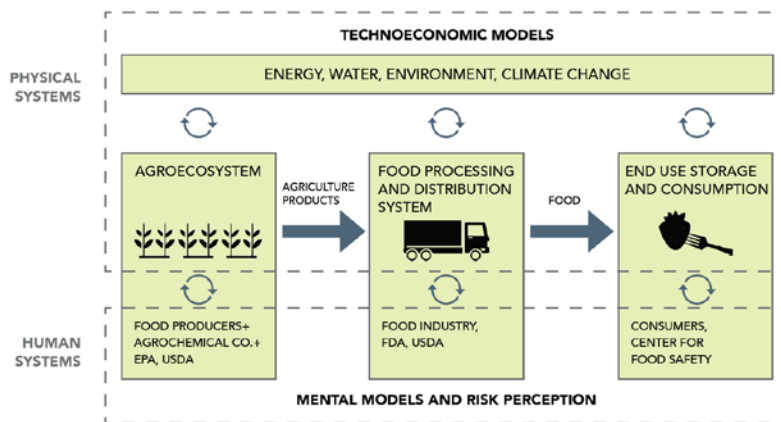


NANOTECHNOLOGY FOR WATER-FOOD-ENERGY:  
**Nanotechnologies to promote sustainable agriculture and food safety**

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**Abstract**

Agriculture is notoriously inefficient. These are exacerbated from food waste, inefficient use of agrochemicals, environmental degradation and climate change. Nanotechnology can help to improve the efficiency of agriculture and food distribution all along the farm-to-fork continuum. I will present and discuss several high value opportunities for nanotechnology to help minimizing resource inputs for food production including minimizing food waste, and the significant scientific, engineering, and social challenges to being able to realize the promised benefits. These opportunities are based in part on the outcomes of an interdisciplinary National Science Foundation workshop that gathered ~50 experts from the U.S. and the EU in the areas of nanotechnology, energy, water, agriculture, systems engineering, data integration and analysis, and social science.



**Figure 1. Nanotechnology provides opportunities for system-level improvements in the agroecosystem, but requires integration of both physical and human systems and new tools for technoeconomic analysis of different technology alternatives.**