IPRO 350: Small Town Sustainable Economic Development

Orange, Massachusetts

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Statement of Problem

- Economic demise of small town America
  - Aging populations
  - Shuttered businesses
  - Deteriorating infrastructure

- Purpose of the Orange-IIT partnership
  - Reverse economic decline
  - Identify new business opportunities
  - Match local resources and human capital with IIT expertise
Our proposed opportunity

- Create a local business for the conversion of local farm waste and municipal sludge to saleable products such as Bio-Char
Benefits of Bio-Char

- Technology is simple: basic pyrolysis
- Bio-Char is an excellent soil amendment
- By-products include bio-fuel and heat
- Converts waste material, reducing disposal costs
- Sequesters carbon when returned to soil
Goals of the project

- **Design a model of a sustainable organic waste management system for rural areas**
  - Municipal Waste
  - Agricultural Waste --> Bio-Char

- **Develop a business case for Orange, Massachusetts**
  - Compare modular units and centralized facilities.
  - Evaluate Economic Impact of the designed system
Progress Towards Goals

• Obtained information on waste sludge generated in Orange, MA.
• Analyzed waste management technologies and the Bio-Char option.
• Created an initial design for our own kiln to produce Bio-Char at IIT.
• Visited Chip Energy to secure their assistance on our project.
• Outlined the pros and cons of alternative business models.
The Bio-Char kiln Design

Bio-Char
Major Obstacles Encountered

• Difficulty acquiring a pyrolysis unit

• Quality and availability of information
  o Reliability of internet sources
  o Little precedent in real world solutions like this
Future Work and Challenges Ahead

• Build a safe and efficient Bio-Char demonstration unit and test Orange materials
• Provide a solution for Orange sludge de-watering problem
• Obtain critical information from Orange on local waste materials (specifications and amount) for business case
Questions?

Replace this picture with a picture of the grill Nasrin is buying from Chip Energy