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Chapter 5: Local Action Plan Long Term Initiatives **Sustainable Agriculture**

DOCUMENT CONTENTS

The Role of Agriculture in Global Warming

Agriculture contributes an estimated 20% of the greenhouse gases (GHGs) that are responsible for global warming.[1] Plowing the soil causes the release of significant amounts of carbon previously fixed in soil structure by speeding the microbial activity that causes decomposition of the organic matter in the soil. Conventional farming activities also release substantial amounts of methane and nitrous oxide. Methane is produced by the decomposition of organic matter like crop residues and also by the digestive processes of grazing livestock like cattle. The excessive use of nitrogen fertilizer contributes to the emission of nitrous oxide. Agriculture is responsible for about 50% of human-related methane emissions and 70% of nitrous oxide emissions.[2]

Because the average molecule of food travels 1500 miles before someone eats it, the transport of agricultural goods also releases CO_2.

Solutions: Local Sustainable Agriculture

Local governments can significantly reduce their community's contribution of GHGs by supporting local sustainable agriculture. Locally produced fruits, vegetables, dairy products and other agricultural goods require far less transportation than products shipped into the community over long distances. They can also be grown in ways that substantially reduce emissions of GHGs.

[1] International Food Policy Research Institute, www.ifpri.org/pubs/books/ufa/ufa_ch24.pdf#search=%22tilling%20and%20global%20warming%22, also archived at, www.natcapsolutions.org/ClimateManual/Cities/Chapter5/LongTermInitiatives/Agriculture/UFA_ch24.pdf, 3 October 2006.

Low-till or no-till farming, a practice called conservation tillage, does not disrupt the soil as much as heavily mechanized tilling practices, allowing the soil to retain a much higher percentage of the carbon that is naturally fixed within it. This also reduces CO_2 emissions released from farm equipment used to till the fields. In addition to reducing the amount of carbon released, conservation tillage reduces the soil's exposure to wind and water erosion, increases options for multiple cropping, improves the soil's ability to retain moisture, and moderates the soil's temperature.[3] Farmers can even be paid, through a program conducted by Chicago Climate Exchange for converting their land to no or low-till practices.[4]

An estimated 38% of the country's total farmland (109 million acres) uses conservation tillage practices, according to the group Conservation for Agriculture's Future (Core 4).[5] It is an especially attractive practice for smaller, local operations. Organic farming reduces or eliminates the use of industrially produced agro-chemicals that require significant amounts of oil and natural gas to produce, deliver and use. Organic farming methods improve soil productivity, reduce the potentially hazardous handling of chemicals and reduce water pollution. Sustainable farming also sequesters carbon in the soil by using organic wastes as fertilizer.

Organic farming is more energy efficient than conventional farming. A study begun in 1978 and released in 2006 by the Swiss government found organic farms to be 20-56% more energy efficient than conventional farms.[6] Increased energy efficiency came in part from decreased fertilizer and pesticide use and decreased transportation of external animal feed sources.[7] A U.K. government study found that, "Organic systems had a lower energy input largely because of an absence of indirect energy inputs in the form of nitrogren fertilizer." The study estimated that large organic arable production used 35% less and organic dairy 74% less energy per unit of production when compared to conventional agriculture.[8]

Local operations are especially well suited to organic production. This can also confer significant competitive advantage to local farmers. Organic farming was a $14.6 billion dollar industry in the U.S. in 2005 and continues to grow around 17% annually.[9] By enabling local farmers to remain viable by entering this market, as well as to grow food for local consumption, a community is investing in the future of its farmers and ranchers, boosting local economic development and reducing the carbon footprint of its agricultural sector, and of its citizens as they feed their families.

A recent study by the U.S. Department of Agriculture's Agricultural Research Service (ARS)[10] concluded that Minnesota grain farmers could make more money by switching to organic grain crops. With the 130 acre Swan Lake Farm as a

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[2] International Food Policy Research Institute, www.ifpri.org/pubs/books/ufa/ufa_ch24.pdf#search=%22tilling%20and%20global%20warming%22, also archived at, www.natcapsolutions.org/ClimateManual/Cities/Chapter5/LongTermInitiatives/Agriculture/UFA_ch24.pdf, 3 October 2006.

[3] A conflict has existed between the practices of organic farming and conservation tillage. Organic farmers do not use chemical herbicides to control weeds and therefore have traditionally used mildly intensive tillage practices to turn weeds under the soil. Recent developments in low-till methods and alternative weed control methods are bringing conservation tillage and organic farming closer together. However, there is growing interest in organic no-till crop production.

[4] CCX Agricultural Soil Carbon Offsets, www.chicagoclimatex.com/news/publications/pdf/CCX_Soil_Offsets.pdf, also archived at, www.natcapsolutions.org/ClimateManual/Cities/Chapter5/LongTermInitiatives/Agriculture/CCX_SoilOffsets.pdf, 30 October 2006.

[5] Conservation for Agriculture's Future, www2.ctic.purdue.edu/Core4/news/annc/CTfact.html, 3 October 2006.

[6] Paul Mader, et.al., "Soil Fertility and Biodiversity in Organic Farming," *Science* magazine, 31 May 2002.

[7] www.organicconsumers.org/organic/stabalize062404.cfm, 15 October 2006.

[8] Mark Shepard et al, *An Assessment of Environmental Impacts of Organic Farming* www.defra.gov.uk/farm/organic/policy/research/pdf/env-impacts2.pdf, also archived at, www.natcapsolutions.org/ClimateManual/Cities/Chapter5/LongTermInitiatives/Agriculture/Organic_Env-impacts.pdf, 15 October 2006.

[9] Organic Trade Association, www.ota.com/pics/documents/short%20overview%20MMS.pdf#search=%22organic%20industry%20billion%22, also archived at, www.natcapsolutions.org/ClimateManual/Cities/Chapter5/LongTermInitiatives/Agriculture/OTA_Survey_2006.pdf, 3 October 2006.

[10] USDA Agricultural Research Service, July 25, 2006 www.ars.usda.gov/is/pr/2006/060725.htm, 3 October 2006.

representative farm, ARS researchers used four years of trial data to predict that over 20 years organic soybeans would fetch up to $14 more per bushel, organic corn up to $3 more per bushel, and wheat up to $5 more. Another projection showed farmers netting an average of $50-60 more per acre even if organic prices were to drop by half.[11]

According to a study by the leaders of the Consortium for Agricultural Soils Mitigation of Greenhouse Gases (CASMGS), such agriculture practices that reverse the decarbonization of the soil, and increase carbon sequestration by farmers in the U.S. could reduce the expected increase in CO_2 emissions by 20% per year.[12]

Government Incentives for Climate Protection Through Local Sustainable Agriculture

Many local governments are implementing programs to encourage local food production, increased use of organic produce and preservation of farmland. Some of these programs are designed to strengthen local economies, some to increase health and some to preserve a way of life. But all have the effect of reducing global warming as well. Increasingly, local governments are linking the benefits of local production with the need for climate protection.

King County, Washington, the county that encompasses Seattle, preserves local farmland, in part to reduce the carbon footprint of agriculture, to enable residents to be more secure in their sources of food and to enhance and preserve the commercial viability of agriculture as an economic sector.[13]

Ron Sims, the visionary County Executive, described how the county's Greenprint for King County[14] would deliver many benefits beyond climate protection:

> The Greenprint gives us a powerful tool to protect an additional 100,000 acres of open space and resource lands by 2010, and strengthen a green infrastructure capable of ensuring that King County's incredible natural assets are safeguarded for generations to come. King County currently owns more than 25,000 acres of lands and more than 106,000 acres of development rights for the purpose of preserving working forests, productive farms, rivers that are managed to support salmon habitat, yet also reduce flood threats and a premier multi-modal, regional trail system.[15]

The county has partnered with national and local land protection organizations to establish this network of protected lands surrounding the urban areas of the county. It is also working with the four county region to encourage similar land protection to ensure local food security and to reduce the climate footprint of meeting its citizens' needs.

The policies needed to connect communities to local farmers are not complex or innovative. Something as simple as mandating the purchase of local and organic foods for government agencies, school districts and any other organization that use municipal funds for procurement of food will have a rippling effect on the local economy. Farmers will respond favorably to the expansion of a new market by providing more goods and more variety.

Woodbury and Cherokee County, Iowa have created policies to support local producers of organically grown agricultural products. Woodbury County instituted a Local Food

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[11] One criticism of organic agriculture is that production yields are not as high as traditional farming. Yields are often reduced as a farmer transitions from conventional production and learns the techniques of organic farming. The process of establishing healthy soil, which is the foundation of successful organic production can take as long as a few years. Once an organic system is in place, however, many organic producers have yields that are as large as or greater than those of conventional operations. According to a study by Holly Born of the National Center for Appropriate Technology (NCAT), average productivity per acre in organic systems is 90 to 93% that of conventional agriculture. With lower input costs and comparable productivity, organic agriculture can be just as profitable if not more so than conventional farms. For example, organic dairy farmers may see reduced average production in the herd, but their animals tend to live longer and require less veterinary care. www.leopold.iastate.edu/pubs/nwl/2006/2006-2-leoletter/rotations.htm, 3 October 2006.

[12] Consortium for Agriculture Soils Mitigation of Greenhouse Gases, www.casmgs.colostate.edu/, 3 October 2006.

[13] King County climate change news, www.metrokc.gov/exec/climate.htm, 30 October 2006.

[14] King County Greenprint, www.tpl.org/tier3_cd.cfm?content_item_id=18178&folder_id=262, 30 October 2006.

[15] King County News Release, dnr.metrokc.gov/dnrp/press/2005/0422Greenprint.htm, 30 October 2006.

Purchase Policy to "increase regional per capita income, provide incentives for job creation, attract economic investment, and promote the health and safety of its citizens and communities."[16] It mandates that all county agencies that regularly procure food as part of their operations purchase locally produced organic food. This includes the Woodbury County Jail, Work Release Center and the Juvenile Detention facilities.

Woodbury County also provides grants of up to $50,000 each year in real property tax rebate incentives for farms that convert from conventional farming techniques to organic farming. The "Organics Conversion Policy" is designed to offset costs associated with establishing the new techniques and losses due to the three-year conversion period that is required in order to attain organic certification.[17]

Cherokee County, Iowa, followed Woodbury County's "Organics Conversion Policy" with a county tax relief program of their own. It provides up to 100% relief of property taxes for up to five years to growers who convert from conventional farming and become certified organic growers[18]. Farmers in the program will also receive support from the Iowa Department of Agriculture and Land Stewardship, the Leopold Center for Sustainable Agriculture, the Iowa State University Extension office and a network of regional organic growers. The Whole Foods stores in the region provided additional help by promising to buy organic produce from the region indefinitely.

The program also hopes to make farming a more economically viable profession for young Iowans who want to stay in the area as farmers. An Iowa study showed that increasing consumption of locally grown produce would create an influx of an additional $302 million in sales and more than 4,000 jobs added to the Iowa economy. [19] The Environmental Quality Incentives Program (EQIP) was established within the 2002 Federal Farm Bill. EQIP is a federal program offering financial and technical assistance to implement structural and management practices on eligible agricultural land. USDA Natural Resources and Conservation Service (NRCS) offices in several states across the country, including Minnesota, Nebraska, Iowa and Montana, offer cost-share incentive programs that help farmers transition from conventional agriculture to organic agriculture.[20]

In Montana, the state helps farmers convert by sharing the cost for organic crop transition, paying $35 per acre for up to 100 acres for a maximum of three years. To help ranchers make their livestock operations organic the state pays $3.50 per acre for up to 1,000 acres for a maximum of three years.[21]

School Programs to Promote Local Sustainable Agriculture

A growing number of school districts across the country are teaming up with local farmers and organic and local produce distributors to offer schoolchildren healthier options in their food programs, while encouraging local production. Schools in Washington State and California have introduced organic food as part of healthy school lunch programs. Thanks to the popularity and lower costs

[16] Woodbury Organic Conversion Policy, www.woodbury-ia.com/departments/economicdevelopment/wc%20organics%20policyv4.pdf, also archived at, www.natcapsolutions.org/ClimateManual/Cities/Chapter5/LongTermInitiatives/Agriculture/Woodbury_OrganicsPolicy.pdf, 3 October 2006.
[17] Woodbury Local Food Purchase Policy, www.woodbury-ia.com/departments/economicdevelopment/WC%20LFPP%20v3.pdf, also archived at, www.natcapsolutions.org/ClimateManual/Cities/Chapter5/LongTermInitiatives/Agriculture/Woodbury_LocalFoodPolicy.pdf, 3 October 2006.
[18] Sioux City Journal, September 2006 www.siouxcityjournal.com/articles/2006/09/20/news/local/54322a2cf28dd753862571ef000a6c3a.txt, 3 October 2006.
[19] Iowa State, Leopold Center, www.leopold.iastate.edu/pubs/staff/files/health_0606.pdf, also archived at, www.natcapsolutions.org/ClimateManual/Cities/Chapter5/LongTermInitiatives/Agriculture/IowaState_economic_2006.pdf, 3 October 2006. For more information, contact: Rich Pirog, Marketing and Food Systems Initiative, (515) 294-1854, rspirog@iastate.edu or Dave Swenson, ISU Economics, (515) 294-7458, dswenson@iastate.edu or Laura Miller, Leopold Center communications, (515) 294-5272, lwmiller@iastate.edu.
[20] USDA Environmental Quality Incentives Program, www.nrcs.usda.gov/programs/eqip, 3 October 2006.
[21] Montana NRCS, www.mt.nrcs.usda.gov/news/releases/progdeadline06-4.html, 3 October 2006.

of an organic salad bar at Lincoln Elementary School in Olympia, Washington, all grade schools in the city now have one.[22] In 2004, the Seattle school district adopted a Breakfast and Lunch Program Procedure banning junk food and encouraging organic food in school cafeterias. California public school districts in Berkeley, Santa Monica and Palo Alto also have organic food programs.

Several states across the country use Farm to School programs to connect local farmers and their products with schools. Oklahoma's Farm to School Programs "provide schools with fresh and minimally processed farm commodities for inclusion in school meals and snacks, to help children develop healthy eating habits, and to improve Oklahoma farmers' incomes and direct access to markets,"[23] as described in the legislation creating the programs. The bill lists the many benefits of Farm to School Programs, including "activities that provide students with hands-on learning opportunities, such as farm visits, cooking demonstrations and school gardening and composting programs, and integrating nutrition and agriculture education into school curricula."[24] Schoolchildren can use the programs to learn about healthy living and the importance of sustainable agricultural practices. The Farm to School Programs provide guidance and resources to Oklahoma Schools so that they may partner with local farmers to provide healthy, locally grown food and the educational opportunity for schoolchildren.[25]

Protect the Climate and Strengthen Local Economies

People who eat locally grown food support local farmers and the local economy, while reducing GHG emissions from transporting food from long distances. Community initiatives that assist local farmers to make their practices more sustainable (i.e., converting to organics, attaining organic certification or implementing conservation tillage) can help the farming community significantly reduce its contribution to global warming. A community that expands its supply of sustainable and locally grown food will help protect the climate while promoting healthier lifestyles, a stronger local economy, cleaner air and water and greater community security.

[22] Grinning Planet, www.grinningplanet.com/2006/05-02/healthy-school-lunch-article.htm, 3 October 2006.
[23] Oklahoma Legislation, Farm to School Program Act www.oscn.net/applications/oscn/DeliverDocument.asp?CiteID=446211, 3 October 2006.
[24] Ibid.
[25] Farm to School Program, www.farmtoschool.org/, 3 October 2006.

Additional Resources

Leopold Center for Sustainable Agriculture
www.ag.iastate.edu/centers/leopold/

National Sustainable Agriculture Information Service
attra.ncat.org/

Stonyfield Menu for Change
www.stonyfield.com/MenuForChange/index.cfm

Organic Farming Research Foundation
www.ofrf.org/

Where does your food come from?
www.foodroutes.org/

Sustainable Food in Schools
www.sustainabletable.org/schools/dining/

Local Harvest
www.localharvest.org/

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