Community and Social Elements of Sustainable Biofuel Systems: Assessment and Application

Paul Smith, Wenping Shi
Pennsylvania State University
Season Hoard, Michael Gaffney, Daniel Mueller
Washington State University
The Community Capitals Framework

Outcomes:
* Healthy ecosystems
* Vibrant regional economics
* Social equity
* Community resilience

Sustainability:

- Communities with a balance of all 7 capitals
- Communities that pursue economic development while maintaining social equity and ecological health
- The CAAM selects for sustainable communities as ideal locations for biorefineries, but also, through strategic application, can help turn communities sustainable
Project Applications

• CAAM: Community Attribute & Asset Model
  – Site Selection
  – (Later) Implementation

• (FAA) Refinery-to-Wing Stakeholder Assessment
  – Barriers & Opportunities for Implementation
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Financial Capital

Natural Capital

Built Capital

Political Capital

Cultural Capital

Human Capital

Social Capital

Site Selection

Biogeophysical Assets

- Forest Residue Volume
- Capital Availability
- Infrastructure Characteristics

Structural Suitability Assessment

Social Assets

- Cultural Capital
- Social Capital
- Human Capital

Social Collective Capacity Assessment

Site Selection, Successful Implementation and Collaboration
According to the World Bank (2012):

“Increasing evidence shows that social cohesion is critical for societies to prosper economically and for development to be sustainable. Social capital is not just the sum of the institutions which underpin a society – it is the glue that holds them together.”

- Little research has quantitatively addressed the social aspect of sustainability for biofuel project implementation.

- The importance of community resistance or enthusiasm for the biofuels industry may be a key to success.
CAAM Development Process

Step 1: Obtain, update, aggregate 3 national data sets
- WESTAF (Creative Vitality)
- Rupasingha (Social Capital)
- R. Wood Johnson (County Health Rankings)

Step 2: Initial selection of representative variables
- Social Capital
- Cultural Capital
- Human Capital

Step 3: Validate and Refine Model
- Ground-truthing with previous work in the region
- New Primary Research
- Case Studies
Social Assets

Cultural Capital
Cultural Vitality Index > .670

Social Capital
2009 > .0413

Human Capital
Health: < -1.43
Obesity: < 26%
Poverty < .34
Education: > 58

Community Social Collective Capacity Assessment

Successful Implementation
County-Level Comparison
## Model Application: Western Montana Corridor

### Case analysis of community capitals in western Montana corridor - differences

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Note: Numbers indicate the difference between the score per capital per county and the applicable cut-off score. Shaded cells represent scores that are better than the cut-off points. Cut-off scores are based on averages for the respective years and variables for the region West (US census region) over 446 counties.
Summary

• Demonstrates the predictive power of Social Assets to assess a community’s capacity for collective action
  – social capital, cultural capital (creative vitality), & human capital (health and education).

• More robust model is being applied to complex projects in the NARA region (and others) to support implementation potential.
  – Already applied in NARA WMC, currently being applied in MC2P and Columbia Plateau.
  – Next steps: apply to Midwest and other regions in the United States.

• Data & methods move beyond binary siting decisions to analyze implementation potential & strategy for highly complex projects in the United States.
Acknowledgements:

• This effort, as part of the Northwest Advanced Renewables Alliance (NARA), was funded by the Agriculture and Food Research Initiative Competitive Grant no. 2011-68005-30416 from the USDA National Institute of Food and Agriculture.

• Follow-up work has been supported by the FAA-funded ASCENT project. (COE-2014-01)