

How waste management affects urban poor

The circular system of waste



(NOEL CELIS, 2018)

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Emma Strömberg

1 Introduction

My strongest impression from our three-week study trip to Manila in February 2020 in the urban shelter course was the large amount of garbage we passed by along the sidewalks and in the neighbourhoods we visited. The streets were covered in trash, leaving a pungent and lingering smell from the waste boiling in the heating sun. The informal settlers were burning toxic waste to get rid of it and small children were going through the waste dumps hoping to find recyclable materials, profitable items or even something to eat. It was impressive to see how creative they were, recycling old materials and giving them new purposes that they can use for housing or sell and gain income from.

In Manila waste collection is a livelihood for many. Scavengers, as they called themselves, are collecting trash as their livelihood and they can get around 500 pesos per day by recycling plastic, metal and glass. Many of them live with problems as skin allergy and pneumonia.

Overpopulation and over consuming is a global problem. How we handle waste management affects our health, the environment, the economy and it is a political matter. In developing countries, like the Philippines, the main problem is the poor waste management system, the large amount of waste and the illegal importation of trash coming from industrialized countries.

In the 70s the many dumped their trash in the Pasig river that runs through Manila. The water is now classified as contaminated and the waste still affects the natural water flow and prevents the water from flowing away during the yearly flooding's. This have had a big impact on the urban poor such as the local fishermen along the riverside, the fish died and they had to flee their flooded homes. (Helmer.R & I Hespanhol, 1997)

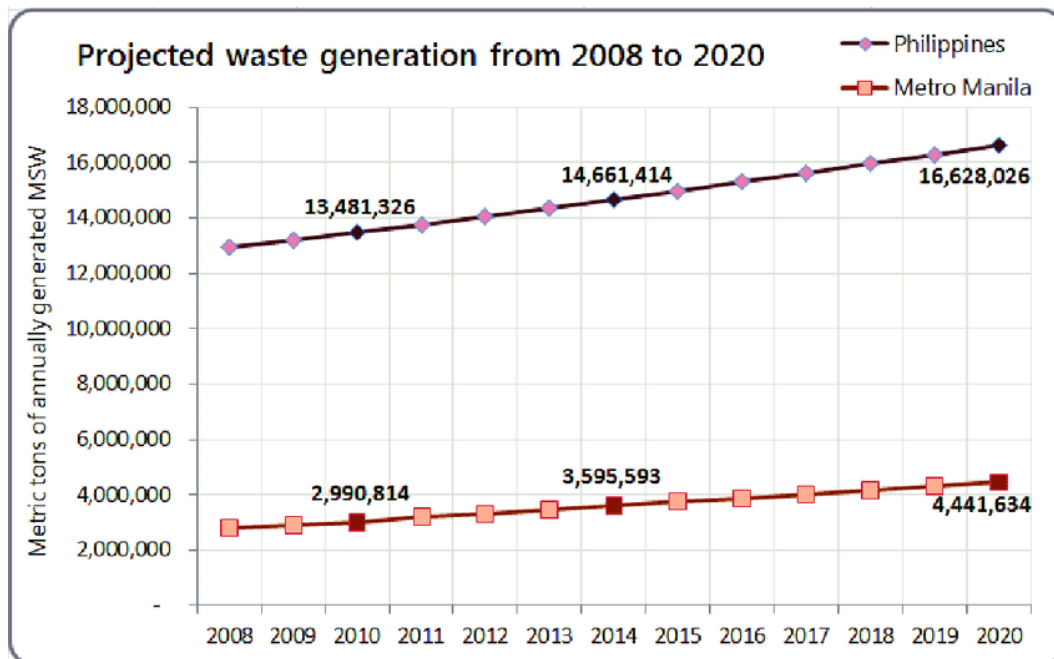
The aim of this paper is to investigate how waste management in Manila affects the urban poor and how we as architects can help to include and implement a well-functioning and sustainable waste management system in an early housing design phase for low-income families.



Biskekville 4, Manila. (Strömberg, E. 2020)

2 Literature Review

The industrialization of the Philippines has led to urban density and the amount of waste continues to grow in relation with the increasing population number, followed by improvement of living standards, rapid economic and industrial growth within the city. (NSWMC. 2017)



Projected waste generation 2008-2020, metric tons per year. (NSWMC. 2015)

Overpopulation and overconsumption are global problems. We are consuming more energy, water and raw materials than we need, and this has a big impact on our climate and air quality. The well-developed countries consume almost ten times as many materials as the developing countries. But it's most often the poorest in the urban context that suffers of the consequences off the waste affects.

(Friends of the Earth Limited)

A lot of Manilas inhabitants live in poverty in urban slums as informal settlers. They often live in vulnerable and hazardous areas like rivers, infills or dumpsites, highway roads or intersections and most of the garbage in the rivers in Manila can be attributed to the squatters. The informal settlers are frequently being accused for the contamination of the areas, like Paul Jenkins explains in his book "Planning and Housing in the Rapidly Urbanising World", " - The direct victims are often the poorest urban residents, but the nature of environmental problems often transcends the poverty ghettos and affects the wide urban area, and the "ecological footprint" of the urban area in its hinterland." (Jenkins, P.

2007) The informal settlers play an important role in the global challenge of environmental pollution. They raise the awareness on recycling, but they are also disturbing the natural process of decomposition of waste, which makes the toxics spread even more. (Binion, E & J. Gutberlet. 2012)

Because of extending urbanization, the Philippines are facing difficulties solving a sustainable urban development and complex urban issues which makes them more exposed to economic failure and environmental impacts such as water contamination, flooding, air pollution and spread of diseases. (UN-Habitat. 2015)

Developed countries and cities have usually more improved and stable institutions with better cooperation and communication between each other. They also have higher incomes which provides more taxes that's pays for larger expenditures for services that strengthens the social security in their society. Because of global urbanism there is generally more focus on larger cities and capitals around the world, both economically and socially which impairs the qualities of life in smaller cities or villages. There is global focus on private wealth and a large and rooted divergence between developed and developing countries which makes it difficult for developing countries to improve their existing conditions with economic growth and better social security. This is reflected in spatial constructions of cities and increases the intra-urban inequalities with problems such as contamination of the environment, waste management and protection of public green areas. The urban poor are affected by poor housing possibilities and are often living in dangerous areas which are heavily affected by environmental pollution from the industrialization of the country. Segregation between social classes is related to increased violence and disorder, especially for countries with growing immigration and racial, ethnic and religious diversity. (UN-Habitat. 2016)

The extractive and manufacturing industry can be essential for a city, it provides livelihood for many but also leads to a higher consumption and a larger amount of waste. The environment gets affected by overconsumption and the lack of a functioning waste management system. In Manila the land is valuable due to overpopulation and people can be provoked by big land volume used for industries, when there is a high need of residential housing. (Jenkins, P. 2007)

In the foreword of *Housing and Urbanisation* by Charles Correa, he refers to a holistic perspective of urban planning and housing by writing,

“Here too, the lessons comes to me: that it was only possible to deal with this issue because of the architects ability (necessity!) to move from the macro to micro, back and forth, every day-in synergy that informs the whole process”

(Correa. C. 2000) To solve the problem with overconsumption and the handling of a growing amount of waste, along with increasing population numbers, we need to create more awareness and work locally and globally to achieve better prerequisites. We also need to start balancing the class differences that provokes segregation. This by democratic politics, affordable housing possibilities for low- income families and sustainable, urban planning with well-functioning circularity.

3 Argument, Critique or Discussion

Waste management has an important impact on public health, well-being, sustainability and the urban economy. It has also a big effect on the quality of the urban environment and our everyday life. A big part of the population does not have access to waste collection services and recycling methods, therefore the have significant problems with solid waste management. (Shübeler, P.1996)

The national act RA9003 in the Philippines created in 2001 also known as “Ecological solid waste management act of 2000” is described as “ an act providing for an ecological solid waste management program, creating the necessary institutional mechanisms and incentives, declaring certain acts prohibited and providing penalties, appropriating funds therefore, and for other purposes”. (Republic of the Philippines. 2001) The first chapter focuses on the protection of the public health and environment and chapter two refers to the institutional mechanism and the established national solid waste management commission. This paper is therefore divided into three topics: health, environment and politics following the national act RA9003.

Health

The World Health Organization (WHO) defines the term health as “state of complete physical, mental and social well-being and not merely the absence of disease or infirmity” gives a foundation to connect waste and health effects. (WHO, 2012).

Toxic waste has a large impact on our bodies and the public health, and the toxicants can be found in air, water and soil. We get affected by them through inhalation, ingestion and skin absorption which leads to several skin disorders, respiratory infections like pneumonia and other dangerous medical illnesses. (UNEP. 2007)

An examination of 974 children working at Manila's main dumpsite showed that 24 % had chronic cough, 25 % wheezing and 19 % a shortness of breath.

Because of poverty many scavengers consume food scraps they find in the waste which gives them diarrhea and parasites. A study on stool samples showed that out of 238 children working at dumpsites in Manila, 96 % had intestinal parasites and 84 % were affected by multiparasitism. Generally, the most common effects of living and working at dumpsites is malnutrition, anaemia and infant growth retardation.

The emotional wellbeing is also affected by the lack of financial security and the social stigma in the different class society, which affects their sense of dignity.

(Binion, E & J. Gutberlet. 2012)

To work and live at dumpsites is also poses a risk of losing your life. In 2000 the garbage dump Payatas collapsed and burned down and destroyed around 100 squatter houses. This took 218 lives and 300 people are still missing.

(Svenningsen, N. 2000)

Environment

One of the main reasons for environmental contamination and degradation within our societies and cities are the lack of a well-functioning solid waste management system. Many developing countries are highly affected by this because of weak and bad functioning regulations and solutions for handling waste disposal. Waste and hazardous waste destroys our ecosystems and pollutes our water, air, land and vegetation. Informal recyclers are raising the awareness of overconsumption and the value of recycling waste but as mentioned before they also get accused for increasing the pollution by disturbing the natural decomposition of waste materials and spreading diseases to greater communities.

Inappropriate disposal management can create hazardous gases, moulds and the waste stream can lead to clogging of sewer systems and stagnant water which has a big impact on the ecosystem and economy. Plants and wild animals are getting transmitted by feeding on the waste at landfills and the polluted nature and plastic waste increase the spreading of malaria, because the plastic heath creates a nutritious habitat for mosquitoes to reproduce.

(Binion, E & J. Gutberlet. 2012)

We have more knowledge about the effects of garbage and waste recycling nowadays. In the 70s a lot of waste was dumped in the Pasig River that runs through the capital. This have had big consequences on the ecosystem and today ecologist consider the river to be

dead. The river runs from Manila Bay, which is one of the most polluted water areas in the world and in 2019 the government started a rehabilitation program to save the ecosystem, together with local industries and volunteers. (De Vera-Ruiz, E. 2019)

This is a costly action and includes relocations for many families, moving from the hazardous areas to new build neighbourhoods, often far away from the city.

From an outside perspective this might look like a charitable action, to relocate the urban poor and give them improved living standards, but in reality this is done because the local government blames the informal settlers for littering and pollution the environment and wants to reclaim the occupied, valuable land.

Economy

In developing countries like the Philippines, solid waste management is consuming around 20-50 percent of the municipal budget. (Shübeler, P. 1996) They also have big problems with foreign garbage dumping and waste trade in the country and even if hazardous waste import is prohibited it still occurs. It is the black market that makes the poor, developing countries suffer and favourable industrial, rich countries. (Endo, J. 2019)

Since 1945 the National Housing Authority (NHA) have been developing housing for low income families in the Philippines (NHA, 2018). Together with our teacher our class went to visit a newly developed project, Biskekville 4. This was newly built, and they didn't have a designed program for handling the waste management in the area. They used a left-over corner of the plot as a garbage dump, where a truck came once a week to pick up the garbage. There was no recycling opportunity and the kids were playing with the trash, looking for objects to reuse. The trash can be dangerous and the smell from it affects the whole community.

4 Urban Shelter Design

Waste management in developing countries is a complex subject and it involves political context, socio-cultural context, economic context and environmental context. It depends much upon collaborations between both public and private actors and should have a high reliance on new technology. (Shübeler, P. 1996)

By moving informal settlers from central but hazardous lands the government only transfer the problem somewhere else. We need to start involving the waste management in an early design phase and implement it in the design brief.

This includes attitudinal factors, contextual factors, personal capabilities and habits and routines which means economical finance, stricter regulations and waste management strategy, recycling stations, awareness and a change of mindset.

Education

By education we can teach people the effect with hazardous waste and how to recycle in a sustainable way. Homeowner associations (HOA) is a common concept in Manila. They are selected members of the board of the housing cooperatives social and structural maintenance within the neighbourhoods. They could work as an intermediary between the urban poor and the government to spread information about this with workshops that introduces the inhabitant to recycle biowaste that can be transformed into soil and be used in their common gardens. It could also work as a start-up of financial income by planting water lilies in the contaminated rivers which will clean the water and from the lilies the can reintroduce the Philippine culture of weaving items made by water lilies which they can sell and make a profit off.

Kindergartens can also work with this concept and in a playful way teach the children about recycling and the importance of it. Then their knowledge will be transmitted into their homes and family members.

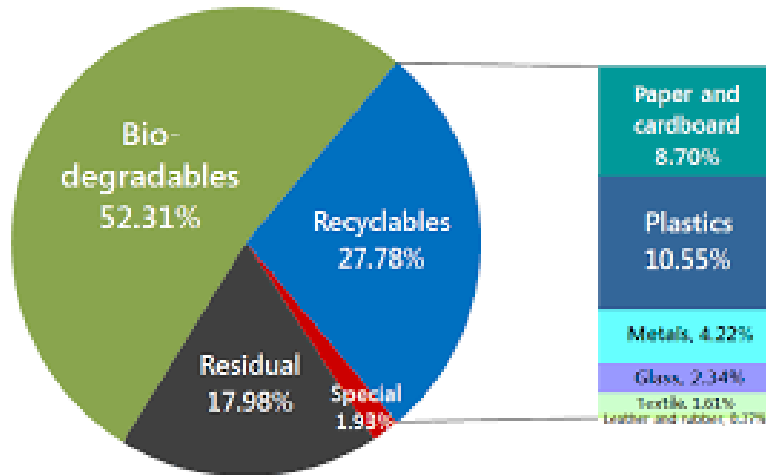
Design

Manila needs more planned space for the development of a well-functioning solid waste management and transportation of it. It could be public recycling stations and the first step could be the design of the waste bins within the communities. By separating the bins and divided them into bio-, plastic-, glass-, paper-, metal- and electronical and chemical, hazardous waste.

It could also be a cooperative concept connected to the HOA where you can recycle or exchange items, borrow tools and fix and create new or products from the recycled waste. Stenkrossen in Lund work as a municipal social, informative and creative hub where you can fix your bike and learn from other how to use machines and so on. I think something

similar in the urban poor residential neighbourhoods could have a large impact on the progress of a more sustainable waste management process.

The diagram below shows that more than half of the waste produced in the Philippines is biodegradable and if this is recycled in the right way it could be used for urban farming and to produce biogas that could be used as more environmentally friendly fuel for cars.



Percentage (%) by weight of MSW fractions in the Philippines

Composition of municipal solid waste in the Philippines, 2008-2013.
(NSWMC. 2015)

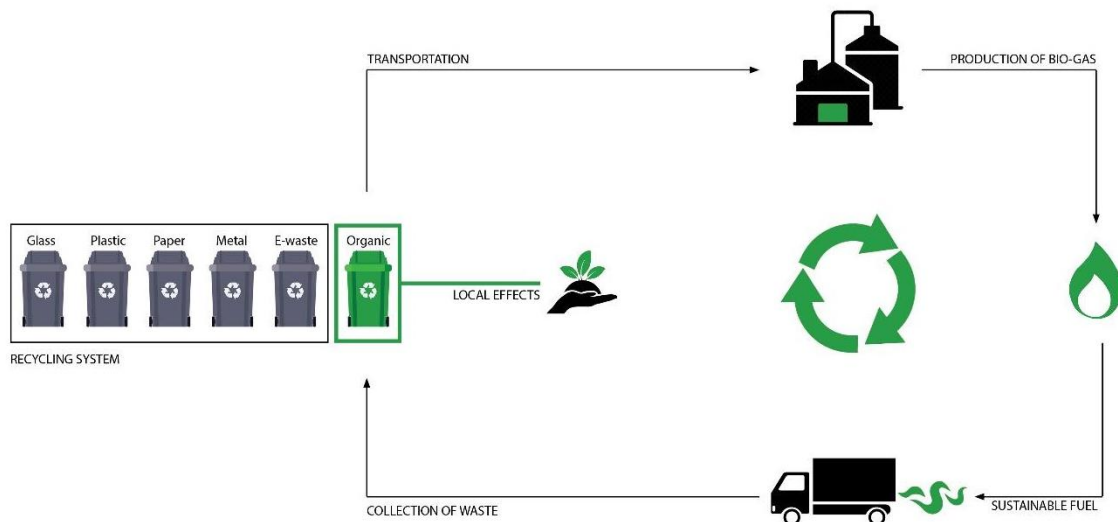


Recycling system in Sweden. (Paulin, S. *Swedish EPA.*)

Meraclo is the leading electricity company in the Philippines and their service is very expensive therefore biogas could be a good alternative transportation fuel.

In Sweden a portion of district heating is produced renewable biogas produced by organic waste. This could be implemented in the Philippines and could be used as less environmentally harmful fuel for trucks and cars transporting of waste which creates a circular waste management. It could also be used as fuels for lighting of public spaces or fuel for cooking as they do at a hospital in Thailand. (WHO,2020).

The diagram below shows a simplified version of this system. It shows the importance of a well design recycling station that makes it easy to recycle organic household waste that can be used for urban farming or be transformed into biofuel. This biofuel can in turn be used to power the trucks that transports the waste to the recycling stations.



Circular waste management system and biogas production. (Strömberg, E. 2020)

Politics and Economy

Since the RA9003 (Ecological solid waste management act of 2000) have not been fulfilled or succeeded we need stricter, updated laws and legislations for waste management. Companies should have to report their supply chain, transportation, land- and water use and their climate impacts. Industries must design products with better materials with less environmental impact and high quality that last longer. We need circular economies that priorities recycling and repairing and limits the use of finite natural resources. An economy that is designed to benefit business, society and the environment. Overconsumption of natural resources and distribution of products made by environmental,

hazardous materials should be controlled. More marketing and information about recycling and overconsumption should be highlighted and a recycling profit should be implemented.

Tourism is a source of income for many in the Philippines. In 2018 the government closed the major tourist destination Boracay and started an environmental rehabilitation. It's now opened to visit but you have to pay a fee that supports the rehabilitation of the island. I think this should be implemented on more locations in the world to protect the nature of developing countries.

To solve the wide effects of waste management we must work both national and international, locally and globally with a holistic long-term view of the processes.

5 The Role of Architects

A first step to improve the knowledge around waste management is through design, education and awareness. As planner and architects, we need to reserve and plan more space for waste management handling within the housing areas. We need to create waste stations and bins that are easy to use and understand and first we need to make sure that it's included in an early design brief and design project. Waste management should have same importance as fire regulations and risks- and evacuation plans. It should be a stated criterion that we need to solve in the detailed plan and therefore it should be presented in the early design process. It should be clearer who's responsible for the design of waste management and there should be stricter legislations and laws around it. In the end we can only solve this with good communication and collaboration between private and public actors. Going back to the quotation in the foreword in *Housing and Urbanisation* of Charles Correa, "to move from the macro to micro, back and forth, every day-in synergy that informs the whole process". (Correa. C. 2000) I believe we architects and urban planners need more time to work and analyse the circularity of our design proposals and this to achieve more sustainable architecture that will generate better future aspects for our public health, well-being, sustainability and urban economy.

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