Overview
Urban Gardens, located in inner city Philadelphia, is looking to install a sustainable irrigation system on one of their garden’s high tunnels operated for the Teens 4 Good program, an internship opportunity for Philadelphia area teenagers. The system is to replace a fire hydrant as a source of water, and eliminate potential water-usage fees and new taxes on water run-off from non-permeable structures.

Objectives
The customer required that the irrigation system:

• Is inexpensive and has easily replaceable parts.
• Is easily replicable so it can be used at all of their urban farms.
• Does not require any electrical power.
• Can be used as an educational tool for urban farming.
• Does not take up any floor space inside the tunnel.

Approach
- Met with advisor to understand background of project and of Teens 4 Good program, and specific criteria for final design.
- Took a site visit to gain understanding of project at hand, customer needs, and necessary measurements of high tunnel for design execution.
- Met with Teens 4 Good participants to gather their input on design ideas.
- Held various meetings brainstorming various rain collection and irrigation methods for high tunnels.
- Researched existing rainwater collection techniques, high tunnel irrigation systems, and bicycle pump designs.
- Remained in contact with sponsor regularly to share ideas and report progress.
- Agreed on final design, created a detailed parts list, and purchased all necessary parts.
- Acquired donated collection tank and irrigation strip from PSU Center of Sustainability and other donors.
- Assembled gutter system and drip irrigation system in workspace to prepare for site installation.
- Tested that all preassemble parts were functioning as intended.
- Installed collection system and drip irrigation system on Teens 4 Good high tunnel in Philadelphia.
- Tested system on-site and made adjustments to create a working irrigation system.

Outcomes
Though this particular project was designing an irrigation system that was customized to a specific high tunnel, the design is easily modified to accommodate any high tunnel dimensions. The parts chosen are all relatively inexpensive and can easily be found in any home improvement store.

As this project proves to be more and more influential to the urban garden community in Philadelphia, this aspect becomes increasingly important, as our design may be used on more high tunnels in the future. This irrigation system should prove to be a useful tool for the Teens 4 Good program to ensure healthy crop growth and an educational experience for all students involved.