

**New York State
Environmental Investment Program
Research Project Summary**

The Gaia Institute

Project Background

The Gaia Institute is a not-for-profit research and education institute located on City Island in the Bronx. Under the leadership of Executive Director Dr. Paul Mankiewicz, Gaia is involved in watershed and wetlands remediation and restoration, storm water runoff reduction, and green roof installations. Historically, the bulk of Gaia's funding has come from government and private consulting contracts, grants and donations. However, since Dr. Mankiewicz holds a patent on an ultra-lightweight growing medium (Dry, it weighs only 10 lbs/ft³.) for green roof installations, the institute could broaden its financial base by manufacturing GaiaSoil™ to create a new revenue stream. GaiaSoil™ is made from recycled expanded polystyrene (EPS), coated with an organic gel, and mixed with compost and clay.

Project Description

This research project would allow the Gaia Institute to establish a pilot manufacturing operation and explore various approaches to commercializing the production of GaiaSoil™, including assessing available equipment, raw material streams, logistics, markets and the processes needed to efficiently and cost-effectively make product and deliver it to potential customers.

Gaia identified the Hitsman Farm in Dutchess County as a good location for its manufacturing pilot. During the project, Gaia would determine the optimal spatial requirements needed for receiving and storing truckload quantities of raw materials, as well as assess various on-site shredding, processing, blending, and finished product storage and transport options. It would identify the minimal and optimal material handling steps required to transform feedstocks into green roofing soil. Gaia would also determine whether there would be a benefit to composting on-site versus obtaining finished compost from other sources. What would be the availability of the raw materials needed to make the lightweight soil in proximity to the manufacturing site?

What would be the cost (or revenue?) associated with getting raw materials to the manufacturing facility? Ultimately, the project would use the data collected to prepare a business plan and assess pricing scenarios.

Project Results

Overall, the project proved very successful. Gaia identified the equipment needed to commercialize production of GaiaSoil™. Several raw material sources were located, and transportation strategies for securing raw materials and delivering finished product were evaluated. Through marketing efforts conducted, Gaia was also able to create a greater general awareness of green roof technologies and demand for its product.

Through the production and installation of more than 700 yards of GaiaSoil™ over two years, the Institute learned that transportation costs for both raw materials and finished product were more significant than originally anticipated. It also determined that the less expensive, standard equipment it had retrofit to produce GaiaSoil™ at the farm would not be adequate for commercial production. Additional storage capacity would be needed to offset the need for "just-in-time" manufacturing. Also, it would not be effective to employ Gaia staff to install green roof projects, and instead the Institute should supply the soil to roofers, landscapers, landscape architects, contractors, and others better equipped to install green roofs. Ultimately, it may be best for Gaia to instead license the technology to others. For its next step, Gaia's will have its GaiaSoil™ analyzed and certified by a third-party lab to help maximize industry and user acceptance of the material. Plus, recent New York tax incentives for building owners who install green roofs should be helpful in popularizing Gaia's product for use in both new construction and building renovations.

Contractor: Gaia Institute
County: New York
ESD Region: New York City
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NYS EIP Investment: \$106,823
Contractor Match: \$101,248
Total: \$208,071
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