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# Generating biogas, clean water and nutrients by pre-treating agro-industrial wastes with anaerobic digestion

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Currently in the US, agro-industrial wastes are, for the most part, treated and disposed of off-site at municipal treatment plants and landfills, imposing a burden on municipalities and the environment. This study considers a paradigm shift in which agro-industrial wastes would be considered a source of valuable resources, including biogas, soil amendment and plant nutrients. Anaerobic digestion offers a way of pre-treating agro-industrial wastes on site, in which the savings and revenues from resource recovery would help to offset the costs of a higher level of treatment. Guiding principles, technological advances, international trends, economic potential and case studies are reviewed, along with an analysis of the potential to apply this approach throughout the State of Kansas. Barriers affecting the diffusion of this technology are identified, along with recommendations to overcome those barriers. A novel approach for co-digesting agro-industrial solid wastes and wastewaters is presented.

## Biography

Robert Weil is a Civil Engineering graduate of the US Coast Guard Academy, practiced in the field of public works and city engineering for 30 years, primarily in the San Francisco Bay Area of California. He has retired from municipal service as the Public Works Director/City Engineer of the City of San Carlos, California in 2011. Having a desire to learn more about water and wastewater treatment, he then completed technical courses and worked as a Water Treatment Plant Operator, both in California and Kansas. In 2017, he started his graduate studies at Kansas State University's Civil Engineering program. He is a registered professional Engineer in California and Kansas and is a Grade IV Water Treatment Plant Operator in Kansas.

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