Developing Sustainability Criteria for Renewable Energy:
A Road Map for a Sustainable Future

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The National Catholic Rural Life Conference is a member of both the Midwest Sustainable Agriculture Working Group and the Sustainable Agriculture Coalition. I am a co-chair of the MSAWG/SAC Conservation & Environment committee; I also collaborated on the MSAWG position paper "Farm-Based Renewable Energy". The talking points below are based on that paper, plus additional white papers and studies by MSAWG/SAC members.

Brief word on MSAWG & SAC:

The **Midwest Sustainable Agriculture Working Group (MSAWG)** is a network of Midwestern organizations working for a system of agriculture that is economically profitable, environmentally sound, family-farm based, and socially just. We are farm, food, rural, religious, and conservation organizations and individuals who organized in 1988 to interject grassroots sustainable agriculture perspectives into crafting a sustainable agriculture program within the U.S. Department of Agriculture, the debate over the periodically renewed federal Farm Bill, annual rural and agricultural budget and appropriations decisions, and federal policy and program reform more broadly.

Our policy work is developed and implemented by four issues committees. These committees bring together farmers, conservationists, researchers, and others to debate policy issues and develop consensus around policy options. The current four issue committees are:

- Conservation & Environment
- Farming Opportunities & Fair Competition
- Marketing & Rural Development
- Research & Extension

The **Sustainable Agriculture Coalition (SAC)** is an alliance of groups that together takes common positions on critical federal agricultural and environmental policy issues and provides financial support for collective representation before Congress and federal administrative agencies. SAC includes many MSAWG organizations as well as other national organizations and organizations from other regional sustainable agriculture working groups (SAWGs). SAC seeks extensive input from farmers engaged in creating sustainable systems and public and private non-profit organizations working directly with farmers. In turn, SAC provides years of experience on how best to effect change within Washington.

The MSAWG/SAC website is www.msawg.org

Farm-Based Renewable Energy

Several MSAWG/SAC members formed an ad hoc working committee in late 2001 to examine the intersection of wind/solar/biomass energy and sustainable agriculture. The committee recognized the potential and opportunities for farm-based renewable energy, but also knew that a precautionary approach was needed to avoid large-scale and long-term problems in the overuse of bioenergy crops. The committee developed a position paper and circulated it for members to sign-on. The position paper and signatory MSAWG/SAC groups can be found at: www.msawg.org/positions/
[Click on “Energy and Sustainable Agriculture” to view]

For purposes of our discussion today – mainly focused on biofuels – I will exclude important points about conservation and efficiency, solar and wind power, and other renewable and recyclable practices on the farm. MSAWG/SAC members, however, are taking a broad view to the use of energy on the farm. Energy savings on any farm mean more money in the farmer's pocket, so it is important to remember that these savings start with efficiency and conservation.

Also, we should recognize that about a third of all energy used in U.S. agriculture goes to commercial fertilizer and pesticide production, the most energy-intensive of all farm inputs. Many producers are saving money by reducing these "indirect" forms of energy consumption.

Finally, over a third of the energy in the U.S. food system goes to processing, packaging, and transporting food. Local food systems can reduce "food miles" and transportation costs, offering significant energy savings.

Potential for Rural Revitalization

As farms have gotten bigger and more industrialized, small towns, family farm incomes and rural services and opportunities have declined. For the struggling rural sector, bioindustrial development offers an opportunity for revitalization. With agriculturally produced crops as feedstocks, farmers stand to gain new and potentially more profitable markets. The diversity of markets can also translate into diversity on the agricultural landscape, as the use of non-traditional commodities and farm products will allow farmers more choices in their crop rotations. Opportunity exists for rural towns as well, as transportation and processing limitations, as well as scale benefits, favor smaller-sized facilities located near the feedstocks. Processing, packaging and other value-added opportunities associated with the bio-based market can help bring new jobs, investment and income to struggling rural communities. The promise of such possibilities is why the bioindustrial sector is being looked at as a potential vehicle for promoting sustainable rural development and improved farm viability.

At the same time, there are potential problems to large-scale and long-term production of bioenergy if we do not take a holistic or systems approach. Burning significant amounts of organic materials can still cause environmental problems. Then there are questions of

land use competition, future water scarcity and food security for developing nations. So more research is needed before we plunge too quickly or too deeply into bioenergy production. Perhaps a look again at the principles of sustainable agriculture and sustainable development might lead us to “sustainability criteria” for renewable energy.

Outlines of a Road Map, or orientation for drawing a map

Sustainable agriculture integrates three main goals: environmental health, economic profitability, and social and economic equity. A variety of practices and policies have contributed to these goals. People in various capacities, from farmers to consumers, have shared this vision and contributed to it.

Sustainability rests on the principle that we must meet the needs of the present without compromising the ability of future generations to meet their own needs (Our Common Future, The Brundtland Report, 1987). **Stewardship of both natural and human resources** is of prime importance. Stewardship of human resources includes consideration of social responsibilities such as working and living conditions of laborers, the needs of rural communities, and consumer health and safety both in the present and the future. Stewardship of land and natural resources involves maintaining or enhancing this vital resource base for the long term.

A **systems perspective** is essential to understanding sustainability. The agri-food system is envisioned in its broadest sense: from the individual farm, to the local ecosystem, and to communities affected by this farming system both locally and globally. An emphasis on the system allows a larger and more thorough view of the consequences of farming practices on both human communities and the environment. A systems approach gives us the tools to explore the interconnections between farming and other aspects of our environment.

A systems approach also implies **interdisciplinary efforts in research and education**. This requires not only the input of researchers from various disciplines, but also farmers, farm workers, consumers, policymakers and others.

Making the transition to sustainable agriculture is a process. For farmers, the transition to sustainable agriculture normally requires a series of small, realistic steps. Family economics and personal goals influence how fast or how far participants can go in the transition. It is important to realize that each small decision can make a difference and contribute to advancing the entire system further on the "sustainable agriculture continuum." The key to moving forward is the will to take the next step.

Finally, it is important to point out that reaching toward the goal of sustainable agriculture is **the responsibility of all participants in the system**, including farmers, laborers, policymakers, researchers, retailers, and consumers. Each group has its own part to play, its own unique contribution to make to strengthen the sustainable agriculture community.

A Sustainable Agricultural System

Sustainable agriculture should not be understood as a specific agricultural practice, technology or system. Rather, agricultural sustainability is a societal goal to be perpetually pursued by and for everyone. According to Prof. Richard Cruse, agronomist at Iowa State University: “The systems analysis we propose embraces a paradigm shift in the way we understand sustainability. Instead of trying to limit the damage to the human and natural environment, sustainable development aims to improve the quality of life in rural communities, the overall health of the ecosystem, and production stability of feedstocks for the bio-economy. Current agricultural structure and production systems increasingly transfer economic and human assets out of rural economies. A sustainable bio-economy should secure a sustained production system that returns economic and social resources to rural communities and improves quality of life.”

The following principles are offered as the basis of a sustainable agriculture system:

1. A sustainable agricultural system is based on the prudent use of renewable and recyclable resources.
A system which depends on exhaustible (finite) resources such as fossil fuels cannot be sustained indefinitely. A sustainable system would use renewable energy sources such as biological, geothermal, hydroelectric, solar, or wind. Use of recyclable resources such as groundwater at rates greater than recharge depletes reserves and cannot be sustained.

2. A sustainable agricultural system protects the integrity of natural systems so that natural resources are continually regenerated.
Given that existing agricultural practices degrade the soil and water, and reduce biodiversity, a sustainable agricultural system calls for a bio-economic system that will integrate all the inputs and outputs of the production and processing systems including labor, transportation, fertilizer, crops, manure, and crop residue. Such integrated systems can improve long-term soil and water quality, and secure sustained feedstock production. Thus, we believe a bio-economic system will not be sustainable as long as the goal is simply to decrease the rate of its degradation. Sustainable agricultural systems should maintain or improve groundwater and surface water quality and regenerate healthy agricultural soils.

3. A sustainable agricultural system is profitable.
Transition to new ways of knowing, doing and being require incentives for all participants. Some of these incentives are necessarily economic. Systems and practices that do not include profitability as one of the prime motivators will not be voluntarily implemented.

4. A sustainable agricultural system improves the quality of life of individuals and communities.
In order to stem the migration from rural to urban areas, rural communities must offer people a good standard of living including diverse employment opportunities, health care, education, social services and cultural activities. Young people must be afforded

opportunities to develop rural enterprises, including farming, in ways which care for the land so that it may be passed onto future generations in as good or in better condition than it was received.

5. A sustainable agricultural system is guided by a land ethic.
Holistic or whole-system analysis views an agro-ecosystem as a dynamic community of soil, water, air and biotic species. All parts are important because they contribute to the whole. This ethic strives to protect the health of the land community; that is its capacity for self-renewal.

Measuring the Benefits of a Land Ethic

Strengthening the Soil
Over time the soil becomes richer in organic matter, the topsoil deeper, and wind/water erosion reduced or eliminated. Conservation tillage and crop rotations will help water retention, maximize carbon sequestration, and improve wildlife habitat. Perennial, deep-rooted crops and grasses are used whenever possible to protect the soil.

Protecting the Air and Water
Water use becomes more efficient. Any water leaving the farm (streams, irrigation canals, etc.) is clean and able to support healthy aquatic ecosystems. Farming practices will reduce or eliminate wind erosion, chemical or biological drift, odors, and other impacts on air quality.

Sound Nutrient Management
Use of on-farm sources of nutrients (manure, crop rotations, cover crops, and related practices) is maximized. The efficiency of fertilizer use is optimized through regular soil testing, timing applications to crop growth/needs, and other measures to ensure the risk of leaking nutrients to the environment are minimized. All nutrients are used with care to reduce runoff, odors and the loss of nutrients into the air. Industrial and other toxic wastes are not used.

Energy Efficiency
Conservation, use of renewables and on-farm energy production are maximized to reduce costs, dependence on fossil-fuel inputs and greenhouse gas emissions.

Promoting Biological Diversity
Farming practices will sustain natural systems, wildlife and biodiversity by protecting habitat and corridors, carefully selecting crop varieties, maximizing the use of polycultures and perennials where appropriate, and by developing conservation plans to protect endangered or imperiled plants, animals and genetic resources.

Economic Sustainability

Farmers and workers receive fair compensation. Crop prices, wages for employees, and returns on investment are adequate to ensure the long-term social and economic sustainability of farming and rural communities.

Safe Packaging, Transportation and Storage
Farmers minimize environmental impacts from handling and shipment of crops, including the use of bio-based packaging and the avoidance of prohibited and other potentially damaging chemicals/toxics. Transport is minimized to reduce costs, energy use and greenhouse gas emissions.

Stakeholder Participation, Transparency and Simplicity
Producers, processors and consumers of the products made from these crops are involved in the evolution of these goals and standards. Careful documentation of plans and actual practices will be an important aspect of this process. In all aspects, it should be clear and simple to enhance understanding and performance.

Next Steps for MSAWG/SAC

Moving forward from our position paper on Farm-Based Renewable Energy, we decided at our last MSAWG/SAC meeting (December 3-5, 2005) to create an ad hoc committee and expand on many of the points identified above. This committee will work towards potential initiatives in the next Farm Bill and how renewable energy can be promoted based on the principles of sustainable agriculture.

MSAWG/SAC members are also preparing for the summer SARE conference in Wisconsin and expect to present some of their research work. Here are examples of some of the research and policy papers being developed:

"**Cultivating a New Rural Economy: Assessing the Potential of Minnesota's Bioindustrial Sector" (2005)**
Institute for Agriculture and Trade Policy www.iatp.org/enviroag/

Much of the environmental allure of bio-based energy and products is the potential benefit to the environment of large-scale production of perennial as opposed to annual crops. While corn, soybean and other annual crops can be produced in a sustainable manner, it is well documented that perennial crops such as switchgrass, willow and alfalfa are generally better at reducing erosion and nutrient runoff. Broad introduction of perennial biomass crops on marginal or sensitive land could help to significantly improve water quality. In this manner, bio-based feedstocks produced from a working landscape can not only offset current environmental degradation, but can actually contribute to its environmental enhancement while providing income for farmers and needed materials for industry.

"Farming and Soil Carbon" (Oct. 2005)
Minnesota Project (www.mnproject.org -- click on "energy", click on "publications")
This paper addresses carbon sequestration on agricultural lands. Policies are converging on a set of agriculture conservation practices that could make a significant contribution to the slowing of global warming – and at the same time bring soil and water benefits to the land. This report is intended to demystify what agricultural carbon sequestration can and cannot achieve, and to encourage participation in the debate about policy options related to agriculture.

"Biofuels in Iowa" Policy Advisory Statement (January 2006)
Iowa Environmental Council (www.iaenvironment.org/BiofuelsAdvisory.htm)
This paper addresses the enthusiastic embrace by Iowa's producers and consumers of corn-grain ethanol and soy-diesel. The Council cautions that biorefineries, burning of biofuels and raising of fuel crops are not without their environmental costs. As society plans their massive transition of agriculture and energy policy, we should not ignore the opportunity to mitigate environmental damage and promote environmental enhancement at every turn of public policy, research and decision-making.

Finally, MSAWG/SAC members will begin to collaborate with a larger network of farm and environmental groups under the umbrella of the National Campaign for Sustainable Agriculture (www.sustainableagriculture.net). This network has a Stewardship Incentives committee with the goal is to strengthen, expand, and improve conservation and renewable-energy policies that help farmers adopt sustainable and environmentally sound farming practices. The Committee is a leading force nationally in support of the Conservation Security Program (CSP).

End Note:

Among the various reports, statements, position papers and other articles I have collected as a "review of the literature" for renewable energy, a particularly interesting and useful paper is **Bioenergy; Pointing to the Future** issued by the Council for Agricultural Science and Technology (CAST Issue Paper #27, November 2004). This issue paper is composed of five stand-alone pieces: Introduction to the Bioenergy Issue; Technology of Bioenergy; Economics and Rural Development of Bioenergy; Environmental Effects of Bioenergy; and Penetrating the Commercial Marketplace with Bioenergy. The total paper is available at www.cast-science.org ($5 charge for non-members).