

Haiti Agriculture: Conserving Water with Compost

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Abstract

- Haiti currently faces issues with soil erosion and water scarcity.
- Haiti's agricultural sector struggling since the 1980s, worsened since 2010 earthquake. Water scarcity is an issue.
- Compost can improve the porosity of soil and prevent soil erosion, allow farmers to use less water, and facilitate crop growth.
- Composting can help save water and help the Haitian economy.

Background

- Haiti is the poorest country in the Western Hemisphere.
- Over two thirds of the population is employed through agriculture. (FAO, 2012)
- Exporting crops is a major source of money for the economy.
- Soil erosion and water scarcity make growing crops difficult.
- Water scarcity is another problem due to uneven rainfall patterns, varying climates.
- In 2010, the already poor country was struck by a disastrous earthquake, leaving, most people without food or shelter.

Methodology

Had to research solution that was all of the following:

- Economically sensible
- Technologically possible
- Sustainable for long periods of time.

Three solutions initially:

- Rainwater catchment to increase water supply
- Drip Irrigation to help conserve watered crops
- Organic compost to help save water and prevent soil erosion and surface water runoff

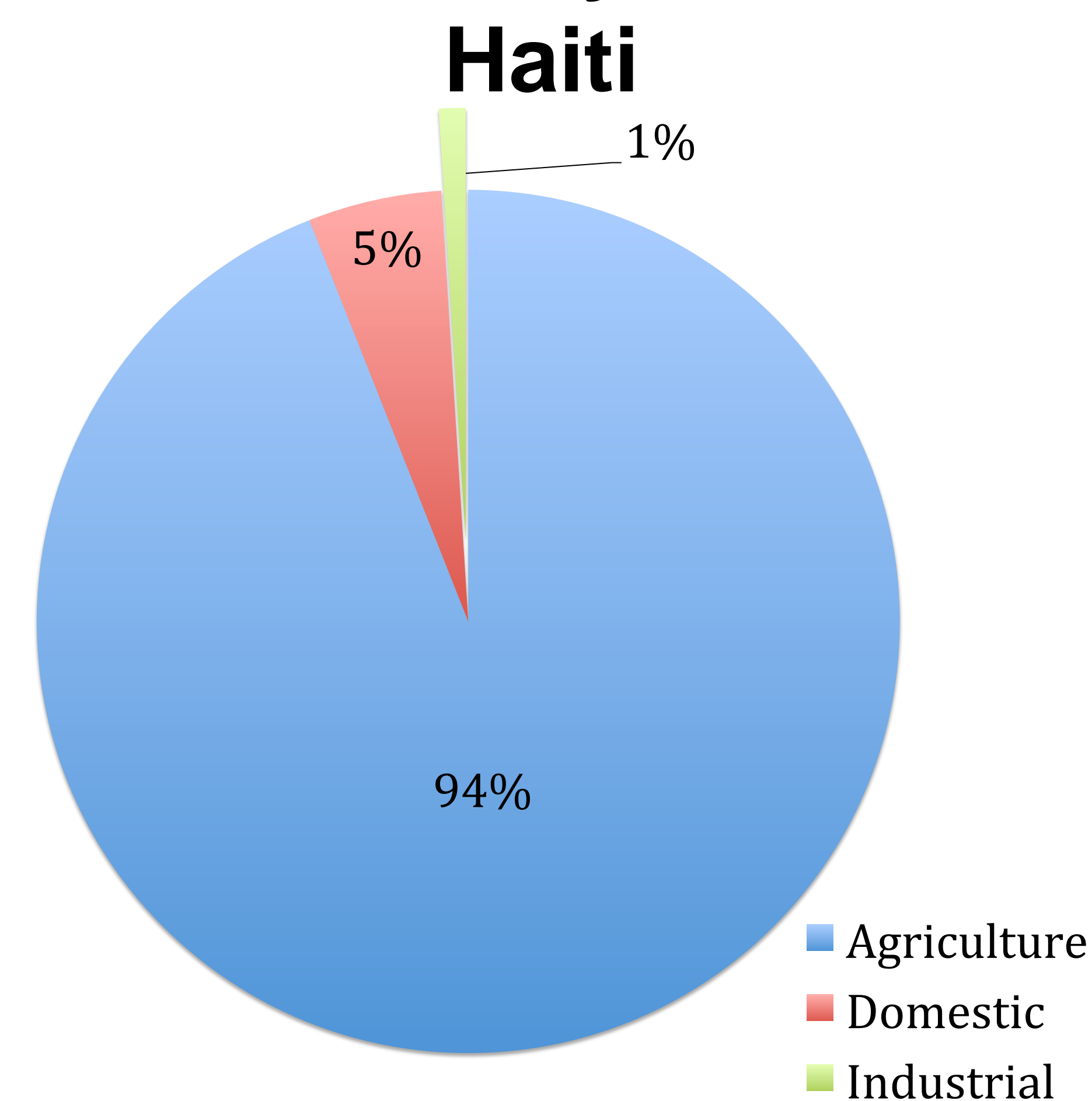
Proposed solution

- Composting helps improve soil porosity and water for farmers.
- Variety of ways to produce compost:
 - In-vessel (for large farms)
 - Windrow (for large farms)
 - Static Pile Aeration (for small farms)

Implementation

1. Find individual farms for soil porosity and size.
 - The size can be measured using information provided by farmers.
 - Porosity can be measured by finding bulk and particle densities of soil.
2. Analyze data collected and offer a composting method to farmers.
 - The soil porosity will determine if the farm needs compost. If the porosity is below .50, then the farm owner will be offered a subsidized package for composting.
 - The size of the farm will determine the composting method needed to produce enough compost.

Usage of Per Capita Water Resources by Sector in Haiti



(Food and Agricultural Organization of the United Nations)

Assessment

Monitoring the project is an important requirement to make sure that the plan is working correctly and completing its purpose. Three things must be measured over a five year period;

- Yearly Crop yield to ensure that more crops are being grown over time
- Gross income of farm to ensure farmers are gaining profit from crops.
- Amount of water used compared to amount used prior to implementation



Example of static pile composting in bins (www.soil-net.com)

(2005, October 09). *Soil-net.com*. (2005). [Web]. Retrieved from [http://www.soil-net.com/album/Plants/Garden/Compost/slides/Compost in the making.html](http://www.soil-net.com/album/Plants/Garden/Compost/slides/Compost%20in%20the%20making.html)



Ideal Bulk Densities for Soil

Soil Texture	Ideal Bulk Density (g/cm ³)	Bulk densities that restrict growth (g/cm ³)
Sandy	Less than 1.60	Greater than 1.80
Silty	Less than 1.40	Greater than 1.65
Clayey	Less than 1.10	Greater than 1.47

(USDA Natural Resources Conservation Service)

Promotional plans

Promotion of this solution is required in order to gain funding and support for this project.

Need support from:

- Nonprofit international organizations to provide funds
- Haitian Ministry of Agriculture, Natural Resources, and Rural Development for government support and funds
- Farmers for cooperation with this project
- People in other countries for donations. Can be promoted through commercials, fliers, etc.



Windrow compost piles in California. (www.o2compost.com)

(1992). *Upper valley disposal service in st. helena, ca.* (1992). [Web Photo]. Retrieved from http://www.o2compost.com/content/Case_Studies.htm

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- USDA Natural Resources Conservation Service. (2008, June). Soil quality indicators: Bulk density. Retrieved from http://soils.usda.gov/sqi/assessment/files/bulk_density_sq_physical_indicator_sheet.pdf
- Fu, R., Dupuy, M., Espaillet, L. R., Wang, J. C., Addison, W. A. B., El-Korchi, T., & Cotnoir, P. D. (2011). Rainwater harvesting in Matènwa, Haiti Technology and Environment (pp. leaves col. ill. 28 cm.). Retrieved from <http://www.wpi.edu/Pubs/E-project/Available/E-project-053111-152653/>