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ABSTRACT

Agriculture is both the source of human life and one of the greatest threats to all life—a major cause of pollution, resource depletion, and climate change. But global population is growing, and food supply must continue to increase to match this growth. This is a predicament in which there are no acceptable tradeoffs— the planet must adequately and equitably feed a growing population expected to peak at 9 billion, and life-supporting ecosystems cannot be pushed beyond their limits.

This research analyzes the supply and demand for food in the presence of ecological thresholds that agriculture threatens to cross, and physiological thresholds of malnutrition and starvation faced by a billion consumers in danger of falling off the demand curve. The goal is to offer an alternative representation of the supply and demand for food that better illustrates the implications of ecosystem thresholds and unequal distribution of wealth. Drawing on the concept of ecological thresholds and concepts from ecological economics, this paper presents multiple representations of the supply and demand for food that account for planetary boundaries and the inequitable distribution of food supply. These supply and demand graphs demonstrate that for multiple planetary boundaries, a *sustainable* supply of food does not meet the minimum daily energy required by a population of near 7 billion people. In addition, I present alternative scenarios for redistribution of food, and the impact of food waste reduction on sustainable supply.