Eating Fossil Fuels

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This article is a chilling excerpt from research published in 1994 by Dr Mario Giampietro, who was a senior researcher at the Istituto Nazionale della Nutrizione, Rome and a visiting scholar at Cornell University, and where Dr David Pimentel is a professor in the College of Agriculture and Life Sciences. The study was commissioned by Carrying Capacity Network (CCN), a non-profit organization in Washington, DC which focuses on the interrelated nature of the economy, population growth, and environmental degradation.

Modern intensive agriculture is unsustainable. Between 1950 and 1984, as the Green Revolution transformed agriculture around the globe, world grain production increased by 250%.[3] The energy for the Green Revolution was provided by fossil fuels in the form of fertilizers (natural gas), pesticides (oil), and hydrocarbon fuelled irrigation.

Technologically-enhanced US agriculture has augmented soil erosion, polluted and overdrawn groundwater and surface water, and even (largely due to increased pesticide use) caused serious public health and environmental problems. Soil erosion, overtaxed cropland and water resource overdraft in turn lead to even greater use of fossil fuels and hydrocarbon products.

More hydrocarbon-based fertilizers must be applied, along with more pesticides; irrigation water requires more energy to pump; and fossil fuels are used to process polluted water.

Worldwide, more nitrogen fertilizer is used per year than can be supplied through natural sources. Likewise, water is pumped out of underground aquifers at a much higher rate than it is recharged. And stocks of important minerals, such as phosphorus and potassium, are quickly approaching exhaustion.[1]

Total U.S. energy consumption is more than three times the amount of solar energy harvested as crop and forest products. The United States consumes 40% more energy annually than the total amount of solar energy captured yearly by all plant biomass. Per capita use of fossil energy in North America is five times the world average.[1]

Quite plainly, as fossil fuel production begins to decline within the next decade, there will be less energy available for the production of food.

By 2025, it is expected that the U.S. will cease to be a food exporter due to domestic demand. The impact on the U.S. economy could be devastating, as food exports earn $40 billion for the U.S. annually. More importantly, millions of people around the world could starve to death without U.S. food exports.[2]

In place of fossil fuel-based fertilizers, US farmers could utilize livestock manures that are now wasted. It is estimated that livestock manures contain 5 times the amount of fertilizer currently used each year.[2] Perhaps most effective would be to eliminate meat from our diet altogether.[1]

Mario Giampietro (Istituto of Nazionale della Nutrizione, Rome) and David Pimentel (College of Agriculture and Life Sciences, Cornell University) postulate that a sustainable food system is possible only if four conditions are met:

1. Environmentally sound agricultural technologies must be implemented.
2. Renewable energy technologies must be put into place.
3. Major increases in energy efficiency must reduce energy consumption per person.
4. Population size and consumption must be compatible with maintaining the stability of environmental processes.[1]

Providing that the first three conditions are met, with a reduction to less than half of the exosomatic energy consumption per capita, the authors place the maximum population to maintain a relatively high standard of living in a sustainable economy at 200 million.[1] Several other studies have produced figures within this ballpark (*Energy and Population*, Werbos, Paul J. http://www.dieoff.com/page63.htm;

Impact of Population Growth on Food Supplies and Environment, Pimentel, David, et al. http://www.dieoff.com/page57.htm).

Given that the current U.S. population is in excess of 292 million,[2] that would mean a reduction of 92 million. *To achieve a sustainable economy and avert disaster, the United States must reduce its population by at least one-third.*

The authors concluded in one referred study [1]:

> "At this stage of human development, any serious policy concerned with energy saving, environ-mental sustainability, increasing jobs, and improving the standard of living has to be based on *reducing population pressure*. This applies to both developed countries (as USA) and developing countries. USA has a privileged situation in that it can afford to escape the demographic trap in which many developing countries are already struggling. However, it too must set the goal of an adequate quantity of arable, pasture and forest land available per capita. This will provide the margin to make agriculture environmentally sound. It will offer the option of using some biomass production for energy, and it will reduce the pressure on land, water, air, energy, and biological resources. Such a program is vital if we want to maintain a decent standard of living for future generations."

None of this research considers the impact of declining fossil fuel production.

Quite possibly, a U.S. population reduction of one-third will not be effective for sustainability; the necessary reduction might be in excess of one-half. And, for sustainability, global population may have to be reduced from the current 6.32 billion people [2] to 2 billion - a reduction of 68% or over two-thirds. The end of this decade could see spiralling food prices without relief. And the coming decade could see massive starvation on a global level such as never experienced before by the human race.

Three Choices

Considering the utter necessity of population reduction, there are three obvious choices awaiting us.

We can-as a society-become aware of our dilemma and consciously make the choice not to add more people to our population. This would be the most welcome of our three options, to choose consciously and with free will to responsibly lower our population. However, this flies in the face of our biological imperative to procreate. It is further complicated by the ability of modern medicine to extend our longevity, and by the refusal of the Religious Right to consider issues of population management. And then, there is a strong business lobby to maintain a high immigration rate in order to hold down the cost of labor. Though this is probably our best choice, it is the option least likely to be chosen.

Failing to responsibly lower our population, we can force population cuts through government regulations. Is there any need to mention how distasteful this option would be? How many of us would choose to live in a world of forced sterilization and population quotas enforced under penalty of law? How easily might this lead to a culling of the population utilizing principles of eugenics?

This leaves the third choice, which itself presents an unspeakable picture of suffering and death. Should we fail to acknowledge this coming crisis and determine to deal with it, we will be faced with a die-off from which civilization may very possibly never revive. We will very likely lose more than the numbers necessary for sustainability. Under a die-off scenario, conditions will deteriorate so badly that the surviving human population would be a negligible fraction of the present population. And those survivors would suffer from the trauma of living through the death of their civilization, their neighbors, their friends and their families. Those survivors will have seen their world crushed into nothing.

The questions we must ask ourselves now are, how can we allow this to happen, and what can we do to prevent it? Does our present lifestyle mean so much to us that we would subject ourselves and our children to this fast approaching tragedy simply for a few more years of conspicuous consumption?

[1] *The Tightening Conflict: Population, Energy Use, and the Ecology of Agriculture***,** Giampietro, Mario and Pimentel, David, 1994. http://www.dieoff.com/page69.htm

[2] *Food, Land, Population and the U.S. Economy, Executive Summary,* Pimentel, David and Giampietro, Mario. Carrying Capacity Network, 11/21/1994. http://www.dieoff.com/page40.htm

[3] *Constraints on the Expansion of Global Food Supply***,** Kindell, Henry H. and Pimentel, David. Ambio Vol. 23 No. 3, May 1994. The Royal Swedish Academy of Sciences. http://www.dieoff.com/page36htm