

A GEOGRAPHIC INFORMATION SYSTEM SITE SUITABILITY ANALYSIS FOR ETHANOL
PROCESSING IN ILLINOIS

An Abstract of
an Applied Project
Presented to the
Department of Geography
Western Illinois University

In Partial Fulfillment
of the Requirements for the Degree
Master of Arts

by
Bibhuti Nakarmi

May, 2010

ABSTRACT

Bioenergy has become an economically viable venture both on a subsistence level and on a vast commercial scale, allowing farmers, industries, and countries to attain energy independence. In United States, the government has formulated, published, and is now implementing a policy for wind, small hydroelectric plants, and biofuels and biomass-generated energy. The current demand for ethanol and the projected increase in the use of these fuels under a national renewable fuels standard continues to stimulate interest in the prospects for the development of new ethanol plants.

This project used siting analysis models to explore potential bioethanol processing plant locations that derive bioenergy from renewable energy sources from corn residue in Illinois. In this project, eleven variables were analyzed to determine site suitability in terms of biomass availability, infrastructure and environmental factors. These variables were selected based on review of literature on ethanol processing plants. Suitability grids for biomass, infrastructure, and environmental factors were combined using multi-criteria decision making. The resulting suitability map showed multiple areas of high suitability for ethanol plant location throughout Illinois with highest suitability in the western and southern portions of the state.