

A Look into the Civilian Conscious Regarding the Trash Management and Pollution, in the town of Monterrey, Madre De Dios; Peru

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Abstract

Solid waste pollution is becoming an issue everywhere in the world with no exceptions. This issue is particularly prominent in third world countries where there is both low education, and low economic status. There are plenty of factors that play a role in determining how polluted a place might be and while it may be easy to assume the answer is lack of governmental aid or lack of civilian education, there cannot be any reasonable assumptions made without talking to people. When it comes to places with a trash service in place that are still visibly polluted the question remains; why?

As with any public health issues, it all comes down to the civilian conscious. To understand the reasoning behind local pollution, I conducted interviews with the people in the town of Monterrey, in the Madre de Dios region of Peru. Learning their personal experiences, and figuring out what they would like to do, because it is ultimately for their health as well as the environment surrounding them. A real, lasting solution comes from the minds of people who have experienced it, for this issue and for any other. After interviewing, some of the key findings were: everyone knew there was a trash service, the majority of the people use the trash service, many people burn as a way to mitigate problems with the service, everyone knows open dumping and burning is bad for health, everyone suggested improvements they would like to see, and everyone wants trash to be disposed of in a safer way. In conclusion, most of the problems mentioned are fixable with low-cost solutions

such as the truck coming more times a week or everyone having garbage bins. These solutions could have been solved with a follow up survey.

Introduction

Peru has more than 33.2 million people, 10 million of which are in Lima, the capital. Having this many people naturally means there will be a lot of solid waste generated- more than 18 thousand tons a day as of 2018, 47% is coming from Lima. (WWF 2021). The remaining 43% are spread throughout the rest of the districts in Peru. In Lima, only 4% of the solid waste (SW) generated is recycled, the percentage decreases throughout the remaining regions. (WWF 2021). Throughout the country there are 52 landfills, 4 of which are in Lima, and only 17% of the total waste is disposed of in safe landfills (Huisman 2021, Limachi 2021). This begs the question of where the rest of the waste goes. Lima, depending on the district, is a generally clean city. They have waste pickers and their waste is managed by 6 private companies (Huisman 2021). In rural areas, there is typically also a trash service that goes around, however the follow up after these services are initially put into place is

unknown and unchecked. In these areas in contrast to the city, open dumping and open burning of trash are common practices despite there being a trash collection service. Unfortunately, these makeshift methods for disposing of trash have negative health effects on people and the environment (Farronato et. al 2019). For example, when open dumping occurs the effects of humans and the environment include; GHG emissions being released, increased possibilities of fire, breeding of animals in the area would expose them to greater disease risk, leachate generated will go into the ground contaminating drinking water sources as well as any food being grown in soil near dump site. Specifically dumping tires will attract mosquitos increasing the risk of mosquito transmitted disease especially in tropical locations. The environmental and human health issues when burning trash include; respiratory illness (more so present in children), release of GHG, generation of cancerogenic compounds,

and also a variety of other compounds such as BC, CO₂, SO_x, NO, and PM. (Farronato et. al 2019). This is also not considering there could be hazardous waste, batteries, and biological waste present. The people in these places are often times aware that these practices are bad for general health, but still continue due to lack of collection resources. Aside from collection issues, a need for greater education on the matter was often expressed by locals. A study done in the Comas district of Peru had the public participating in various recycling/disposal methods as well as engagement and education activities. By the end there was a positive public response, calling for new methods of trash removal to be put in place (Garcia 2007). Education and outreach may seem last on the list of priorities considering the Peruvian government has arguably bigger fish to fry when it comes to rural pollution, for example the most aggressive culprit in the Madre de Dios region is industrial pollution from illegal mining. In response to this, the region of Tahuamanu is making headlines in prioritizing a new green agenda revolving around

deforestation which would in turn decrease pollution by slowing illegal activity. (WWF 2021). With emphasis placed on this matter, it is easy to shift all blame to larger illegal organizations rather than what could be fixed towns.

The town of Monterrey, in the Madre de Dios region of Peru, is an excellent example. It is a rural highway town a 45-minute bus ride away from Puerto Maldonado, the biggest city in the region. The town is not unique, there are multiple rural highway towns in the region. There is a trash service that goes around, however as you drive through, piles of trash can be seen on fire in the evening, as scraps of trash blowing around during the day, so that brings up a new question; if there is a trash service, why is there still SW lying around? It can be inferred in many ways why there is trash being burnt and dumped despite there being services, however no reasons can be pinpointed, without going to the source- the people. This global issue has yet to see any lasting solutions. Having a solution to safely dispose of solid waste would greatly increase the health of not only the humans in these areas but also the

environment. By interviewing people living with these challenges about various aspects of trash collection and management in their area, as well as their thoughts and feelings on what's going on, new insight can be gained about how to fix these issues with the best interest of

Methods

The location for the project is Monterrey, Madre de Dios district, Peru. To gather information, interviews were conducted with 8 town locals. The locals were unbiasedly chosen by who was available at the time, 9 people were approached for interviews, only 1 declined due to lack of time. Interviews lasted around 10 minutes and were given in Spanish. Questions were organized into 4 sets: the trash service, trash in the home, trash out of the home, and general end questions touching on thoughts and feelings of first 3 question sets. In total, there were 17 questions and 3 sub-questions. 7 of these questions were yes/no and involved no further elaboration. When there is no answer given for certain questions, it either means it was answered for the specific

the humans involved. Having a baseline into the collective consciousness would be beneficial to future projects pertaining to underdeveloped locations, and other such which have been severely overlooked in aspects to waste management compared to urban areas.

person previously, or they chose not to answer

Questions asked in the trash service set were: Is there a service that comes and collects trash? Where does it come to pick up the trash? What days a week does it come? Do you use the trash service? Is there also a recycling service? The questions asked for the trash in home set: What do you collect your trash in inside your home? Do you separate it? Is there anything you save and reuse? How often do you take your trash out? The questions asked for the trash out of the home set: What do you do with your trash once it leaves your home? Why? Who taught you how to dispose of trash? Are there any other ways that you know the people around here do to discard of their trash? Have you tried any other ways? For

the last set of general questions interviewees were asked: Do you think the current trash service does a good or bad job? Would you like there to be any improvements? As you know there is a good amount of trash outside, is this something that bothers you? Are you aware openly dumping of trash and burning trash has been linked to health problems in humans and the

Results

The interviewees had ages between 21 and 56, 6 out of 8 were female, 4 out of the 6 women were housewives. The 2 males of the groups had occupations of pineapple farmer and cacao manufacturer.

For the first set of questions regarding trash service, all the interviewees were aware of the presence of the trash service and that the service was run by the municipality Las Piedras and that it starts in Planchon (only one person was not sure about and state it was running from Puerto). Most people (7/8) agreed that the service run once a week, specifically the day Wednesday. However, sometimes they also said that it come on Thursday. One person stated that trash is collected on Thursday. However, this person

environment? Would you like trash to be disposed of in a safer way? Why?

After interviews, interviewees were given a contact card and given the option to have their phone numbers taken down for a follow up report, only one person did not provide her/his phone number due to the lack of possessing a phone.

did not use the trash service. They all said there is no recycling service.

For the second set of questions, trash in the home, most people collect their trash in plastic bags (6/8), while the remaining collect in bins. There was almost an even split with separating trash, (5/8) separate, while the rest do not; 1 person only doing bottles. For the separated trash, (2/5) burn separated plastic and paper, and (2/8) separate also for compost. Half of the people reuse, specifically bottles, while the rest do not.

For the third set of questions, (3/8) take out their trash when its full, (2/8) do once a week with no specification, (2/8) do on Wednesdays, (1/8) do every day. To

get rid of trash, (3/8) people exclusively use the trash service, (4/8) use trash service and burn, and only one person solely burns. For the people that do not exclusively use the trash service (5/8) the reasons for why varied with; the trash service does not take everything, the trash service does not always come, and they have too much. One person learned how to dispose of trash from school, one learned from neighbors, (3/8) learned from family, and (3/8) did not answer. When asked other methods people in the area used, (5/8) said people burn, (2/8) said trash service, and (1/8) said dig a big hole. (5/8) admitted to using these other methods, (1/8) has never used any other method, (2/8) no answer.

For the last set of questions, if the trash service does a good or bad job, (2/8)

Discussion

The biases in mind, when thinking as to why there is still trash around when there is a trash service in place, the initial reasoning harshly blames the actions of those in town. One possible explanation was thought to be no one knew of the trash service, but in fact everyone did, the

said it does a good job, (3/8) said bad job, (3/8) said good but there are problems. For improvements, one person said they should take more, one person said they should separate the trash, and one saw no need for improvements and the rest (5/8) said they should come more. All interviewees said they were bothered by the trash in the streets, various reasons included it being smelly, ugly, bringing animals, and blowing into people's houses. All said they know it is bad for health. All wanted trash to be disposed of in a safer way. The various reasoning for this being: human health, environmental health, so people do not have to clean their property of blown in trash, and because they no longer want to burn it. (3/8) also said they want increased education on the matter.

majority of people using it also. It was assumed, initially the people must not have knowledge that burning, and dumping is bad for human and environmental health however everyone knew, and their tone changed when they answered the question- from normal to

somber. The people who use the trash service and other methods, mostly burning, emphasize they burn as a last resort that unfortunately they must turn too often.

The government may have put a trash service in place however there are obvious overlapping concerns and calls for change that could clearly be seen coming from only talking to 8 people. Talking to the people revealed easy fixes to get the majority of solid waste pollution out of town. The trash service needs to come more, or the people need to have trash bins. With bins, they would not need to worry about the wind or animals getting at their trash and moving it around when they put it outside. They would not need to worry about having too much trash because there would be a place to store it that is out of their houses. One concern was that the trash trucks are not big and cannot take all the trash every time, the trash service coming more than once a week would fix this issue and would be cheaper than getting bigger trucks. Another issue is that trash is not separated. A good amount of people in the

interviews said they separate their paper, plastic, and bottles; these are all recyclables, having a recycling service would help them not have to burn these trash items. A young adult said she learned how to separate trash in school, however there was a call for education, one was from a teacher of young kids. Assuming then, waste management is taught only occasionally, an increase of education could help the percentage of people who do not use the trash service or who do but also frequently burn trash.

These are all lower cost solutions to problems that could have been found out with a simple follow up survey. It is clear the people want the trash service and would like improvements. They want trash to be disposed of safer for various reasons and would in most cases, burn to mitigate the issue of trash not being fully collected. Aside from the outreach of more education, solutions can be found by tweaking the current trash collection system, and by doing that, it would make a much safer home for the residents in Monterrey.

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References

“Almost 90% of the Garbage Generated Daily Is Not Recycled.” *WWF*, 2018, <https://www.wwf.org.pe/?328834%2FAalmost-90-of-the-garbage-generated-daily-is-not-recycled#:~:text=Every%20day%20on%20average%2C%20more,waste%20are%20generated%20in%20Peru>.

Ferronato, Navarro, and Vincenzo Torretta. “Waste Mismanagement in Developing Countries: A Review of Global Issues.” *International Journal of Environmental Research and Public Health*, MDPI, 24 Mar. 2019,

<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC6466021/>.

Garcia, Lopez. *SOLID WASTE MANAGEMENT AND DEVELOPMENT: A CASE STUDY IN LIMA, PERU*. 2007, https://www.theseus.fi/bitstream/handle/10024/80777/Frolova_Svetlana.pdf.

Huisman, Herman. *20210208 Report Waste Management Study LATAM Waste Management Country* ... 2021, https://hollandcircularhotspot.nl/wp-content/uploads/2021/04/Report_Waste_Management_Peru_20210322.pdf.

Limache Flores, Marisol.
“Programa De Mejora Del Nivel De
Concientización Ciudadana Sobre
La Recolección De Residuos
Sólidos En El Barrio De San Carlos,
Huancayo.” *Industrial Data*,
Universidad Nacional Mayor De
San Marcos, 2021,
[http://www.scielo.org.pe/scielo.php
?pid=S1810-
99932021000200193&script=sci_ar
ttext&tlng=en](http://www.scielo.org.pe/scielo.php?pid=S1810-99932021000200193&script=sci_arttext&tlng=en).

“‘Green’ Madre De Dios: The
Province of Tahuamanu Moves
towards Sustainable Development.”
WWF, 2018,
[https://www.wwf.org.pe/?330711%
2FGreen-Madre-de-Dios-the-
province-of-Tahuamanu-moves-
towards-sustainable-development](https://www.wwf.org.pe/?330711%2FGreen-Madre-de-Dios-the-province-of-Tahuamanu-moves-towards-sustainable-development).