



# Urban trees in low-income settlements in the Philippines

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*Urban Shelter Theory*

## 1 Introduction

In February 2016, I went to the Philippines along with other classmates from Lund University, Sweden, for a field study, which was part of the architecture course *Urban Shelter*. When walking in the streets of Manila, there are many things that clutter the sidewalks and between which a us as pedestrians had to slalom. Some fruits that are put directly on the ground for sale, kids running around, stray dogs looking for food, abandoned bags of waste, trees coming directly out of the concrete... And this last item is particularly invasive, with its roots cracking the ground which can easily leads to the fall of some distracted walker. Besides, there is a strange feeling coming from those trees arising from an asphalt sea. It feels like they were here before the road, the sidewalk, the cars, tricycles and the people moving fast in a chaotic ballet. They were there and someone poured concrete around it as the city was extending and the urban tissue taking over the tropical forest. The phenomenon is not only happening in the streets but everywhere : trees out of a roof (fig.1), trees between a road and a sidewalk (fig.2), trees in the narrowest alley possible (fig.3), trees passing through a balcony (fig.4). However, I couldn't help but noticing their absence from the new low-income development housing projects we visited during our stay in Manila.

What is the importance of trees in low-income settlements in the Philippines? Why are they often not included in those new housing projects, and how does it affect the life of people over there?

In this essay, I will first talk about urban trees in general, and then develop their importance in low-income settlements in the Philippines. Finally, I will try to reflect on how to incorporate them in an Urban Shelter Design Project.



*fig.1*



*fig.2*



*fig.3*



*fig.4*

## 2 Trees in cities

### *An ideal development of a city*

In his book *House form and Culture*, first published in 1969, Amos Rapoport does not only describes house forms but studies the origins of these forms, which he describes as « a whole range of socio-cultural factors seen in their broadcast terms » (47). He mentions for example socio-cultural forces, needs, site, climate, religion, economy, materials available... Landscape, and particularly trees, are part of these factors. In an example of a carpenter reviewing the characteristics of a given site before planning a house, he mentions the particular attention the carpenter gives to the trees existing on the site, and asks « the owner which trees might be sacrificed », because it is an important decision that will later shape the project, not the opposite.

Building at the scale of a single house makes it easier to focus on details like the vegetation already present on site. But what about a whole city? According to Jan Gehl in *Cities for people*, it is first the life that should be observed when planning on a large scale, the habits of people, then the spaces, and last, the buildings. In the Philippines, if trees are a part of the habits of people who put on posters or let their clothes dry there, or if they are particularly appreciated by children for climbing, playing, hiding : the space should be shape according to everyday life habits of people, taking them into consideration.

### *Development of Metro-Manila*

The city of Manila has not always been the chaotic and overpopulated concrete megalopolis that we know today. Located along the eastern shore of Manila Bay, in the deltaic plain of the Pasig river, surrounded by agricultural land, protected by the Sierra Madre hills and the Bataan Peninsula Mountains, it was originally called Maynilad, from the once profusing flowery shrubs growing along the banks of the river.<sup>1</sup> But it has been exposed to a rapid economical development and urbanization after world war II, and today this expansion continues towards the north, the city continuing to take over the agricultural lands. In merely 2 decades, the national population grew from 60 million in 1990 to 94 million by 2010. Today, with 100% urbanization, the National Capital Region (NCR), the

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<sup>1</sup> <http://www.global.britannica.com/place/Manila>

region where Metro Manila is located, is the most densely populated area in the country with 18,165.1 persons/km<sup>2</sup> spread over an administrative land area of 636 km<sup>2</sup> constituting only 0.2% of the total land area of the country.

(Asian Development Bank, 2014)

Besides, with a high population that continues to grow, mainly due to high birth rates, Metro Manila is now facing a housing shortage : over 5 millions housing units are now needed, and the land in the city center, with its proximity to the job opportunities, is rare and expensive. These factors combined leads developers to plan bigger-scaled projects to provide housing for a greater number of filipino families, further from the city to get a land at an affordable price. To reach these projects, new roads are built, and original trees are cut down to let the highway pass. The increasing traffic generates more pollution, and a urban heat island effect (An **urban heat island** (UHI) is a city or metropolitan area that is significantly warmer than its surrounding rural areas due to human activities<sup>2</sup>) that cannot be absorbed by the few greenery left.

What is the impact of the massive change of the environment in the city, climate wise but also in people's lives? Why are urban trees important?

### *Urban trees in general*

Trees in cities have several purposes and benefits. They can be summarized in some categories (from National Urban Forestry Unit, 2005. *Trees Matter! Bringing lasting benefits to people in towns*) :

**climate & biodiversity** : the shadow provided by tree leaves can cool down nearby buildings, reduce the effects of air pollution, absorb carbon dioxide and then reduce the rate of global warming, and even slow down rainwater when reaching the ground with a reduction of localized flash flooding. Tree roots help to bind the soil together and prevent erosion. Some trees can also clean up contaminated land. They play a vital role in the urban ecosystem, by helping to support a great variety of wildlife.

**health** : « by filtering polluted air, reducing chemical smog formation, shading out harmful solar radiation and providing an attractive, calming setting for recreation, trees can have a positive effect on the incidence of asthma, skin cancer and many stress related illnesses. »

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<sup>2</sup> Wikipédia definition for Urban Heat Island

**landscape** : « Trees and woods can bring out the best in an area's local character. They provide a sense of long-term stability and a living link between the past, the present and the future. Trees soften the landscape of hard-edged towns and cities, making them greener, more comfortable and more attractive. »

**material production** : « even in towns, trees yield traditional products such as timber, fruit and horticultural mulch, whilst renewable non-fossil fuel, high-value chemicals and pharmaceuticals may be the wood products of the future. »

**community** : « the landscape is the place where people meet. When communities play an active part in caring for their local trees and woods, this helps to build more confidence and shared enjoyment. »

These are the principal benefits of urban trees in a regular city. We will look now at the situation in informal settlements in the Philippines.

### 3 Trees in low-income settlements in the Philippines

#### *Some reasons for the lack of trees in low-income development areas*

When visiting Manila newly developed areas (such as the Camarin Residences-Megaword LRBS NHA Low-Rise Low-Income Housing) under a burning sun, the need of shading is so high that the absence of it is immediately noticeable. That is why the lack of trees in very recent project was so obvious, compared to other streets in neighborhoods closer to the city center, where the vegetation is acting as a natural protection against the sun.

Usually, very few existing trees are kept while planning low-income areas in Manila, for several reasons. First of all, it is difficult to take into account while planning on a large scale, with already dimensioned buildings. It is much easier and faster for planner to just ignore the aspect of the natural land and start from scratch to aligned the fixed housings.

Then, to keep a tree occupies an area of land which has a high price regarding housing demand, especially in the center of the city where the land is extremely valuable due to its proximity to workplaces. These reasons are commonly evoked to justify taking down existing trees on a site while developing a new housing project. Of course, the need of housing is critical, but what is the impact of this change in the natural eco-system of the

place? Could keeping these trees be in fact extremely valuable for the place and for people?

### *Benefits of trees in low-income settlements in the Philippines*

The lack of shading is not the only problem that results from the absence of trees in a neighborhood. As we saw earlier, trees are essential to maintain a good climate, air and soil quality, and biodiversity in urban areas, but have an even greater role in low-income settlements.

*« Urban trees and forests can contribute immensely to the quality of life in towns and cities in the region. In low-income settlements the most important benefits of the urban forest may be directly productive ones such as supply of building materials, fuelwood and even fodder. Many other functions are environmental, including protection of water-supply catchments for the cities, protection against landslides, climate mitigation. Yet others are aesthetic - the beauty and the room offered for recreation. Some roles cannot be quantified in money terms but this does not mean they are any less important. » (Kuchelmeister G., 1998)*

In low-income settlements in the Philippines, people are usually very vulnerable. Be it by their exposure to natural disasters such as typhoons, floods, landslides or tsunamis, or by the terrible waste management and strong pollution they have to deal with.

But couldn't a tree in a slum act as a shelter? Trees are strong living organisms, and the bigger they are, the bigger the roots and the strongest is the attachment to the ground. In the Philippines, the level of a typhoon can sometimes be measured by the type of tree it is capable of destroy : level 2 for banana trees, level 3 for coconut trees, etc.. Some of them are very resistant to natural disasters, especially if they are native trees. Sometimes trees in the city are artificially added and misplaced, have a shallow root system, they can cause damages to cars or electrical cables if they end uprooted by too strong winds, but certain species native from the Philippines (for example, pili, dau, or molave tree) have a very good resistance to typhoons, much better than light material informal houses<sup>3</sup>. And in case

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<sup>3</sup> <http://www.pacifiqa.com/news/planting-wrong-trees-exotic-trees-making-typhoon-damage-worse-philippines-manila-native-trees/>

of flooding, taking shelter in the higher branches of a solid tree can be a solution to escape the dangerous waters. Mangroves are also used as a buffer as they are a good and natural protection against tsunami waves. In the report *The state of Asian and Pacific cities 2015*, UN-Habitat and ESCAP take the example of Tacloban, a fishermen town in the Philippines that was really damaged by the 2013 Haiyan typhoon, while a protective Mangrove helped minimizing the effects of the storm on other villages. « *The town of Tacloban, near the open sea, was badly hit. Mangrove regeneration north of Tacloban, however, helped minimise damage to other towns, as the trees reduced the impact of the waves generated by the storm. After the 2004 tsunami, it was found that 30 coastal trees per 100 m<sup>2</sup> could reduce the flow of a tsunami by as much as 90 percent. Mangroves also help low-lying coastal areas adapt to rising sea levels by increasing sedimentation, while its above ground roots act as carbon sinks.* » (p. 148)

The trees, and planting vegetation in general, is also a natural and effective way to help cleaning soil, water or polluted air in an area. Planting trees on the banks of a river can also prevent landslides and downstream erosion.

Trees in slum areas can act and partially help on two of the main problems of the poor regions of the Philippines : natural disasters and pollution. Moreover, we saw in the first part that trees were also an excellent social meeting point, can be used for shelter, shadow, children games, and a lot more activities for the local population. There are plenty of reasons to incorporate them to Urban Shelter Design projects.

In the next part, we'll look at how to integrate them in a design depending on the space, land availability, quality of the ground, and function given to the tree.

## 4 Urban Shelter Design

We can think about different criteria that will develop the role of existing trees, not only preserve them but enhancing their presence by giving a clear function to the space around them.

-trees as shelters, protection

The trees can be used as very good natural shadow providers, for a street, or a square. People tend to gather under the branches roof, where the temperature is cooler. But they could also be developed as a landmark, if some platforms are build around the main ones,

where people know they can gather and use their heights in case of a flooding, and climb upper in case of an emergency.

-trees as environment cleaner

In polluted areas, keeping trees can help naturally cleaning the soil, the air, and provides a better life for people in poor areas that can never escape the pollution of the megalopolis.

-trees as urban features (place to cook/meet/play/pray)

To provide people basic furniture to install at the feet of existing trees in an informal settlement can create a big change in the community life. Following the idea of urban acupuncture, developing little precise points like trees can encourage people to meet, gather, eat, sell their fruits, pray and more generally just be together, under a natural roof.

## 5 The Role of Architects

I developed in this paper the strong connexion between natural trees and the built environment, the mutual influence they have on each other, and how sometimes mistakes have been made in order to provide a high, easy planned and fast built number of housing in newly developed projects in Manila. From these mistakes, there are some lessons to take, about the impact of the cities on nature.

I think the role of an architect is to be able to understand the context of a project, from a large scale (connexions, flows, rivers, landscape) to the little details like habits of people already living on or next to the site, which vegetation is already present, what is it's role, the smell, where does it come from, the sun, is it too strong for humans but good for flowers, the wind, the animals... to listen to what people have to say, to understand what is important to them and to balance all these factors together to try to find the best solution. I think an architect should try to not forget any aspect that could have an impact on the project, and the opposite, think about what the project is going to change in the site, and with all these elements, do its best to maintain harmony.



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