



TRANSITIONING TO SUSTAINABILITY THROUGH RESEARCH AND DEVELOPMENT ON ECOSYSTEM SERVICES AND BIOFUELS Workshop Summary (2008)

Sustainability is an increasingly important objective for many federal agencies and is now a key element of their research and development (R&D) efforts. Some agencies such as EPA have formal sustainability research strategies. However, there currently exist few mechanisms to identify research and development programs focused on the most critical challenges to sustainability, to identify areas where research and development programs in multiple agencies could be better coordinated to promote a transition to sustainability, or to determine critical research

gaps and needed analytical tools.

To provide such a mechanism, the National Research Council's Roundtable on Science and Technology for Sustainability hosted its first Federal Sustainability Research and Development Forum in October 2007 in the form of a workshop on R&D activities related to ecosystem services and biofuels, topics in the public spotlight and of interest to a number of government agencies. Ecosystem services are benefits that people obtain from ecosystems, for example, food, fuel, recreation, and educational value. Biofuels are liquid fuels and blending components derived from biomass (plant) feedstocks that are used primarily in the production of transportation fuels. The R&D community can increase public understanding in these areas by creating new knowledge, tools, and effective management approaches

KEY POINTS OF DISCUSSION

Research Gaps. Considerable research is being done in the natural sciences associated with ecosystem services and biofuels, and much has been learned. However, there are significant gaps in understanding the associated social, economic, political, and behavioral issues. Some specific research questions include:

- Is it possible to more clearly identify effects of changes in ecosystem conditions on communities?
- What are the implications of expanded U.S. ethanol production for habitats and biodiversity?
- What are the economic and social impacts of biofuel production on rural communities?
- Are indicators to evaluate programs matched with needs of local resource managers?
- How can the concept of ecosystem services be made "real"? Participants acknowledged that efforts to value ecosystem services were helpful but suggested that better information was needed to educate stakeholders about the functions of ecosystem processes and services.

Holistic Approach. For both ecosystem services and biofuels, participants emphasized the need to maintain a big picture or holistic perspective that draws on multiple disciplines, focuses on different geographic and temporal scales, and recognizes the needs of a diverse set of stakeholders.

Increased Interagency Collaboration. There is some R&D collaboration among agencies in addressing both ecosystem services and biofuels, but many opportunities for additional collaborations and to leverage activities of other agencies, especially at a local level.

Knowledge Dissemination. Participants from the academic and industrial communities suggested making information from federal R&D activities more widely available since results of federal research are often not published in scientific journals, and thus dissemination is rather limited.

Linking Knowledge with Action. Participants emphasized the need to focus on linking existing scientific and technical information to programs and policies at federal, regional, and local levels. A number of barriers, however, remain in linking knowledge to program and policy actions: limited understanding of how decisions are made at the local/regional level and of the importance of politics and institutions at all levels; problems in integrating across political scales (local to federal) as well as across local jurisdictions; and uncertainty and/or the lack of complete information.

NEXT STEPS

Participants suggested steps that could be taken by their own organizations or the National Academies, including:

- Convene a regional forum with federal, state, and private partners to explore how R&D efforts are used to determine policies and local management programs, to identify barriers to more effective ecosystem services management efforts, and to understand the research needed.
- Develop a set of indicators related to ecosystem services to identify management priorities.
- Create regional centers of excellence to pool agency R&D resources.
- Create a framework for assessing bioenergy production in the context of sustainability.
- Examine changes required in the U.S. transportation infrastructure to accommodate increased biofuel production and the necessary R&D to do so.
- Convene workshops between the science and investment communities to inform investment decisions that are likely to have an impact on long term sustainability.
- Host a future Forum possibly looking at R&D activities related to oceans and coastal areas.

For More Information

Copies of *Transitioning to Sustainability Through Research and Development on Ecosystem Services and Biofuels: Workshop Summary* are available from the National Academy Press; call (800)624-6242 or (202)334-3313 (in the Washington metropolitan area), or visit the NAP website at www.nap.edu. For more information on the project, contact staff at (202) 334-2047 or visit the Policy and Global Affairs website at www.nationalacademies.org/pga