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SRC report

Stormwater is a prevalent issue that generally does not receive enough attention within communities. A safe assumption is that most people focus on other environmental issues such as pollution or energy. Flooding is not usually addressed until a community or home is negatively affected after an intense storm. Stormwater is becoming increasingly more important due to human expansion and climate change worsening. Developing more homes or manmade structures results in impervious surfaces, areas that do not absorb water and allow waterflow, while climate change is creating intense and frequent storms that cause more rainfall. Clean Waters consulting agent Stephen Souza lists the series of complications, saying runoff can "create high volumes and velocities, alter baseflow and stream hydrology, harm water quality, increase the movement of pollutants, negatively affect habitats that rely on water in ways that impact ecosystems" (Souza 5). Most communities are not equipped to deal with these new flooding problems and a majority of townspeople do not have an adequate understanding of the situation. More places are working together to implement systems and projects that will improve their ability to cope with stormwater. Several things are generally agreed upon by most experts and institutions: green infrastructure is a promising option that has the potential to mitigate if not resolve these issues. The general consensus is also that the public needs to be more educated in regards to stormwater. Many communities share a similar hinderance also; there is almost never enough funding to set these ideas in motion (Copeland). This is where experts start to differ in ideas. There are several arguments about how to fund these expenses, what the green infrastructure will be capable of, and even how the green infrastructure should be used. Due to

mishaps and miscalculations where green infrastructure has failed, it seems appropriate to use a combination of GI and gray infrastructure.

Green infrastructure (GI) is a relatively new and upcoming option for stormwater management. The idea has been present for a reasonably long time, but it is finally being considered and taken seriously. Green infrastructure is processes that "use or mimic natural processes to infiltrate, evapotranspire, or reuse stormwater runoff on the site where it is generated" (Copeland 2). They are generally some form of vegetation, collecting a fraction of runoff and rainwater so there is less amassing from impervious surfaces. It varies vastly from the common gray infrastructure: projects that mostly involve cement and metal piping. While green infrastructure focuses on capturing stormwater and repurposing it, gray infrastructure and previous methods mostly focused on getting rid of the water. It wouldn't be uncommon to just redirect the water somewhere else, negatively affecting other communities or homes. Considering the cost of gray infrastructure and how much money is needed to repair or build new projects, the search for other methods has become a high priority (Copeland). Green infrastructure is generally at the forefront of these options. Many believe that it can be an effective stormwater collector, create jobs, reduce the movement of pollutants, and actually be more cost efficient than gray infrastructure. Small towns and even large cities like New York are investing and trusting in green infrastructure. When discussing their GI plan, the report states, A critical goal of the green infrastructure component is to manage runoff from 10% of the impervious surfaces in combined sewer watersheds through detention and infiltration source controls" (Bloomberg and Holloway). The city is confident that their setup and process will work. The issue is the lack of background and data for the green infrastructure. While Bloomberg and others heavily support the green flood mitigation methods, others are not so

confident. Claudia Copeland, a specialist in resources and environmental policy, states in a report on urban stormwater that "In many cases, there is insufficient technical knowledge and experience with the practices, and deficiency of data demonstrating benefits, costs, and performance" (Copeland 10). This make some nervous about relying on green infrastructure, especially when in some cases it has been failing or not performing as expected. Because of this, it seems like the best option is to continue studying green infrastructure. Mass implementation should probably be avoided until more specifics are known. GI has a lot of potential and the next move should be slowly using it alongside gray infrastructure together. This way the benefits of the GI are taken advantage of, but the gray infrastructure provides a sense of reliability.

The major aim of the sustainability internship is to work towards having a better understanding of effective stormwater practices. The project has this overarching theme, but was split into several different aspects including policy, field work, and research. The policy revolves around implementing a program for the townspeople to save them money on their flood insurance. The field work itself includes working with the Watershed Institute and the engineers at the municipal government. Devices are being set up by the Watershed to measure flow rates, turbidity, temperature and more to study the effects of stormwater runoff and see where these effects had the biggest impact. The collaboration with the town engineers involves updating their ArcGIS maps, an online system uses coordinates, data layers, and water infrastructure within the town. This analytic work will help determine where the major flooding issues are, allowing the town to make positive changes. The research is meant to delve deeper into the field of stormwater management that Princeton is attempting to gain more knowledge in. The main research points revolve around the cost of stormwater per gallon captured, stormwater utilities and their benefits/cons, and the cost of green infrastructure for homes and larger projects. This

research could provide more insight into the capabilities of green infrastructure and how it can be

used in the future.

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