



Department of Civil & Environmental Engineering & Earth Science

EE/ES Series

On the Sustainability of Food, Water, and Especially Energy

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Abstract

The World faces a major challenge: how to provide for the human population within the limits of one planet, the Earth, over the long term. This challenge is the genesis of the concept of sustainability in the modern sense. To explore sustainability, I will focus on the closely related human needs for food, water, and energy. The sustainability issues related to food and water are in part due to the uneven distribution of food and water across the globe, often not matching the needs of the human population. Energy, however, presents a subtle and different challenge which we will explore in some depth. In addition, there is the often over looked question of maintaining order and stability, particularly in the socio-political system. This is important because the implementation of sustainability is unlikely to be successful in the absence of socio-political order and stability. These issues, unfortunately, present critical but not well-bounded problems, and for that reason there are many more questions than answers. To explore the issues and their bounds, I will discuss what is known, including some planetary limits and limits imposed by the known laws of Nature. We will conclude with some thoughts on which approaches might stand the best chance of adoption and implementation under current and foreseeable future conditions.