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Proposal for a Green Infrastructure Cooperative as a Solution to Pittsburgh’s Wet Weather and Water Quality Issues

Introduction

Pittsburgh’s urban and geographic landscape make for both a unique and challenging case of sustainable development. In the context of wet weather issues and poor water quality, Pittsburgh must develop a cost-effective, sustainable strategy to fix these water problems in the long term. But a sustainable solution must not only be about incorporating economic progression, instead it should strive for “socially responsible economic development” that gives back to all levels of the Pittsburgh community and considers the local environment (IUCN/WWF).

In fact, there is a growing realization seen at the basis of national and global sustainable initiatives that “economic well-being, social development, and environmental stability must be addressed together if development is to be sustainable” (IUCN/WWF). These three factors of sustainability are referred to as its ‘three pillars’ whereby “[a]ddressing any of the pillars in isolation, without considering their interactive effects,” keeps development from being truly sustainable and “can give rise to unanticipated consequences” (IUCN/WWF).

Furthermore, many projects of this sort, and especially those in the Pittsburgh area, need to be implemented with special consideration of poverty elimination as past and present sustainable developments often only address the economic and environmental aspects of the problem and unfortunately overlook the social needs of their respective communities. In some cases, those living in poverty have been made worse off than before a sustainable initiative (e.g. an electrical company increasing service costs to reduce electricity consumption) was implemented in their community for lack of incorporating the so-called social pillar (IUCN/WWF).

 In 2010, about 280,000 Pittsburgh citizens (12.1% of the population) were below the poverty line (Vita et al.). Clearly, poverty is still majorly prevalent in Pittsburgh despite the city having entered post-industrialization in the past 30 years. Any sustainable development, including that which is required to correct the city’s water quality and wet weather issues, must directly involve and give back to the poor.

Problem and Solution

Pittsburgh is a city known for its abundance of water and its hilly terrain. When these two characteristics are combined with a large population, high average annual rainfall, many impermeable surfaces, and an insufficient combined sewer system, wet weather events often result in untreated sewage/stormwater overflowing into the city’s rivers and streams (3 Rivers Wet Weather). Water quality, economic development, and community and environmental health are all negatively impacted by this overflow (3 Rivers Wet Weather). Additionally, because the EPA’s Clean Water Act is violated on this account, the Pittsburgh region’s sewer authority, ALCOSAN, and its 83 municipalities are under a federal consent order to stop the pollution caused by this overflow (3 Rivers Wet Weather).

The most viable solution to this overflow problem is developments in green infrastructure “that not only reduce the volume and rate of stormwater runoff but also reduce the pollutants contained in the runoff,” and additionally incorporate a private-public partnership (P3) between the city and its businesses and citizens (3 Rivers Wet Weather). Green infrastructure (which includes techniques such as porous paving, green roofs, bioswales, rain gardens, and more) is a cost-effective and sustainable way to involve Pittsburgh’s government and its citizens, including those in poverty, through developing a complete green infrastructure plan and through providing long-term employment for the installation and maintenance of said infrastructure techniques (3 Rivers Wet Weather).

Proposal

 A P3 green infrastructure maintenance company that works with Pittsburgh’s governing body will be built to correct the city’s wet weather and water quality issues. The public sector of this initiative will be responsible for strategizing the green infrastructure plan, mapping the sewer collection system, monitoring the flow of the system, repairing the sewers and drains as required, and partial funding (3 rivers). The private sector will train and employ local businesses and citizens to install and maintain the green infrastructure. In addition, the skills and education that these businesses and future workers will develop will serve to increase the social and economic standing of Pittsburgh because they will be transferable to the city’s other businesses and projects. The public role of this initiative will be cheaper and more streamlined than previous city-wide developments through greater private business and community participation as part of being a P3. Lastly, this participation and the visible results it will yield will ensure that the development of Pittsburgh’s green infrastructure is a lasting solution to its wet weather and water quality problems.

Strategy

 A key aspect of this green infrastructure maintenance company is reducing the city’s poverty level through employment and skills training, so the company must take several logistical steps to make sure that it is accommodating and accessible for potential workers of all backgrounds. First, the operating location(s) of the company should ideally be located within the city near public transportation routes to minimize the need for alternative (and potentially unaffordable) transportation means. The city should also fund advertising for the water issues and the company in public spaces so that those living in poverty or those without access to the internet or good work connections can discover the company. A more crucial step that the company needs to carry out is the training and educating its future employees so as to make the positions that it offers friendlier to the existing skills of the workers and more helpful to the workers in later job pursuits.

 The first generation of the company’s employees will need to consist of individuals with significant experience in fields ranging from civil engineering to urban and natural landscaping to sustainability and the environment and more because they will be responsible for setting the standard practice of construction, maintenance of green infrastructure techniques. Though the public sector of this wet weather and water quality initiative with be primarily responsible for strategizing the exact implementation of the green infrastructure in the city’s communities, the company may want to have a small team dedicated to the day to day or case by case construction and operation of the green infrastructure. After these initial employees develop a sufficient background in operating the company and the green infrastructure, they can begin to train workers of lower skill and experience and/or those in serious need of work.

 Training new employees will be a significant aspect of the company’s credibility and the quality of the green infrastructure developments. Installing and maintaining the projects within these groups will be the main, day to day duties and will be taught to all employees. These techniques will be grouped together to make the training process and regular work thereafter more efficient and tailored to their respective resource, construction, and maintenance needs. The groups are as follows:

* Small-scale Landscaping: involves green space projects that focus on planting native plants in smaller locations on case by case basis. Includes: rain gardens, stormwater trees, and native landscaping.
* Large-scale Landscaping: involves green space projects that handle larger plots of land and may require more public funding, permits, and planning. Includes: bioswales, greenways, wetlands, permeable paving, and green roofs.
* Residential Techniques: involves small-scale projects on site of residential areas that capture rain water. Includes: rain barrels, cisterns, and planting small rain gardens.
* Management: involves secretarial and office work at the company’s location. Includes: receptionist/secretarial duties, communication with the city government and residents, company finances, and other company logistical and organizational needs.

The maintenance of these green infrastructure techniques (save those in the management group) will be the most critical, long term work of the company since construction events will only require relatively short periods of work in the beginning. Because of this, the groups will have to regularly check up on their past projects to make sure that all of the green infrastructure is functioning properly. The list as follows shows the necessary inspection periods and resources/equipment for the aforementioned groups:

* Small-scale Landscaping:
	+ Stormwater trees: weekly to bi-weekly pruning, trimming, watering, raking leaves. Equipment: shovel, rake, shears, watering supplies.
	+ Native landscaping/rain gardens: weekly weeding, clearing dead debris, watering (when needed). Equipment: shovel, trowel, weed puller, watering supplies.
* Large-scale Landscaping:
	+ Greenways/wetlands/bioswales: check for proper draining, erosion, debris, clogging, unwanted vegetation after moderate to heavy rainfall. Equipment: shovel, rakes, weed puller.
	+ Green roofs: check for unwanted vegetation, clogging, leaks, runoff and water monthly. Equipment: trowel, weed puller, rake, watering supplies.
	+ Permeable paving: check for debris, clogging, cracked pavement after moderate to heavy rainfall and monthly. Equipment: street broom, flat-blade shovel, rake.
* Residential Techniques:
	+ Rain barrels/cisterns: check for leaks/damage, debris, clogging, overflow as needed and empty during winter months. Equipment: ladder, hose, water skimmer.
	+ Rain gardens: weeding, clearing dead debris, watering if requested by residential owners. Equipment: shovel, trowel, weed puller, watering supplies.

Each of the groups will be responsible for the duties defined in the aforementioned lists but may also help other groups with duties as needed. The management group will be responsible for overseeing that each group remains consistent with its maintenance schedule and keeps track of the condition of its green infrastructure installations. Also within the management group’s responsibilities is recording the maintenance and construction costs, such as new equipment and transportation costs, and allocating money based on the scale and complexity of a project.

Most of the training for these groups of projects will consist of on-site visits and field training, but will also require education programs like presentations, information sheets and manuals, and equipment demonstrations. Additionally, all potential employees must pass a certification program for their project group devised by their instructor(s) to ensure adequate construction and maintenance knowledge/ability, and proper safety protocol. This certification program will primarily involve field testing, and also any other means of testing depending on both the instructor’s and the city’s discretion.

 After the training period, which with last no less than two weeks, employment will be confirmed so long as the prospective employees are fit for work (e.g. no serious criminal background, stable health condition). Employees with be paid a starting hourly wage of $10 per hour from which they can earn raises after so many months of working at the company. Employees who demonstrate serious financial instability can apply for higher wages that with be confirmed by the city government and vary case to case.

Conclusion

 The direct objective of this P3 green infrastructure development is to correct the Pittsburgh area’s sewage and storm water overflow while increasing the water quality of the area’s rivers and streams. More importantly however, is that through this objective the implementation and practice of its associated green infrastructure will be sustainable and embody all three of the sustainability pillars. Economic, environmental, and social considerations must all be made in this initiative to give back to Pittsburgh’s citizens and the environment that they live in. The proposed company will work as a cooperative effort between the governing bodies of Pittsburgh and it citizens and private businesses to maximize efficiency and to minimize costs. Furthermore, by employing Pittsburgh residents who are struggling on account of their incomes and other socioeconomic limitations, the company will ensure that this sustainable development will treat them equitably and specifically work to provide them with skills and experience for later jobs.

Works Cited

"Sustainable Development, Poverty, and the Environment: A Challenge to the Global Community." SUSTAINABLE DEVELOPMENT, POVERTY AND THE ENVIRONMENT: A CHALLENGE TO THE GLOBAL COMMUNITY (n.d.): IUCN. International Union for Conservation of Nature. Web. 17 Mar. 2016. <http://cmsdata.iucn.org/downloads/poverty.pdf>.

Vita, Carol J. De, Sarah L. Pettijohn, and Katie L. Roeger. "Understanding Trends in Poverty in the Pittsburgh Metropolitan Area." PsycEXTRA Dataset (n.d.): Urban Institute. Urban Institute, 31 May 2012. Web. 17 Mar. 2016. <http://www.urban.org/sites/default/files/alfresco/publication-pdfs/412559-Understanding-Trends-in-Poverty-in-the-Pittsburgh-Metropolitan-Area.PDF>.

3 Rivers Wet Weather. 3 Rivers Wet Weather, 2012. Web. 17 Mar. 2016. <http://www.3riverswetweather.org/>.