

Water Retention and Community Engagement: United in Crisis

Justin:

Flooding is already a massive issue that affects most of the world, and even more so in the last decade due to rapid global warming, but where all that water goes is another issue. Water retention, or lack thereof, is a problem plaguing many people across the whole world. These problems include: flooding, water contamination, socioeconomic status, state-wide crises, and a multitude of others. Community gardens as water retention are one of the ways communities cope with these issues, in social, industrial, and soil management facets, which as a positive side effect, can serve the community at large, but there are some pieces of evidence that prove the contrary. That is what this paper is hopefully going to achieve.

To start, the social aspect of water retention issues is that they inflame issues that have long since been ignored by surrounding communities or communities that hardly get more of a second glance from politicians, such as a mayoral position. The article, “The Poisoning of an American City,” details how water contamination infected the residents of Flint, Michigan. For 19 long months, the residents of Flint were left to rot and languish in lead-tainted water from the Flint River and it took a disgusting amount of time to get politicians to take action, and even then, it was too little, and too late. One other thing about the Flint, Michigan water crisis was that it mostly affected those who were middle class and below, and that's likely why it took so long for politicians to take action, “I’ll tell you what—if the kids in a rich suburb of Detroit had been drinking contaminated water and being bathed in it there would’ve been action,”(Hillary Clinton/Sanburn.)

Community gardens can offer a solution to the water retention issues on a social level in that they can help bring together a community that has, again, been ignored by most of the world.

The next way water retention can play a part in larger issues is human health, Water is something all humans need to consume to live healthy lives, so imagine what would happen if the water that we were drinking was full of sewage, microbes, and fecal contaminants?

According to an article detailing the atrocious and disgusting reality of living in a space constantly flooded by sewage with virtually no help from governments, that is a question some are all too familiar with (If White People...). In this example, every time it rains, the stench of waste wafts throughout the air, and human fecal matter runs through water in the streets. Water needed to be donated because their water was virtually unusable and unsafe.

Another issue concerning human health is the concept of food deserts. Food Deserts are essentially when healthy and quality food (particularly fruits and vegetables), is just simply out of reach to the general population of that community. This lack of quality food can lead to a whole host of issues, such as obesity, vitamin deficiencies, diabetes, and even some cancers. (National Institute of Health).

These problems could both be remedied by community gardens, at least to an extent. Soils, particularly compost, has the ability to not only retain but also filter water because it possess properties that convert nitrogen wastes, (Urine), into more manageable and usable materials. Regarding the use of community gardens for non-biological materials, community gardens take extra precautions with these because lead and other harmful minerals can't be filtered through the soil and the metals are likely to be absorbed by the plants themselves. So while it is possible to filter out lead through other methods, it is not recommended for community gardens.

One final pillar to the problem of water retention actually connects very well with community gardens: Soil Management.

Soil is right next to the water in its importance to community gardens, its the base for what the vegetation needs to grow, but the gardeners have run into problems with managing the soil composition, soil itself is very sensitive to the world and its currently environment, even more so in an urban setting, because as previously stated they suffer the constant changes affecting cities, particularly droughts. Long periods of heat and a lack of water severely diminish the chances of urban gardens, which is exacerbated by the fact that they are mostly surrounded by impervious concrete, never letting water get absorbed by the plants, and heating up their environment even more. If the soil lacks moisture, the vegetation cannot flourish. (Lin, Brenda).

Water Retention is especially important in situations such as this, and gardeners must educate themselves on soil composition before purchasing. One alternative is compost which is far more porous and dense, meaning it can retain water for longer, and the gardener has more water to spare if a drought does come.

Water retention and community gardens come together hand in hand in more ways than one. Water retention helps repurpose water sustained from flooding, can filter out water that would otherwise be unusable, and can make use of what would be a natural disaster. Community gardens can help the most underserved communities, and bring those communities together through a shared goal of helping the people around them. While Community gardens aren't always perfect, they are a step in the right direction.

Ayiana:

The next step that we should take in order to resolve our problem of water infrastructure has to do with community gardens. However, we are specifically looking at rain gardens, which I will expand more

on shortly. We believe that rain gardens can be a good way to help reduce flooding from the rain water that runs off of roofs, driveways, streets, as well as other things. The community that we would be implementing these solutions into is East St. Louis, Illinois. It is a city that has faced devastating flooding for many decades. These rain gardens will help to combat the overflow of water that gets stuck above ground, giving it a place to go.

Firstly, to give more information about rain gardens, they are defined as “a depressed area in the landscape that collects rain water from a roof, driveway or street and allows it to soak into the ground” (United States Environmental Protection Agency). These rain gardens have a lot of uses that can help the community as well as the habitat it resides in. Some of those uses are that they can provide food for butterflies, song birds and other wildlife while simultaneously providing shelter. Rain gardens can also filter out certain pollutants in runoff by slowing down the water flow, allowing the roots to take in nutrients as well as filter out those pollutants. This ties into the topic at hand because rain gardens can reduce runoff from your property which can help to combat excessive flooding. The way the gardens reduce that runoff is during the same process of filtering out pollutants, which is when the depressed area of the garden collects the runoff water coming from the multitude of areas on and around your property. However, a disadvantage to rain gardens is that if it isn’t designed properly it can lead to flooding. So, these rain gardens would need to be designed properly to carry out the advantageous duties(Oregon State University).

Secondly, the community we would be implementing these rain gardens into would be East St. Louis, Illinois. This city has been facing disastrous flooding for decades leaving the city with prolonging issues. An example of these floods is the Great Flood of 1993, and this flood was “unprecedented and has been considered the most costly and devastating flood to ravage the U.S. in modern history” (National Weather Service). It occurred on August 1st, 1993 where “the Mississippi River at St. Louis crested at 49.58 feet, the highest stage ever recorded” (National Weather Service). Situations like these have been happening to this community for so long, leaving them in constant fear of when the next flood will

happen. Every heavy rain that pours down on this city threatens the chance of flooded streets and houses. Looking at the demographics for East St. Louis, it is estimated by the United States Census Bureau that in 2023, 94.6% of the population was Black or African American. In addition to that the median household income in 2022 was \$28,519, and it was estimated that 31.6% of people were in poverty, compared to the 11.6% for the state of Illinois as a whole (United States Census Bureau). Those demographics show that this city is constantly being systematically neglected while the community doesn't have the funds to advocate for improvements and change to address the flooding issues.

The third thing I want to talk about is the solutions for this problem. I have already explained what rain gardens are, as well as how they function. However, I now want to further explain the next steps that we will take and how we will implement these gardens into the community. One way we could do this is by organizing volunteer work where people come out to help install these gardens into the resident's homes, and this can also count as community service hours for students of all ages. By using this way to implement the rain gardens, it allows for the community to receive help from people willing to put in the time and effort, while simultaneously making sure that they do not have to pay so much out of pocket to install them.

In conclusion, in order to help solve our problem of water infrastructure, we decided that implementing rain gardens into the community will help to reduce flooding in a cost-effective way. Rain gardens are an option that is not as expensive as some others are, especially when native plants are used in these gardens, which would come in handy since the community we are working with do not have large amounts of funds to advocate and carry out solutions to solve this problem. Also, with the community receiving help from volunteers in order to install these gardens, it keeps the cost of this solution down. That is why we believe that rain gardens can be a good way to help reduce flooding from the rain water that runs off of roofs, driveways, streets, etc. in East St. Louis.

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- Flooding is an ongoing problem plaguing East St. Louis which has very recently gotten worse
- It has very much negatively affected the homes, more specifically the residents, being forced to leave their homes
- This issue is exacerbated when the resident lives in an underserved community
- To add insult to injury, the water is essentially unusable
- Retention might be a viable solution to this problem in that it holds the water, but can also have the ability to filter it
- Water Retention is essentially a given medium

ability to hold and withstand water, and a way to combat flooding (such as porous pavement, or cracks within the pavement)