

Abstract

Yak are a high yielding but underutilized commodity in American agriculture; a sector that could benefit both economically and ecologically from diversification. Diversification in agriculture is important to help alleviate stress on the environment and provide economic security. This analysis used fuzzy overlay to conduct a statewide site suitability analysis in Illinois to locate the most favorable counties and subcounty divisions to begin yak-based agriculture. Yak-based agriculture refers to a farming or ranching operation where yak are raised as a commodity. Based on a review of literature regarding the conditions for successful yak-based agriculture, the fuzzy overlay analysis undertaken here incorporated both continuous data forms, particularly the climate criteria of temperature, precipitation, and vapor pressure deficit, and the categorical data of cropland use and soil associations. While initially considered to be key criteria for successful yak-based agriculture, the factors of slope and market proximity were removed from this analysis. Slope was not included because nowhere in the study area was the slope a limiting factor. Market proximity was not included due to the dense road network and easy road accessibility throughout the state. However, it is noted that these factors should be incorporated in any future studies that replicate this approach. In the final results, Will, Kankakee, and Iroquois counties were found to be suitable locations for potential yak-based agriculture but not highly suitable as Illinois' climate is not similar to the yak's native range of Tibet. Conclusions from this analysis and similar ones undertaken in the future have potential to assist county farm bureaus in better understanding how to diversify farming to protect the farmer from potential economic disasters and the soil from the harmful effects of monocropping.