropical, with an average temperature of 26.6°, that keeps almost constant during day and night, being there very little temperature excursion. The relative humidity level is high, since the islands are surrounded by warm waters: it ranges from 71% in March to 85% in September. This makes the operative temperature particularly uncomfortable during the hot months from March to May. Similar (or even higher) relative humidity levels can be found in Europe, but the average temperature is much lower (see Table 1). Temperature mainly varies with altitude, that's why Baguio City (circa 1500 m above sea level) was designated as the "Summer Capital of the Philippines" in 1903: every summer the government was transferred there from Manila, in order to escape the heat of the lowlands, at least 8 °C degrees hotter.

There are two different seasons in the Philippines: the *Tag-init* (also called *Tag-araw*)

Fig. 1 – (previous page) Satellite photograph of the Philippines (Google Earth, 2016)

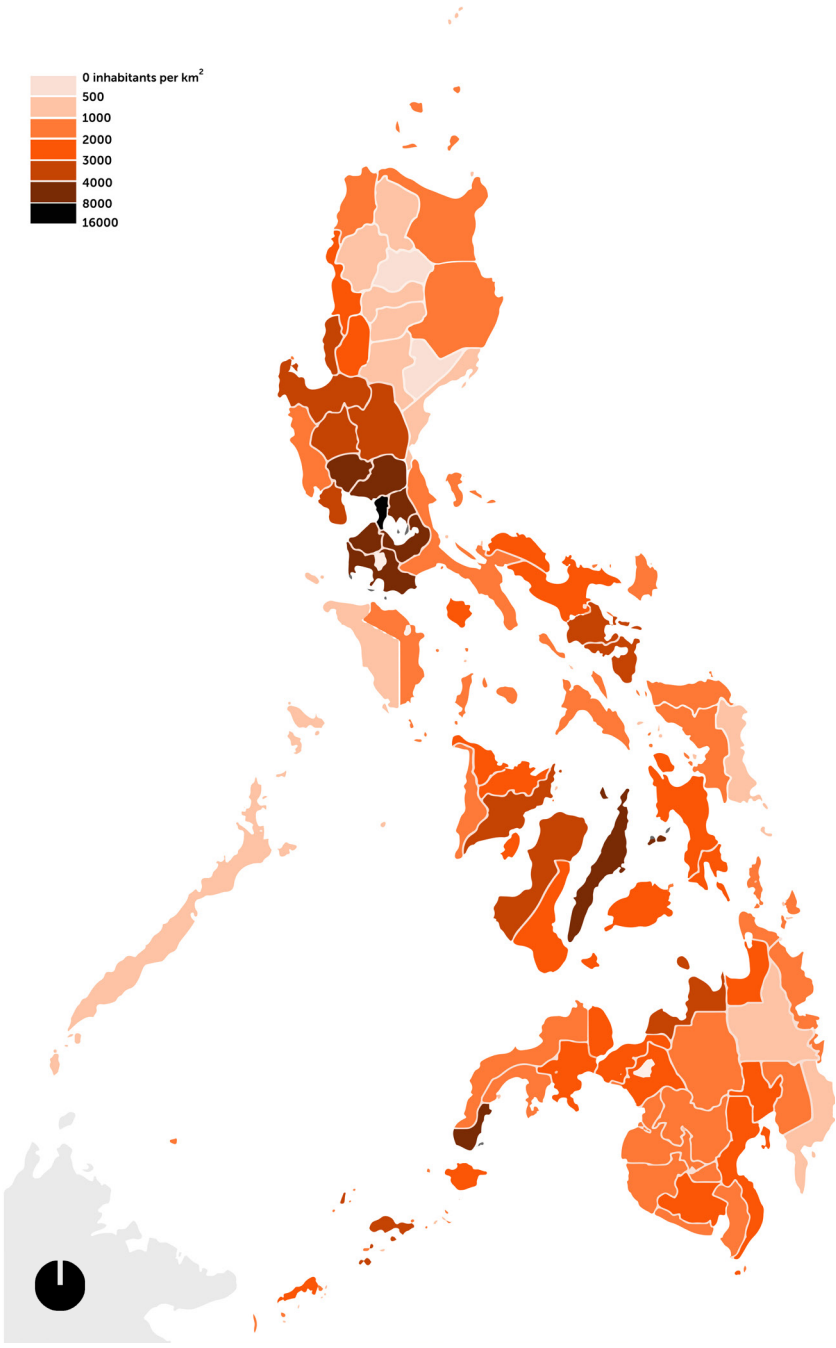


Fig. 2 – Population density map in 2015

	Philippines	Italy	Great Britain
Average temperature (°C)	26.6	13.3	12
Humidity (%)	71%-85%	65%-80%	75%-90%
Annual rainfall (mm)	2000 mm	900 mm	1300 mm

Table 1 – Data comparison between average data in the Philippines, Italy and Great Britain

is the dry season, which goes from December to May and can be divided into cool dry season (December to February) and hot dry season (March to May); the *Tag-ulan* is the rainy season, which goes from June to November. The rainy season brings in monsoons with heavy rainfalls; the northern and eastern sea borders are prone to extremely disruptive typhoons and are usually struck by around 20 typhoons a year, the deadliest of all so far being Typhoon Hayaan in November 2013.

History

The Philippines was a Spanish colony for more than 300 years, from the 16th century, until 1899. The Spaniards first arrived to the Philippines in 1521 with the Portuguese-born explorer Ferdinand Magellano, although some islands were already known to the Europeans. During a later expedition, explorer Villalobos named the islands after the Spanish heir to the throne, Philip II of Spain. In 1571, the Spanish occupied the kingdoms of Maynila and Tondo and established Manila as the capital of the Spanish East Indies, settling on the south bank of the Pasig River, in the Intramuros fortress.

The Spaniards had to fight many battles with the indigenous sultanates, the Chinese (who had trade interests in the islands) and the Muslims (who fought for independency in the southern islands), but they eventually succeeded in imposing a stable control over the country and in Christianizing practically the whole of the population.

The Spanish colonial government lasted until the Spanish - American war. The Filipino revolutionary sentiments that had been spreading all over the country eventually led to a declaration of independency, completely ignored by the treaty of Paris in 1899, by means of which Spain was forced to hand the control of the Philippines over to the U.S.A.

American control (at first colonial, and then as Commonwealth from 1935 to 1946) lasted until World War II, when the Philippines were occupied by the Japanese. The U.S.A. took back their control over the Philippines once the war was finished.
The first democratic elections were held in April 1946, with Manuel Roxas becoming

the first (actual) president of the independent Republic of the Philippines, even though Quezon is considered to have been the first president, since he had been head of the Commonwealth. The United States officially ceded its sovereignty over the Philippines on July 4th, 1946: from that moment on, the Philippines were internationally recognized as an independent country, although still highly economically dependent from the U.S.

Marcos became president in 1965 with democratic elections and imposed martial law by 1972. Martial law was officially lifted in 1981; however, Marcos retained much of the government's power for arrest and detention. Corruption and nepotism as well as civil unrest, contributed to a serious decline in economic growth and development under Marcos government.

Opposition leader Benigno Aquino, Jr. was assassinated at the Manila International Airport on his return to the Philippines after a long exile, in 1983. The opposition united under Aquino's widow, Corazon, and, eventually, a peaceful civilian-military uprising, which is now called the "People Power Revolution", forced Marcos into exile and installed Corazon Aquino as president on February 25, 1986, officially reconstituting democracy.

The current president of the Philippines is Rodrigo Duterte (*Partido Demokratiko Pilipino*), who has been elected in May 2016 and comes after Benigno Aquino III, son of Corazon Aquino. Duterte has been mayor of his city, Davao, for twenty-two years. His political activity has earned him the nickname "The Punisher", for his zero tolerance against criminals, which has indeed decreased the crime rate in Davao, but, at the same time, has exposed him to severe criticism by human rights associations, such as Human Rights Watch and Amnesty International.

Economy

The Philippines is one of the most dynamic economies in the East Asia region, with a globally recognized competitive workforce.

The Philippines has been a rapidly and steadily growing economy over the last 15 years, with a Gross Domestic Product (GDP) of 5,6% in 2015[3], and rank number 39 in the International Monetary Fund list of countries by GDP of 2015.

Many western countries have invested in the Philippines for two main reasons: the low cost of labour and the education of the people, which is higher than the average level that can be found in other Asian countries. The most important economic sectors are agriculture, electronics, shipbuilding, automotive, outsourcing and tourism.

However, only the upper classes are benefiting of this economic growth. The middle class is constantly emigrating to western countries in order to send money back home: remittances from expatriate represent about 10% of GDP[4] and are one of the country's most important voices of income, which the government highly relies upon. The lower classes live in makeshift towns in the most hazardous areas of the cities, striving to earn 150 PHP a day (1€=57,3 PHP).

The World Bank has been collaborating with the Philippines since 1957[5], mainly

providing loans for the development of rural areas and the agricultural sector, but more reforms and improvements need to be implemented.

Religion

The Philippines have a very strong catholic tradition that derives from the Spanish colonization and cultural influence. About 90% of the total population is Christian, and the majority of them is Catholic; many people belong to sects of Christian derivation. About a 5% of the population is Muslim, mainly living in the southern island of Mindanao. Some people, mainly tribal groups, still practice traditional indigenous religions.

Notes

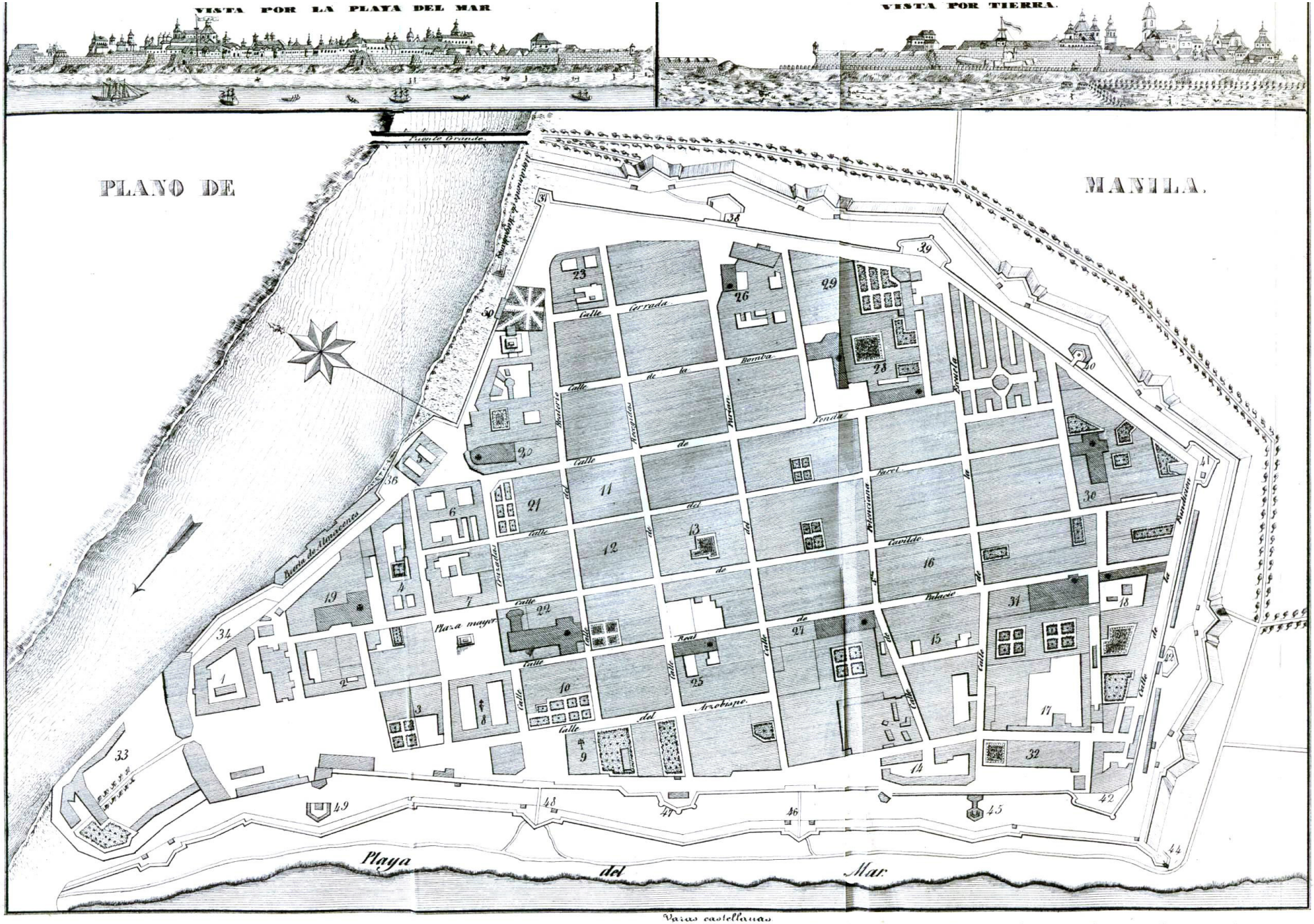
1 Live data collected on April 27th 2016 from www.worldometre.info

2 *The State of Asian and Pacific Cities 2015* UN-Habitat, 2015

3 "Philippines posts strong Q4 growth despite global chill" www.channelnewsasia.com (January 28th, 2016)

4 www.heritage.org

5 www.worldbank.org


VISTA POR LA PLAYA DEL MAR
VISTA POR TIERRA.
PLANO DE
MANILA.
Puente Grande.
Bateria de Abanicos
Plaza mayor
Playa del Mar.
Varas castellanas

Manila

A brief historical overview of its evolution

16th century: the origins of urban Manila

Manila has a history of urbanization that goes back to the 16th century, when the Spaniards established there their colonial capital in 1571, conquering an original settlement right at the end of the Pasig River. The Spaniards built *Intramuros*, the walled city, following an urban template codified in the *Leyes de Indias* (Laws of the Indies)[1]. The Intramuros urban layout consisted of a grid of streets with a central square, surrounded by the church, the houses of the Spanish elite and other symbols of power and authority.

Manila was actually one of earliest colonial capitals in Southeast Asia to be planned with this formal pattern. Urbanization was used as a symbol of hegemony and socio-cultural transformation of the native population.

Outside *Intramuros*, the *extramuros* (*arrabales*) was house to the Asian population: Chinese and Japanese traders, beside the native Filipinos. They were already occupying the swampy lands surrounding both the Pasig River and its canals (*esteros*). These settlements were morphologically organic – formality arrived in the 17th and 18th centuries, when the *nipa* huts[2] began to be replaced by stone buildings.

The Chinese, in particular, settled in the area of Tondo, which was the first indigenous settlement in Manila Bay. Even the native Filipino traders who lived there were considered Chinese, because of their strict relations.

Settlements then kept on spreading along the Pasig and the canals, due to a high increment of population in the first century of colonization: it went from 2.000 people to approximately 100.000. The carrying capacity of the area allowed incremental urbanization, so the effects of crowding were not an issue yet. Growth was also regulated by the Spanish regular purging of the Chinese population: they would send off back to China as much as 20.000 people at one go.

Trade in the 19th century

Manila's growth slowed down in the 18th century, since its economy was solely based on the Galleon Trade.[3] The end of the Galleon Trade in the 19th century, the arrival of new technologies lie steamships and the re-opening of the ports to the other Asian countries brought to irreversible demographic movements. Manila's population grew to 200.000 before the end of the century, despite the wars with Spain and U.S.A.

Trade blossomed towards the end of the 19th century, thanks to efficient transportation along the canals, the Pasig River and the coastline. Migrants from the provinc-

Fig. 1 – (previous page) *Intramuros* map, 1851 (Perry-Castañeda Library Map Collection, University of Texas Libraries)

es would arrive to Manila by water and would settle wherever possible. The Tondo area grew consistently and fastly, becoming one of the most densely populated areas in Manila, mainly occupied by informal settlements.

Urbanization in the American colonial period

The Spanish colonial government lasted until the Spanish - American war.

The Filipino revolutionary sentiments that had been spreading all over the country eventually led to a declaration of independence, completely ignored by the treaty of Paris in 1899, by means of which Spain was forced to hand the control of the Philippines over to the U.S.A.

The turnover to the Americans proved difficult and put additional pressure on Manila, which kept on receiving increasing migrants. Daniel Burnham's plan for Manila in 1905 was due to a colonial regime's perception of the deteriorating environment of Intramuros and the adjacent business and port districts.

Burnham's plan addressed various issues: hygiene, parks, public squares. Transportation would have still relied on water ways, which had been characterizing Manila since its origins.

Parts of Burnham's project were realized in the 1920s and 1930s, but most of it remained on paper. The American urban programs were cut short, since the U.S. public opinion did not agree with such "overseas efforts" and pushed for a more domestic involvement of the authorities.

Formal patterns and informal responses

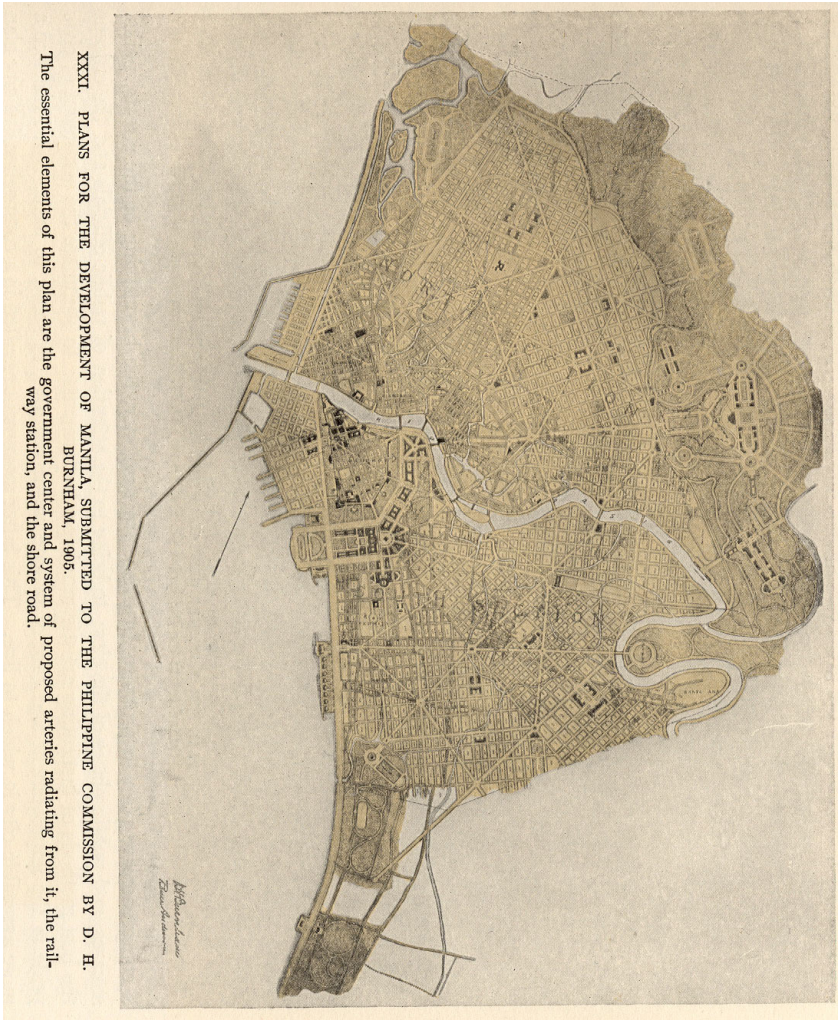
The evolution of the informal settlements sector is strictly linked to the formal one. The urban upgrading that was meant to reshape Manila needed lots of workers to be realized – workers that would go and live near the factories or the building sites they were working in (a practice that continues today), although not always in a legal way.

As more migrants arrived into the city, canals, creeks, riverbanks started to get filled up.

The colonial authorities started to be concerned by the congestion of these settlements. Governors and other officials undertook surveys of the most populated areas, but could not find a solution – they could only point out the terrible health and social conditions people were living in.

In 1926, Vice Governor Joseph Hayden wrote:

> Murphy thereupon appointed an able Housing Committee to prepare the way for the eradication of the Manila slums. The Committee found that approximately 10.000 families, or 50.000 people, lived in slum areas in Manila. The Tondo slums are notorious in Philippine history as breeding grounds for ideas, crime and sedition. Periodically they attract world attention when swept by fires that render multitudes homeless. Within their limits, thousands of fragile nipa shacks are crowded helter-skelter on stilts above low lying land, which, during rainy season, becomes a vast, stagnant and filth-in-



XXXI. PLANS FOR THE DEVELOPMENT OF MANILA, SUBMITTED TO THE PHILIPPINE COMMISSION BY D. H. BURNHAM, 1905.

The essential elements of this plan are the government center and system of proposed arteries radiating from it, the railway station, and the shore road.

Fig. 2 – The Burnham plan for Manila, 1905 (The Commercial Club, Chicago)

> fected mire. In them under-nourishment and such disease as *beri-beri*, tuberculosis and intestinal parasitism are rampant. In other days (the turn of the century) cholera epidemics carried off their inhabitants by ten of thousands – and would again should modern defences against this disease, common elsewhere in the Orient, be temporarily weakened. From such slums, too, come a large proportion of the gangsters who in recent years have made crime a more sinister problem than ever before in Philippine history. Under such conditions, sound, loyal citizens cannot be produced.[4]

These words were written exactly ninety years ago, and without any doubts we could say that they perfectly describe the situation of 2016 squatters.

Governor General Frank Murphy created a Housing Committee, based on Hayden's report, which built an experimental settlements of thirty one units in Tondo. The intervention was clearly not enough to face the housing issue.

The Commonwealth years

The Commonwealth governed the Philippines from 1935 to 1946 (exception made for the period of exile during World War 2, from 1942 to 1945, when Japan occupied the country). Manuel Quezon was President of the Commonwealth from 1935 to 1944 and tried to address the ever growing housing problem with the Homesite Act of 1936 and the Poeple's Homesite Corporation (PHC), to support house construction and ownership, and the establishment of housing cooperatives. The Homesite Act mainly addressed the middle class, which was also facing a housing shortage.

Quezon then travelled to Latin America. This experience deeply influenced his political views and he engaged himself in a more social position. The government thus acknowledged its responsibility in housing the unprivileged: social housing was provided to many blue collars workers and other wage-earning people living in slums.

Meanwhile, Manila was approaching the million mark of population, but the war obviously put all housing programs on hold.

Post-war urbanization

The U.S.A. took back their control over the Philippines once the war was finished. WW2 had left the country in a state of complete destruction.

Manila was deeply damaged, the Intramuros had been razed to the ground by the American shelling and over 200.000 citizens had been killed or seriously injured.

Makeshift shelters appeared anywhere they could, since people had to make do with what they could find, both in terms of building materials and available areas. Thousands of newcomers from the provinces arrived with the returning citizens.

Despite the losses during the war, population had increased, arriving to over a million and a half by 1950. A pull factor was the pattern of industrialization: industrial plants settled around Manila instead of spreading across the country, for the proximity to the port and the concentration of

Fig. 3 – Manila map realized by the American Army and Navy YMCA, 1932 (www.flickr.com)

labour force and administrative headquarters.

However, industries did not provide sufficient jobs for everyone, and more and more people had to settle for jobs in the informal economic sector: pedicab, scavenging, sidewalk vending, etc.

The progressive deterioration of Manila's central core gave private investors the opportunity to develop the suburbs, addressing the upper and middle class desire to move away from such a degradation. No homes were being provided for the ordinary wage earners, let alone the urban poor.

Urban population kept on growing by 100.000 people per year and squatting became a tangible and visible issue, addressed with unplanned actions such as bulldozing of slums and relocation of the people to unprepared sites, lacking of transportation and livelihoods of any sort, more than 20 km outside the city.
Squatters were considered an urban disease, a "menace to the community", as stated by Manila Mayor Arsenio Lacson in 1957.

About 30% of the relocated people's wages was used to commute to work in the city, so, after few years, most of the relocated people would go back and live in the city's slums, (illegally) selling the house the government had provided them in the provinces to other people. The relocation sites would not offer anything to the relocated people: no jobs for men, no markets for women, no car watching or shoe-shining for children, so there was no source of income whatsoever.

Other than being far from the city, the relocation buildings lacked essential facilities: there were no elevators to reach higher floors (these buildings were at least seven-stories-high), water pressure was just enough for water to reach the third floor, and maintenance was very poor to say the least, not to mention garbage collection, which is still the worse problem that the Philippines have, and haven't managed yet. Medical services were absent or insufficient to provide assistance, so people could only rely on nuns or priests of the local church.

Such urban and spacial degradation can quickly bring to social degradation, and that's what happened then – and is still happening now, in Manila and in all metropolitan cities across the world. Inter-neighbourhood violence spread and caused deaths and woundings.

Alternative programs were tried. One of them was based on the assumption that slummers would have gone back to the rural areas and worked in agriculture if properly trained, and would eventually resettle there; the problem was that slummers did not want to go back to the country, so the program was a failure.

The Marcos era

During the 1970s, the government tried to address the slum issue by means of the Ministry of Human Settlements and the Metro Manila Commission, that would have dealt with regional and metropolitan planning. In 1975, the National Housing Authority (NHA) was established with the only scope of providing houses to the poorest of the poor.

The MHS was initially headed by Imelda Marcos herself, and was the reference body

Fig. 4 – The units provided to ISFs by Marcos. They were located in rural areas, far from any source of livelihood. (Alcazaren, P. Ferrer, L. Icamina, B. *Lungsod Iskwater*)

Fig. 5 – Medium rise social housing buildings by the NHA in the 1970s (Alcazaren, P. Ferrer, L. Icamina, B. *Lungsod Iskwater*)

of the various agencies dealing with the housing issue. The government, however, was more concerned with appearances than with truly addressing the problems of the country, and the work of the agencies reflected that; every project was highly promoted, but in reality they were just a drop in the sea: the NHA built only 400 apartments per year, from 1975 to 1985.
What regularly happened was that the government would clear the chosen areas for the new buildings, bulldozing the existing slums; then, the cost of the apartment would be beyond an average slummer's capacity to pay, so a middle class family would rent or buy it. This approach clearly did not solve the urban poor situation.

For many years, slummers were considered a problem to be hidden from the public opinion and the international media. Imelda Marcos referred to slummers as "plain landgrabbers" and implemented a beautification campaign (high white fences, large billboards, concrete walls, etc.) to hide slums and low cost tenements – which she found distasteful – to the eyes of the wealthy Filipinos and tourists.

From the 1980s on

The biggest change of the last years is the involvement of both international and local NGOs and a more spread awareness of the situation. The estimated backlog is over one million units in the Metro Manila area alone. This means that the Philippines government should do as soon as possible what Singapore and Hong Kong have done in more than thirty years – which is obviously impossible, due to lack of funds and a highly inefficient bureaucracy system, which doesn't allow to identify who is or has been responsible for what.
Propaganda and control over the media are still major governmental tools to hide the facts from the public opinion, even in a democratic republic.

Metro Manila: the world's most densely populated city

Governance of the Manila area has proved difficult over the years.

In 2002 the National Capital Region, also known as Metro Manila, was created. The NCR includes sixteen cities, amongst which we find Manila and Quezon City. The NCR is administrated by the Metro Manila Development Authority (MMDA), who works in strict relation with the national government.

The urban growth of Manila over the last thirty years has been massive and uncontrolled. The population has nearly reached 13 millions people (as from the 2014 official census) , and at least one third of them is living in slums, in the very same conditions described by Joseph Hayden in 1926 – if not worse.

Metro Manila is now one of the biggest megacities in the world. The only European city shown in the chart (Table 1) is London, with more than 10 million inhabitants, while 17 out of 28 cities are in Asia, which is inhabited by the 60% of the world's total population (4.3 billion) and the 55% of its urban dwellers. [5]

Figg. 6 and 7 are photos taken by NASA satellites, in 1988 and in 2014. Manila's metropolitan agglomeration has sprawled in an uncontrolled way in all four directions,

Rank	Agglomeration	Country	2014 Population
1	Tokyo	Japan	37,833
2	Delhi	India	24,953
3	Shanghai	China	22,991
4	Mexico City	Mexico	20,843
5	Sao Paulo	Brazil	20,831
6	Mumbai	India	20,741
7	Kinki (Osaka)	Japan	20,123
8	Beijing	China	19,520
9	New York-Newark	United States	18,591
10	Cairo	Egypt	18,419
11	Dhaka	Bangladesh	16,982
12	Karachi	Pakistan	16,126
13	Buenos Aires	Argentina	15,024
14	Kolkata	India	14,766
15	Istanbul	Turkey	13,954
16	Chongqing	China	12,916
17	Rio de Janeiro	Brazil	12,825
18	Metro Manila	Philippines	12,764
19	Lagos	Nigeria	12,614
20	Los Angeles	United States	12,308
21	Moscow	Russian Federation	12,063
22	Guangzhou, Guangdong	China	11,843
23	Kinshasa	D.R.Congo	11,116
24	Tianjin	China	10,860
25	Paris	France	10,764
26	Shenzhen	China	10,680
27	London	United Kingdom	10,189
28	Jakarta	Indonesia	10,176

Table 1 – The world's largest urban agglomerations; population shown in thousands (from *The State of Asian and Pacific Cities* UN-Habitat, 2015)

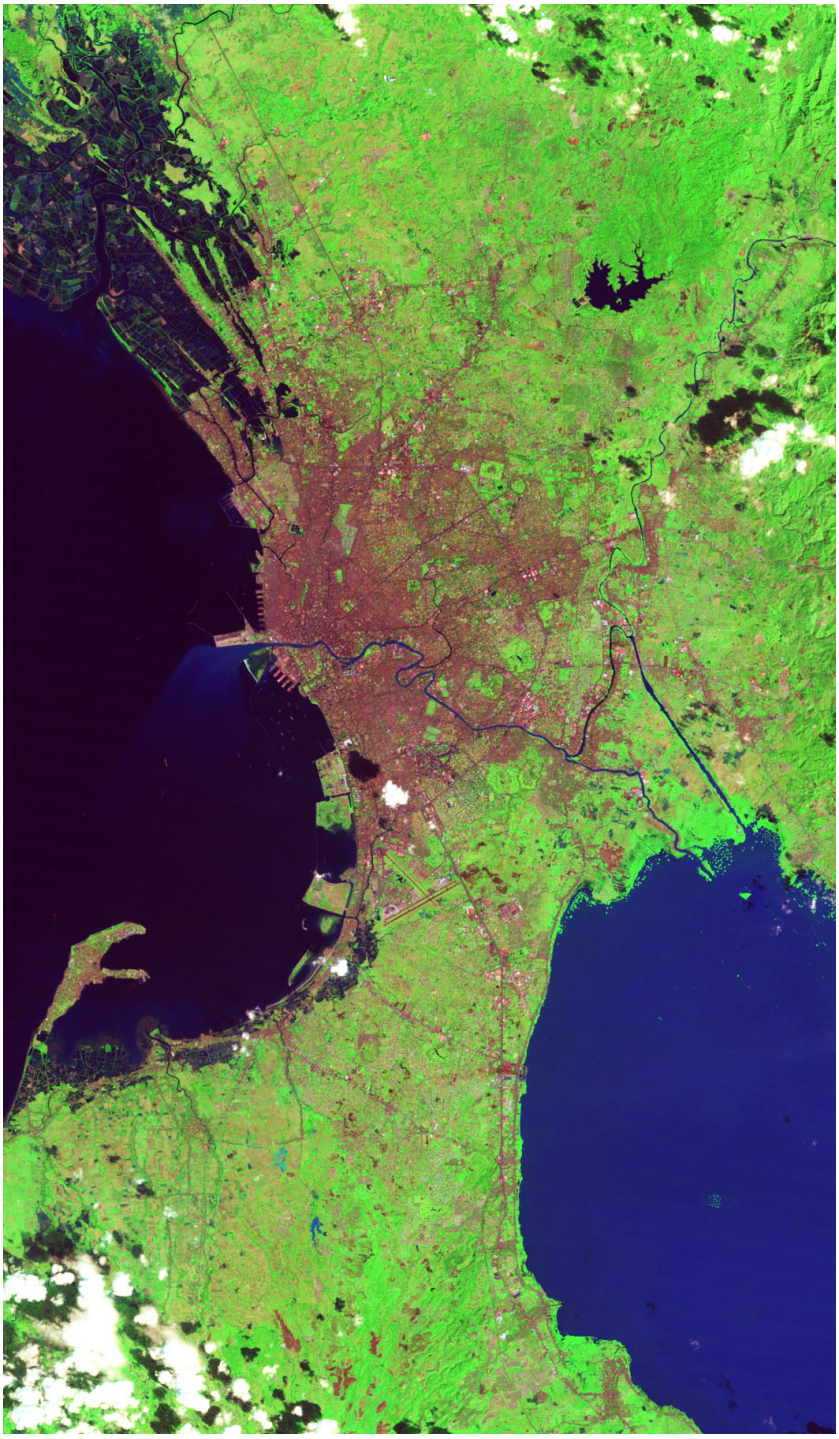
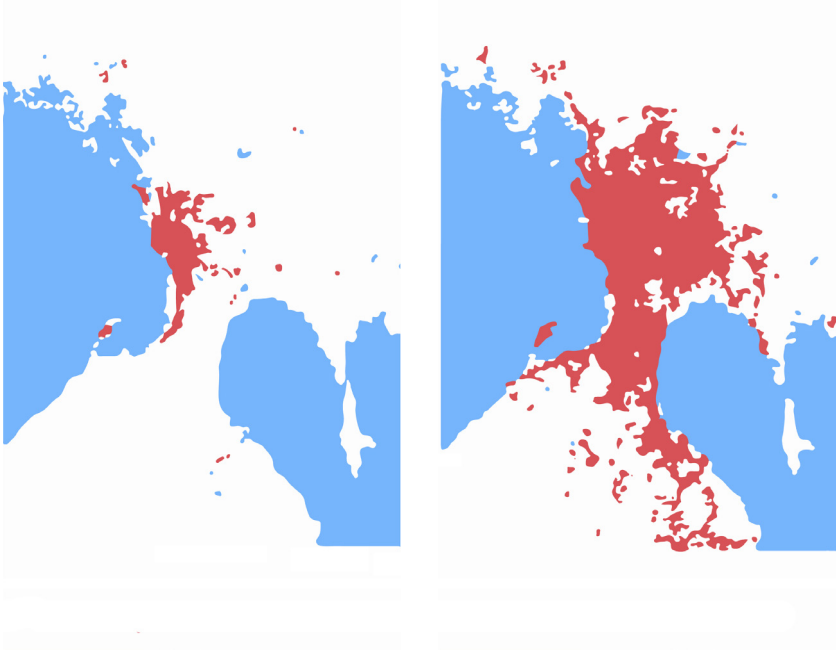


Fig. 6 – Satellite photograph of Manila, 1988 (NASA)

Fig. 7 – Satellite photograph of Manila, 2014 (NASA)



and the urban area has occupied the whole land between Laguna de Bay (East) and Manila Bay (West) .

Projections show that the expected population in 2020 is 14 millions people, which will likely get to 17 millions by 2030 if the growth rate keeps constant.

The World Bank has recently stated :

> Manila's urban area is the Philippines' undisputed primate city, with no close competitors. In 2010, it had 56% of the urban land in the country and more than 70% of the country's urban population. [6]

Although massive, this spatial growth does not adequately respond to the population growth, and this is translated into the highest density of population rate in the world. The average density in the entire metropolitan area is around 40.000 inhabitants/km^2, with peaks of about 100.000 inhabitants/km^2 in Tondo, the most populated district in Manila, which is the chosen area for this study. If Tondo were a city, and not a district, it would rank as the 10th most populated city in the Philippines.

Such a density, paired with extreme administrative fragmentation and inadequate governance, has brought Metro Manila to a situation of total collapse. Congested streets, extremely high population density in disaster prone areas and poor (read: non-existing) garbage management, total absence of public transport are the most pressing issues that authorities should address.

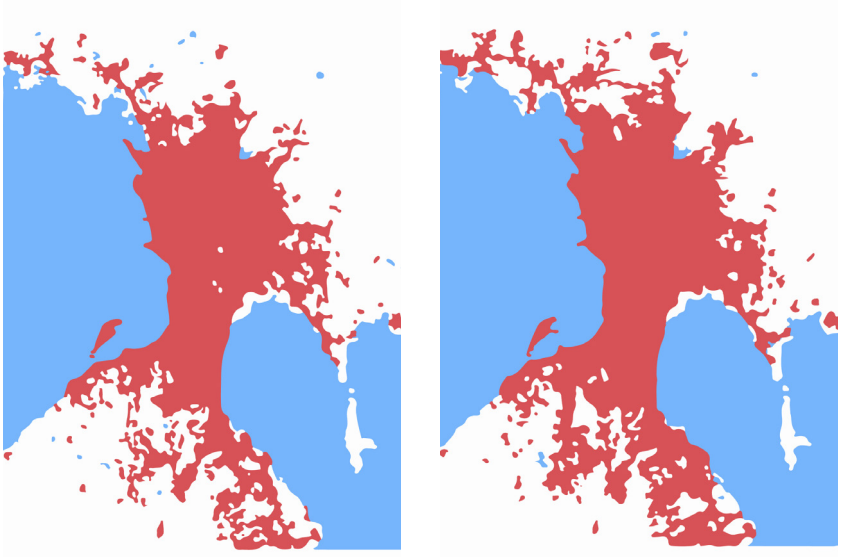


Fig. 8, 9, 10, 11 – (previous and current pages) Metro Manila urban footprint in 1975, 1990, 2000, 2010 (reworked version of the urban footprints detected by Landsat and terraSAR-X data)

Architecture and urbanism can do very little, if the problem is not previously faced from a political, socio-economical and cultural point of view.

Together with seriously planned and implemented interventions on the Metro area, an urgent plan for rural areas development is needed too, in order to allow people to have the possibility to choose where to earn a living. This will only be possible if a regional level planning is adopted, with complete collaboration between all levels of governance: the Metro area (MMDA), cities, districts, LGUs (Local Government Units).

Notes

1 The entire body of laws issued by the Spanish Crown for the American and Philippine possessions of its empire.

2 The traditional Filipino bamboo hut.

3 The Spaniards closed trade with all countries but Mexico, thus creating the Acapulco -Manila trade, which was an actual monopoly.

4 Hayden Joseph in *Lungsod Iskwater – The evolution of informality as a predominant pattern in Philippine cities* by Alcazaren, P. Ferrer, L. Icamina, B. Anvil Publishing Inc., Manila, 2013

5 *The State of Asian and Pacific Cities* 2015, UN-Habitat, 2015

6 *East Asia's Changing Urban Land Escape* World Bank, 2015

The case study

Smokey Mountain and Paradise Heights

Solid waste management, poverty, slums and social housing are strictly connected themes in Metro Manila (MM), since scavenging is the main occupation of the urban poors, who are, at some extent, making up for the lack of a proper waste management system in the Metro region.

Solid waste management in Metro Manila

One of the most problematic issues of Metro Manila is waste management, as it has been reported in the previous chapters.

A few years ago, nearly every waterway crossing the city have been declared biologically dead, because of uncontrolled waste disposal and pollution from transports, garbage and industrial emissions.

There are no programs for a sustainable management of waste, and still now garbage is invading the streets and the canals of Manila. Until recently, MM even lacked an official waste management structure, so many rich households would provide for it by themselves, paying scavengers to come and collect their own garbage. Some rich families still do it.

Efforts have been made to face the issue, but there is no continuity nor planning: episodic interventions are quite useless with such an endemic problem. The Metro area government couldn't afford to pay the waste collectors' wages, so a privatization strategy was tried, but without success.

MM generates about 6 thousand tons of garbage every day; a big part of it is burned, thrown in canals and rivers, or illegally dumped in open air, causing environmental and public health hazards because of gaseous emissions and leachates.[1]

The most important and biggest open air dump-site is now Payatas (after Smokey Mountain was officially closed in 1995), in the north east part of MM. Payatas is heavily polluting the La Mesa reservoir, the most important source of drinking water of the city.

A fishermen village becomes a dump-site

Smokey Mountain (SM) has become a strong, negative landmark in Manila's urban landscape. It was, and still is, the concrete representation of everything that was wrong in the governance of the National Capital Region.

Originally, this area of the Tondo district was inhabited by fishermen, who earned their living by fishing in the rich waters of Manila Bay.

It is still not clear how the area was converted into a dump-site; some say that it was a governmental decision back in the

Fig. 1 – (previous page) Paradise Heights (© David Montasco)

1950s, others say that the disposal site grew spontaneously. What is certain, is that the area soon became the main disposal site of Metro Manila and that the fishermen soon became scavengers, earning a few pesos a day looking for recyclables in the garbage that was dumped there daily.

The waste disposal site earned itself the name of Smokey Mountain for the gases it emitted and the dimensions it reached: more than 30 m in height when it was fully operative.

People coming from the provinces were attracted to this site, since they had no other way of making a living. In the early 1970s, the influx of newcomers was so large that there was not enough garbage for everyone. This brought to serious fights between newcomers and previous occupants, solved by the intervention of the local priest.[2]

In the 1980s, policies against squatters and scavengers became more repressive: Imelda Marcos, the first lady, created the Metro Manila Commission for Squatters, in order to demolish squatter settlements, that had become a reason of international shame for the Marcos regime, as already seen in chapter 3.

The shanties built by the scavengers of Smokey Mountain were bulldozed in 1983. The people who were living there were relocated to Bulihan, in the province of Cavite, more than 50 km from Tondo.
Obviously, authorities had painted a rosy picture of the relocation site, assuring Smokey Mountain residents good facilities and availability of jobs. Anyway, the fact is that 90% of the relocated people were back in Smokey Mountain by 1986, since they had not found any source of income in Bulihan.

Another plan of relocation for the Smokey Mountain residents was proposed in 1987, but thousands of people protested and eventually convinced the government not to implement the plan.

Paradise Heights

Smokey Mountain continued to be the main disposal site until 1995, when the government officially closed the dump-site and started clearing up part of the area to build 30 medium rise buildings for the families who were living there (Fig. 2). The SM residents were not involved in the program, nor they participated in the design process. Most of them simply decided to move to the other disposal site, Payatas, in order to scavenge there.

Temporary units were provided to the people who had not moved to Payatas (about 14.000 people, from the official census), in an area nearby SM. The temporary site was called Happyland, from a distortion of the word *hapilan,* which means "smelly garbage" in one of the numerous Filipinos dialects.

Twenty years after, Happyland is still home to more than 20.000 people living in indescribable conditions (Fig. 3), because newcomers from the provinces went to live in the units left behind by the ex SM residents, who gradually moved to the new buildings compound around 1997. The picture in the following pages describe better than any words the actual situation.

The new compound (Fig. 6 to 13), built by

Fig. 2 – Paradise Heights during its construction. In order to realize the buildings, part of the dump-site was digged out and cleared. The rest of the heap was covered with land. (© Neil Oshima)

Fig. 3 – The "temporary" lodgings in Happyland (www.cnnphilippines.com)


Manila Bay
Harbour Centre
Port Terminal
S.M. 2


San Rafael village
Estero de Marala
S.M. 1
P.H.
Formal *barangays*
Slum area
Estero de Vitas

Fig. 4 – (previous pages) Satellite photograph of the area
Fig. 5 – An alley in Smokey Mountain 2 (from *Meal of the day* a documentary by Giselle Santos)

Fig. 6 – The newer buildings of Paradise Heights, completed in 2014 (© David Montasco)

the governative agency NHA on part of the ex-SM dump-site, was called Paradise Heights. The intervention followed the general operational system we have already seen in Chapter 3, a "one-fits-all" approach: 5-storey-high concrete buildings, with twenty-four units of 17 m^2 each (net area) per floor. Though, a positive aspect must be pointed out: the government chose to upgrade the area itself in order not to relocate the families in new settlements in the provinces.

The original plan was to realize 30 blocks, but only 21 were completed in 1997 for lack of funds, officially due to the need of foundations on poles, more expensive than what had been estimated.

The other 9 buildings were completed in 2014 and have already been given to the selected informal settler families (Fig. 6)

This intervention, as all the others implemented by governmental plans so far, was ideally meant to improve the scavengers' living conditions, but it proved to be the exact opposite and deteriorated their living standards. People did not have any other working ability than the one that had provided for them so far – scavenging – so they were forced to move to other dump-sites or to scavenge in the streets, lowering their income.

Moreover, living in a formal building means that one has to pay for rent and bills, so expenses grew exponentially, while it is yet to be determined whether their quality of life has gotten better or not. Many residents of Paradise Heights say they preferred to live in slums, where they could arrange their home as they wanted, to fit their needs.

Smokey Mountain 2

Although the dump-site was officially closed down in 1995, smaller waste disposal sites arose spontaneously all around the area; eventually, the quantity of garbage thrown in Pier 18 of the port grew so much to earn it the name of Smokey Mountain 2, since it is just across the Estero de Vitas, a few hundreds of metres south from SM 1. More and more scavengers moved near there and just started all over again the same process that had led to the "colonization" of SM 1, proving that the governmental attempts of housing the poor in the city have failed so far, being just top-down interventions, despite all the campaigns and propaganda across the national media.

Paradise Heights now

Paradise Heights, about 15 years after its completion, has become a vertical slum inhabited by about 40.000 people (estimated). Being proper buildings, the compound originally lacked the informality that defines most of slum settlements (we have seen that the words "informal settlement" and "slum" are used in an interchangeable way), but informality has been invading the buildings both in the inside and in the outside, to answer to the actual needs of the people living there. This was also made possible by the fact that the NHA gave up the management of the area all of a sudden, without any explanation. Residents were thus left to deal with the maintenance of the buildings without any know-how and, even more importantly, without any resources to do it.[3]

Many problems can be pointed out, first of all the choice of materials (concrete

Fig. 7, 8, 9, 10 – (previous and current page) Various views of Paradise Heights (Fig. 7, 8 © David Montasco; Fig. 9, 10 from *Meal of the day* a documentary by Giselle Santos)

	Height (m)	m^3/person	Total volume (m^3)	m^2/person	Total area (m^2)
World Health Organization				4,95	
BP 220	2				20
National Building Code of the Philippines	2,4 ÷ 2,7	14,5		6	
Paradise Heights existing units	3,75 (2,05 m living area, 1,60 m mezzanine)	1,94 ÷ 5,80	34,85	0,94 ÷ 2,83	17

Table 1 – Standards set by World Health Organization, BP220 and NBC compared to Paradise Heights density data.

bearing structure, with cement blocks walls), but this can easily be linked to the need of a rapid and economic intervention.

The main problems are definitely the overcrowding of the units and the lack of public and commercial areas.

The *Batas Pambansa* 220 law (BP 220) which is the law regulating standards for economic social housing in the Philippines since 1981, sets a minimum of 40 cubic metres per family, while the National Building Code sets a minimum of 14 cubic metres per person, so a rapid elementary count shows that the smallest standard units would be suitable for a family of 2.8 people, while the average composition of a Filipino family is of 6 people.

In Paradise Heights in particular, the average occupancy per unit is of 12 people in a 17 m^2 unit (34,85 m^3 in volume, if we do not consider the mezzanine, as it is not a space suitable for living, being only 1,60 m high); this leads us to speak of overcrowding, instead of just density.
The apartments in the newer blocks are slightly bigger, but this doesn't solve the overcrowding issue, and in a few years time the same level of degradation will permeate these buildings too, since they were designed following the very same scheme of the older buildings.

The inside of the buildings has been adapted as much as possible to the needs of the residents, by the residents themselves: small front shops (*sari sari* shops), "relax areas" and so on; residents are trying to make the best they can with what they can make up, just as if they were still living in a slum, and to gain as much external space they can.

Electricity and water provision is often controlled by groups of people that have gained power over the community; it is not possible to know whether this authority is just the result of prominence in the community, or of organized local criminal gangs.

The sense of community of PH residents is strong, and overcomes the *divide et impera* policy (i.e.: divide and command) that is

Fig. 11 – Internal view of the tenements. Common spaces as indoor expansions. (www.adb.org)

Fig. 12 – Internal view of the tenements. Some residents have decided to remove the skylight window to improve ventilation (www.adb.org)

generally adopted by the government in the assignation of the units: authorities have an interest in weakening the relations and society structures that had been previously formed in the informal communities, in order to deal with smaller and disorganized groups of people, who would not be able to speak up and have a strong voice in case any issue came up. As a result of these approach, the people who used to live next to one another in a slum area, would be assigned lodgings in different buildings.

The lack of proper spaces for the community, both indoors and outdoors, makes it hard for the local NGOs to properly organize activities and workshops to teach people crafts works or to carry on family planning and feeding programs, so they have to do these in their own spaces, which are often far from the PH tenement.

The only public spaces provided (beside the streets, of course) are two covered basketball courts; the need of covered public outdoor spaces is evident, since in the Philippines (and in the Tropics in general) people spend most of the day outdoors.

Self-help has provided for these people until now – and it is not to be forgotten that informal trade and activities are amongst the most important economic sectors in the Philippines. Informality and the ability of making up with what one can find has also made possible the growth of more structured activities that are involving the local people, helping them to make a living in alternative ways other than scavenging and charcoal making. Small shops and tricycle[4] parking spots have been built all around the tenements and along the perimeter of the remaining part of Smokey Mountain, and they provide much more than the massive, "modern" and "solid" concrete buildings.

Paradise Heights, an overall evaluation

As already said in the previous pages, the units provided by the National Housing Authority are 17 m^2 and house an average of 12 people. Overcrowding combined with wrong choice of materials makes the apartments extremely hot, both during the night and during the day.

From an analysis made with an *Energy* + 3D model of the single unit (through the Grasshopper plug-in Ladybug), the temperature in four particular days of the year (March 21st, June 21st, September 21st and December 21st) have been calculated, at 6 am, 12 am, 6 pm and 12 am. The higher temperature is reached at 6 pm on March 21st, about 32 °C (Fig. 13, 14, 15, 16).

The model does not consider the occupancy data; we can suppose that a high occupancy rate, as in this case, contributes to determine a higher internal temperature than the one resulting from the analysis.

Internal ventilation is also lacking, although the openings could act as inlets of cool air and outlets of hot air, being on different levels, but they are small and divided by the mezzanine slab, so there can't be a continuous air-flow (see Fig. 17). Moreover, the buildings are so close that any natural air movement is obstructed (in some cases there are about 3 m between two adjacent 22 m high buildings). For this reason, cross ventilation is very difficult to achieve.
As previously said, what we are criticizing

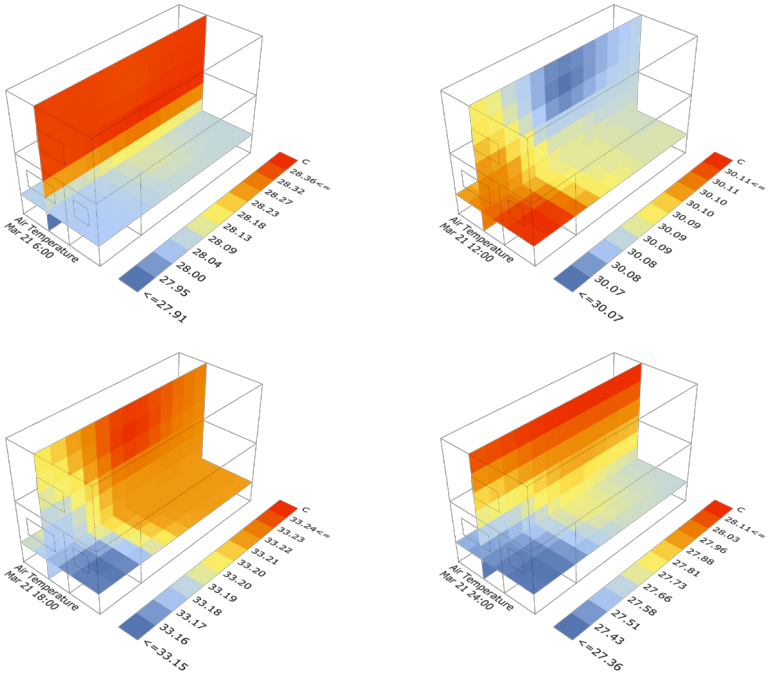


Fig. 13 a, b, c, d – Internal temperatures of a unit on March 21st, at 6 am, 12 am, 6pm, 12 pm.

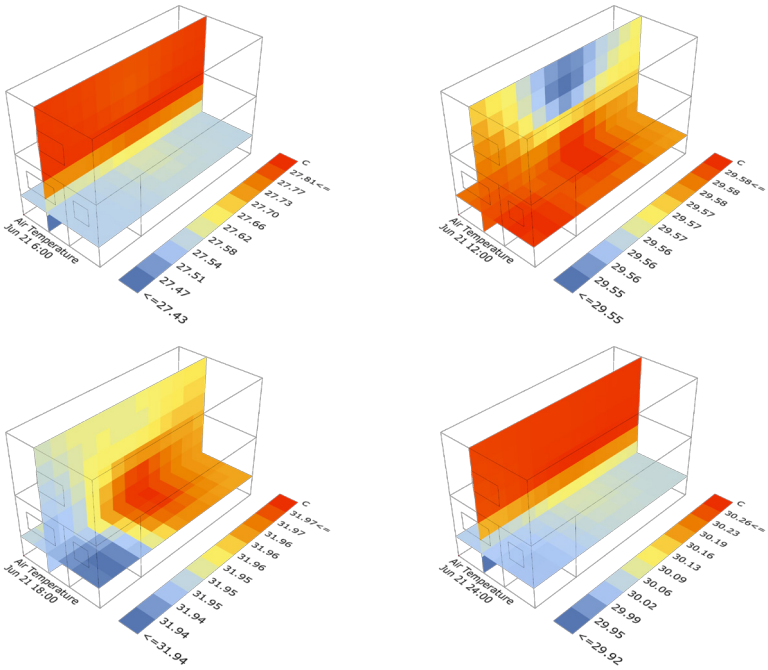


Fig. 14 a, b, c, d – Internal temperatures of a unit on June 21st, at 6 am, 12 am, 6pm, 12 pm.

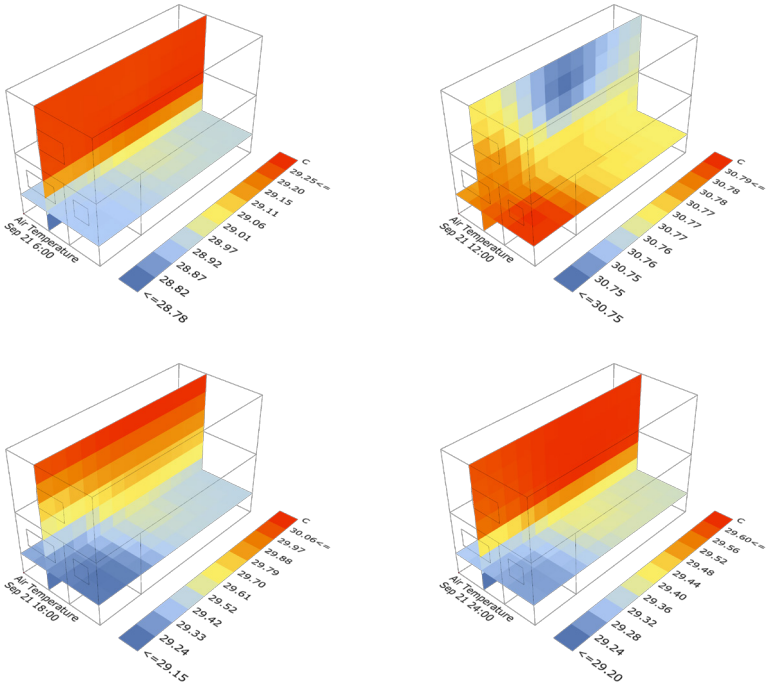


Fig. 15 a, b, c, d – Internal temperatures of a unit on September 21st, at 6 am, 12 am, 6pm, 12 pm.

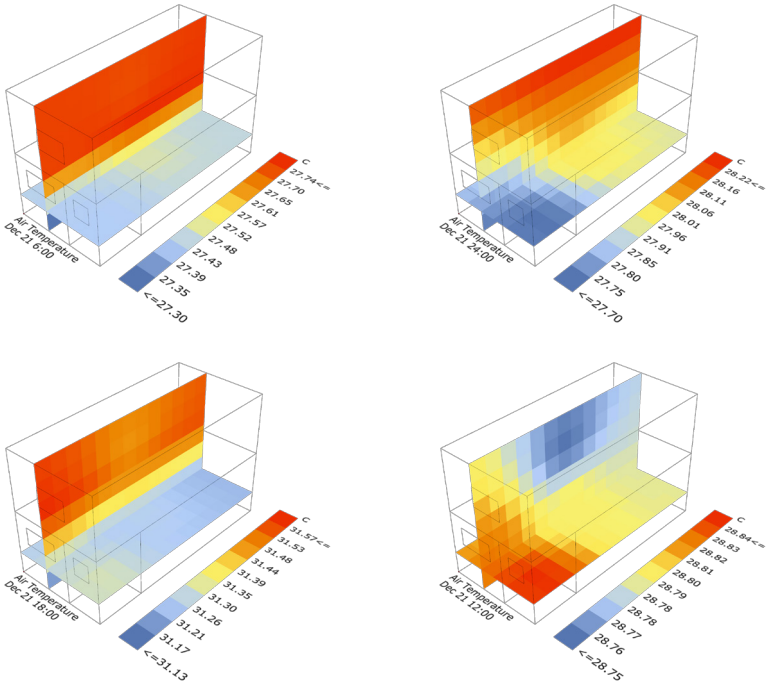


Fig. 16 a, b, c, d – Internal temperatures of a unit on December 21st, at 6 am, 12 am, 6pm, 12 pm.

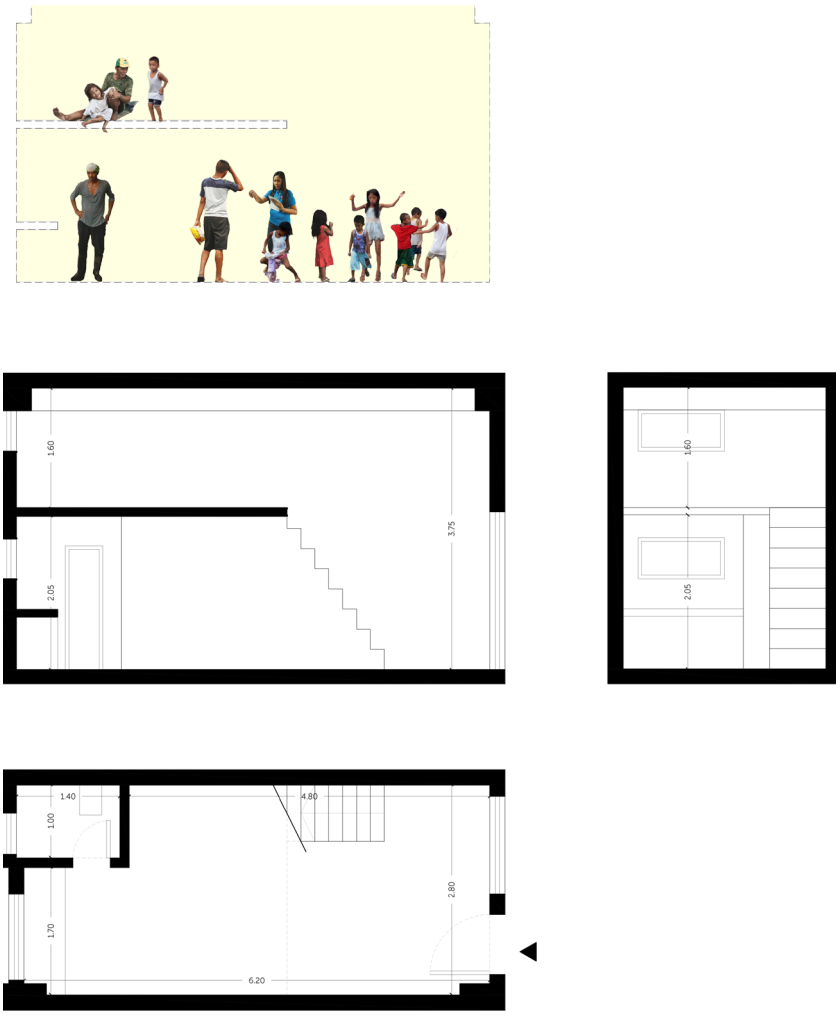
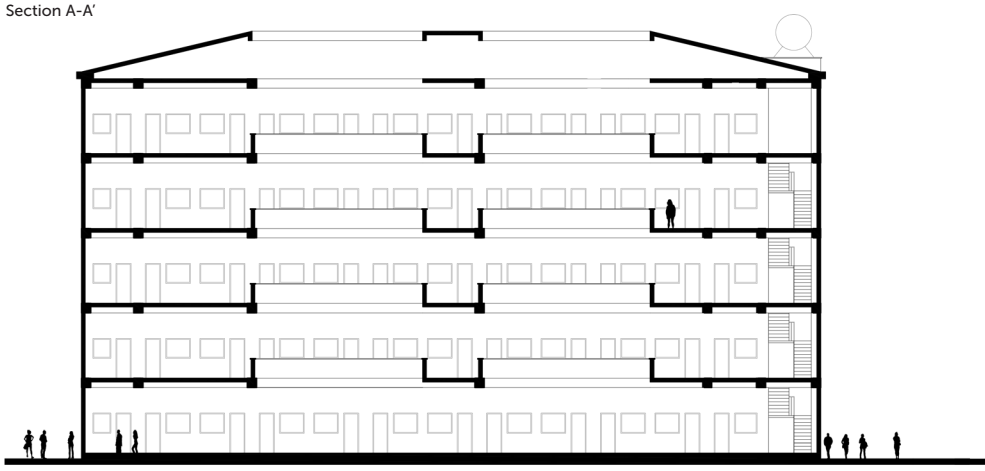
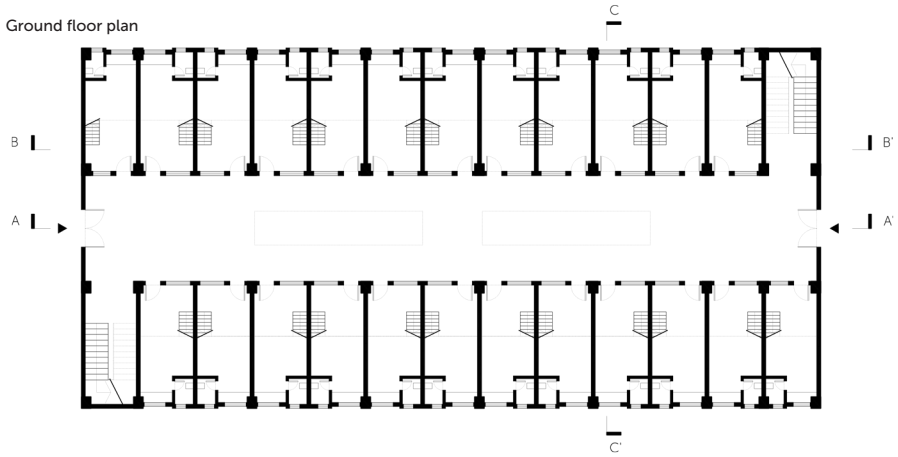


Fig. 17 – Each unit is approximately 17 m² and has a sleeping area in the 1,60 m high mezzanine. The average occupancy is 12 people per unit.

Section A-A'



Ground floor plan



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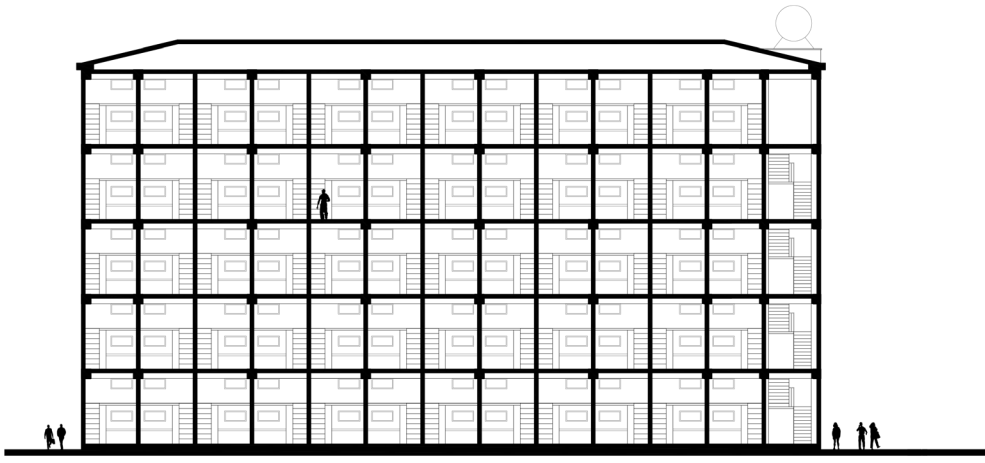


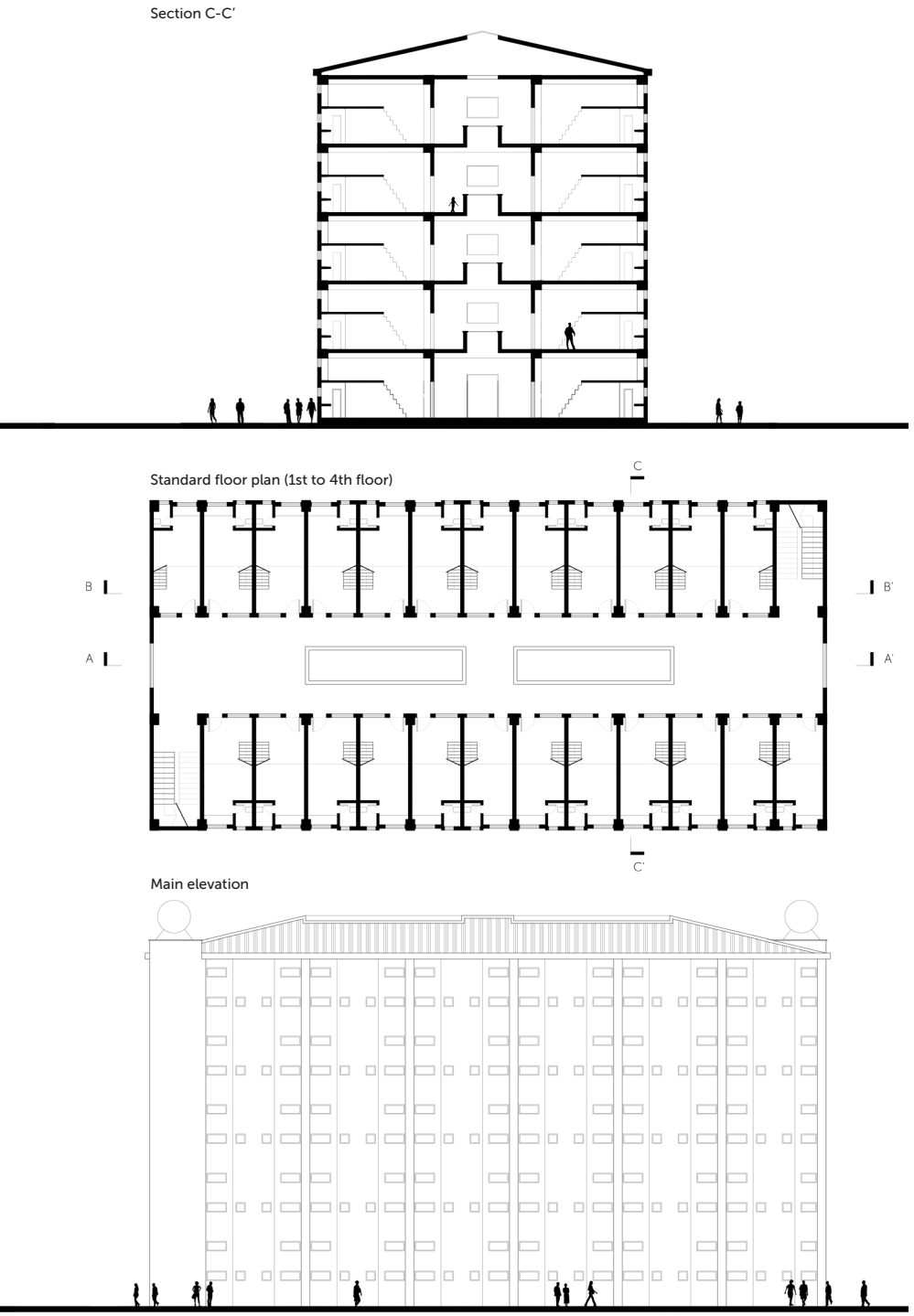
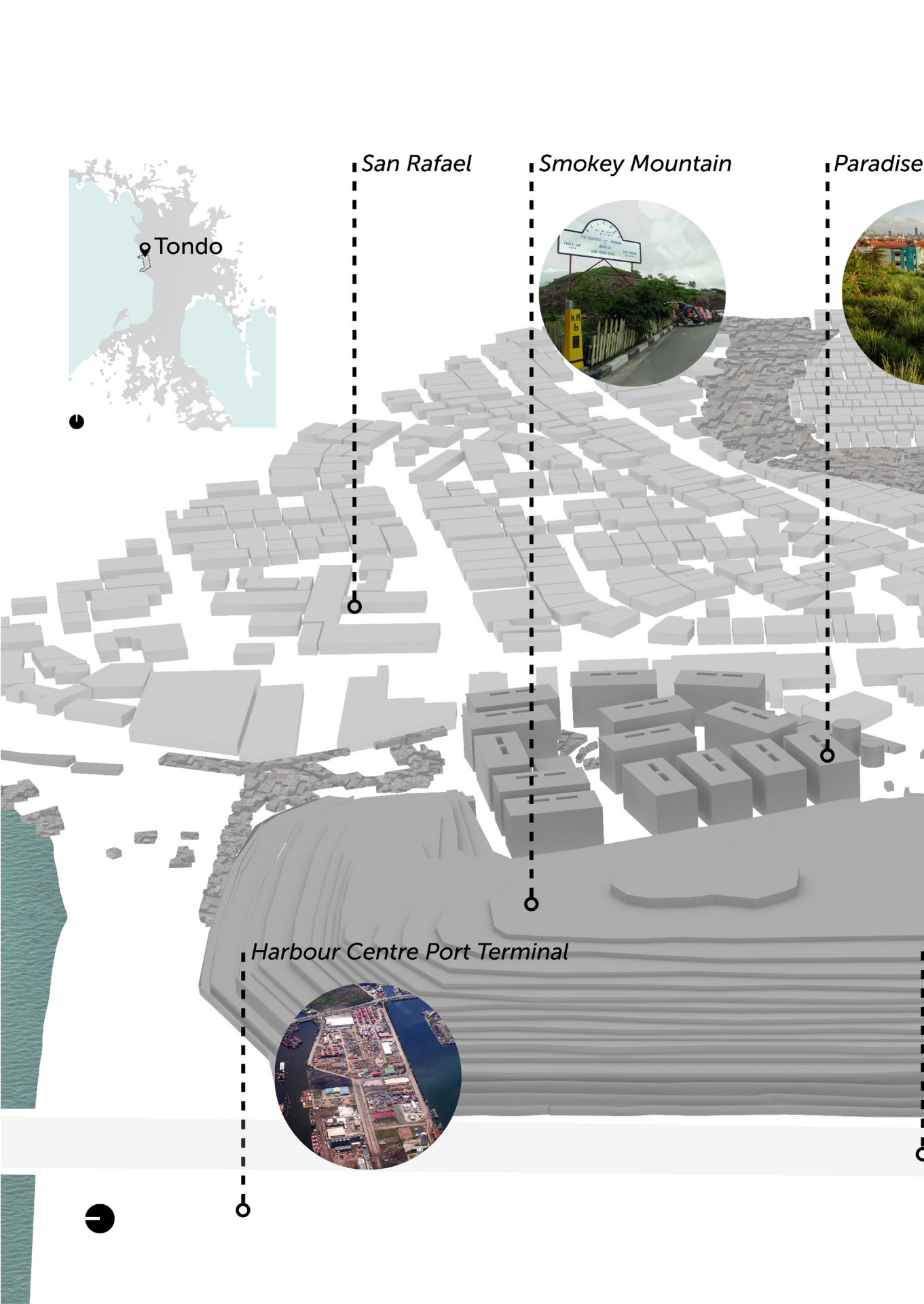
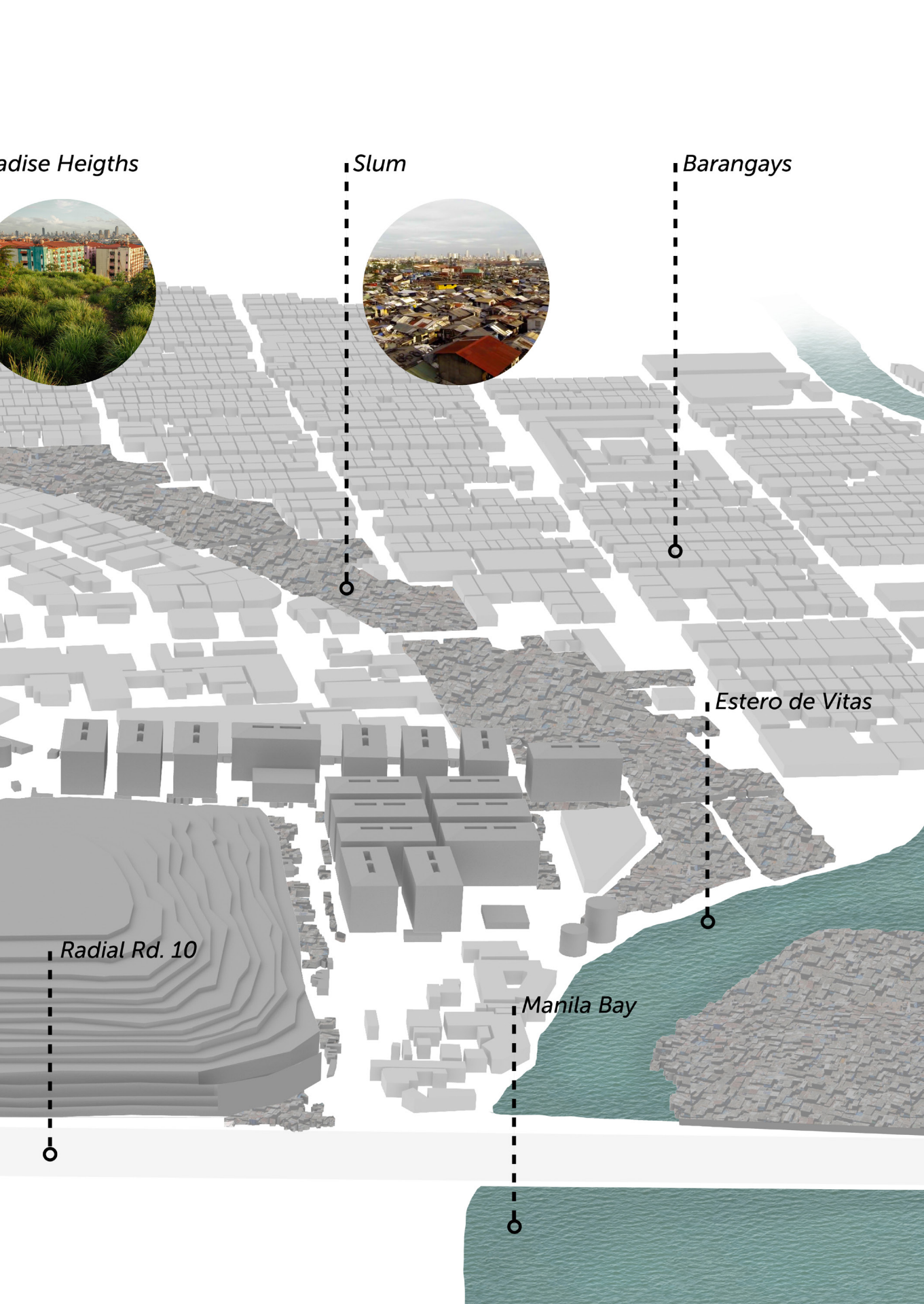


Fig. 18 – (previous and current pages) Sections, floor-plans and main elevation of the existing PH buildings.


Tondo
San Rafael
Smokey Mountain
Paradise
Harbour Centre Port Terminal


adise Heigths
Slum
Barangays
Estero de Vitas
Radial Rd. 10
Manila Bay

about the Paradise Heights existing buildings is not the technological aspect itself, which is completely understandable in a economic housing intervention, but the concept of mini-apartments where spaces have assigned functions, with no possibility of expansion, and the dimensions, based on an average family of 3 – extremely rare case in the Philippines, especially in the poorer classes.

On one hand, with such small land availability and such a high demand for lodgings, it is obvious that a high density approach should be implemented and that the apartments will necessarily be small. On the other hand, high density and overcrowding are very different concepts, and this is what has mainly determined the approach for the housing project that will be described in the next chapters.

The surrounding urban fabrics

The area presents many different urban fabrics that are in a proximity relation and share the same margins, but are quite independent by each other (see Fig. 4 and 19).

Paradise Heights is limited by a continuous wall along the East side, that divides it from the commercial and residential areas right beyond it.

The slum area has progressively filled what originally was a canal, used both for the irrigation of the rice fields and for transportation[5]. The result is an urban fabric that has grown in an organic way, by consecutive additions and filling of interstitial spaces.

The slum is limited by two formal urban fabrics: San Rafael village on the North – West side, *Barangays*[6] n. 130, 131, 138, 142, 146 and 135 on the South – East side.

Based on the classification proposed by Alcazaren and Ferrer (as seen in chapter 1), we might speculate that this slum could have been originated by servants of the adjacent middle-low class village (San Rafael), but no actual document can support this hypothesis.

A part from this potential connection, the different density and scale of these areas facing each other make visible the different incomes of the people that live there.

Fig. 19 – (previous pages) A 3D conceptual view of the case study area.

Notes

1 Medina, M. *The world's scavengers – Salvaging for Sustainable Consumption and Production,* Altamira Press, Oxford, 2003

2 *Ibid.*

3 From a conversation with Shareen Elnashie, a Londoner architect who worked both with Paradise Heights and Katuparan residents (12/05/2016)

4 Typical Filipino transport, made from a small motorbike with a passenger car attached.

5 This has been at first supposed by analysing the shape and the location of the informal settlement, then the hypothesis has been proved by overlapping historical maps.

6 *Barangay* literally means village; in this case it defines the smallest unit of the local government.

The project

Searching for continuity

The project that is described in the following pages is just one of the thousands of answers that could address the current situation in the Smokey Mountain area, and it does not claim to be nor the right, nor the best one. It does not even claim to be *beautiful* – it is just a physical and architectural formalization of a process, an approach that has proven to be successful, though hard to implement and to carry on, which is the community based approach, "from the bottom up".

The one-fits-all approach has repeatedly failed in the years, and big international organizations that provide architectural and urban design services often act with a sort of subsidy mentality, seeing the people they provide this service to as mere recipients of help. The work of architects and engineers facing situations of extreme poverty should not be much different from the work they should do in a more familiar environment: the client is still a person with specific needs and requests, regardless of his/her ability to pay for your service.

Unfortunately, it has not been possible to visit the area during these last months, mainly for safety and bureaucratic reasons, but a careful, thorough research (both on line and in libraries) and interviews with architects, practitioners, NGO volunteers and film makers that have worked in the area and know the situation extremely well, have made this work feasible. Numerous attempts to get in touch with the National Housing Authority have been made without success, because of the lack of a direct contact with the office responsible for the Smokey Mountain project.

The project addresses some of the issues that influence the life of the people living in the area: overcrowding of the Paradise Heights buildings; lack of sanitation in the slum area; lack of covered public spaces; lack of continuity and connection. This last issue, the lack of continuity and connection, is the common thread linking all the various interventions proposed, and each and every building has been designed and positioned keeping this in mind.

The project is made of many pieces: some are small, some are big, but they all concur in the common goal of architecturally represent the sense of community that characterizes the people living here.

Smokey Mountain itself has been considered a resource during the design process. Although it is definitely a negative landmark, it has represented the only source of livelihood for many people for so many years, and could still be so, if strategies for the disposal of all that material will be implemented: a few years ago, the government itself promoted pilot studies on how to re–use that enormous mass, in order to make space for new housing accommodations. One of these studies is by Scott Purdy and Francis Sabugal[1]. This pilot study proves that the organic material of SM

Fig. 1 – A lightweight structure on the beach, providing shelter from the sun and the rain (© Nacho Hernandez)

could be used as an organic fertilizer, once properly divided from the plastics, metals and non–recyclables present. The pilot study was successful, but lack of governmental funds made the full scale application impossible. However, the government did clear and dig part of the disposal site to build Paradise Heights, in order to provide housing to the slummers without relocating them away from their livelihoods, so it is likely that such a thing could be done, in time, with the rest of the heap, thus using SM as a resource of material to be treated (and this could also trigger the lack of occupation issue, creating the possibility of new jobs) and of space to be occupied by new houses. The total area of Smokey Mountain is now about 120.000 m^2.

Mapping

The mapping process represents the first phase of the project.

In order to fully understand the urban landscape and its evolution, historical maps of Manila have been researched (see chapter 3); from the overlapping of these maps, it has been possible to mark various steps that have led to the actual configuration of the area. Not every map covers our area, but it is likely that the area would present the same features as the adjacent areas mapped.

The North end of the 1898 "Plano de Manila y de sus Arrabales" (Fig. 2) made by the Spaniards, shows a system of irrigation canals, which indicates that our area interest (immediately outside the map) was originally next to rice fields, and might have been a rice field itself.

In the 1905 Burnham plan for Manila (see Fig. 2, Chapter 3) it is clear that part of our area of interest was a small island, surrounded by canals on three sides and facing the sea on the West side.

The first map that entirely shows our area is the one made in 1963 by the Army Map Service of the U.S. Army (Fig. 3). Overlapping the 1905 Burnham plan and the 1963 map, we can see that the canal defining the North side of the island in the 1905 maps, has been filled and connects two parts of land that were originally divided, creating Cocomo Island.

We can not say if the slum already existed back in 1963, but the map shows that the area was being urbanized following the patterns that are still present today (the orthogonal system of the Barangays in the South and the organic tendency of San Rafael village).

Comparing the orthophoto taken by the Google Earth satellite (see Fig. 4 chapter 4) with the 1963 map, we can see that from 1963 on, the coastline has progressively advanced, and also that a new port has been built (the Harbour Centre Port Terminal). The port was built with reclaimed land at the beginning of the 1990s by a private contractor, R-II Builders, and is part of the regeneration project of the area, together with the Paradise Heights social housing project by the NHA. Initially, the project included also an incinerator, but it has never been built since it would have been too close to the residential buildings (less than 1 km).[2]

Many pieces, only one goal

The many pieces composing this project

Fig. 2 – *Plano de Manila y de sus Arrabales* (Perry-Castañeda Library Map Collection, University of Texas Libraries)

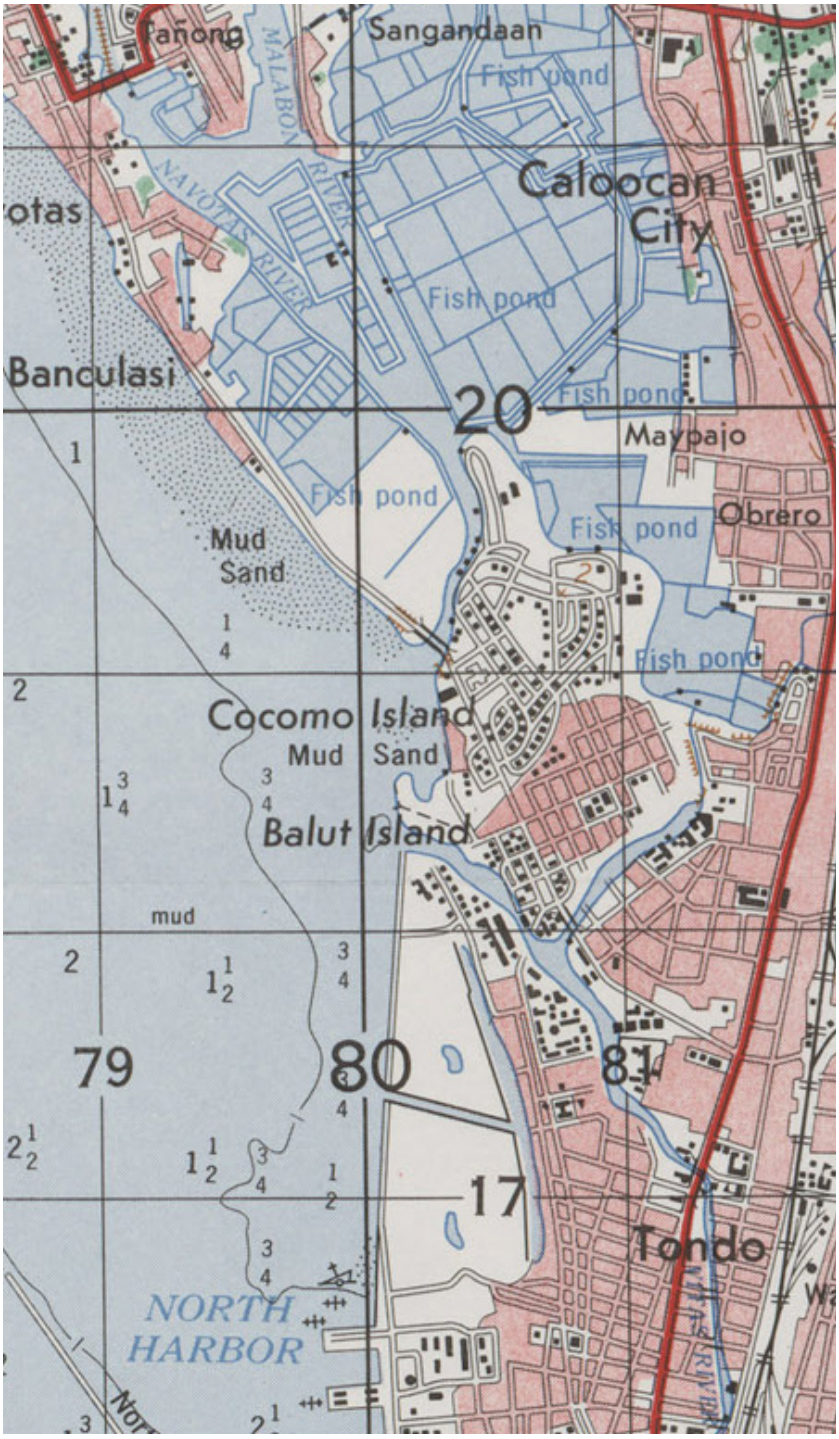


Fig. 3 – Partial reproduction of the Manila map made by the Army Map Service of the U.S. Army (Perry-Castañeda Library Map Collection, University of Texas Libraries)

try to insert themselves in this radicated urban structure in a punctual way, exception made for the housing project, which necessarily differs from the others in scale and, as anticipated, uses SM as a resource of space and initially occupies a strip of land dig along the actual border of SM facing Paradise Heights.

The first phase of the project will address the creation of public covered areas using the ground floors (or part of them) of some buildings in PH. The units that will be lost in this operation will be regained with the construction of the social housing buildings here proposed.

In the second phase, the overcrowding of PH and the need of sanitation facilities in the slum area will be addressed. The units (apartments and makeshift homes) lost in this process could be regained continuing on digging out SM, in order to clear the area and create available space.

These two phases must not be considered as massive and destructive interventions: both of them should be implemented step by step, evaluating the consequences of each action in time, for example: the first step of the first phase could be the use of the ground floor of one building X and the construction of 2 new buildings. If the spaces created are not successful – read: used by the people – the process should stop there.

For the overcrowding part of phase 2, however, the situation is different: the process is only meant to offer alternative and bigger lodgings in the same area, to alleviate the overcrowding of the buildings, and not to insert there new different functions.

The many pieces we have been talking about are:

- covered public spaces
- alleviation of the overcrowding issue
- new social housing intervention
- diffused sanitation facilities for the informal settlement
- a family planning and vaccination centre
- a junk shop.

The actual final layout of the area could be much different from the one proposed in this project, but this is a variable that has been taken into consideration and is considered a necessary part of a community based approach.

Water supply and sanitation provision

Another recurring theme of the project is water supply and sanitation provision, a crucial issue in the Philippines and other developing countries, managed by governmental agencies as well as NGOs and international bodies.

The distribution of access to adequate water and sanitation in many countries mirrors the distribution of wealth. Access to piped water into the households averages about 85% for the wealthiest 20% of the population, compared with 25% for the poorest 20%.

Inequality extends beyond access: the poorest people not only get access to less water (and to less clean water) but they also pay some of the world's highest prices: people living in the slums of Manila (as

well as the ones in Jakarta, Nairobi, and many other countries) pay 5 to 10 times more for water per unit than those in high-income areas of their own cities, and more than consumers pay in London or New York.

Since 1997, when Metro Manila authorities privatized water and sewerage provision, there has been a focus on increasing access to clean water. Sanitation has received less attention, partly because of the big scale of under-provision and of a legacy of underinvestment.

The following sections will describe how the issue of sanitation and water supply has influenced the design choices in the various "pieces" of the project.

Covered public spaces

The existing buildings of PH propose the same situation of the whole area, in a smaller scale: a strong relation of proximity, but no continuity; each building works separately from the other and there is no connection with what is happening in the streets, which is where these people's life takes place (Fig. 6).

Ideally, parts of all the 30 buildings could be used as public covered spaces, but this would cause an enormous displacement of people: even if we considered using only half of the ground floor, it would mean to lose 12 apartments/floor in 30 buildings, making a total of 360 apartments; knowing that each apartment has an average occupation of 12 people, it is clearly not possible to implement such an intervention.

Specific buildings have been pointed out because of their position; some of them have been used in total and others only in part, with a total loss of 120 units.

The buildings that have not been selected for this purpose will concur in the process of connection by simply opening their ground floor corridor and making it become a secondary covered street. The corridor is 5,60 m wide, which is even more than the distance between some of the buildings, and has a height of 4 m, so it has got the proportions of an urban space, considering the different perception of density and heights that defines the Filipino urban structures.

The final result is a dense fabric of pedestrian streets that connects all the buildings with a diffused capillary system, and wide, open covered spaces that will act as public verandas, or might incorporate existing or new commercial activities, or open air workshop spaces for ONGs activities, as well as being additional gathering spaces for functions and celebrations during the local festivities (Fig.7).

Some of the toilets will not be demolished, in order to have sanitary facilities at the ground floor level, that could be controlled and managed by the people living in the building. The project proposes to keep 1/3 of the toilets, which has been thought a good compromise to provide sanitary facilities without turning the ground floor into a huge public toilet, a situation that would likely cause degradation.

However, once again, this is just a proposal: depending on the needs of the community, we could keep all the toilets, get rid of them all, or keep 1/2 instead of 1/3, and so on (Fig. 8-13).

These spaces have not been assigned a specific use, so that the community will decide what to do with them and, in time, occupy and use them in the most efficient way: workshop areas, verandas, *sari sari* shops (mini-groceries shops, run by families inside or in the front of their homes), and so on, as already said.

This system will work as one with the ground floor level of the new social housing buildings, since the same inter-floor distance has been used. See Table 1 for the detailed quantification of the units involved.

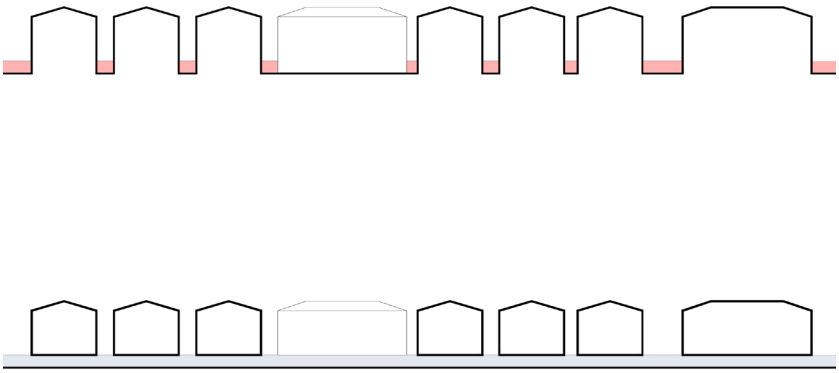


Fig. 4, 5 – Schematic conceptual sections of P.H. actual situation (top) and after the realization of public covered areas, that will continuously connect the ground level (bottom).

Fig. 6 – Map of the actual layout of the area. Each P.H. building is an independent and enclosed block.

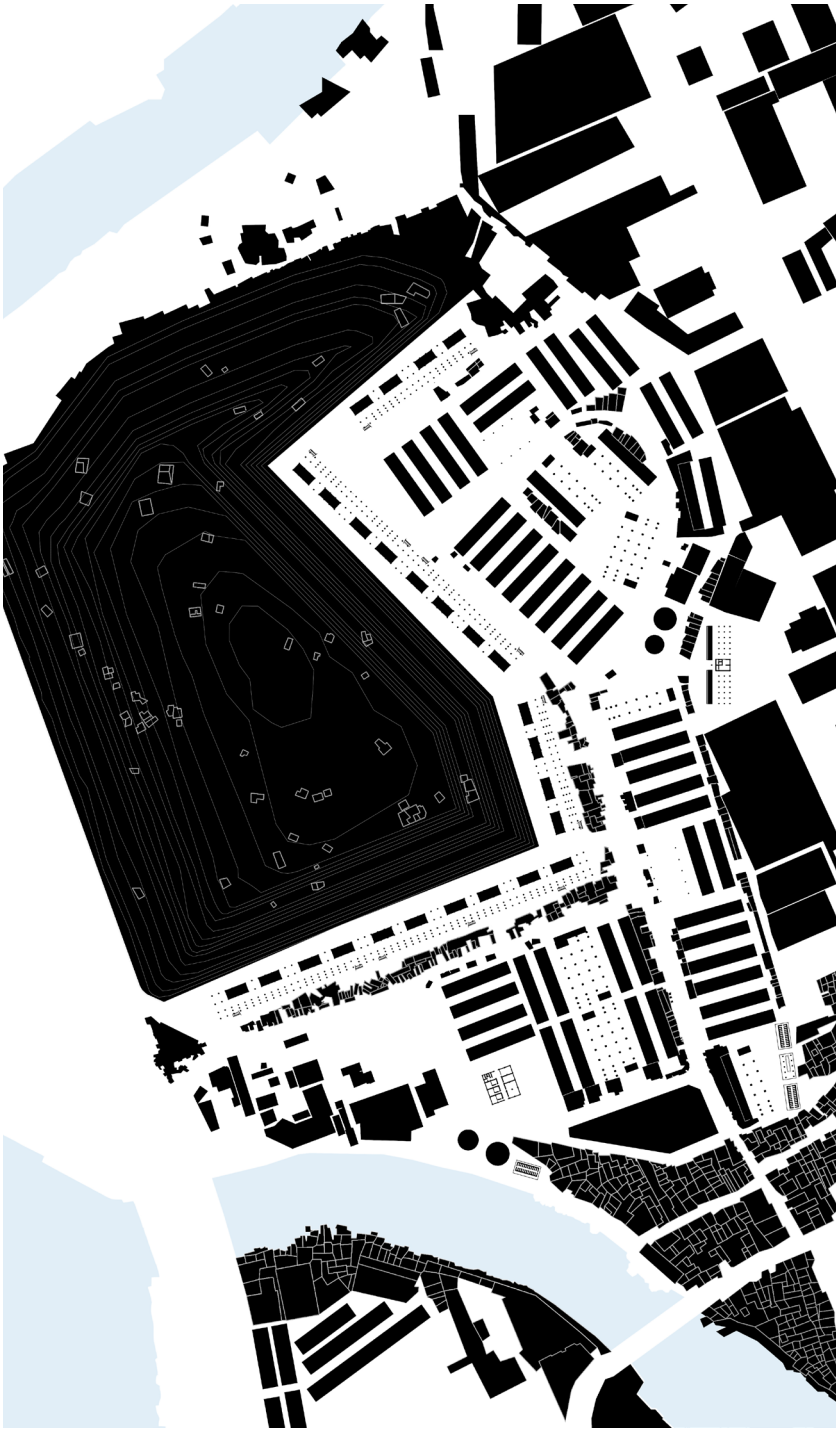


Fig. 7 – Map of the project layout of the PH+ SM area. The use of the ground floors of selected PH buildings allows to create a continuously open ground floor public space, together with the new social housing buildings and all the other interventions.

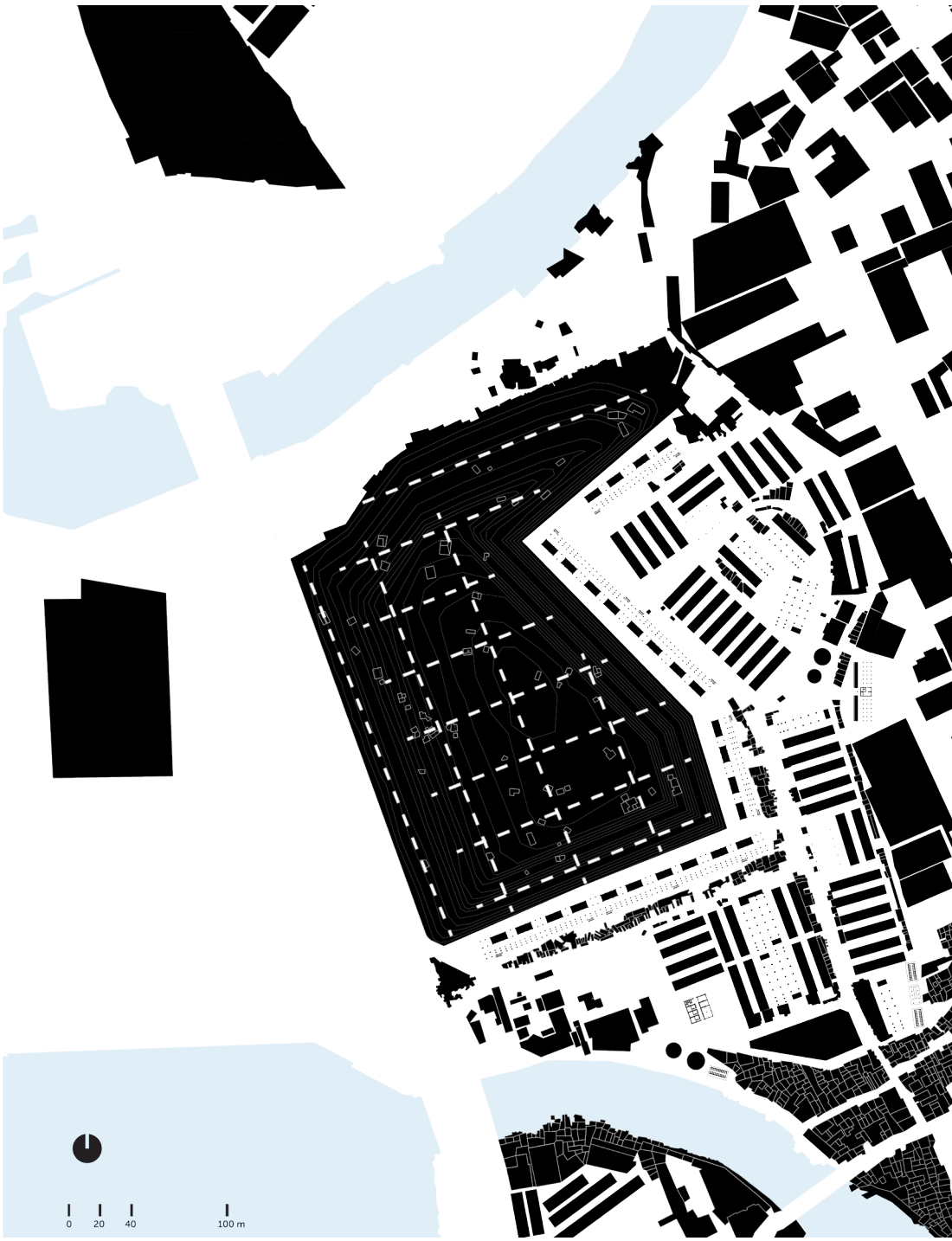
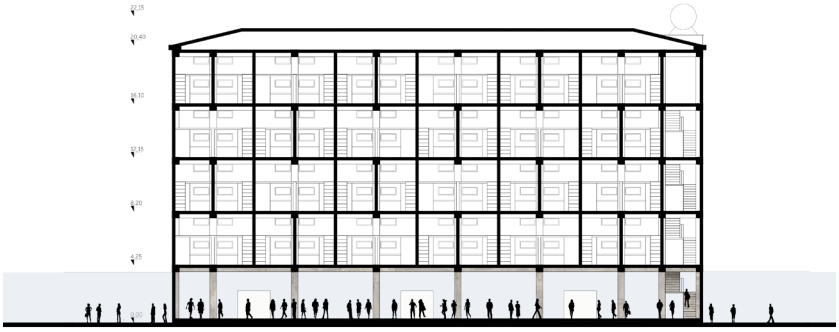
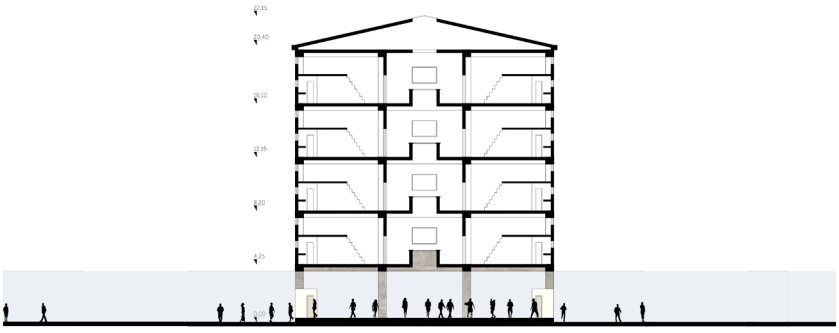

0
20
40
100 m

Fig. 8 – Map of the project layout of the area, including the slum, with a scheme of a possible urban grid for the implementation of the housing expansion after the reclamation of the remaining part of the dump-site.





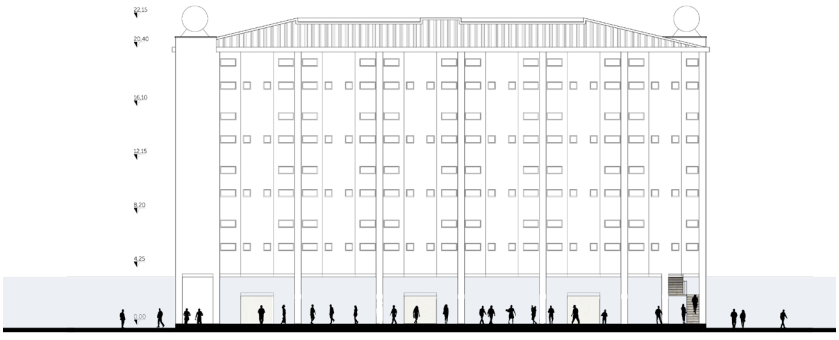
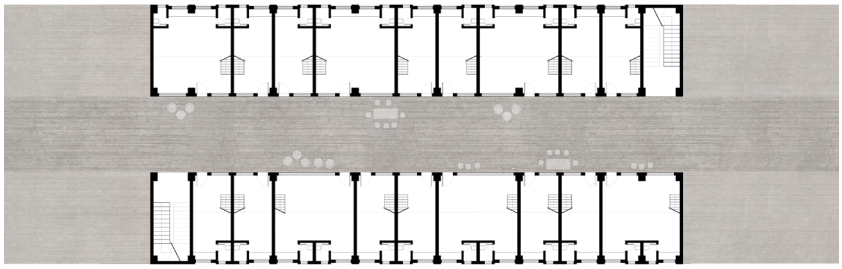


Fig. 9, 10, 11 – (from the top) Longitudinal section, transversal section and main elevation of a P.H. building in the project layout. The longitudinal section shows that some single units (12 per floor) have been paired to create 6 double units.



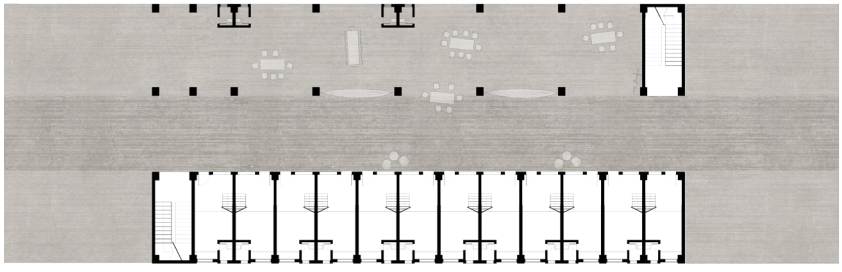


Fig. 12, 13, 14 – (from the top) Standard floor plan (from ground floor to 4th floor); partially public ground floor plan; totally public ground floor plan.

	n
PH buildings with partially public ground floor	4
Units involved per each building	12
PH buildings with totally public ground floor	3
Units involved per each building	24
Total units involved	120
Number of new housing presented	13
Units provided (each building in basic configuration)	104
Units provided (each building in maximum occupation configuration)	416

Table 1 – Number of units involved in the realization of public spaces.

	n	m²
Total demolished units (Smokey Mountain shacks, slum sanitation, Paradise Heights floors 1st–4th)	845	
Area occupied by each new building		1.200
Buildings needed (basic configuration, 8 units/building)	105,63	126.756
Buildings needed (max occupation configuration, 32 units/building)	26,01	31.212
Smokey Mountain area after first phase		92.000

Table 2 – Number of units involved in the alleviation of overcrowding and slum sanitation.

Overcrowding

The overcrowding problem of PH is a complex situation. If we consider the estimate population of the tenement , 40.000 people, and an allowed occupation of 3 people in each apartment (that makes a total of 10.800), we have an over-occupation of 29.200 people. With a basic calculation, we see that 81 more buildings like the existing ones are needed, or 174 if we consider to make the expansion with the social housing building type we propose in this project (taken with its maximum occupancy configuration).
This situation calls for urgent action by the local and national government.

In order not to solve, but to alleviate the overcrowding issue, one thing that could be done is to pair some of the units. We propose to pair 12 units per floor, thus having 6 double units to assign to the most numerous families, and 12 single units for the others (see Fig. 8 and Table 2). This clearly doesn't solve the emergency, but it would be a first step to achieve a lower density. This expansion would need 26 new units in the maximum occupation configuration or 105 in the basic configuration; considering an intermediate situation with different layouts, we can project that the expansion could fit in the remaining part of SM (92.000 m²).

Incremental social housing

The social housing building type here proposed aims at a high density system without stepping into an overcrowding situation.

A medium rise typology has been chosen,

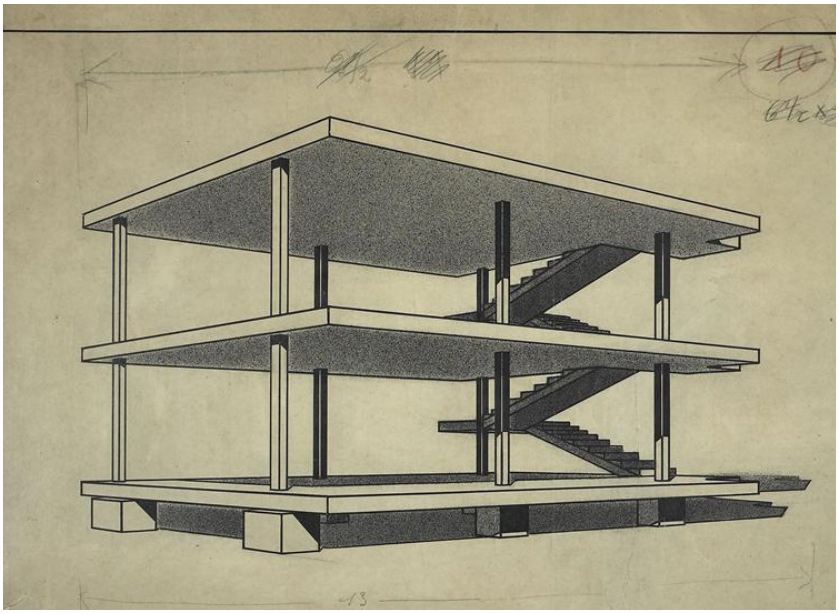


Fig. 15 – Le Corbusier's *Maison Dom-Ino* (www.fondationlecorbusier.fr)

in order to have a good compromise between a high rise building (that would have surely been the best choice in terms of lodgings provided/area occupancy, but would require high technological expertise and substantial economical funds for construction and maintenance), and a low rise single house type (which is generally regarded as the best housing type by the average family, but is not efficient in terms of land use).

The main differences between a high rise building and a low rise building lie in the relationship between the building and the street level: a high rise building uses common stairs and elevators to connect the lodgings to the ground, while a low rise building is directly associated to the ground with a door or internal private staircases. Another difference is about external spaces: generally speaking, apartments in high rise buildings do not have (or have very small) outdoor spaces.

The social housing building here proposed aims at providing the quality of the spaces a family would have in a low rise building, but using the available land in the most efficient way possible.

The main references of the project are Le Corbusier's *Maison Dom-ino,* Charles Correa's work in India and Elemental's work in Chile for economic housing.

The name *Maison Dom-ino* comes from the combination of "*domus*" (Latin for house) and "innovation" (Fig. 14). The *Maison Dom-ino* is a reinforced concrete structure waiting to be filled by people in different and customised ways; it was designed in 1914 to address the problems of post-war reconstruction, and its connection

to the "infill architecture" theme is quite clear. Infill architecture is considered by many a simplistic answer to the ever increasing uncontrolled growth of cities (as, we have seen, it is happening in Manila), but, for others, it is a way of encouraging participation from the inhabitants themselves in building their own environment. For us, infill architecture could be both or neither of these two options; it all depends on the response a specific community gives: it could work in a Rio de Janeiro *favela*, and, at the same time, it could fail in a Nairobi slum.

Analysing how Paradise Heights inhabitants have been customizing their own apartments, and how radicated the DIY (Do It Yourself) approach to life is in the Philippines, especially amongst the poorest classes, an infill architecture approach could work and might as well create a more formal know-how in building techniques. Interviews of PH inhabitants show their lack of a sense of possession of the area, since the lodgings have just been handed to them, and it could partially explain the decay of the area.

Correa's work has been a reference for equity in urban and architectural design. The principles stated by Correa about housing in the developing world have been looked up throughout the whole design process:

> If there ever is a Bill of Rights for housing in the Third World, it would surely have to include – enshrine! – the following cardinal principles:
>
> INCREMENTALITY
> PLURALISM
> MALLEABILITY
> PARTICIPATION
> INCOME GENERATION
> EQUITY
> OPEN-TO-SKY SPACE
> DISAGGREGATION[3]

Correa has been a major reference also regarding the density aspect; we could cite the Belapur housing project as a main example, designed in the 1980s to accommodate more than 90% of Bombay's low-income profile, with a variation from 45m^2 to 70m^2 in lodgings dimensions.

The overall plan of the intervention is a fractal structure, with the repetition on various scales of the aggregation scheme. The Belapur project gets to a density of 500 people per hectare (including all services and public areas and buildings), with low rise incremental houses, where each family has a free-standing dwelling, in order to allow them to expand depending on their own needs (Fig. 16, 17).

Elemental have re-proposed incrementality in their social housing projects in Chile. Amongst their projects, some of the most known examples are Villa Verde and Quinta Monroy (Fig. 18, 19) in Chile, and Monterrey in Mexico (Fig. 20).

Their approach to the social housing issue is simple and effective: with the available funds for social housing interventions, one could build a small house; but if the architects and builders use the available funds to design and build the "difficult half" of the house (stairwells, installations, toilets), and then leave it to the inhabitants to construct an eventually needed expansion for more bedrooms or living spaces in a previously defined free space, the same amount of money could generate, in time, bigger,

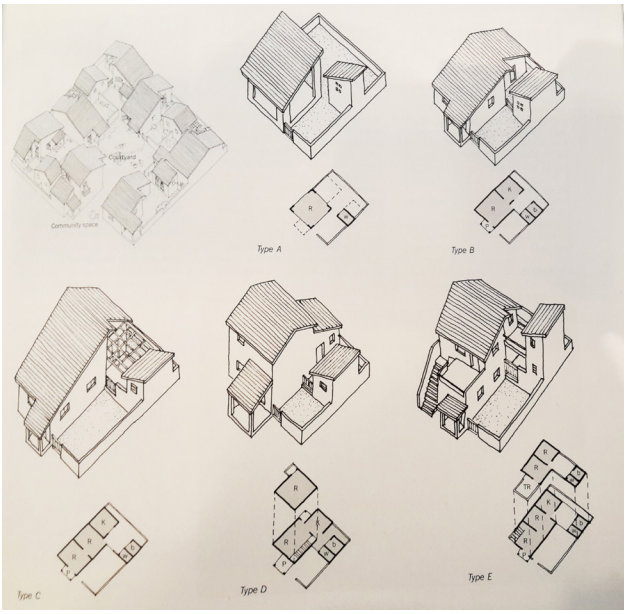


Fig. 16 – Correa's housing project in Belapur: apartments typologies and nuclear agglomeration (Correa, C. *Housing and Urbanization*)

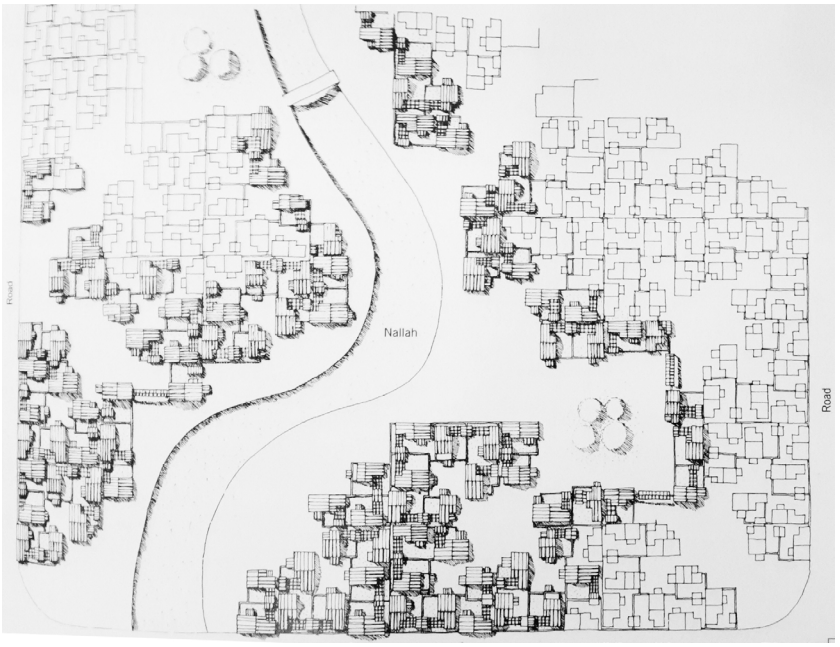


Fig. 17 – Correa's housing project in Belapur: a fractal agglomeration (Correa, C. *Housing and Urbanization*)

Fig. 18 – Elemental's social housing Villa Verde in Constitucion, before and after the inhabitants' expansion (www.elementalchile.cl)

Fig. 19 – Elemental's social housing in Iquique; some units have been expanded, others haven't (www.elementalchile.cl)

Fig. 20 – Elemental's social housing in Monterrey, Mexico (www.elementalchile.cl)

customized and more comfortable houses. The design has also been influenced by "technological" choices, determined by some elementary considerations to be applied when designing for a warm humid climate area:

- trying to enhance natural cross ventilation of the interiors, with openings on at least two opposing façades
- natural ventilation should be possible also during rainfalls
- direct sun shading and protection from the glare of the sky
- wall surfaces not directly exposed to rainfalls
- transitional outdoor spaces around the units
- maximize the use of lightweight materials and minimize the use of solid walls in order to store as less heath as possible
- open plans for the dwelling units in order to enhance ventilation and avoid internal moisture.

These simple indications should be followed for any project in a warm humid area, but they are even more useful when working in poor environments, since they allow to avoid the use of expensive air treatment machines.

All these inputs (and many more) have been read keeping in mind that these principles should have been translated into a building that could fit in the Filipino culture, lifestyle and environment.
The result is a 5-storey-high building with

a reinforced concrete bearing structure, light wooden panels for the walls, water harvesting cisterns on the ground floor.

The key factor of the building is its incrementality, both at an urban scale (simple and regular structure that can easily form an urban grid) and at an architectural scale (for the possibility to expand and/or further divide the provided units in sub-modules).

The basic configuration of the standard floor-plan has 2 units, one that could lodge up to 9 people and another for up to 12 people, with 6,7 m^2 per person. We consider optimal a density of 2 people per 20 m^2 (or 10m^2 per person), but a standard higher than the one set by BP 220 is guaranteed also with a 3 people per 20 m^2 density (or 6,67m^2 per person), which is the minimum area per person set for these projections (see Table 3).

The optimal maximum density achievable is the one described by configuration G: a building with 7 units per floor, a 10 m^2 per person density. In the initial configuration, there aren't units at the ground floor, but 30 m^2 units could be realized for elderly or disabled people, getting to a total of 94 people per building, which represents a +31% increment of the basic configuration. With the same layout, but a higher density (6,7m^2 per person) we could get to accommodate up to 141 people per building, which is a +96% increment.

The schemes (Fig. 22-30) show some possible configuration of the standard floor plan. Configurations that lead to a higher occupation than the one considered as the most efficient are shown also, as it is likely that at least some of the families will occupy all the available space. Obviously, the more the units expand on the floor-plan, the less cross ventilation will be possible: every configuration has its pros and cons.

The maximum occupation achievable is the one described by configuration I: 8 units on each floor, with up to 168 people in each building (which can get to 177 with the realization of two ground floor units).

Intermediate situations will be the real outcome, since each floor in each building will surely present a different layout and a different density.

Four sizes of units are proposed, to be able to meet the needs of different families: the smallest unit is made of one 20 m^2 module, and can be occupied by up to 3 people; the unit made of 2 modules (40 m^2) for up to 6 people; the unit made of 3 modules (60 m^2) for up to 9 people; the unit made of 6 modules (120 m^2) for up to 18 people, which has been considered the most numerous family that can be found.

A maximum compresence of 8 units per floor has been planned, in order to avoid conflicts between too many families sharing the same common areas.

The interior is conceived as an open space which will be adapted to the different uses at different hours of the day, just like the traditional *bahay kubo* hut, which is the main example of the vernacular Filipino architecture, as seen in chapter 1. Despite the dimensions, in every type of unit (exception made for the 20 m^2 one) it is possible to obtain at least one private bedroom, likely to be used by the parents.

The *bahay kubo* characteristics have also concurred in shaping and defining the

	units/floor	floors used	floor total area (m^2) *	area occupied by apartments/floor (m^2)	common covered open area/floor (m^2)	n. of people/floor	n. of people/building
A1 (basic configuration)	2	4	544,7	151,6	393,1	18	72
with g.f. units (6 people)		5					78
A2 (basic configuration with max.density)	2	4	544,7	151,6	393,1	21	84
with g.f. units (9 people)		5					93
B	4	4	545	151,6	393,4	14 ÷ 21	56 ÷ 84
with g.f. units (6 ÷ 9 people)		5					62 ÷ 93
C	5	4	545	173,1	371,9	16 ÷ 24	64 ÷ 96
with g.f. units (6 ÷ 9 people)		5					70 ÷ 105
D	6	4	545	194,6	350,4	18 ÷ 27	72 ÷ 108
with g.f. units (6 ÷ 9 people)		5					78 ÷ 117
E	6	4	545	214,6	330,4	20 ÷ 30	80 ÷ 120
with g.f. units (6 ÷ 9 people)		5					86 ÷ 129
F	4	4	545	234,6	310,4	22 ÷ 33	88 ÷ 132
with g.f. units (6 ÷ 9 people)		5					94 ÷ 141
G (best intermediate configuration)	7	4	545	234,6	310,4	22 ÷ 33	88 ÷ 132
with g.f. units (6 ÷ 9 people)		5					94 ÷ 141
H	8	4	545	274,6	270,4	26 ÷ 39	104 ÷ 156
with g.f. units (6 ÷ 9 people)		5					110 ÷ 165
I (max occupation)	8	4	545	294,6	250,4	28 ÷ 42	112 ÷ 168
with g.f. units (6 ÷ 9 people)		5					118 ÷ 177

Table 3 – Density and occupation of some possible configurations of the standard floor-plan

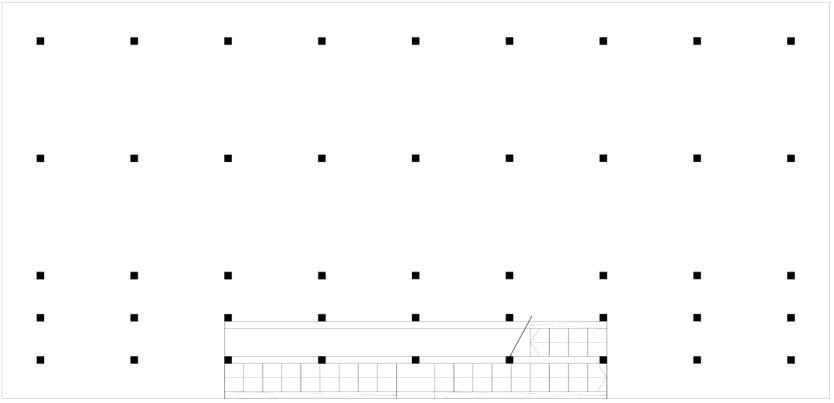


Fig. 21 – The structural layout.

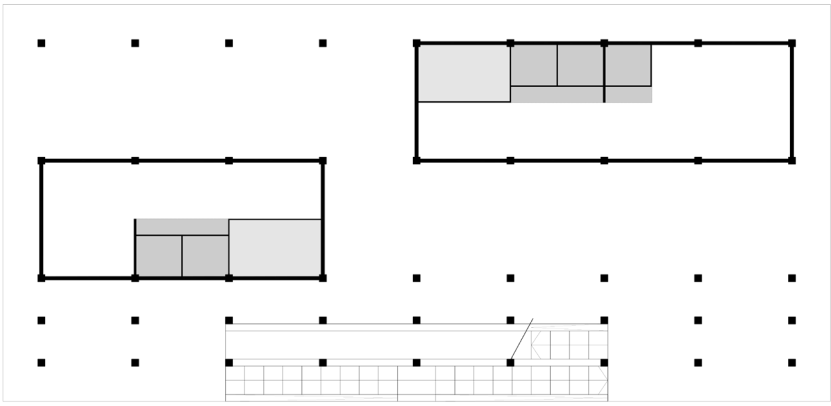
overall building: lightweight materials, large roof overhangs to protect from the rain and the solar radiation, structure lifted from the ground to resist to water in flood prone areas. These are all passive strategies to best fit in a warm humid climate without the need of expensive materials or air treatment installations: they all come from traditional vernacular architecture and can be used in scarce resources contexts to make to most out of what is available, in terms of economic funds and materials.

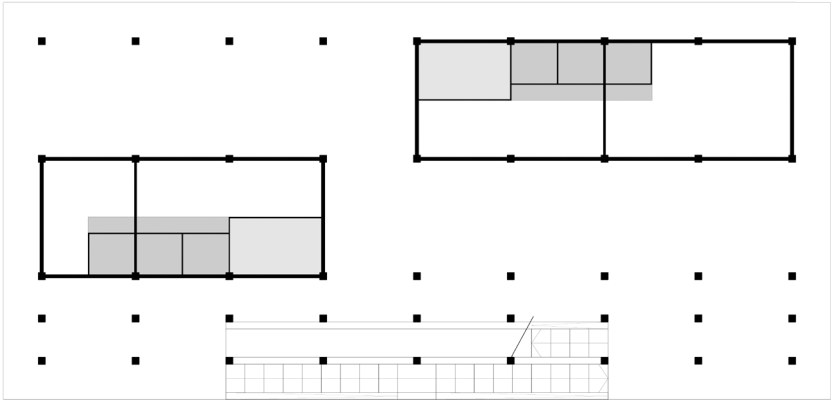
We can easily see that the characteristics of the *bahay kubo* respond perfectly to the requirements of a building in a warm humid area listed above.

The modular structure, the position of the installations and the initial position of the units on the standard floor-plan have been designed to allow for incrementality and flexibility.

The walls are made with lightweight materials, in order to minimize the heath gain of the structure and to allow natural ventilation of all the interiors. The panels are made with coconut wood frames and closed by coconut wood slats or bamboo mats. Internal mosquito nets are provided, and it is possible to add another internal bamboo mat to ensure complete obscurity during the night (see detailed section, Fig. 43).

The expansion of the units is clearly legible in section and also in plan, since the interiors will be defined by wood slats expanding over the concrete floor. The progressive appropriation of the floor-plan is thus determined by the expansion of wood elements over the concrete structure (Fig. 33-41).





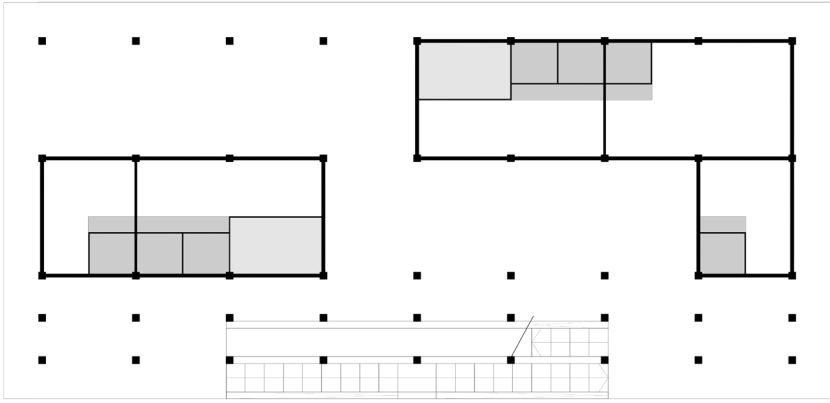
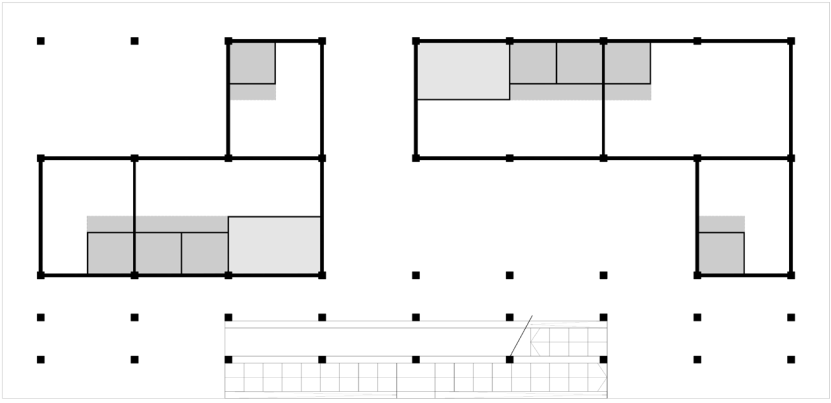
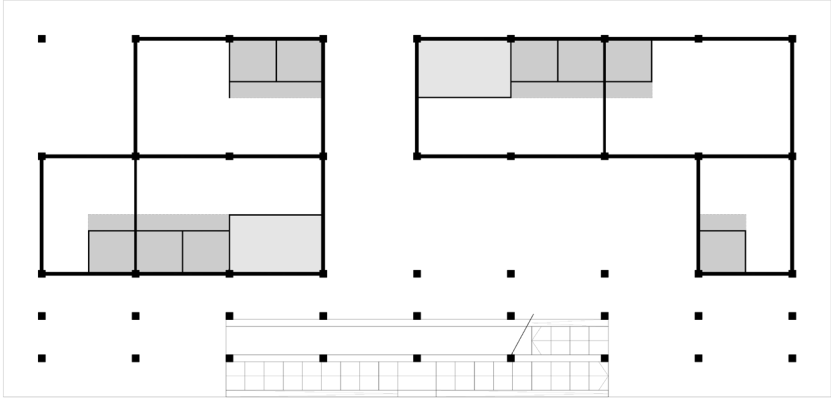


Fig. 22, 23, 24 – (from the top) Configurations A, B, C of the standard floor-plan





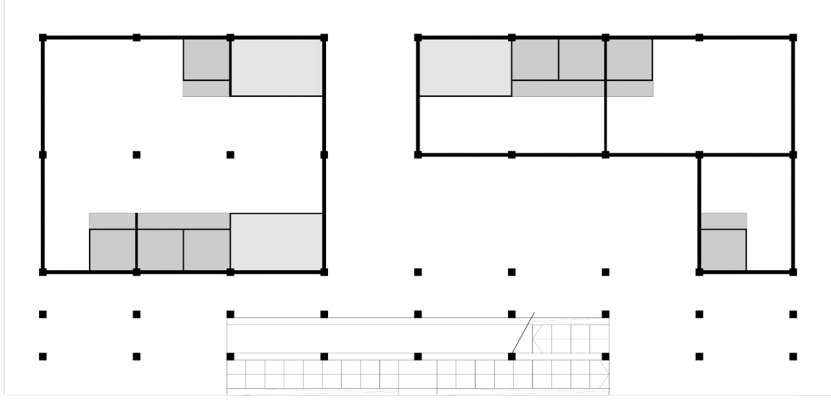
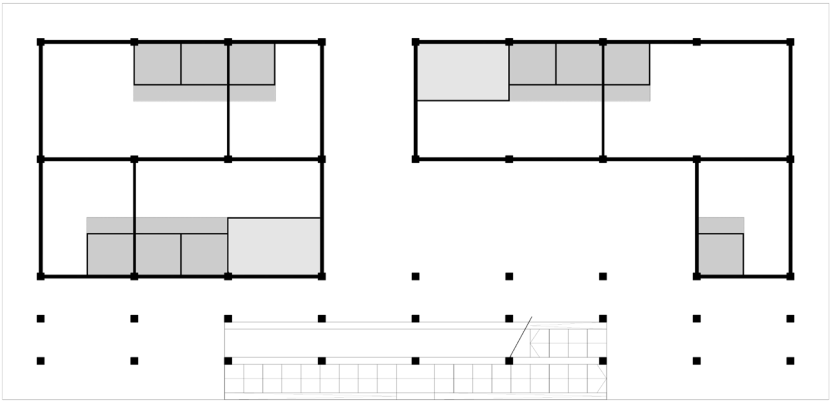
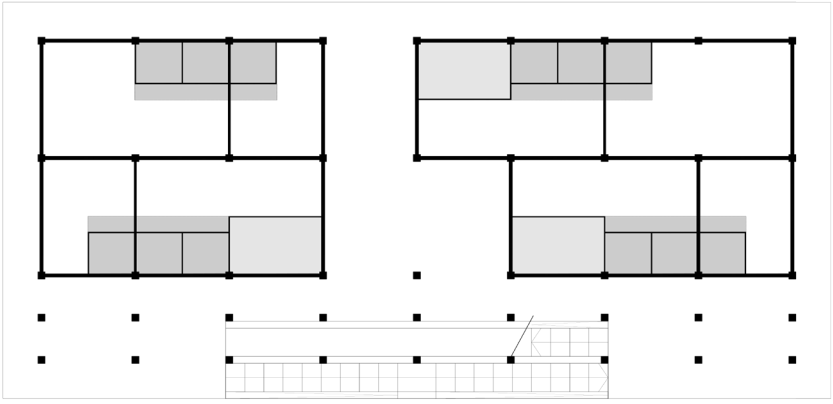


Fig. 25, 26, 27 – (from the top) Configurations D, E, F of the standard floor-plan





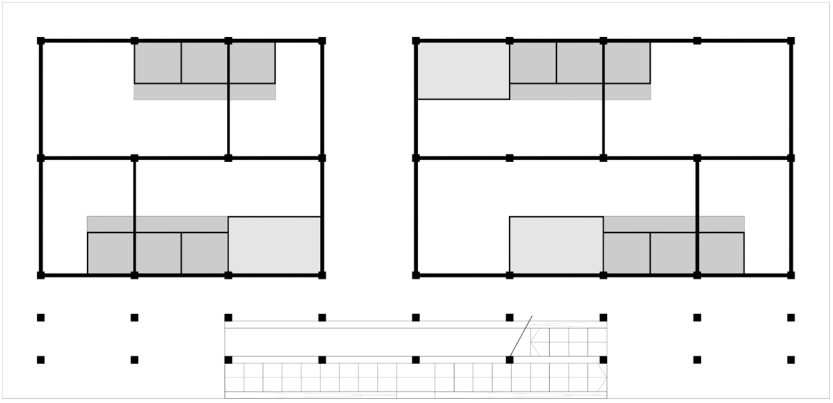


Fig. 28, 29, 30 – (from the top) Configurations G, H, I of the standard floor-plan

	mm/year	Wettest month – August (mm)	Driest month – February (mm)
Rain (average quantity)	2.061	474	7

Table 4 – Average rainfalls in Manila.

	roof area (m2)	potential harvested water in August (l)	volume of cistern (m^3)	n. of cisterns	capacity (l)
Housing	630	223.965	133,1	2	266.200

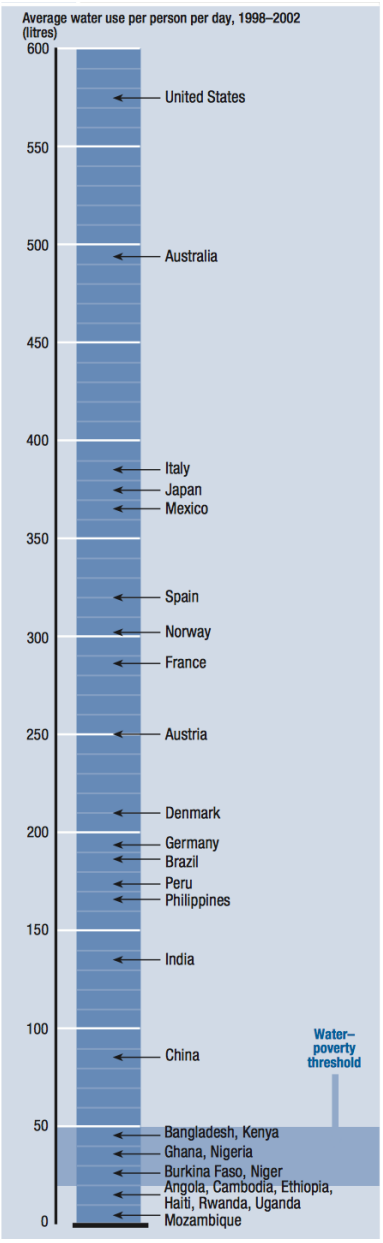
Table 5 – Water harvesting system of the residential buildings.

Drains and plumbings (water, electricity cables, sewer) are all external and have been positioned following a sub-module of the bearing concrete structure (Fig. 42). The plumbings are scattered from one longitudinal front to the other, so that each group of 3 plumbings can serve two units per floor in every configuration, since they are placed in correspondence of the wall dividing two units.

The drains go from the roof to the two water harvesting cisterns on the ground floor, which have a total capacity of 266.200 litres (see Table 5). The estimate water consumption per day in the Philippines is 165 litres per person (Fig. 31), and the harvesting system could cover a consistent part of it, especially during the wettest months from July to September, with peaks of precipitation in August (474 mm, as shown in Table 4).
Initially, the cisterns had been positioned in an underground floor, which would have allowed for a higher number of units in each building, but would have also made the intervention much more expensive.

Vertical connection is realized with a low-step staircase on the front facing the street (Fig. 42). The street becomes staircase and allows for a continuous flow of people, making the difference between public and private very slim. This concept is connected by the lifestyle of these people: they convivially lead their lives outdoors, both for climatic and cultural reasons, so the residential building is designed to be uninterruptedly connected to the public street.

Being 5-storey-high, the new social housing building does not necessarily need an elevator; however, the structure makes a successive realization possible in the *loggia* dividing (and at the same time, joining) two adjacent buildings, so that one elevator could serve two (or more) buildings, connecting to each floor with an independent



structure of footbridges. This way, the residents could split the costs of construction and maintenance of the elevators.

Instead of the elevator, an additional security stairwell could be realized in the *loggia*. It will be up to the residents to chose the option they prefer.

The roof is made of a light wooden structure; it is insulated and covered with corrugated iron panels painted in white, to reduce the air temperature in the fourth floor units. The gap between the wooden structure and the reinforced concrete beam will act as a hot air outlet, as per the stack effect (see detailed section, Fig. 43).

The inter-floor distance is 2,50 m. The NBC of the Philippines actually requires a minimum height of 2,70 m for naturally ventilated rooms, and 2,40 m for artificially ventilated rooms, but the layout of the designed units and the chosen materials allow a continuous natural ventilation, being completely permeable to air, so an internal 2,50 m height will be sufficient, considering also that the average height of a person is 1,60 m.

The fourth floor units are higher, because of the inclination of the roof and the gap between the roof and the structure, so it will be possible to realize internal independent mezzanines for additional storage spaces, leaving at least a 2 m height for the living area.

The next pages show the architectural proposal in detail. Floor-plan layouts A (basic), I (intermediate) and G (maximum occupation) are shown in different hours of the day and with the addition of *sari sari* shops.

Fig. 31 – Domestic water consumption. In the Philippines, the average per person is 165 l/day (FAO, 2006)

Fig. 32 – Plan of the new social housing intervention. The first phase presents the construction of 13 buildings which is the first step for the progressive regeneration of the dump-site area.

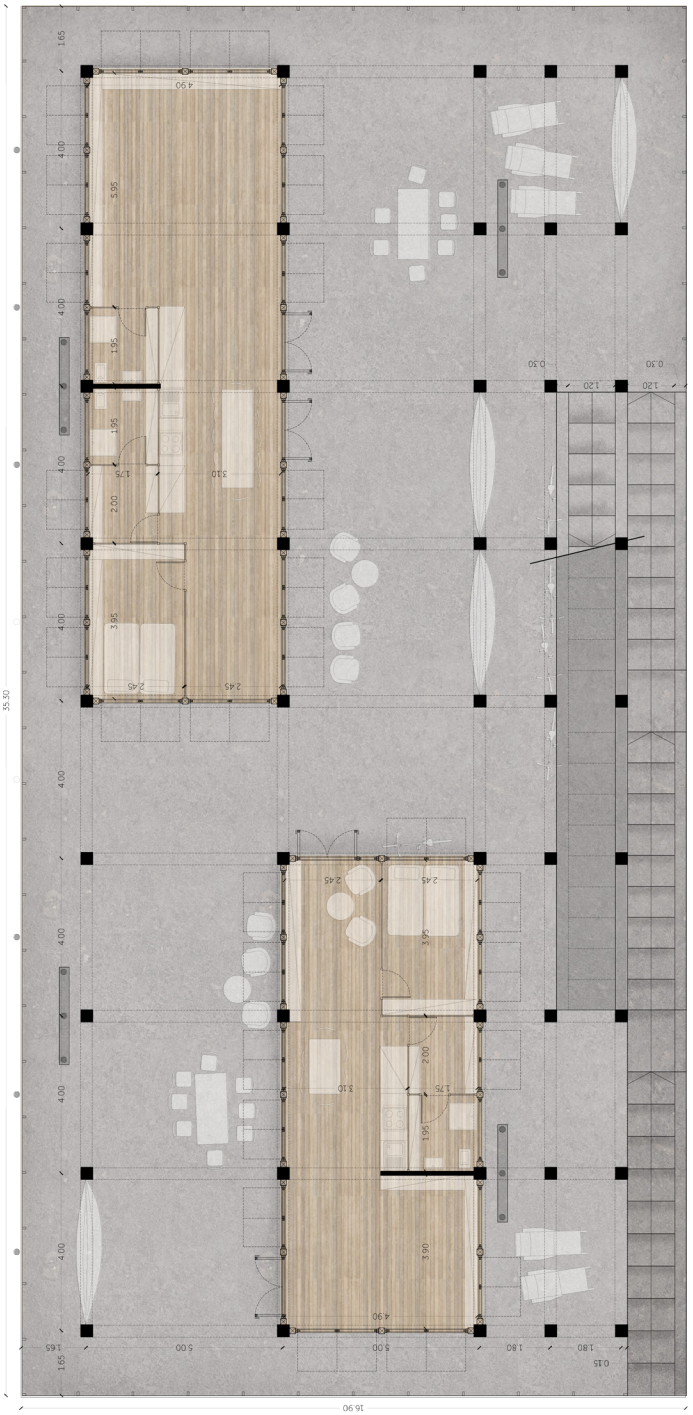


Fig. 33 – Configuration A: layout of the standard floor-plan during the day.

Fig. 34 – Configuration A: layout of the standard floor-plan during the night.

Fig. 35 – Configuration A: layout of the standard floor-plan during the night, and possible addition of *sari sari* shops.

Fig. 36 – Configuration G: layout of the standard floor-plan during the day.

Fig. 37 – Configuration G: layout of the standard floor-plan during the night.

Fig. 38 – Configuration G: layout of the standard floor-plan during the night and addition of *sari sari* shops.

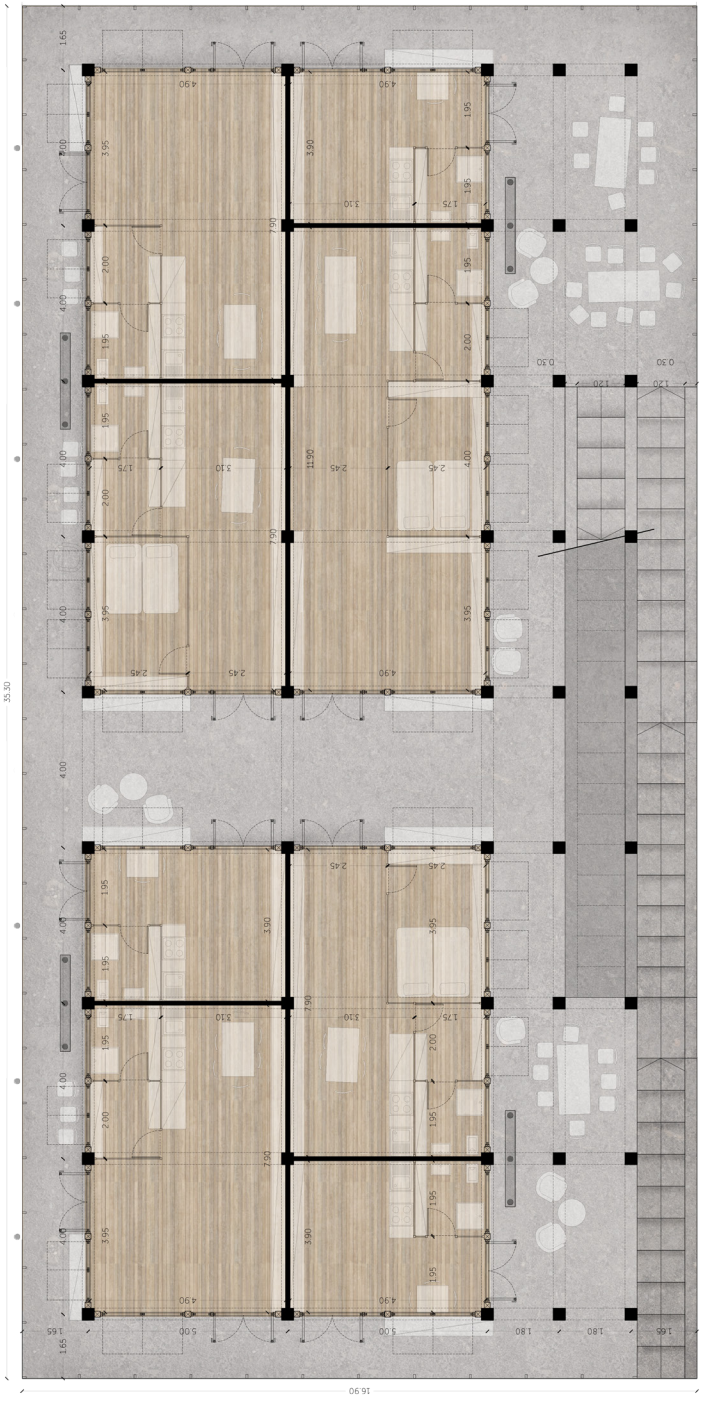


Fig. 39 – Configuration I: layout of the standard floor-plan during the day. Even in this configuration, each unit has always 2 external walls, to allow natural ventilation.

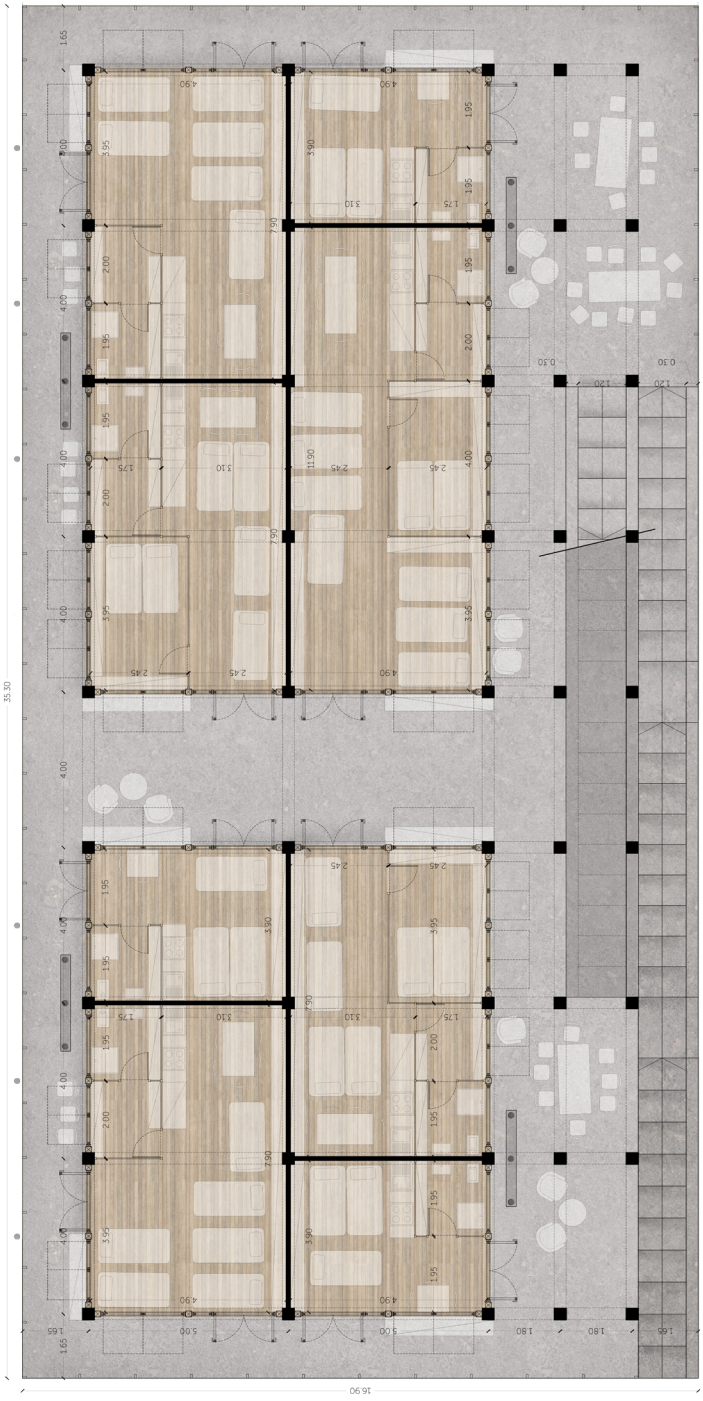


Fig. 40 – Configuration I: layout of the standard floor-plan during the night. Even in this configuration, each unit has always 2 external walls, to allow natural ventilation.

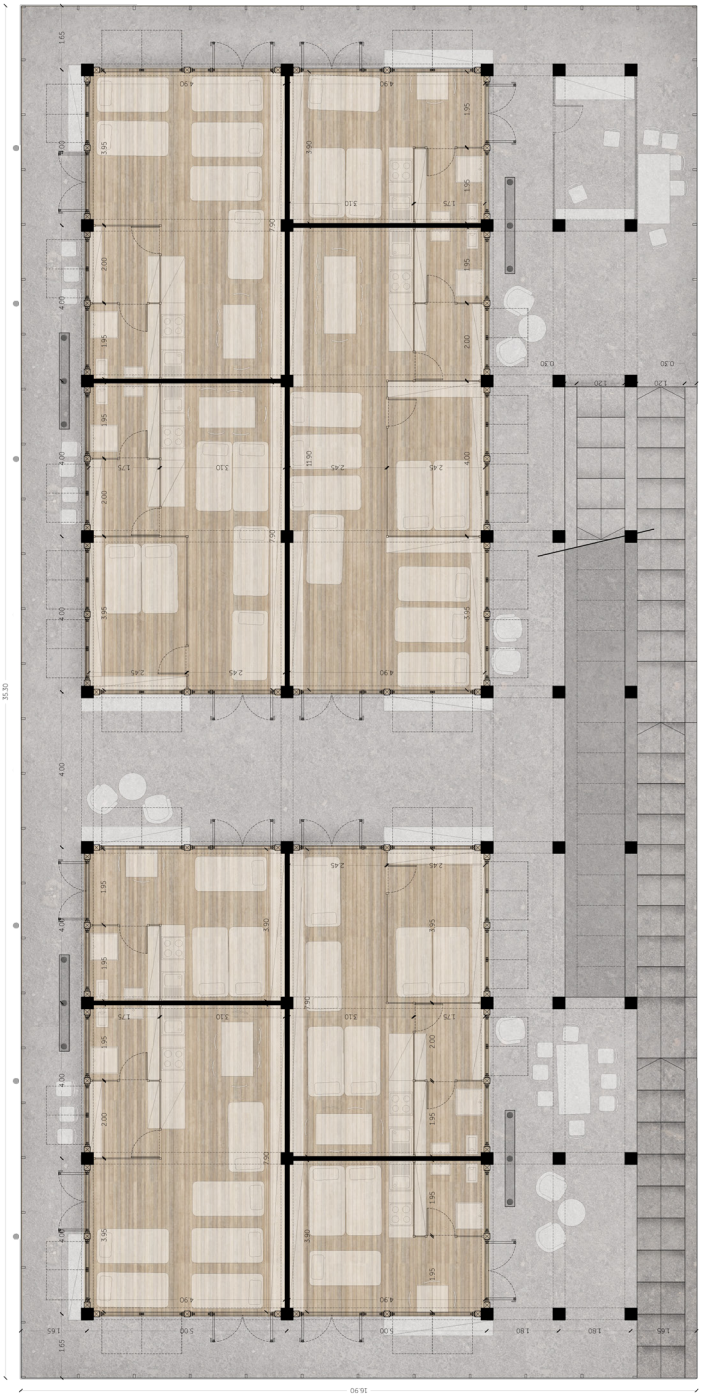


Fig. 41 – Configuration I: layout of the standard floor-plan during the night and addition of *sari sari* shops.


17.87
13.28
10.35
7.42
4.40
0.00

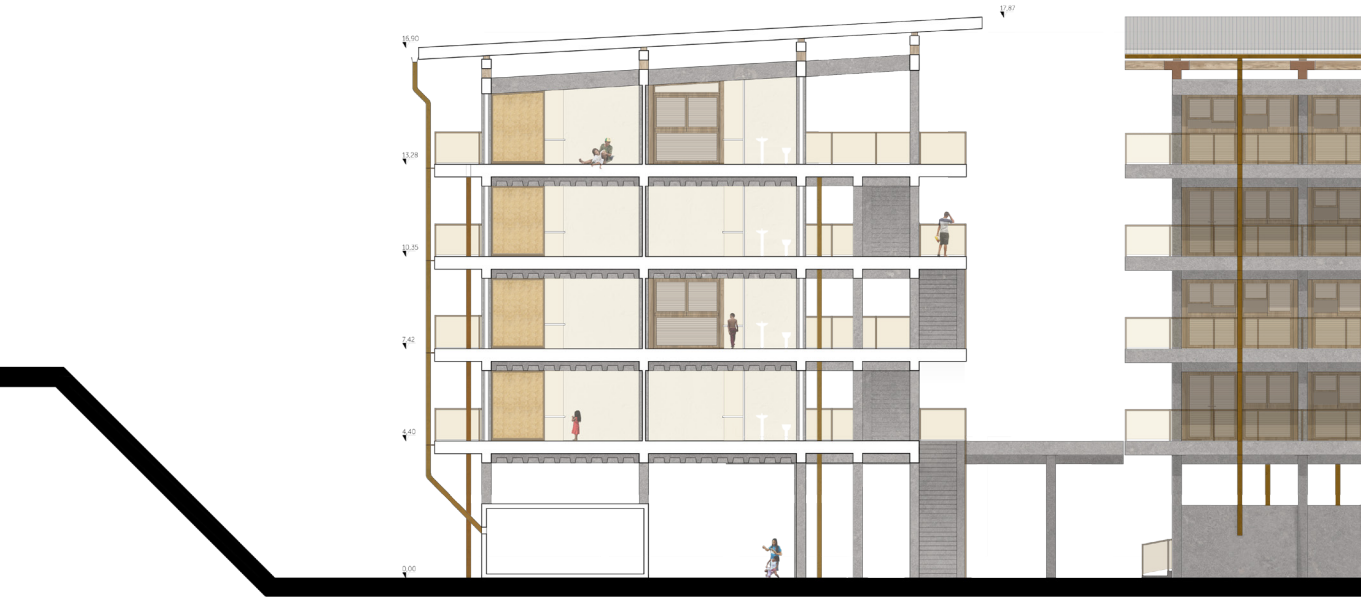

16.90
17.87
13.28
10.35
7.42
4.40
0.00

Fig. 42 – (from the top) Elevation on the street side, transversal section and elevation along S.M. side. All the vertical elements follow modules and sub-modules of the structural system, interrupting, together with the stairwell, the prominent horizontality of the building.

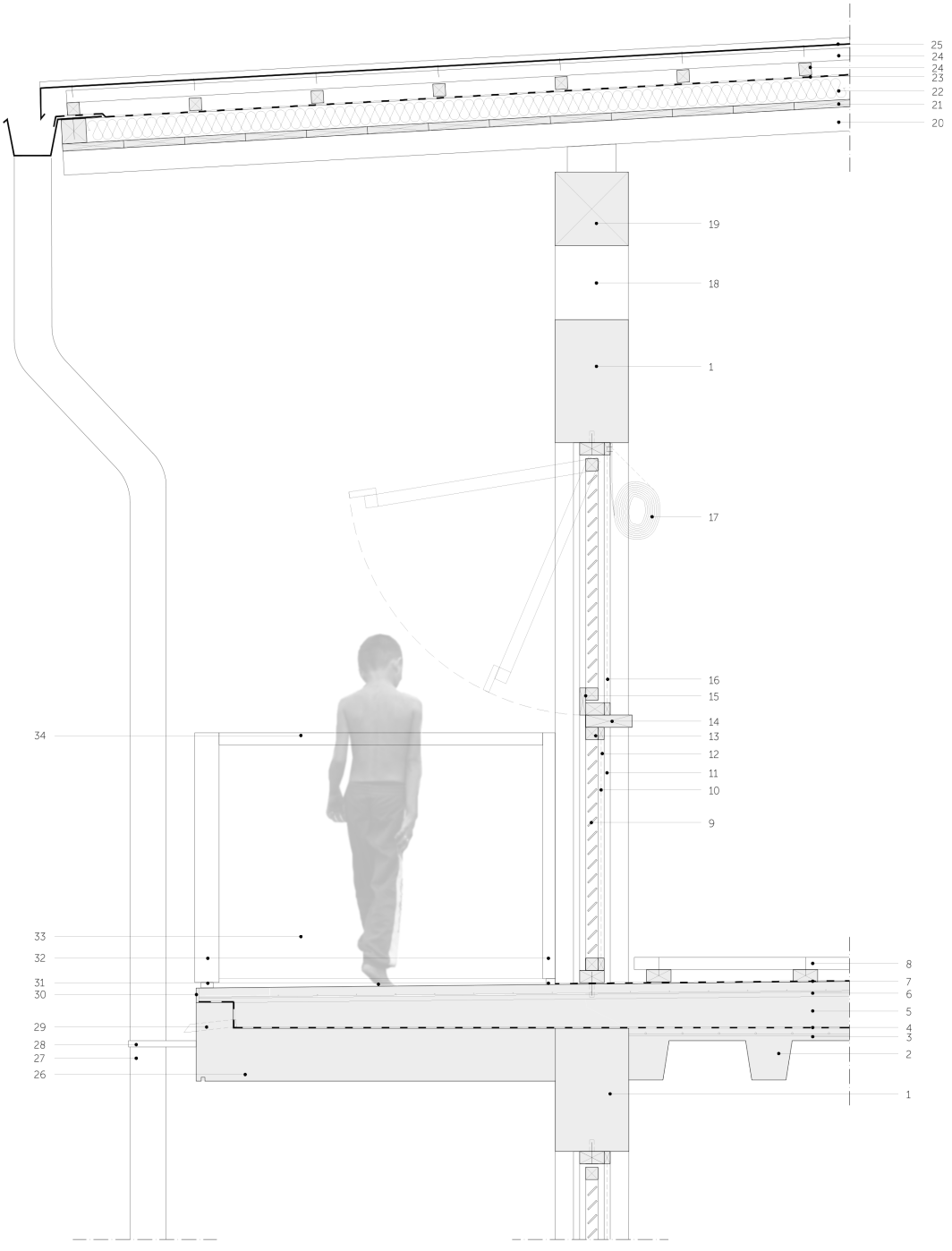


Fig. 43 – Detailed section of the 4th floor (see legend in the next page).

Legend

1. Reinforced concrete beam 50x30 cm
2. Reinforced concrete rib 16x14 cm, 50 cm on centre distance. Metal tile fillers (tin pans) to be removed
3. Reinforced concrete slab 5 cm, with welded wire mesh, wire Ø 6 mm, 15 cm opening
4. Waterproof coating
5. Screed in light cement, thickness 11 cm, 1% sloping
6. Wrought cement flooring, thickness 6 cm, with welded wire mesh, wire Ø 5 mm, 15 cm opening
7. Waterproof coating
8. Bamboo slats flooring, slats section 5x10 cm, underneath frames 50 cm opening
9. Coconut palm wood slats, thickness 5 mm
10. Fixed mosquito net
11. Coconut palm wood post, section 15x15 cm, opening 177,5 cm
12. Coconut palm wood main frame, slats 7,5x5 cm
13. Coconut palm wood secondary frame, slats 5x5 cm
14. Coconut palm wood board, section 5x20 cm
15. Coconut palm wood slats, 5x5 cm and 16x2,50 cm for closing
16. Openable mosquito net
17. Obscuring bamboo mat
18. Coconut palm wood T shaped profile
19. Coconut palm wood beam, 30x30 cm
20. Coconut palm wood scantling, 10x10 cm
21. Coconut palm wood boards 2,5x10 cm
22. Rock-wool panel insulation, thickness 10 cm
23. Waterproof coating
24. Coconut palm wood slats, section 5x5 cm, opening 55 cm
25. White painted aluminium roofing sheet
26. Concrete slab, thickness 20 cm
27. Copper plumbing, Ø 15cm
28. Plumbing support
29. Gutter
30. Mastic seal for waterproofing layer protection
31. L shaped steel profile for railing support
32. Coconut palm wood railing vertical elements, slats 10x5 cm, h 100 cm
33. Thick mesh
34. Coconut palm wood railing horizontal elements, slats 10x5 cm

Fig. 44 – Lightweight external wall panels. The frames are in coconut palm wood, while the panels could be either in coconut palm wood slats or in woven bamboo mats. From the top: window panel; door panel; fixed panel, mainly used as the bathrooms external wall.

Fig. 45 – Junction with a C shaped steel element between reinforced concrete column and timber post, and timber panel section, with a primary fixed frame and a secondary opening frame.

Sanitary facilities and accesses to the slum area

Sanitation and toilets are considered, by many, not worthy of the commitment of architectural professionals. There surely is a great difference in scale, form and technology between a toilet and a skyscraper; but we should consider architecture and engineering as tools for the creation of quality urban and architectural spaces for the people, rather than as an end unto themselves. If a public toilet can concur in slightly improving the life of some people, then it is worthy of the commitment of architectural and engineering professionals.

In Metro Manila, less than 4% of the population is connected to the sewer network. Richer households have responded by building their own sanitation facilities. Flush toilets are widely used, connected to private septic tanks, often serving large housing developments. Around 40% of households now have on-site latrines, which count as an improved source. There are an estimated 1 million or more septic tanks in Manila and in the Metro area there are 75 companies providing tank desludging services.[4]

The problem is that sludge treatment and disposal facilities are rare. The result: indiscriminate disposal of inadequately treated effluents into the Pasig River – a complex network of waterways that links the Laguna de Bay to Manila Bay through a huge urban canals web. Another 35 tons of solid domestic waste is deposited in the Pasig river annually by squatters dwelling along the river's and canals' banks. In total, some 10 million people discharge untreated waste into the river.

This has serious consequences for public health. The Pasig is one of the world's most polluted rivers, with human waste accounting for 70% of the pollution load. Faecal coliform levels exceed standards set by the Department of the Environment and Natural resources by several orders of magnitude – and around 1/3 of all illness in Manila is water related. The 4.4 million people living along the river face particularly acute problems, especially during the floods in the June to October rainy season. During the low flow season the Pasig River reverses direction and carries pollution into Laguna Lake, creating further public health problems.[5]

The slum in the area of our project and its development have already been described. It is clear from the maps that the density of this settlement is extremely high. These makeshift homes are not linked to the sanitation and water system that provides for the formal settlements all around, and the urban fabric it creates is so dense that access is possible only on foot: a fire truck or an ambulance could not enter the area in case of emergency.

This situation has been addressed with a demolition intervention (kept to the minim required to ensure the realization of the connections, Fig. 47, 48), limited to the lodgings that are along a way that could serve as access for vehicles and as path for the connection to the drainage and water systems. Additional crossing passages have been identified, following the streets defining the blocks in the *Barangays* on the South-East side. An estimate of the number of houses along these paths has been done and they have been included in the total new residential units needed for the further development of the area.

Fig. 46 – Plan of the sanitation and accesses intervention in the slum area.

A diffused public toilets system has been positioned along the paths defined and in already existing available areas. A more capillary web than the one proposed could be realized, but only at the condition of priorly finding alternative housing solutions. This approach has been successfully implemented in the upgrading of the traditional vernacular areas of Beijing (*hutong*): originally, these traditional houses did not have private toilets; when it was decided to upgrade these areas, public toilets were built to guarantee hygienic services to everyone, since it wasn't possible to provide each house with a private toilet.

Acting in slum areas is extremely difficult, as the titles of the people living there are not always clear: there can be actual land-owners, unauthorized occupants, professional squatters[6], renters and many other types of residents. The first thing that is needed is a census of the people living there and of their titles; then, a map of the existing drainage and water system is obviously essential. These information about the informal settlement next to PH are currently lacking, or, at least, they are not available for a public consultation, so the proposal should not be regarded as a defined project, but only as a way of proceeding.

The toilets and washing facilities distributed in the slum area follow the same simple structure of the housing buildings: reinforced concrete bearing structure, sloping wooden roof with large overhangs, lightweight walls and water harvesting cisterns. In this case, the cisterns are underground, in order to be able to harvest more water and occupy less space than it would have been possible with cisterns at the street level.

The public toilets present a total of 10 W.C.s (with also a small sink) and 10 showers. Access is possible from both the short sides and, in case of the construction of a single module, a dividing panel can be positioned in the middle, to ensure divided services for women and men (Fig. 49-53).

The showers have the same dimensions of the W.C.s to provide easy access for a parent with a child and allow them to easily wash the clothes they are wearing.

External sinks are provided for immediate access to water and for hygienic education campaigns often carried on by NGOs in poor areas.

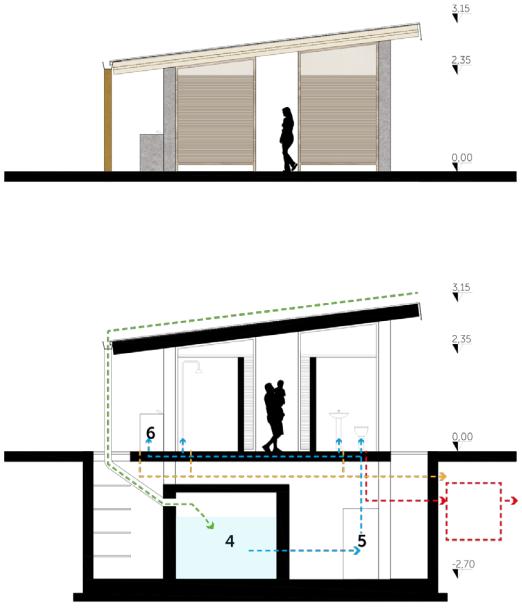
The panels of the walls do not reach the ground, in order to make the cleaning easier with high pressure water.

The same structure – without the wall panels – is used for a washing facility module, a sort of small wash-house, with a wash-tub, coin washing machines and a surveillance area (Fig. 54-58).

Both the toilets and the wash-houses could be run and managed by the people of the slum, creating, at the same time, occupation and a sense of appropriation of the services, which would help against potential acts of vandalism. In Filipino slums, it is usually up to the women of the family to earn a living, while men often stay at home; this diffused system of facilities could improve the lives of women and girls under at least two aspects: first, they would have access to hygienic facilities they are now denied, a situation that causes serious sanitary problems; second, they could run the management of these structures, being able to work and provide for their families.

Fig. 47 – Slum area. Plan showing the existing voids.

Fig. 48 – Slum area. Plan showing the project voids.



Legend

1. Access and storage area
2. Shower
3. W.C.
4. Underground rainwater harvesting cistern in concrete
5. Water pump
6. External sinks

Rainwater harvesting
Filtering and distribution
To the greasy water treatment
To the septic tank/sewage
Overflow

Fig. 49, 50 – Public toilets module. From the top: access side elevation; cross section with water managing scheme.

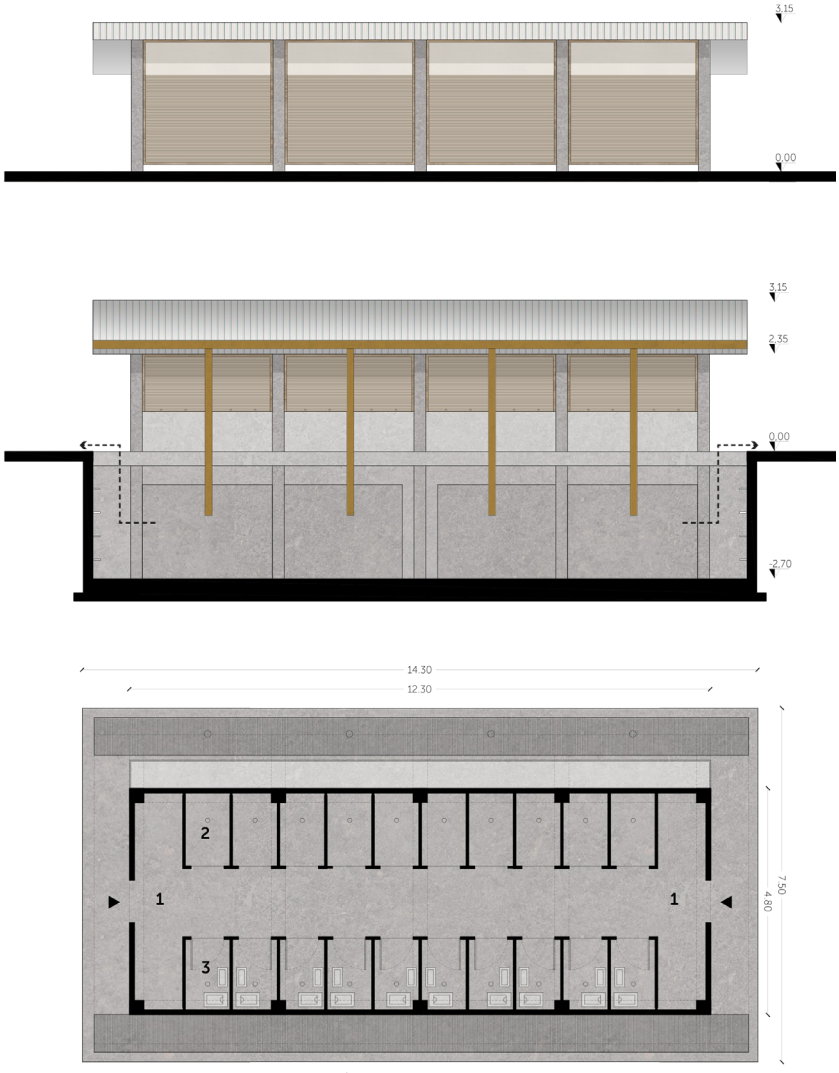
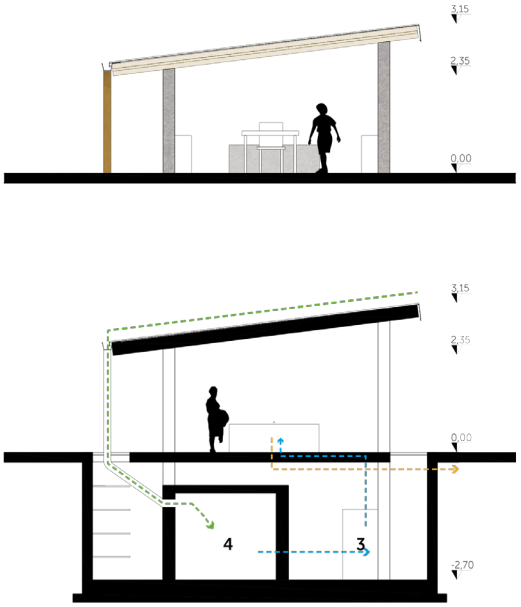


Fig. 51, 52, 53 – Public toilets module. From the top: elevation on W.C. side; section along showers side; floor-plan.



Legend

1. Washtub
2. Surveillance area and coin washing machines
3. Water pump
4. Underground rainwater harvesting cistern in concrete

Rainwater harvesting
Filtering and distribution
To the greasy water treatment
Overflow

Fig. 54, 55 – Wash-houses module. From the top: side elevation; cross section with water managing scheme.

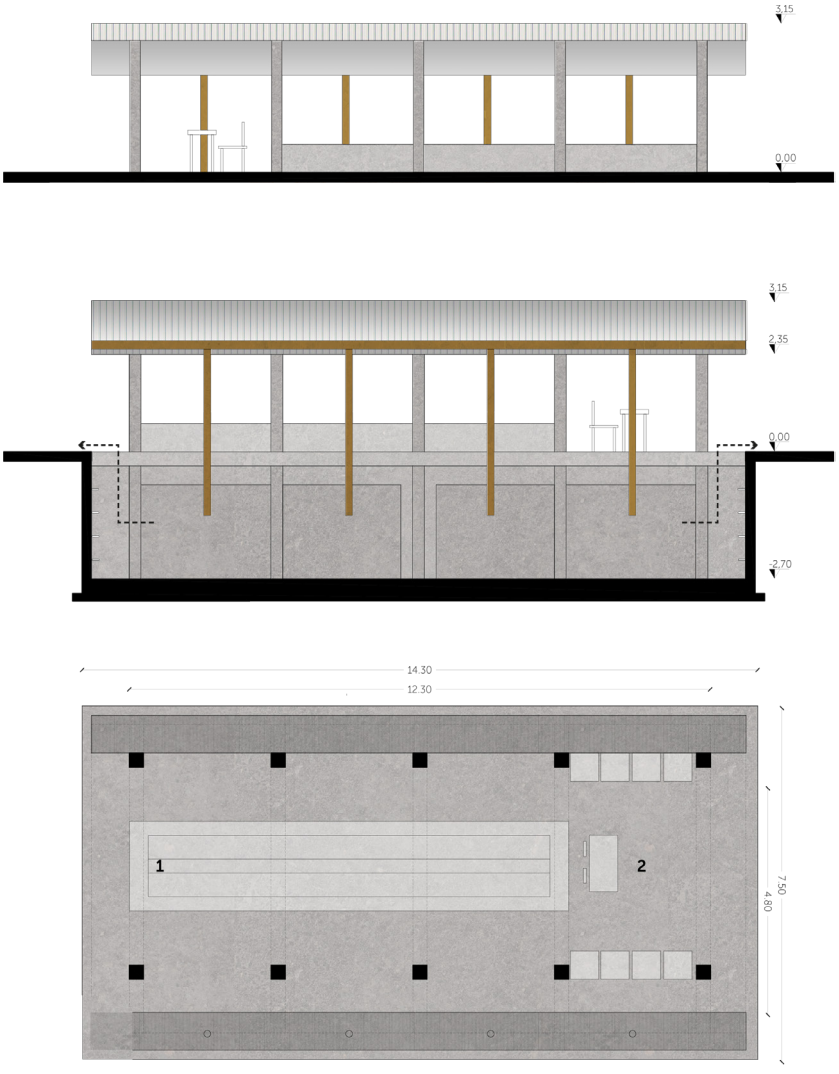


Fig. 56, 57, 58 – Wash-houses module. From the top: longitudinal elevation and section; floor-plan.

Fig. 59 – Position of the former offices of the NHA. The building is situated right at the entrance to P.H. from the main road.

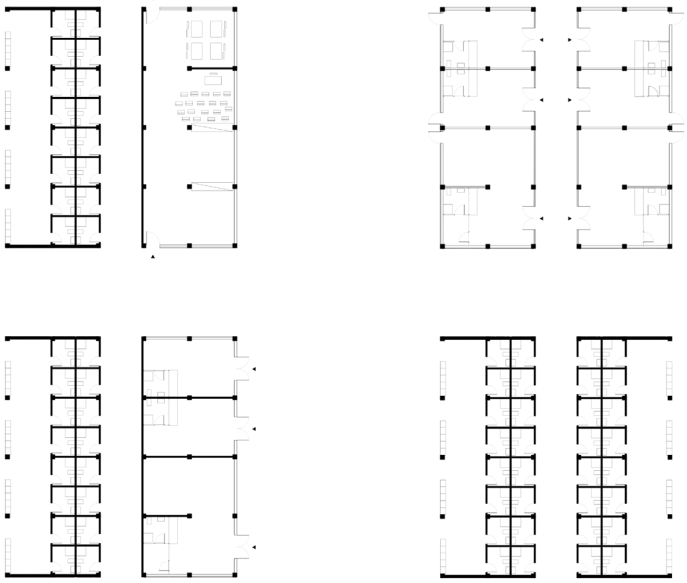


Fig. 60 – Options considered for the regeneration of the former offices. From top left, clockwise: public toilets and workshop areas; apartments; public toilets and apartments; public toilets.

Reuse of former NHA offices: family planning and vaccinations centre

The National Housing Authority managed Paradise Heights until 2 years ago; shortly after the last nine buildings were constructed and assigned to ISFs (Informal Settler Families), the NHA left the management of the area without notice, and abandoned the offices. This building (Fig. 59) has not been used since then, but could be regenerated and reused as a public service to the community.

Many options have been considered: public toilets; apartments; workshop areas; combination of the previous functions (Fig. 60). The proposal that has eventually been chosen is a centre for family planning and vaccinations (Fig. 61).

Family planning is an important issue in a deeply Catholic and poor country as the Philippines: lower classes families can get to have up to 10 children (or more), and government attempts to make birth control freely available have been blocked by the Catholic church, so responsibility falls to NGOs, whose volunteers teach and inform women and men about contraception and surgery interventions; they can even schedule the surgeries and provide assistance to manage the paperworks needed, as many of the people they assist would not be able to do that.

The centre will have out-patient clinics, small rooms for private meetings and classrooms for lessons and workshops.

It will be possible to use the centre for vaccination campaigns throughout the year.

Legend

1. Entrance
2. Admin office
3. Toilets
4. Doctors' office
5. Private meetings
6. Classrooms

Fig. 61 – Family planning centre. From the top: section A-A'; floor-plan; section B-B'.

Fig. 62 – A woman sorting recyclables in a junk shop.

Junk shop

Junk shops are popular businesses in the Philippines, in Metro Manila in particular.

The absence of a proper waste management system (and everything this has led to in terms of pollution and hygiene) has created fertile environment for jobs in the informal economy (see chapter 4): scavengers take to the local junk shop the recyclables they find in a day's work and can earn about 1,50 or 2$ per day, depending on the quantity and the quality of the material the find.

Some scavengers are directly "employed" by middle class families to collect domestic garbage directly at their own houses.

From the analysis of the area, we have seen that these four parts of the city (PH, San Rafael, the *Barangays*, the slum) are in a relation of proximity, but are not connected one another.

As many people from PH and the slum are scavengers, when an abandoned area along the East side of PH was found, it seemed natural to use it for an activity that would physically and conceptually link those parts of the city, and this activity is a junk shop.

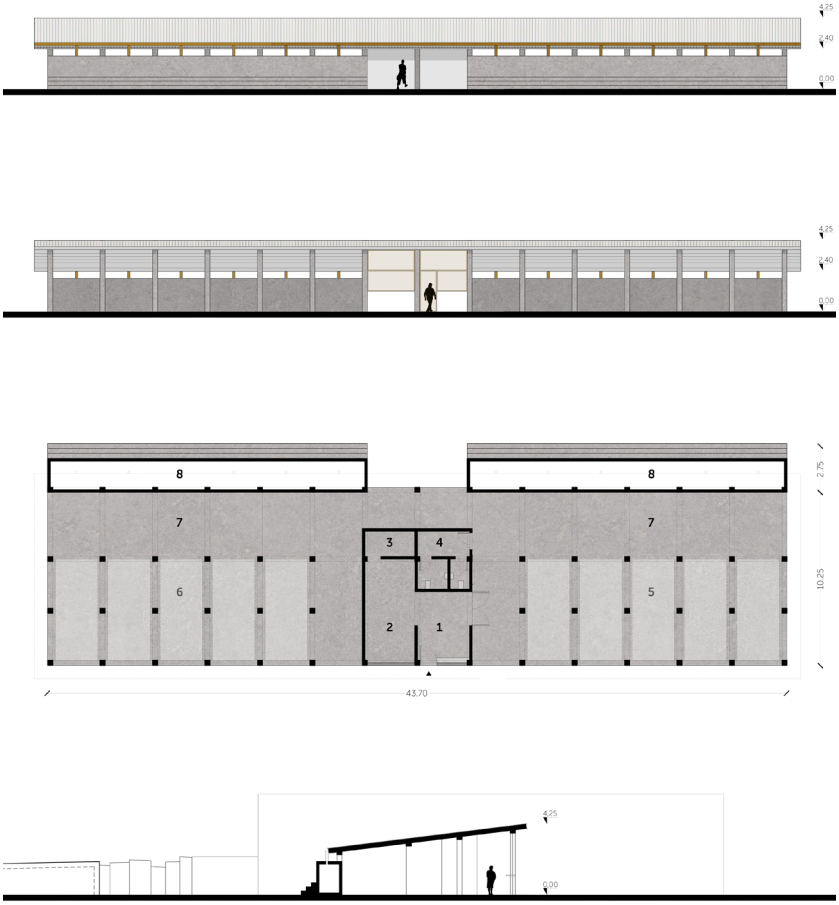
The structure formally re-proposes the same image of the other buildings (housing and toilets/wash-houses), so it is not necessary to repeat the description (Fig. 64).

The central core of the building includes a front desk and office for the administration staff, a meeting room, that could be used also for workshops initiatives, and a small archive; the lateral wings, instead, are opened and will be used for the storage of dirty unsorted material on one side, and of clean divided material on the other side.

A wide service area on the front will be used for circulation and parking of trucks, while the washing and sorting procedures will be possible on the back.

Removing just a couple of storage huts along the East side of PH, a clear pedestrian connection will be created (Fig. 63).

Fig. 63 – The junk shop has been placed in an abandoned area along the wall diving P.H. from the nearby commercial and residential area.



Legend

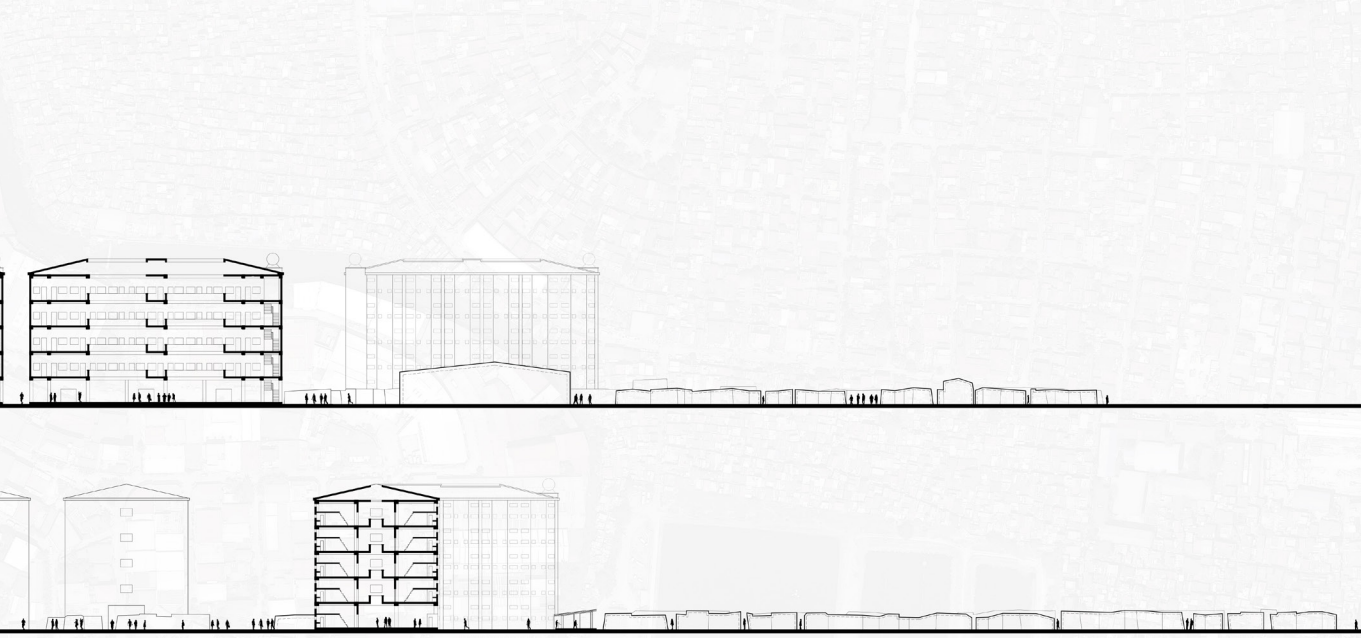
1. Front desk and admin office
2. Meeting room and workshop area
3. Archive
4. Toilets
5. Containers for unsorted material
6. Clean material
7. Operative area
8. Rainwater harvesting cisterns

Fig. 64 – The junk shop. From the top: elevation towards P.H.; elevation towards the street; floor-plan; cross section.

Sezione A-A'

Sezione B-B'

0 5 10 25 m




CLAIRE STORE
BABY Store
Coca-Cola
MJ STORE
ZARLIEF

Notes

1 Purdy, S. Sabugal, F. *Pilot study: conversion of the Smokey Mountain dump-site waste to organic fertilizer, Manila, Philippines* in Proceedings of the 8th International Waste Management and Landfill Symposium, CISA, Cagliari, 2001

2 From a conversation with Shareen Elnashie, a Londoner architect who worked both with Paradise Heights and Katuparan residents (12/05/2016)

3 Correa, C. *Housing and Urbanisation* Thames and Hudson, London, 2000

4 *Philippines: Meeting Infrastructure Challenges* World Bank, 2005

5 *Beyond scarcity: Power, poverty and the global water crisis* Human Development Report, UNDP, 2006

6 A person who has illegally sold the apartment that the government has given him/her for cash and has preferred to go back to live in the slum

Fig. 65 – (pag. 125, 127) Sections and overall plan of the intervention, showing the uninterrupted ground floor public spaces created.

Fig. 66 – (pag. 128, 129) A rendering view of the new social housing building proposed, seen from the inside of an existing P.H. building.

Conclusions

> Ora dirò della città di Zenobia che ha questo di mirabile: benché posta su terreno asciutto essa sorge su altissime palafitte, e le case sono di bambù e di zinco, con molti ballatoi e balconi, poste a diversa altezza, su trampoli che si scavalcano l'un l'altro, collegate da scale a pioli e marciapiedi pensili, sormontate da belvederi coperti da tettoie a cono, barili di serbatoi d'acqua, girandole marcavento, e ne sporgono carrucole, lenze e gru.
> Quale bisogno o comandamento o desiderio abbia spinto i fondatori di Zenobia a dare questa forma alla loro città, non si ricorda, e perciò non si può dire se esso sia stato soddisfatto dalla città quale noi oggi la vediamo, cresciuta forse per sovrapposizioni successive dal primo e ormai indecifrabile disegno. Ma quel che è certo è che chi abita a Zenobia e gli si chiede di descrivere come lui vedrebbe la vita felice, è sempre una città come Zenobia che egli immagina, con le sue palafitte e le sue scale sospese, una Zenobia forse tutta diversa, sventolante di stendardi e di nastri, ma ricavata sempre combinando elementi di quel primo modello.
> Detto questo, è inutile stabilire se Zenobia sia da classificare tra le città felici o tra quelle infelici. Non è in queste due specie che ha senso dividere le città, ma in altre due: quelle che continuano attraverso gli anni e le mutazioni a dare la loro forma ai desideri e quelle in cui i desideri o riescono a cancellare la città o ne sono cancellati.[1]
>
> *Le città invisibili*
> Italo Calvino

The Philippines is one of the most rapidly urbanizing countries in Asia. This trend reflects the effects of years of high rates of natural population growth and consistent rural-to-urban migration.

Urbanization in the Philippines has been led by Metro Manila, also known as the Na-

Fig. 1 – A young boy flying a kite and standing on Smokey Mountain. Manila's skyline in the background. (www.adb.org)

tional Capital Region (NCR), since the 1950s. Metro Manila and the other five metropolitan areas of the country produce 80% of the Philippines' Gross Domestic Product (GDP), and no development strategies for the rural areas are to be implemented in the foreseeable future.

The spread of informal settlements in the Philippines has become a phenomenon associated with big cities and unplanned expanding urban centres. From the early 1970s to more recent years, estimates of the number of informal settlers in the country have varied, ranging from 470,000 to 2.5 million families. Current estimates[2], place the number of informal settlement families (ISFs) at about 1.5 million, 15% of the Philippines' total urban population.

Many ISFs live in chronic urban poverty and are confronted by physical, economic, social, legal and environmental risks on a day-to-day basis. They have limited or no access to security of tenure, capital, social networks, environmental safety and legal security. Clearly, as in other developing countries, the pervasiveness of informal settlements in the Philippines can be traced back to low income, inadequate urban planning, lack of serviced land, lack of affordable social housing, and many other factors.[3]

In Metro Manila and other growing urban centres, informal settlers live in sprawling slums that do not meet the most basic needs (or, worse, are used as dumping grounds for hazardous wastes) where they are constantly exposed to serious health risks. This issue has been too often addressed in ineffective ways: demolitions, relocations to extra urban areas, overcrowded tenement buildings.

The aim of this work is to demonstrate that the informality that shapes this settlements and the social housing provided by the government so far can't be repressed, and should be incorporated in what is commonly considered "proper" architecture. These two aspects can successfully work together to generate an environment that responds to the needs of the people. Formality can lay the basis for informality to happen and evolve in a solid, safe and hygienic environment. This is the principle that defines the whole strategy here proposed for the chosen case study, the Smokey Mountain and Paradise Heights area in Tondo, Manila.

The project is focused on the creation of public spaces at the street level using abandoned areas and existent and new buildings, in order to continuously connect parts of the city that share the same margins, but are not linked to one another.

The proposal presents a series of covered public spaces realized using parts of some existing buildings and the alleviation of the overcrowding issue that affect this neighbourhood; a new and incremental social hosing building prototype, that would provide families highly flexible spaces; a diffused system of public toilets and wash-houses in the slum area, to provide ISFs with the sanitary and hygienic facilities they don't have access to; a family planning centre, with day-clinics for medical visits and classrooms for edu-

cational meetings and initiatives; and a junk shop, that could be the first step for a co-operative recycling business in the area.

Another aspect that is pointed out is that in contexts characterized by scarcity of resources in terms of funds and materials, vernacular traditional buildings are the greatest resources for architects and engineers, as people managed to protect themselves from the weather elements with simple and effective precautions and no need of high-tech solutions.

Of course, these precautions and architectural forms are to be actualized and adapted to the needs of a family living in a city of the 21st century, and this is were architects, engineers and planners should contribute with their expertise.

Numerous NGOs have been and are working in the Smokey Mountain area, mainly carrying on important and indispensable feeding and schooling programs; I hope that this project, although probably utopian, will be able to raise awareness towards the living conditions of so many people also from an urban and architectural point of view.

Notes

1 "Now I shall tell of the city of Zenobia, which is wonderful in this fashion: although set on dry terrain it stands on high pilings, and the houses are of bamboo and zinc, with many platforms and balconies placed on stilts at various heights, crossing one another, linked by ladders and hanging side-walks surmounted by cone-roofed belvederes, barrels storing water, weather vanes, jutting pulleys, and fish poles, and cranes. No one remembers what need or command or desire drove Zenobia's founders to give their city this form, and so there is no telling whether it was satisfied by the city as we see it today, which has perhaps grown through successive superimpositions from the first, now undecipherable plan. But what is certain is that if you ask an inhabitant of Zenobia to describe his vision of a happy life, it is always a city like Zenobia that he imagines, with its pilings and its suspended stairways, a Zenobia perhaps quite different, a-flutter with banners and ribbons, but always derived by combining elements of that first model. This said, it is pointless trying to decide whether Zenobia is to be classified among happy cities or among the unhappy. It makes no sense to divide cities into these two species, but rather into another two: those that through the years and the changes continue to give their form to desires, and those in which desires either erase the city or are erased by it." *Invisible cities* by Italo Calvino, English translation by William Weaver.

2 From National Housing Authority data.

3 "Developing a National Informal Settlements Upgrading Strategy for the Philippines" a collaboration between the Philippines government, the Cities Alliance and the World Bank.

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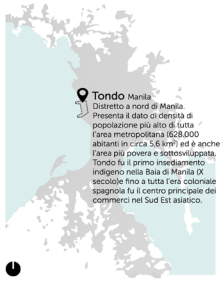
Appendix A

Presentation panels

The following pages contain the presentation panels of the project.
The original panels have been presented in A1 format.

In-Formality

Introduzione dell'area di progetto



Tondo Manila

Distretto a nord di Manila. Presenta il dato di densità di popolazione più alto di tutta l'area metropolitana (628.000 abitanti in circa 5,6 km²) ed è anche l'area più povera e sottosviluppata. Tondo fu il primo insediamento indigeno nella Baia di Manila (X secolo)e fino a tutta l'era coloniale spagnola fu il centro principale dei commerci nel Sud Est asiatico.

San Rafael Village

Quartiere di classe medio-bassa, con piccoli condomini, alcuni dotati di giardini privati.

Smokey Mountain

Ex discarica principale di Manila, chiusa nel 1995 e in parte bonificata per la realizzazione di alloggi economici destinati agli scavengers che vivevano sopra la discarica. Nel periodo di massima operatività, era arrivata ad un'altezza di 35 m.

Paradise Heigths

30 edifici di social housing di 5 piani ciascuno, destinati alle famiglie che vivevano sopra Smokey Mountain. Ogni edificio contiene 120 mini-appartamenti di 17 mq netti cognuno. La popolazione stimata di P.H. è di 40.000 persone.

Slum

Insediamento informale che ha, nel tempo, occupato il letto di un canale. Non è possibile stimare con un margine di errore accettabile la popolazione presente. Gli alloggi sono privi di servizi igienici e di collegamento alla rete idrica. Risulta impossibile l'accesso con mezzi di soccorso in caso di emergenza, a causa della densità di questo tessuto urbano.

Barangays

Il termine *Barangay* significa letteralmente "villaggio", ma indica anche la più piccola unità di governo locale delle Filippine. In particolare,i *barangays* confinanti con l'area di nostro interesse sono popolati da classi di ceto medio-basso della popolazione.

Estero de Vitas

Uno dei numerosi canali che attraversano la città. Originariamente, i canali di Manila servivano come vie di trasporto. A causa dell'inquinamento industriale e del deposito di rifiuti, l'acqua della maggior parte dei canali è stata dichiarata biologicamente morta.

Radial Rd. 10

L'unico tratto ad oggi concluso della Radial Rd. 10 attraversa Tondo e procede verso nord.

Manila Bay

La baia di Manila è ad oggi uno dei luoghi più inquinati al mondo.

Harbour Centre Port Terminal

Porto industriale costruito a inizio anni '90. L'intervento fa parte del programma di recupero generale dell'area.

università degli studi di napoli federico II | facoltà di ingegneria | dastec | corso di laurea magistrale in ingegneria edile - architettura | tesi di laurea magistrale | IN-FORMALITY | spazi pubblici, social housing e sanatoria a smokey mountain, manila | candidata: kyra rossi | relatori prof. arch. luca lamini (dastec) prof. arch. maurice mitchell (arcsa) arch. ing. fabio candido | a.a. 2015/201

Pieni e vuoti

Stato attuale

La strategia progettuale mira alla **ricucitura di parti di città** che si interfacciano e condividono dei margini, ma non sono effettivamente collegate tra loro.

Ogni edificio di Paradise Heights funziona come un'isola a sé stante, e sia PH che l'area di slum urbano ad essa adiacente si ritrovano delimitate da muri che le dividono dal resto del tessuto urbano limitrofo.

In generale, **ogni edificio – nuovo o esistente – concorre alla creazione di uno spazio urbano continuo e totalmente permeabile a livello strada**, in modo da non interrompere, ma anzi potenziare, il flusso delle persone attraverso tutta l'area di interesse.

Il progetto mette in luce una **rete di percorsi che già esisto-no all'interno di PH** e hanno solo bisogno di essere esplicitati o potenziati, attraverso l'**uso totale o parziale di alcuni piani terra degli edifici di PH e l'apertura di tutti i corridoi centrali al livello strada.**

L'intervento nell'area dello slum riguarda la creazione di **percorsi interni accessibili da mezzi di soccorso e la realizzazione di un sistema di servizi igienici pubblici** che si collegherà alla rete esistente di gestione dei liquami.

Attraverso **mirate demolizioni**, che si è cercato di mantenere al minimo indispensabile, e lo **sfruttamento degli spazi interstiziali e dei margini**, si ottiene una **rete di percorsi pedonali** che coprono l'area di interesse in modo capillare, e una serie di **aree pubbliche coperte** che saranno usate in modi diversi a seconda dell'ora, del giorno, della stagione.

Dati popolazione	n	km²
Edifici di Paradise Heights	30	
Unità abitative per piano	24	
Piani	5	
Unità abitative per edificio	120	
Unità abitative totali	3.600	
Abitanti totali (stime non ufficiali)	40.000	
Superficie dell'area		0,5

0 20 40 100 m

Tesi di laurea magistrale in Progettazione della Città e dell'Architettura | tesi di laurea magistrale | IN-FORMALITY spazi pubblici coperti per la riqualificazione di slum | relatori prof. arch. luca lamini (destec) prof. arch. maurice mitchell (arcsr) arch. ing. fabio candido | a.a. 2015/201

Pieni e vuoti

Stato di progetto

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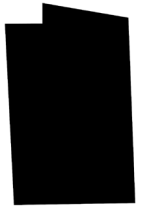
Fase 1 spazi pubblici

	n
Edifici con PT parzialmente pubblico	4
Unità abitative coinvolte per ogni edificio	12
Edifici con PT interamente pubblico	3
Totale unità abitative al piano terra coinvolte	24
Totale	120
Edifici del nuovo intervento di housing	13
Unità abitative fornite con la configurazione base del nuovo intervento di housing	104
Unità abitative fornite con la configurazione di massima densità del nuovo intervento di housing	416

Fase 2 sovraffollamento di P.H. e rete servizi igienici slum

	n	m²
Unità demolite complessive (baracche su Smokey Mountain, slum, Paradise Heights piani 1–4)	845	
Superficie occupata da ogni edificio (compresi gli spazi pubblici)		1.200
Edifici necessari (configurazione base con 8 unità/edificio)	105.63	126.756
Edifici necessari (configurazione massima occupazione con 32 unità/edificio)	26.01	31.212
Superficie di Smokey Mountain dopo la prima fase (appross.)		92.000



0 20 40 100 m

Alessandro Gaeta | tesista di laureando | Corso di laurea magistrale in Progettazione edilizia - Architettura | tesi di laurea magistrale | IN-FORMALITY spazi pubblici e spazi informali in contesti informali | relatori prof. arch. luca lanini (destro) prof. arch. maurice mitchell (arcsi) arch. ing. fabio candido | a.a. 2015/2016

Paradise Heights stato attuale

Il complesso di *Paradise Heights* nasce come risposta all'emergenza abitativa di Smokey Mountain da parte del governo democratico di Aquino.

Il problema era stato affrontato anche precedentemente dal dittatore Marcos, con una politica di demolizioni e trasferimento delle ISF (*Informal Settlers Families*) fuori dalla città, in nuovi insediamenti costruiti dal governo, lontani da servizi e luoghi di lavoro. Il risultato fu che, dopo 3 anni, circa il 90% dei nuovi alloggi fu abbandonato e le famiglie tornarono a vivere nelle baracche in città.

Smokey Mountain arrivò ad ospitare circa 20.000 persone tra gli anni '80 e '90. Il progetto del 1995 della *National Housing Authority* (NHA), prevedeva la realizzazione di 30 edifici a 5 piani, con 24 alloggi da 17 mq netti per piano.

Nel 1996 furono ultimati 21 edifici, mentre dei rimanenti 9 vennero realizzate solo le fondazioni, a causa di mancanza di fondi. L'intervento è stato completato nel 2014, seguendo il progetto originario del '95.

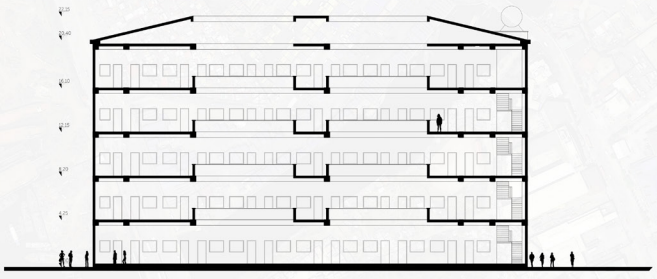
Si stima che *Paradise Heigths* ospiti circa 40.000 persone, ed è quindi uno dei luoghi a più alta densità abitativa al mondo.

Gli edifici sono delle classiche strutture con scheletro in calcestruzzo armato e tamponamenti in blocchi di cemento, scelta tecnologica ovviamente dettata da esigenze economiche e di tempistiche. La critica che si fa a questo progetto non riguarda tanto la scelta dei materiali, che non è sicuramente la scelta migliore in termini di performance termica, ma è comunque dettata dalle esigenze prima citate. Il problema maggiore è la concezione di mini–appartamenti che non hanno alcuna possibilità di espansione successiva e che sono adatti ad ospitare 3 persone (secondo la normativa che regola popolare nelle Filippine) mentre la famiglia media è composta da 6 persone (10–12 nelle classi più povere). Ciò ha portato ad una situazione di **estremo sovraffollamento**, come si può vedere dagli schemi riportati. A questo si unisce la **mancanza di spazi pubblici coperti** (fatta eccezione per i due campi da basket), necessari in climi tropicali.

Scala 1:1000

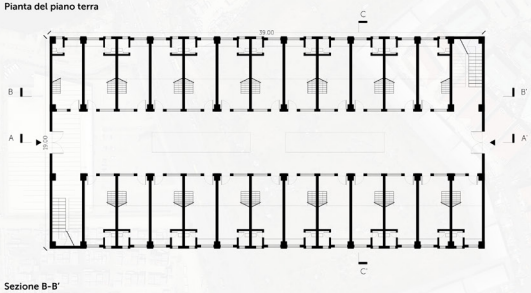
0 10 20 50 m

Sezione A-A'

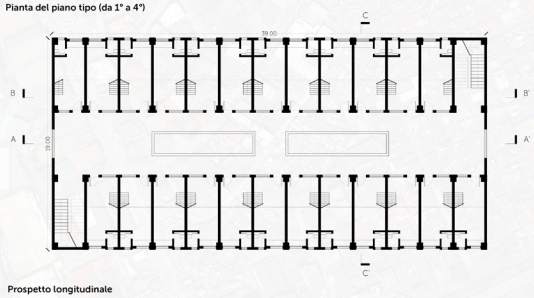


Sezione C-C'

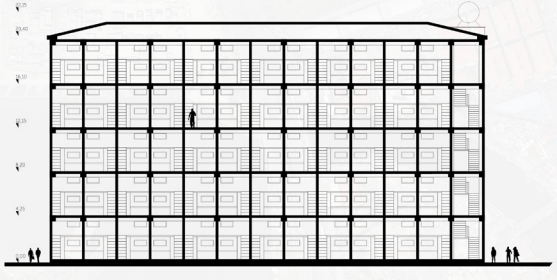
Pianta del piano terra



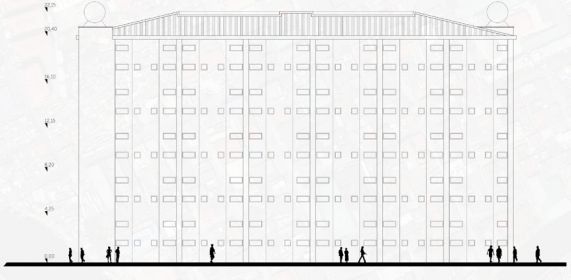
Pianta del piano tipo (da 1° a 4°)



Sezione B-B'



Prospetto longitudinale



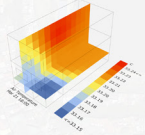
Scala 1:200

0 2 4 10 m

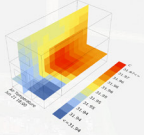
Temperature interne

Tramite un modello *Energy+* della singola unità abitativa, si è simulato l'andamento della temperatura interna in 4 giorni dell'anno, alle ore 6, 12, 18 e 24. Vengono di seguito riportati i grafici relativi alle temperature nei giorni scelti alle ore 18, essendo l'orario in cui si raggiunge la temperatura massima.
Si può notare come la temperatura subisca piccole variazioni durante l'anno, raggiungendo un valore massimo di 33,24 °C il 21 Marzo.
Si fa inoltre presente che il tasso di umidità relativa si mantiene sempre tra l'80% e il 90%.

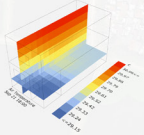
21 Marzo



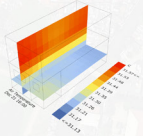
21 Giugno



21 Settembre



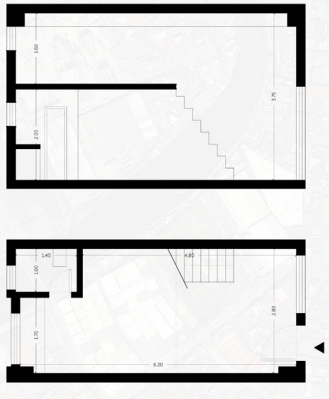
21 Dicembre



Densità abitativa

Superficie netta	17 mq
Media di abitanti/unità	12 persone
Max. di abitanti per legge	3 persone
Persone oltre il max. consentito	9 persone

	Altezza (m)	m²/persona	Volume (m³)	m³/persona	Area tot (m²)
Organizzazione Mondiale Sanità				4,95	
BP 220	2				20
National Building Code of the Philippines	2,4 – 2,7	34,5		6	
Unità esistenti Paradise Heights	3	2,83 – 8,5	51	0,94 – 2,83	17



Scala 1:50

0 0,5 1 2,5 m

università di pisa | scuola di ingegneria | destec | corso di laurea magistrale in ingegneria edile - architettura | tesi di laurea magistrale | IN-FORMALITY spazi pubblici, social housing e sanitation a smokey mountain, manila | candidata lyza rossi | relatori prof. arch. luca lanini (destec) prof. arch. maurice mitchell (arcsa) arch. ing. fabio candido | a.a. 2015/201

Paradise Heights stato di progetto

Proposta per riduzione del sovraffollamento e destinazione pubblica del livello strada di alcuni edifici

La prima fase del progetto si focalizza sull'uso parziale o totale dei piani terra di alcuni edifici di P.H. (con il mantenimento di alcuni servizi igienici) per la realizzazione di spazi pubblici coperti, privi di funzioni predefinite, in modo che la popolazione possa utilizzarli nel modo che ritiene più opportuno: espansione dello spazio interno delle unità abitative, spazi per workshop, *sari sari shops*, rimessa per biciclette e trycicle, etc...

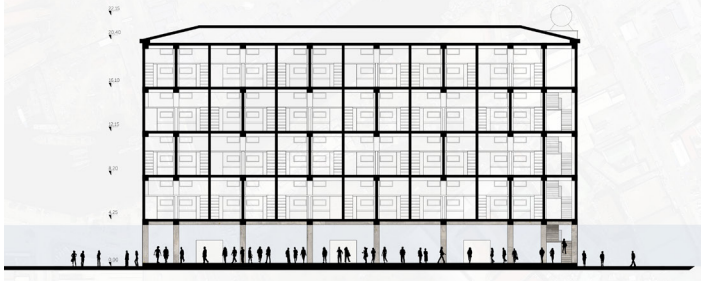
La seconda fase si rivolge alla questione del sovraffollamento di tali edifici. L'intervento di minore invasività che è stato possibile definire è l'accoppiamento di 12 unità per piano, per ricavare alloggi più grandi da destinare ai nuclei familiari più numerosi.

Ovviamente ciò non risolve il sovraffollamento, ma rende la spazialità interna leggermente più flessibile.

Scala 1:1000

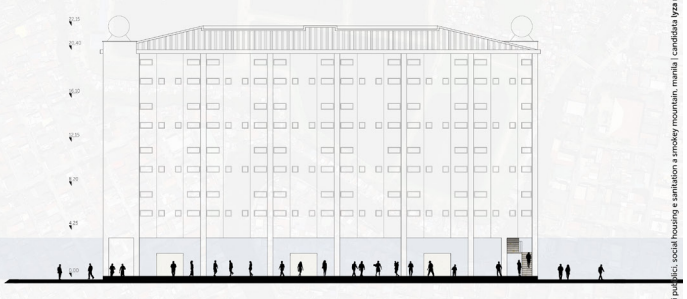
0 10 20 50 m

Sezione A–A'

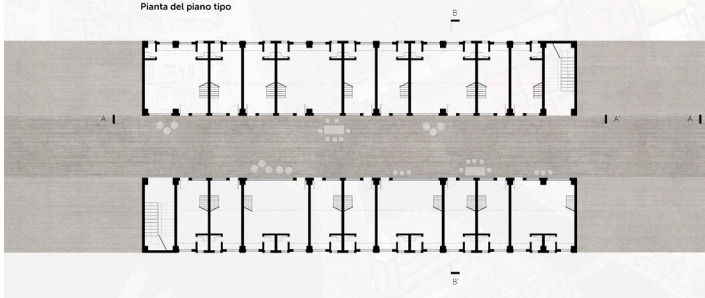


Sezione B–B'

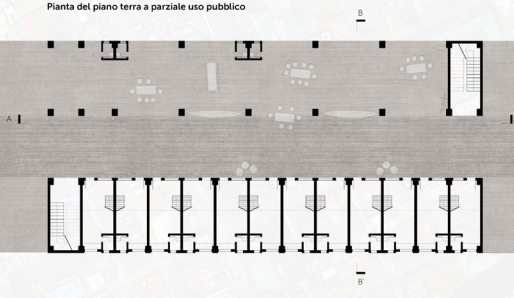
Prospetto longitudinale



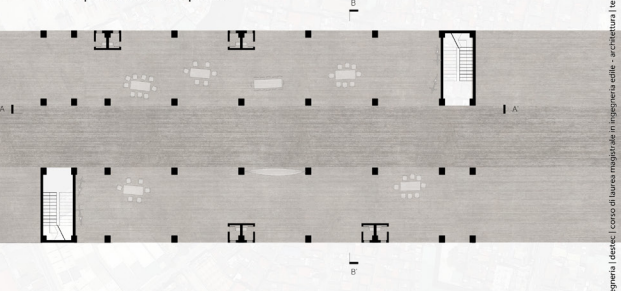
Pianta del piano tipo



Pianta del piano terra a parziale uso pubblico



Pianta del piano terra a totale uso pubblico



Scala 1:200

0 2 4 10 m

università di pisa | scuola di ingegneria | destec | corso di laurea magistrale in ingegneria edile - architettura | tesi di laurea magistrale | IN-FORMALITY spazi pubblici, social housing e sanitation a smokey mountain, manila | candidata lyza rossi | relatori **prof. arch. luca lanini** (destec) **prof. arch. maurice mitchell** (arcsa) **arch. ing. fabio candido** | a.a. 2015/201

***Social housing* incrementale**

Alcune possibili configurazioni del piano tipo

In questo progetto, viene considerata **ottimale** una densità di 2 persone/20 m² (o **1 persona/10 m²**), ma viene garantito uno standard minimo superiore del minimo normativo della BP220 anche con una occupazione di 3 persone/20 m² (o 1 **persona/6,67 m²**), che è il tasso di occupazione massimo considerato e (teoricamente) ammesso.

La configurazione G descrive la **situazione ritenuta più efficiente in termini del rapporto densità abitativa/spazi aperti comuni**: un edificio con 7 unità abitative per piano, considerando una occupazione di 1 persona/10 m², con eventuale aggiunta di unità abitative di 30 m² al piano terra, per persone anziane o con disabilità; tale configurazione permette un incremento del 31% rispetto alla configurazione base (94 persone totali).
Lo stesso layout, ma con il tasso di densità massimo (1 persona/6,7m²) porterebbe ad un aumento del 96% , con un totale di 141 persone in ogni edificio.

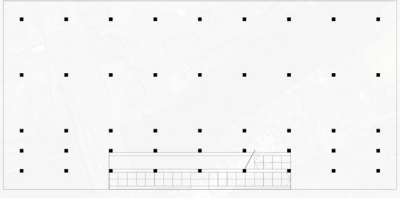
Il **massimo tasso di occupazione** che è possibile ottenere è dato dalla configurazione I: 8 unità abitative per piano e fino a 168 persone per edificio (177 se venissero realizzate le unità ai piani terra).

Sono qui presentate anche configurazioni che portano a delle maggiori occupazione e densità rispetto a quelle considerate ottimali, in quanto va tenuta in considerazione l'espansione che sicuramente le famiglie metteranno in atto.

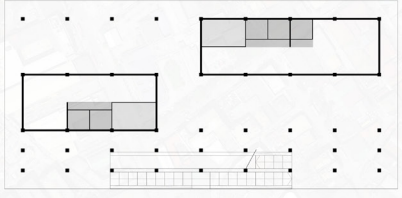
L'edificio è stato studiato in modo da fare propria l'informalità e renderla possibile all'interno di una struttura architettonica formale.

	unità/piano	piani occupati	superficie totale del piano (m²) *	area occupata dalle unità/piano (m²)	area coperta comune/piano (m²)	persone/piano	persone/edificio
A1 (configurazione base)	2	4	544,7	151,6	393,1	18	72
con unità al PT (6 persone)		5					78
A2 (configurazione base con max densità)	2	4	544,7	151,6	393,1	21	84
con unità al PT (9 persone)		5					93
B	4	4	545	151,6	393,4	14 ÷ 21	56 ÷ 84
con unità al PT (6 ÷ 9 persone)		5					62 ÷ 93
C	5	4	545	173,1	371,9	16 ÷ 24	64 ÷ 96
con unità al PT (6 ÷ 9 persone)		5					70 ÷ 105
D	6	4	545	194,6	350,4	18 ÷ 27	72 ÷ 108
con unità al PT (6 ÷ 9 persone)		5					78 ÷ 117
E	6	4	545	254,6	330,4	20 ÷ 30	80 ÷ 120
con unità al PT (6 ÷ 9 persone)		5					86 ÷ 129
F	4	4	545	234,6	310,4	22 ÷ 33	88 ÷ 132
con unità al PT (6 ÷ 9 persone)		5					94 ÷ 141
G (configurazione intermedia migliore)	7	4	545	234,6	310,4	22 ÷ 33	88 ÷ 132
con unità al PT (6 ÷ 9 persone)		5					94 ÷ 141
H	8	4	545	274,6	270,4	26 ÷ 39	104 ÷ 156
con unità al PT (6 ÷ 9 persone)		5					110 ÷ 165
I (occupazione max)	8	4	545	294,6	250,4	28 ÷ 42	112 ÷ 168
con unità al PT (6 ÷ 9 persone)		5					118 ÷ 177

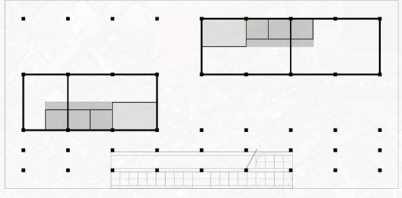
Struttura portante



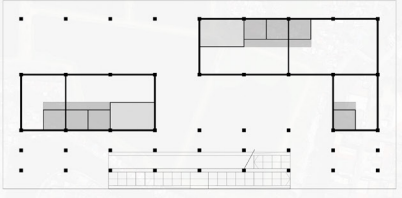
Configurazione A (base)



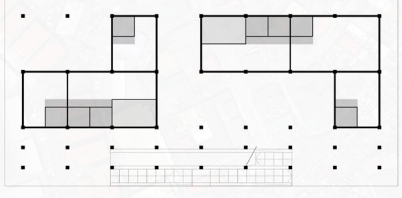
Configurazione B



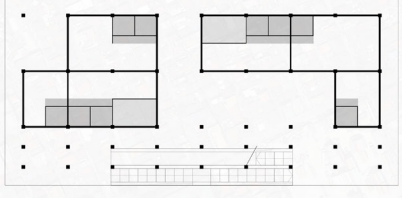
Configurazione C



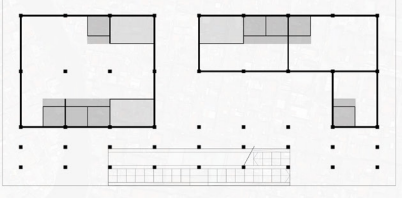
Configurazione D



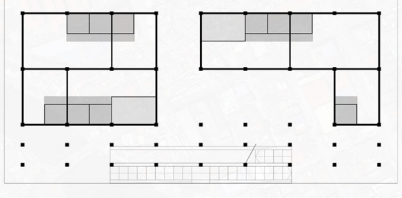
Configurazione E



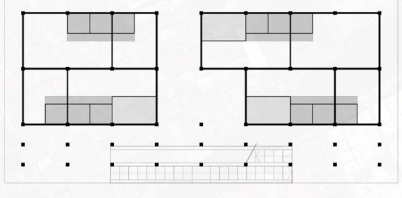
Configurazione F



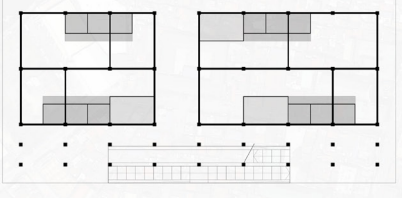
Configurazione G



Configurazione H



Configurazione I



Legenda

- Camera da letto
- Blocco servizi
- Open space

Scala 1:200

0 2 4 10 m

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***Social housing* incrementale**

Configurazione base

Il progetto degli edifici di *housing* si basa sui seguenti punti cardine:

– edifici *medium rise*: giusto compromesso tra edifici alti (area disponibile/numero di persone) e abitazioni singole (qualità degli spazi di pertinenza); non c'è obbligo di ascensore, ma la struttura è pensata per poterlo eventualmente integrare e metterlo a servizio di più edifici;

– compresenza di **massimo 8 nuclei familiari per piano** (nella configurazione di occupazione massima) per diminuire possibilità di conflitto;

– **incrementalità a scala architettonica**: la configurazione base può essere ampliata fino ad occupare il doppio dell'area della configurazione base, oppure può essere ulteriormente divisa in sottomoduli, grazie alla disposizione degli impianti;

– **incrementalità a scala urbana**: la struttura regolare del singolo edificio ne rende possibile la ripetizione in linea per la creazione di una griglia urbana;

– **alta densità Vs sovraffollamento**: per quanto possibile, la struttura è stata progettata per arrivare ad una configurazione di massima occupazione oltre la quale non si possa andare, mantenendo un rapporto accettabile di spazi aperti comuni/spazi privati;

– il piano terra ospita le **cisterne per immagazzinamento dell'acqua piovana** raccolta dal tetto al piano terra; in caso di necessità (persone anziane o disabili) vi è spazio sufficiente per la realizzazione di unità abitative di 30 mq al piano terra, garantendo comunque la permeabilità continua del livello strada;

– **struttura portante in calcestruzzo armato, pareti leggere e traspiranti per garantire massima areazione, copertura leggera in legno**: è possibile realizzare la scheletro portante in legno, alleggerendo quindi la struttura, ma ciò comporta costi maggiori;

– **loggia pubblica continua al livello strada**, per la creazione di spazi pubblici che potranno rimanere liberi oppure inglobare nel tempo le attività commerciali antistanti.

Scala 1:2000

0 20 40 100 m

Uso diurno

Uso notturno

Aggiunta di *sari sari shops* al piano

Scala 1:100

0 1 2 5 m

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***Social housing* incrementale**

Configurazione intermedia

Il progetto degli edifici di *housing* si basa sui seguenti punti cardine:

– edifici **medium rise**: giusto compromesso tra edifici alti (area disponibile/numero di persone) e abitazioni singole (qualità degli spazi di pertinenza); non c'è obbligo di ascensore, ma la struttura è pensata per poterlo eventualmente integrare e metterlo a servizio di più edifici;

– compresenza di **massimo 8 nuclei familiari per piano** (nella configurazione di occupazione massima) per diminuire possibilità di conflitto;

– **incrementalità a scala architettonica**: la configurazione base può essere ampliata fino ad occupare il doppio dell'area della configurazione base, oppure può essere ulteriormente divisa in sottomoduli, grazie alla disposizione degli impianti;

– **incrementalità a scala urbana**: la struttura regolare del singolo edificio ne rende possibile la ripetizione in linea per la creazione di una griglia urbana;

– **alta densità Vs sovraffollamento**: per quanto possibile, la struttura è stata progettata per arrivare ad una configurazione di massima occupazione oltre la quale non si possa andare, mantenendo un rapporto accettabile di spazi aperti comuni/spazi privati;

– il piano terra ospita le **cisterne per immagazzinamento dell'acqua piovana** raccolta dal tetto al piano terra; in caso di necessità (persone anziane o disabili) vi è spazio sufficiente per la realizzazione di unità abitative di 30 mq al piano terra, garantendo comunque la permeabilità continua del livello strada;

– **struttura portante in calcestruzzo armato, pareti leggere e traspiranti per garantire massima areazione, copertura leggera in legno**: è possibile realizzare la scheletro portante in legno, alleggerendo quindi la struttura, ma ciò comporta costi maggiori;

– **loggia pubblica continua al livello strada**, per la creazione di spazi pubblici che potranno rimanere liberi oppure inglobare nel tempo le attività commerciali antistanti.

Scala 1:2000

0 20 40 100 m

Uso diurno

Uso notturno

Aggiunta di *sari sari shops* al piano

Scala 1:100

0 1 2 5 m

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***Social housing* incrementale**

Configurazione di massima occupazione

Il progetto degli edifici di *housing* si basa sui seguenti punti cardine:

– edifici **medium rise**: giusto compromesso tra edifici alti (area disponibile/numero di persone) e abitazioni singole (qualità degli spazi di pertinenza); non c'è obbligo di ascensore, ma la struttura è pensata per poterlo eventualmente integrare e metterlo a servizio di più edifici;

– compresenza di **massimo 8 nuclei familiari per piano** (nella configurazione di occupazione massima) per diminuire possibilità di conflitto;

– **incrementalità a scala architettonica**: la configurazione base può essere ampliata fino ad occupare il doppio dell'area della configurazione base, oppure può essere ulteriormente divisa in sottomoduli, grazie alla disposizione degli impianti;

– **incrementalità a scala urbana**: la struttura regolare del singolo edificio ne rende possibile la ripetizione in linea per la creazione di una griglia urbana;

– **alta densità Vs sovraffollamento**: per quanto possibile, la struttura è stata progettata per arrivare ad una configurazione di massima occupazione oltre la quale non si possa andare, mantenendo un rapporto accettabile di spazi aperti comuni/spazi privati;

– il piano terra ospita le **cisterne per immagazzinamento dell'acqua piovana** raccolta dal tetto al piano terra; in caso di necessità (persone anziane o disabili) vi è spazio sufficiente per la realizzazione di unità abitative di 30 mq al piano terra, garantendo comunque la permeabilità continua del livello strada;

– **struttura portante in calcestruzzo armato, pareti leggere e traspiranti per garantire massima areazione, copertura leggera in legno**: è possibile realizzare la scheletro portante in legno, alleggerendo quindi la struttura, ma ciò comporta costi maggiori;

– **loggia pubblica continua al livello strada**, per la creazione di spazi pubblici che potranno rimanere liberi oppure inglobare nel tempo le attività commerciali antistanti.

Scala 1:2000

0 20 40 100 m

Uso diurno

Uso notturno

Aggiunta di *sari sari shops* al piano

Scala 1:100

0 1 2 5 m

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***Social housing* incrementale**

Prospetti e sezioni

L'alzato, esattamente come la pianta, mostra in modo chiaro la dualità tra scheletro portante in calcestruzzo armato e partizioni verticali leggere in legno e bambù. Anche la copertura è in legno, per alleggerire la struttura ed evitare eccessivo accumulo di calore all'ultimo piano.

La **scala** definisce lo stretto **rapporto tra edificio residenziale e strada**, creando un **collegamento senza soluzione di continuità** tra i due, coerentemente con il modo di vivere gli spazi aperti e comuni come diretta espansione dello spazio privato, dell'abitazione della singola famiglia.

Gli **elementi verticali** (pilastri, montanti in legno, discendenti e tubazioni varie) scandiscono la facciata in modo regolare, secondo moduli e sottomoduli della maglia strutturale, e, insieme alla scala, si contrappongono alla **marcata orizzontalità delle superfici dei solai**.

Prospetto lato strada

Sezione trasversale

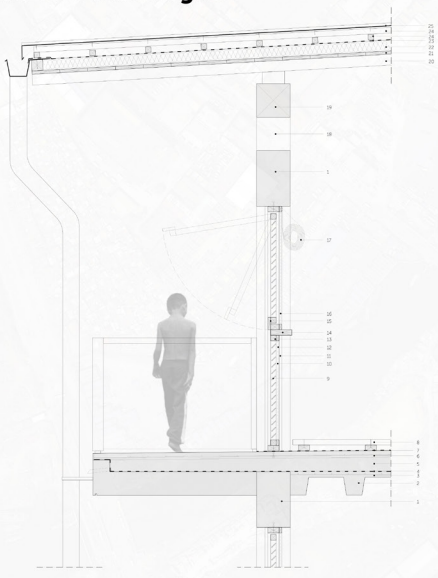
Prospetto lato *Smokey Mountain*

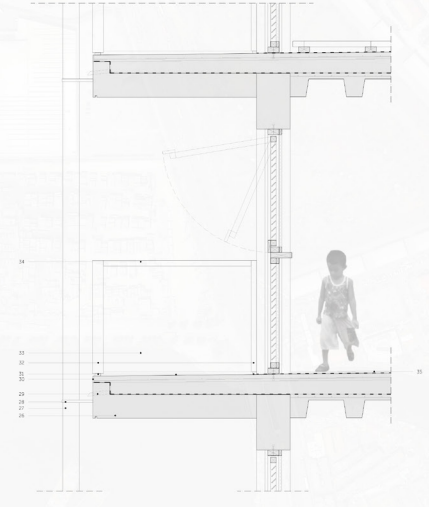
Scala 1:100

0 1 2 5 m

università di pisa | scuola superiore sant'anna | dsphec | corso di laurea magistrale in ingegneria edile - architettura | tesi di laurea magistrale IN-FORMALITY spazi pubblici, social housing e riqualificazione a smokey mountain, manila | candidata **lyza rossi** | relatori **prof. arch. luca lanini** (dsphec) **prof. arch. maurice mitchell** (arcsa) **arch. ing. fabio candido** | a.a. 201

Sezioni di dettaglio





Scala 1:20

0 20 40 100 cm

Legenda striscia di facciata e pannelli di parete scala 1:20

1. Trave in c.a. 50x30 cm
2. Travetto in c.a. gettato in opera 16x14 cm, interasse 50 cm. Elementi di alleggerimento in alluminio *tin pans* rimovibili
3. Soletta in c.a. di spessore 5 cm, con rete E.S. diametro 6 mm, passo 15 cm
4. Guaina impermeabilizzante
5. Massetto portaimpianti in cls alleggerito, spessore 11 cm, pendenza 1%
6. Pavimentazione in calcestruzzo battuto, spessore 6 cm, con rete E.S. diametro 5 mm, passo 15 cm
7. Guaina impermeabilizzante
8. Pavimentazione di tavole di bambù, sezione 5x10 cm, telaio sottostante a passo 50 cm
9. Listelli in legno di palma da cocco, sp. 5 mm
10. Zanzariera fissa
11. Montante di sostegno, sezione 15x15 cm, passo 177,5 cm
12. Telaio primario in legno di palma da cocco, listelli 10x5 cm
13. Telaio secondario in legno di palma da cocco, listelli 5x5 cm
14. Tavola in legno di palma da cocco, 5x20 cm
15. Listelli in legno di palma da cocco, 5x5 cm e 16x2,50 cm per chiusura battente
16. Zanzariera apribili
17. Stuoia oscurante
18. Profilo di sostegno a T in legno di palma di cocco
19. Trave in legno di palma da cocco, 30x30 cm
20. Travicelli in legno di palma da cocco, 10x10 cm
21. Tavole in legno di palma da cocco, 2,5x10 cm
22. Isolante in lana di roccia, sp. 10 cm
23. Guaina impermeabilizzante
24. Listelli in legno di palma da cocco 5x5 cm, interasse 55 cm
25. Copertura in alluminio pre-verniciato di bianco
26. Soletta in c.a. sp. 20 cm
27. Discendente in rame, Ø 15cm
28. Sostegno del discendente
29. Scolo
30. Mastice sigillante per protezione guaina
31. Profilo in acciaio a L fissaggio parapetto
32. Elementi verticali del parapetto in legno di palma da cocco, listelli 10x5 cm, h 100 cm
33. Rete a maglia fitta
34. Elementi orizzontali del parapetto in legno di palma da cocco, listelli 10x5 cm
35. Stuoia in bambù
36. Tessuto

Legenda nodo scala 1:10

1. Pilastro in c.a. 30x30 cm
2. Profilo a C in acciaio per fissaggio montante
3. Montante di sostegno, sezione 15x15 cm, passo 177,5 cm
4. Telaio primario in legno di palma da cocco, listelli 7,5x5 cm
5. Battente in legno di palma da cocco, listelli 2x10 cm e 5x5 cm

0 10 20 50 cm

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Sanitation e vie di accesso allo *slum*

Dotazione di servizi igienici pubblici e accessi per mezzi di emergenza

Il tema degli **insediamenti informali nelle aree urbane delle megacittà** è estremamente complesso ed è oggetto di ricerca da parte di enti internazionali, accademici e ONG per la definizione di metodologie di intervento efficaci, nel rispetto delle persone che vi abitano e delle loro necessità.

L'insediamento informale che si sviluppa a est di *Paradise Heights* ha progressivamente occupato quello che originariamente era un canale per l'irrigazione delle risaie dell'area. Il risultato è un **tessuto urbano sviluppatosi in modo organico**, risultato di **addizioni consecutive e riempimento di spazi interstiziali**. Lo slum risulta confinato da due tessuti urbani formali: il quartiere di San Rafael sul lato nord ovest, i *Barangay* n. 130, 131, 138, 142, 146 e 135 sul lato sud est; il *Barangay* (lett. *villaggio*) è la più piccola unità del governo locale nelle Filippine.

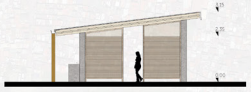
La quasi totalità degli alloggi informali non ha servizi igienici. Si è quindi ritenuto di progettare un intervento di collegamento ai sistemi fognari e idrici esistenti, con la **distribuzione diffusa di servizi igienici** (con W.C., docce e lavandini esterni per le campagne di educazione all'igiene personale rivolte ai bambini) e **lavatoi/spazi lavanderia pubblici**. Tali servizi potranno essere presi in gestione dagli stessi abitanti dell'area, creando quindi occupazione, e renderà possibile un controllo diretto delle strutture, contro eventali episodi di vandalismo e incuria.

Sarà necessario **demolire alcuni alloggi**, sia per il collegamento alle reti fognaria e idrica, sia per la creazione di vie di **accesso per mezzi di soccorso**, che al momento non possono raggiungere le parti più interne dello slum, essendo un insediamento ad elevatissima densità.

Viene qui proposta un'iniziale distribuzione dei moduli. **La rete dei servizi potrà in seguito essere sviluppata e incrementata, coprendo in modo più capillare l'area**, ovviamente avendo a monte una strategia progettuale di ricollocamento nell'area delle persone espropriate.

Modulo tipo per servizi igienici

Prospetto laterale



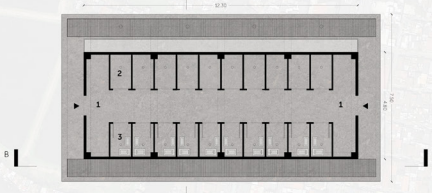
Prospetto longitudinale – lato W.C.

Sezione A-A'

Raccolta
Filtraggio e distribuzione
Al pozzetto acque grigie
Alla fossa settica

Sezione B-B'

Troppo-pieno



La struttura ha uno scheletro portante di c.a., pareti leggere in legno e bambù e copertura in legno. Ogni modulo presenta **10 W.C.** e **10 docce**. In caso di costruzione di un modulo singolo, è possibile porre un divisorio a metà della struttura, in modo da garantire **servizi igienici divisi per donne e uomini**. L'accesso avviene da entrambi i lati corti, attraverso uno spazio di ingresso da usare come ripostiglio e/o spazio armadietti. I **box doccia** hanno le stesse misure del W.C. per agevolare l'eventuale accesso di un genitore insieme al figlio, e per consentire il lavaggio dei vestiti che si hanno indosso.
Le **cisterne in calcestruzzo armato** per la raccolta dell'acqua sono interrate, sia per esigenze di spazio, sia per poter garantire un volume di riserva maggiore. Si stima un consumo medio di 20 l/persona/giorno.

area tetto (m²)	acqua raccolta in Agosto (l)	volume cisterna (m³)	n cisterne
90,75	32.261,63	20,88	2

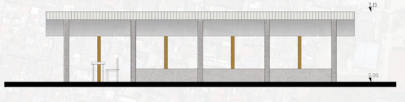
Legenda

1. Ingresso
2. W.C.
3. Box doccia
4. Cisterne in c.a. per raccolta e conservazione dell'acqua piovana, con filtro
5. Pompe
6. Lavandini esterni

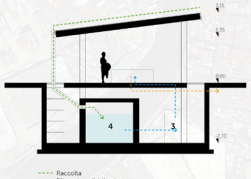
Modulo tipo per lavatoi pubblici e lavatrici a gettoni

Prospetto laterale

Prospetto longitudinale

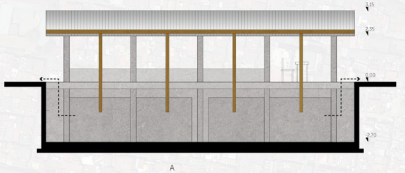


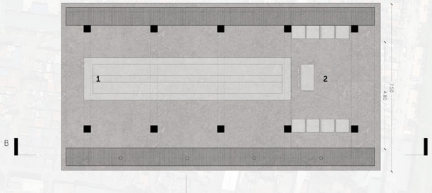
Sezione A-A'



Raccolta
Filtraggio e distribuzione
Al pozzetto acque grigie

Sezione B-B'





La stessa struttura del modulo dei servizi igienici (senza i pannelli di parete) viene riproposta come lavatoio pubblico, con una vasca per il lavaggio a mano che occupa 3 maglie, mentre la quarta ospita le lavatrici a gettoni e una postazione di controllo.

Legenda

1. Vasca per lavaggio a mano
2. Postazione controllo e lavatrici a gettoni
3. Pompe
4. Cisterne in c.a. per raccolta e conservazione dell'acqua piovana

Scala 1:100
0 1 2 5 m

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Centro di *family planning* e vaccinazioni

Proposte di riuso degli uffici abbandonati della NHA

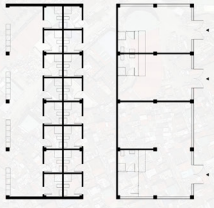
L'edificio in questione rappresenta l'unico **presidio pubblico** del quartiere di *Paradise Heights*. Si tratta di un edificio ad un piano al cui interno trovavano originariamente spazio gli **uffici della *National Housing Authority*** (l'agenzia governativa che dagli anni '70 si occupa del problema abitativo), durante la costruzione dei 30 blocchi di *social housing*, tra il 1995 e il 2014. Da circa due anni, l'NHA non si occupa più della gestione e manutenzione dell'area e, di conseguenza, l'**edificio è stato abbandonato**. Sono state studiate varie possibili opzioni di riuso di questo spazio. Tra le nuove destinazioni proposte, si ritiene che l'uso come **centro di *family planning* e vaccinazioni** (con ambulatori e aule per incontri di formazione della popolazione) sia la migliore opzione, in quanto consente di mantenere la natura di presidio pubblico della struttura e si rivolge a temi che fortemente influenzano la vita delle famiglie filippine, specialmente quelle di estrazione sociale più bassa, come, per l'appunto, nel caso di *Paradise Heights*.

Scala 1:2000

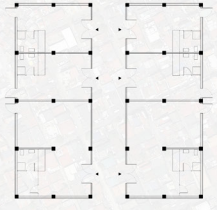
0 20 40 100 m

Servizi igienici pubblici e aule workshop

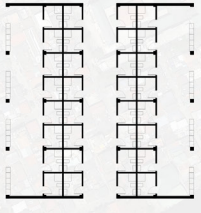
Servizi igienici pubblici e unità abitative



Unità abitative



Servizi igienici pubblici



Scala 1:200

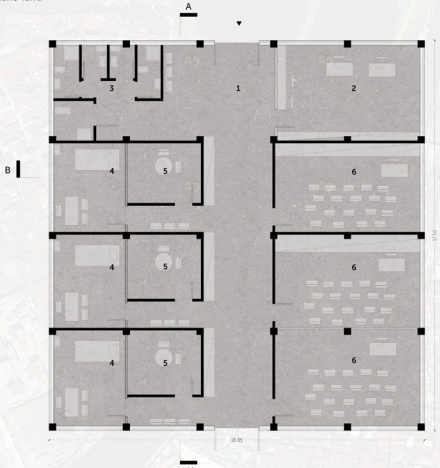
0 2 4 10 m

Centro di *family planning* e vaccinazioni

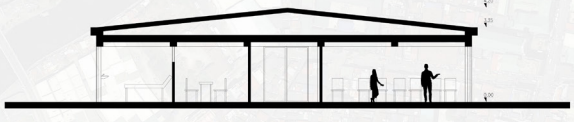
Immagini tratte dal documentario "*The slum*" di Al Jazeera, ambientato a Tondo, il distretto di cui fanno parte *Paradise Heights* e *Smokey Mountain*

Sezione A-A'

Pianta piano terra



Sezione B-B'



Legenda

1. Ingresso
2. Ufficio segreteria e front desk
3. Servizi igienici
4. Ambulatorio visite
5. Colloqui privati
6. Aule per incontri informativi e workshop

Scala 1:100

0 1 2 5 m

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Junk shop

Da economia informale ad attività commerciale regolare

Il *junk shop* è una attività commerciale molto diffusa nelle Filippine, in particolar modo a Manila.

L'assenza di una gestione pubblica dei rifiuti rappresenta uno dei problemi principali dell'intera area metropolitana. Da questa mancanza, è derivato un elevatissimo tasso di inquinamento e la maggior parte delle acque che attraversano Manila sono state dichiarate biologicamente morte da tempo.

Questa situazione di emergenza ambientale e sanitaria ha, paradossalmente, reso possibile lo sviluppo di un'economia informale che per molte persone (i *poorest of the poor*) rappresenta la sola fonte di guadagno. L'attività di ***scavenger***, termine che letteralmente indica gli animali che si nutrono di carcasse, mentre in questo caso si riferisce alle persone che vanno nelle discariche e rovistano fra i rifiuti per cercare materiale riciclabile da portare al locale ***junk shop*** e guadagnare così 1/1,50$ al giorno. Alcuni *scavengers* si fanno assumere da famiglie della classe media per raccogliere la spazzatura domestica direttamente nelle loro case.

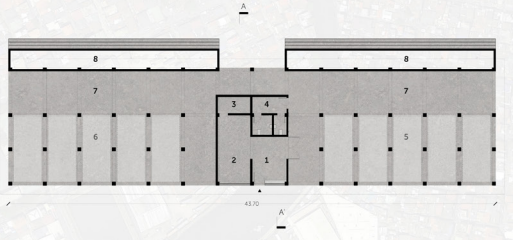
Uno dei problemi di *Paradise Heights* è la completa divisione dal resto del tessuto urbano circostante per quanto riguarda la circolazione pedonale: un muro delimita tutto il lato est dell'area, rendendo così impossibile un collegamento trasversale continuo in direzione ovest - est.

Molti degli abitanti di *Paradise Heights* vivono dell'attività di *scavengers*, quindi, una volta individuata l'area abbandonata lungo il muro di confine, è sembrato naturale destinarla ad un'**attività che potesse idealmente e fisicamente collegare i diversi tessuti urbani che si interfacciano**, tramite l'inserimento di un *junk shop*, con spazi di immagazzinamento divisi per materiale sporco da scegliere e materiale pulito e diviso, e una parte di ufficio e sala per meeting e per laboratori artigianali per il riutilizzo dei materiali raccolti.
Le foto presentate a lato danno un'idea delle attività svolte in un centro di questo tipo.

Prospetto Ovest

Prospetto Est

Pianta piano terra



Sezione A-A'

Scala 1:200
0 2 4 10 m

Legenda

1. Ufficio e front desk
2. Meeting room
3. Archivio
4. Servizi igienici
5. Spazio container per materiale da pulire e dividere
6. Spazio container per materiale pulito
7. Area lavaggio e scelta materiale
8. Cisterne raccolta acqua piovana

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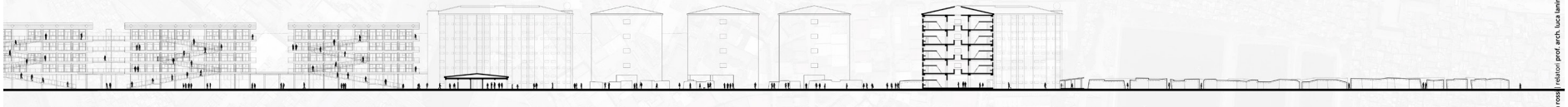
Paradise Heights e ***Smokey Mountain*** stato di progetto

Spazi pubblici continui per la comunità

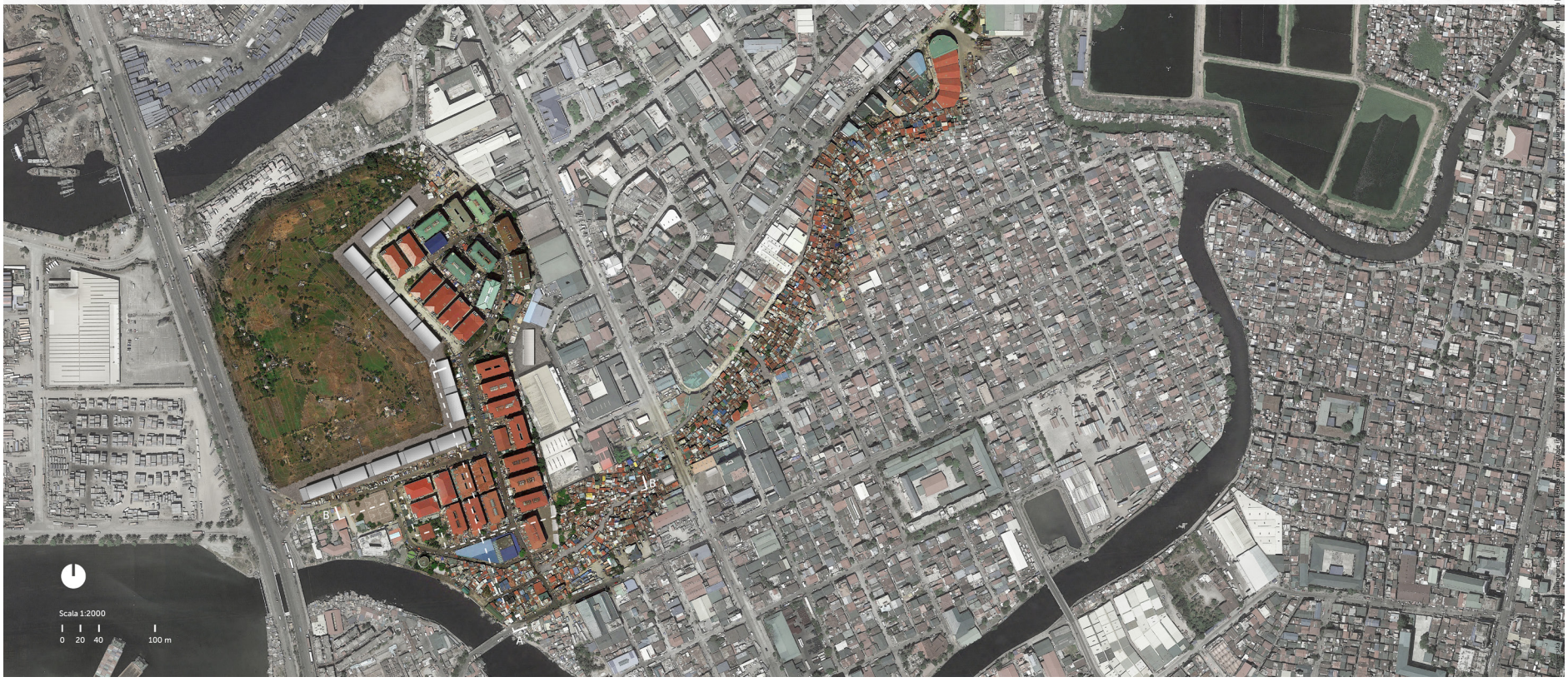
Sezione A-A'

Sezione B-B'



Scala 1:500

0 5 10 25 m



relatori prof. arch. luca lanini (destra) prof. arch. maurice mitchell (sinistra) arch. ing. fabio candido | a.a. 201
candidata lyza rosso

Paradise Heights* e *Smokey Mountain stato di progetto