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### Data driven digital smart farming to optimize agricultural resources in mitigating climate change

Data-driven digital farming have been adopted by progressive farmers to optimize the use of chemicals and fertilizer to reduce cost and increase crop yield. Energy input in agriculture has increased tremendously, and accounts for about 17% of total U.S. energy consumption. Practical, yet innovative solutions will be required if we are to meet growing demand for food in changing climate that reduces yields. Wide-spread adoption of precision agriculture (PA) is a practical solution to optimize the benefit-to-cost ratio in agriculture. PA optimizes input use-efficiency for resources such as fertilizer, chemicals, seeds and irrigation water to reduce crop production costs and to enhance crop yield while simultaneously reducing

harmful environmental costs associated with inefficient use of agricultural inputs. Even assuming only 10% of the US farms adopt PA technologies, 61 million liters of fuel, 1.8 million kg of insecticide and 1.9 million liters of herbicide can be saved annually, reducing not only farm operating costs but also the cost to human and ecosystem health related to agricultural pollution. Additionally, PA has great potential to reduce and offset GHG emissions by optimizing chemicals, fertilizer and water applications through variable rate application. Smart farming technologies greatly aid in mitigating climate change impacted by agriculture.

### Biography

Ganesh C. Bora is Precision Agricultural Program Leader and an Associate Professor of Precision Agriculture and Machinery Systems at Mississippi State University, USA. He is the Chair of USDA Committee NCERA180: Precision Agriculture Technologies for Food, Fiber, and Energy Production. A highly regarded experienced professor for 25 years, he conducts research in mitigation of climate change, telemetry, UAS, data management, precision planting, energy savings through auto-guidance, sensing techniques for VRT, renewable energy. He was the Director of NDSU's Bio-Imaging and Sensing Center from 2010 to 2016. He has received Superior Paper and AE50 award from ASABE. He has maintained excellent global presence, received patent in Kazakhstan and conducted workshops in Vietnam, Thailand, India and Bangladesh; besides teaching "Advanced Agricultural Technology Management" in Kazakhstan. He co-chaired the "Mechanization and Precision Agriculture" committee in 'Engineering and Technology Innovation for Global Food Security,' in South Africa. He received his PhD from Kansas State University, Manhattan, KS, USA.

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