INSEPARABLE FUTURES
Healthy Food and Sustainable Agriculture

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Reviews of the government's 2015 to 2020 Dietary Guidelines for Americans were mixed. Most nutritionists welcomed recommended limits on added sugars, sodium, and saturated fat combined with emphasis on healthy fats and overall eating patterns rich in fruits, vegetables, and whole grains. But notably missing from recommendations was the Dietary Guidelines Advisory Committee's advice to reduce consumption of red meat, particularly if processed, and sugary beverages. And any mention of the sustainability of food production, a major part of the committee analysis, was gone. Critics denounced the politics behind what was left out.

The advisory committee said that sustainability plays a critical role in meeting current and future nutrition needs. Promoting healthy dietary patterns that are produced more sustainably will conserve resources for present and future generations and help ensure long-term food security. But Big Agriculture would have none of it, lobbying successfully to reject sustainability in the final guidelines.

Big Ag's program of high-input, large-scale monocultures and factory farms that produce abundant cheap calories while putting workers and communities at risk, degrading soil, and fouling air and water with noxious pollutants and greenhouse gases is threatened by a sustainability goal.

But a diverse and growing food movement in the U.S. and abroad has different ideas. At its core it embraces the need to address the sustainability of food systems and equitable access to healthy food as essential to protect public and planetary health using approaches shaped by local circumstances.

The dominant agricultural system in the U.S. relies on government support and public acceptance of externalized costs of pollution, loss of biodiversity, and ecosystem degradation. It is based on tenuous and often baseless assumptions of climate stability, reliable water sources, and cheap energy. Structural vulnerabilities of the entire enterprise are increasingly obvious.

In Iowa, the heart of corn production, the Des Moines Water Works has brought a lawsuit against three drainage districts to recover costs of removing agriculture-related nitrates from their drinking water. Schools and their advocates in California demand extended pesticide-spraying buffer zones to protect their children from drift. Ranchers in the West are selling off cattle earlier because of feed and water shortages. Weather patterns are changing. Wells are drying up. Conflicts over access to surface- and groundwater are growing. Food systems that do not adapt will be increasingly at risk from conditions that they helped create.

Climate Change and Agriculture

In the US, the EPA attributes about 8.5 percent of all greenhouse gas (GHG) emissions to agriculture (Figure 1), but this is an underestimate since the agency's GHG inventory assigns production of energy-intensive nitrogen-containing fertilizers to the industrial sector, carbon releases from agriculture-related land use change to a land-use change category, and carbon from on-farm energy use and food transport to the energy sector.

Figure 1: 2014 US Agriculture Greenhouse Gas Emission Sources (MMT CO2 Eq.)[1]
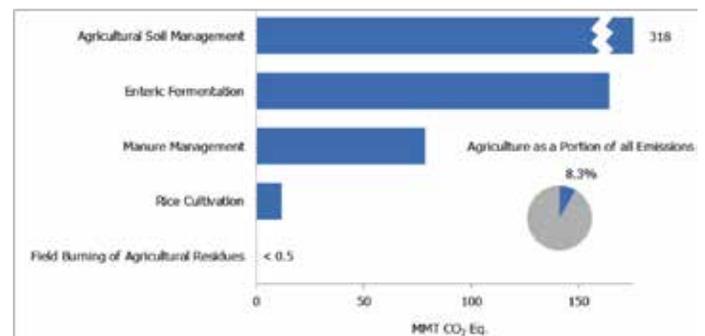
Agriculture contributes three GHGs—carbon dioxide (CO_2), methane (CH_4), and nitrous oxide (N_2O). Their turnover rates and global warming potentials (GWP) differ. For a one-hundred-year timeframe, equivalent masses of CH_4 and N_2O have an estimated twenty-three and three hundred times the GWP, respectively, as CO_2.[2]

Animal agriculture in the U.S. accounts for about half of EPA's inventory of agriculture-related GHG emissions, although globally livestock are responsible for about fourteen percent of all GHG emissions.[3] Much of that excess comes from the release of enormous amounts of carbon stored in forests and grassland soils converted to corn and soybean production for animal feed to satisfy the rapidly growing appetite for meat, particularly in developing countries.

Enteric fermentation of feed in cattle and sheep is the largest source of agriculture-related CH_4 in the U.S., representing nearly twenty-five percent of total emissions from anthropogenic activities. About eighty percent of all N_2O emissions come from fertilized soil, nitrogen runoff, and manure.[4] Manure management accounts for about fourteen percent of the total GHG emissions from agriculture.

Tens of millions of acres of corn production largely in the upper Midwest, more than thirty-five percent of which is processed for animal feed, is heavily dependent on use of energy-intensive nitrogen-containing fertilizer. Nitrogen leaching is not only a source of N2O but also unsafe spikes of excessive nitrates in drinking water sources. Elevated levels of nitrate in drinking water can increase the risk of birth defects and thyroid cancer in communities downstream and contribute to eutrophication of freshwater and marine aquatic systems.[5,6,7]

Analyses of the carbon footprint of various protein sources find that beef production is responsible for far higher emissions of GHGs than others. Expressed as CO2 equivalents/kg protein, beef is responsible for 50-600 kg CO2e/kg protein, varying with feeding and production practices, pork for 20-55, poultry for 10-30, and pulses—e.g. lentils, chickpeas, dry beans—for 4-10.[8]

Water in Agriculture

Livestock alone accounts for more than eight percent of total global water use, most of which goes to irrigate feed crops.[9] Irrigation withdrawals increasingly exceed supply rates, for example, in the Ogallala aquifer underlying the Great Plains.[10] In California, long embroiled in conflicts over competing water uses, more than ninety-percent of the state's "water footprint" is associated with agriculture (Figure 2). Meat and dairy products have especially large water footprints due to the amount of water-intensive feed required to raise the animals. A study of virtual water content of various food products using intensive systems in CA finds that beef requires 100,000 L/kg protein compared to 47,619 for pork, 30,303 for poultry, and 13,158 for beans.[11]

Figure 2. California's Water Footprint by Sector[12]
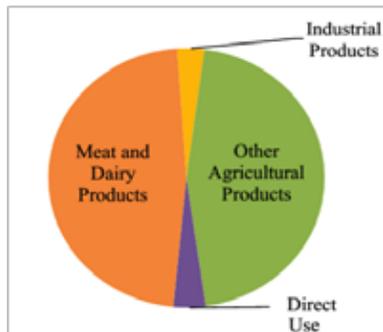

Healthy Food, Sustainable Agriculture

Achieving food system sustainability is critical in order to meet current and future nutrition needs. Soil and ecosystem degradation, chemical contamination, unsustainable water use, and climate change are driving development of new models of food production. Among current efforts: organic farming, rebuilding soil carbon through reduced tillage, more extensive use of cover crops, restoring grasslands and biodiversity, improved grazing management, and combining crops, trees, and animal husbandry in integrated systems.[13,14,15] The good news is that truly healthy diets can be produced with sharply reduced environmental and public health impacts.

Local, regional and institutional efforts are gaining traction around the country. In the health care sector, the Healthy Food

in Health Care program of Health Care Without Harm is deeply engaged in this transformation.[16] Health care systems, professionals and communities have forged partnerships with food producers, processors, and distributors in order to align purchasing with sustainable agricultural practices.[17] Early projects that focused on rejecting the routine use of antibiotics in meat production are expanding to include a less meat-better meat approach and increasing plant-based protein alternatives. Hospitals around the country are hosting farmer's markets and community supported agriculture distributions featuring healthy local and regional food produced more sustainably. In higher education, Real Food Challenge recently developed a set of sustainable food standards for evaluating the ecologic, sociologic, and economic impact of food products to inform purchasing decisions in universities.[18]

Perhaps the next iteration of Dietary Guidelines for Americans will reflect the obvious need for sustainable food production over the long-term. If not, it will become irrelevant, as drivers of new agricultural models are not waiting for the government to catch up. The world is warming, oceans are acidifying, rainfall and weather patterns are changing, soil is degraded, and water supplies are dwindling. We can respond now to help mitigate these changes and their impacts or force current and future generations to adapt to an uncertain future in which food security becomes more and more tenuous for large and growing numbers of people around the world.
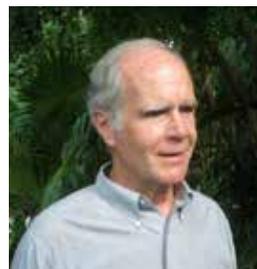
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AIR POLLUTION AND CHILDREN

UNICEF is calling on world leaders to reduce air pollution, saying it leads to the deaths of more children yearly than malaria and HIV/AIDS combined. Around 600,000 children under age 5 die every year from diseases caused by or exacerbated by outdoor and indoor air pollution, especially in poor nations. UNICEF is asking world leaders to take four steps:

• Reduce pollution by cutting back on fossil fuel combustion and investing in energy efficiency.

• Increase children's access to health care, including more immunization programs and information programs about pneumonia, a leading killer of children under 5.

• Minimize children's exposure to air pollution by keeping schools away from factories and other pollution sources and using cleaner cookstoves in homes.

• Improve monitoring of air pollution.

The "Clear the Air for Children" report can be found at - http://weshare.unicef.org/Package/2AMZIFKPWU1