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Energy, the Environment and the Bottom Line

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## Farming for 9 Billion People

By [James Kanter](#)

How will the world meet the growing energy and food demands of a population projected to approach nine billion in 2050? And how can it do so in a sustainable manner, despite the prospect of climate change?

Two frequently cited solutions — raising productivity through large investment in fertilizers, irrigation and mechanization, and extending farming to degraded, abandoned or pasture lands — would still leave food and energy supplies falling short of demand, according to [a study released on Thursday by the climate change advice division of Deutsche Bank](#).

Such measures are also likely to exacerbate water constraints and increase carbon emissions. Irrigation, for example, uses water; the production of fertilizer creates greenhouse gases; and mechanized equipment currently uses fossil fuels.

To overcome these constraints, the bankers say that it will be necessary to explore alternative approaches to present-day agribusiness practices. Such alternatives would include radical shifts in land use, genetically modified crops and organic farming.

Farmers, markets and governments will need to look at “a whole host of options” including “the re-emergence of small, self-sufficient organic farms, characterized as local, multi-crop, energy and water efficient, low-carbon, socially just, and self-sustaining,” according the Mark Fulton, the bank’s global head for climate change investment research.

Mr. Fulton also recommends examining ways to sequester carbon in the soil, through means like tilling the soil less (which may reduce carbon dioxide emissions) or by using [biochar](#), or sometimes called charcoal, to trap carbon dioxide.

The bank’s research, done in collaboration with [The Nelson Institute’s Center for Sustainability and the Global Environment at the University of Wisconsin-Madison](#), estimated that the caloric needs of the planet will soar 50 percent by 2050. The main drivers would be population growth, wealth gains, dietary trends and demand for biofuels.

For more discussion on how a planet with nine billion people will cope, visit Andrew C. Revkin’s blog at The Times, [Dot Earth](#).