



Ecological Society of America

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December 2, 2013

Dr. Catherine Woteki
Under Secretary for Research, Education and Economics and Chief Scientist
United States Department of Agriculture
1400 Independence Ave. SW
Washington, D.C. 20250

Dear Dr. Woteki,

The Ecological Society of America is grateful for the opportunity to submit comments on the USDA's draft revised Research, Education, and Economics (REE) Mission Area Action Plan.

The Ecological Society of America (ESA) is a nonpartisan, nonprofit organization of scientists who conduct research, teach, and use ecological science to address environmental issues. ESA members include Dr. Ann Bartuska, your Deputy Undersecretary for Research, Education, and Economics (and an ESA past-president), among many other prominent ecologists.

The USDA REE Action Plan lays out the mission area's highest priority goals and the actions necessary to undertake for achievement of those goals. We are glad to see the priorities placed on studying natural resources, sustainable agricultural systems, and the environment more broadly. ESA shares these priorities, and a large number of our members research and practice within these areas.

Correspondingly, we strongly encourage a more and specific fundamental focus on ecology within the REE Mission, and in particular, the subfield of agroecology. The current REE Mission Area Action Plan draft document includes only two mentions of ecology (both in reference specifically to microbial ecology). And although Long-Term Agro-Ecosystem research is appropriately highlighted and supported, its broader home fields of agroecology and ecology are not—and LTAR's are only acknowledged in the context of a smaller part of Subgoal 3A ("Water Availability: Quality and Quantity"). Yet the field of agroecology would appear logically foundational to achieving practically all of the primary goals and subgoals laid out in the Draft document, which emphasizes "a comprehensive approach to agriculture and working lands", and in taking "an assertive and progressive approach to transforming USDA REE into a high-profile research organization" (*USDA Science Research, Education, and Economics Action Plan (draft), dated February 2014, Preamble: p. iii*).

Agroecology is a scientific field and a set of practices based on the application of ecological concepts and principles to the design and management of sustainable agricultural systems. Agroecologists seek to promote comprehensive, multi-faceted research that supports the

environmental and economic viability of communities. Most fundamentally, agroecology works from the acknowledgment that agricultural systems are inescapably ecological and social systems, and thus must be analyzed from these contexts. Agroecologists study agriculture's effects on natural resources, the socioeconomic viability and effects of different farming systems and practices, disease ecology and prevention in crops and livestock, forestry, conservation biology, biotechnology and crop genetics, biodiversity, pest control, soil science, and agriculture's responses to and effects on climate change, among other areas. In other words, its areas of focus precisely align with USDA REE objectives. And again, although LTAR's are an excellent resource and support many excellent projects, both the focus and the contributions of agroecology extend far beyond the contexts of Subgoal 3A, water availability, and long-term research sites.

Recent prominent agroecological work includes Adam Davis and Matt Liebman's research, which showed diversified agroecological (3- or 4-year rotations as opposed to 2 years) systems increased productivity and maintained profits, while decreasing agriculture-related ecotoxicity by two orders of magnitude (see dx.plos.org/10.1371/journal.pone.0047149); Blesh and Drinkwater's findings that legume-based N and complex crop rotations generated nearly 90% less nitrogen run-off and loss than synthetic fertilizer-based corn-soybean systems (<http://dx.doi.org/10.1890/12-0132.1>); and a decade-long project by Snapp, Bezner-Kerr and colleagues found that diversified legume-based systems could halve fertilizer application, maintain yields, and in some cases double profitability—all leading to enhanced environmental and food security. Agroecologists such as Alison Power (an ESA past-president), Ivette Perfecto, and David Andow have also contributed significantly to our understandings of disease transmission and resistance, natural pest control, and the dynamics of refugia in genetically modified crops, respectively.

Further, examining the ISI Web of Science Database of peer-reviewed research shows that agroecological research has been increasing steadily in prominence, and agroecological research is cited, on average, approximately equally or more often than research in organic agriculture, agronomy, or soil science (Appendix A). We note with approval your new Long-Term Agroecological Research (LTAR) programs.

In recognition of the opportunities and growing prominence represented by agroecology, we submit the following suggestions:

(1) The incorporation of ecology into the REE plan

As the biological field dedicated to understanding the interactions between organisms (including humans) and their environment, ecology should be one of the centrally organizing principles and disciplines for many of the REE goals, including land stewardship, natural resource management, mitigating climate change and climate change's impacts, and understanding how to improve pest and disease resistance and productivity of agroecosystems.

(2) A dedicated budget line within USDA REE for agroecological research

Agroecology addresses all seven of the outlined REE goals (Local and Global Food Supply and Security; Responding to Climate and Energy Needs; Sustainable Use of Natural Resources; Nutrition and Childhood Obesity; Food Safety; Education and Science Literacy; Rural Prosperity/Rural-Urban Interdependence), and as a scientific field expressly parallels many of

the REE Guiding Principles, particularly “[to] improve sustainable agricultural systems, integrating productivity, profitability, and stewardship of natural and human resources, upon which agriculture and land stewardship depend.” Such a budget line could be similar in scale and scope as the existing Sustainable Agriculture Research and Education (SARE) programs, building on (not replacing) that program, but going beyond, LTAR. This expansion is justifiable given, as previously mentioned, the promising research in agroecology showing the potential to maintain or increase farmer incomes while increasing productivity and food security, and decrease runoff and environmental impacts.

(3) An annual high-level Conference on Agroecology, under the auspices of the USDA.

As a rapidly growing, highly-cited field with prominent practitioner and academics worldwide, as well as being the only field that seeks to incorporate and address scientific questions in agriculture around society, the environment, productivity, economics, stewardship and culture, an annual conference on agroecology offers the USDA the opportunity to stay abreast of the latest advances in this holistic field, while also providing visibility and support for highly productive established and new agroecologists. Given the need for dynamic, innovative problem-solvers in agriculture, such a conference would provide value to USDA, agroecological researchers, farmers, and citizens, as well as establish the United States as a global leader in this established, but still-growing field.

Although many more suggestions could be made, we feel that these initiatives would significantly advance all of USDA REE’s goals, drawing on the integrative potential of agroecology. As with all fields, there is a diversity of opinion and research within agroecology, but as with its parent field of ecology, the opportunities for continued development and application of this young field are vast.

We thank you for your attention in this matter.

Sincerely,

Katherine McCarter



Executive Director
Ecological Society of America