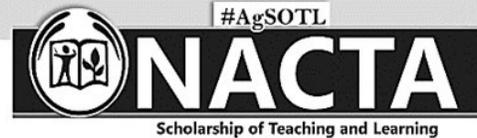


Book Reviews



Resilient Agriculture: Cultivating Food Systems for a Changing Climate

Kristin Ohlson. 2014. New Society Publishers, Gabriola Island, British Columbia, Canada.
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Resilient Agriculture addresses some of the most complex and intractable challenges facing our current food systems in the U.S.: vulnerability to climate change, scarce production resources, and ability to adapt to uncertain weather and markets. Among the solutions proposed are ecosystem-based design, adaptive management, and increased resilience through biodiversity. “Soil-to-soil” systems of cycling nutrients are described in language that is accessible and engaging for anyone interested in agriculture and food systems.

An introductory chapter traces the challenge of climate change through the context of agriculture as a food procurement strategy. Historical systems based on selection of native plants for improvement, plus reliance on contemporary soil nutrients and precipitation, were enhanced by early use of irrigation to produce enough food to free up people for other pursuits and provide a foundation for sedentary agriculture and growth of cities. Native American cultivators also gathered food and hunted to supply a diverse diet, and European colonists brought with them crops and experience that quickly spread across the “new” continent. Like rotating areas for cultivation practiced in developing societies, farmers typically planted only a portion of their land and allowed fertility to regenerate in the rest. But this quickly gave rise to a more industrialized alternative through invention of specialized equipment and eventual adoption of chemical pesticides and fertilizers. Today’s large-scale, mechanized and vertically-integrated monoculture systems provide low-cost food, but appear to be particularly vulnerable to present unpredictable weather extremes and expected future climate change trends. They are also highly dependent on fossil fuels, fresh water for irrigation, and a land base per person that is eroding due to population increase and land development for other purposes.

Vulnerability of agriculture is conceptualized as a function of exposure to climate risk, sensitivity to weather extremes, and potential adaptive capacities of monoculture systems. Chapters Two through Four delve more deeply into the concepts using specific examples that will be recognized by the lay reader. Historical climate trends and future scenarios are presented to explain exposure, those aspects of type and intensity of climate impacts experienced in specific location. Detailed summaries of how crops, weeds, pathogens, insects, livestock, natural resources, farm infrastructure and finances, and management concerns are impacted by climate change. This could be called the sensitivity of a farming system. Important to the discussion are the adaptive capacities of a system to cope with, moderate, or take advantage of changes in climate, situations that are often highly location-specific and unpredictable.

The National Climate Assessment to which the author has contributed includes changes in predicted precipitation, temperature trends, and their projected impacts on sectors in addition to agriculture. A common theme is that these sectors are closely interconnected by their needs for scarce resources, and by the impact that decisions in one sector will have on another. Agricultural exposure to these future scenarios cannot be viewed without attention to the involvement of other parts of society and the economy.

With focus on agriculture and the underlying physiological processes of plants, the author explores projected impacts on photosynthesis, efficiency of water use, temperature-related processes such as dormancy and vernalization in key crops, and heat requirements of major commodities that are the foundation of current food systems. Although it is tempting to associate sustainable agricultural practices and systems with increased adaptive capacity, systems that appear sustainable under current resource use and cultivation practices may not necessarily be “climate ready” for the projected changes.

Linkages between sustainable farming practices as we understand them today and climate adaptation are explored in Chapters Five through Eight, using case studies from two dozen currently successful farming operations. These represent the major cropping and livestock producing regions of the continental U.S., including a range of systems including not only crop and livestock production but also specialty crops such as vegetables, fruits and nuts that are crucial to local economies. Profiles are based on farm families with extensive experience in their specific locations and are described as leaders in production and conservation practices as well as innovation related to sustainability. Long chapters dedicated to crop production and to livestock systems are justified by the dominance of these farms and ranches in the agricultural economy. The richness of the book is built on the differences among regions and types of agriculture, and agroecology approaches that include holistic views of the entire system as practices in each place informs potential for long-term sustainability and adaptive capacity described for unique locations.

The final two chapters on managing for resilience in the face of climate change provide hopeful scenarios for the future. The author concludes that ecosystem-based adaptation strategies will be the key to sustainable agroecosystems, and that these can enhance ecosystem services on managed landscapes for provide resilience to maintain productivity as conditions change. These strategies provide “climate-protection” services through biodiversity and appropriate placement of enterprises in the rural landscape. Key components to build resilience include design criteria, functional and response diversity, modularity and loose connections among components, self-regulation, and reserves of biological and capital assets. A strength of the book is the reliance on specific cases of successful farms that appear prepared to face coming changes. Author Laura Lengnick builds on extensive experience as a soil scientist and sustainable agriculture advocate, and her work with the USDA climate reports. This is a valuable book for students and a public concerned about future food systems in a changing climate.

Submitted by –
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