

In Partial Fulfillment of the Requirements for the Degree of

Doctor of Philosophy

Jared Stoltzfus

Will defend his prospectus

Organic Waste Management: Mechanisms for Closing the Human Phosphorus Cycle

Abstract

Phoenix is among many cities attempting to divert organic wastes from landfills to control long-term costs of waste disposal. In addition to extending the useful lives of area landfills, the program hopes to help create jobs, spur innovation, and attract 'green' industries to the Valley. While diversion is a notable goal, cities are also trying to figure out what to do with the organic waste. In parallel, ASU's Phosphorus Research Coordination Network (P-RCN) is addressing the unsustainable nature of the P cycle. P is a nonrenewable, non-substitutable resource that is mined and ultimately ends up in waterways as runoff, or landfills as organic waste. The P-RCN is looking at ways to recover P from our wastes in order to have a sustainable P system. Unfortunately, despite its importance to global food production, there are limited economic benefits of P recovery, and recycled P products may be incompatible with farmer needs.

Closing the Human P Cycle will therefore require identifying mechanisms for processing organic waste that recover multiple value streams, while creating a recovered P product that farmers want. In my research I will first identify the major mechanisms for organic waste management available to cities, and outline the underlying contexts (both market and policy) through case studies that make them successful. I will also include sites in New Delhi, and Jalgaon India, in the study to include contexts from the Global South, and in order to identify critical conditions for success across cultures. I will then assess the mechanisms for their scalability and ability to close the Human P Cycle, while identifying other sustainable outcomes like GHG reductions and job creation. Finally I will create scenarios based on waste volume and composition, and the critical conditions I identify to assist municipalities in their waste management decisions.

Monday, September 29, 2014
3:00 p.m.
Wrigley Hall, Room 323

Faculty, students, and the general public are invited.

Supervisory Committee:
Dr. Dan Childers
Dr. George Basile
Dr. Nick Brown