Environmental Management Systems

ECOP/ESCOP/CSREES Environmental Initiative Task Force

Executive Summary

In August 2000, a task group was named by ESCOP, ECOP and CSREES to explore the concept of creating an environmental "think tank" to define how the Land-Grant University System might organize to better address environmental issues. The charge sets a big expectation and the task force struggled to describe definably unique contributions that could be made by the Land-Grant System; the task force sought to draw on the breadth of the system's expertise, and yet define a unique set of skills and resources that our combined research and extension system brings to addressing critical environmental issues. As well, the task group was looking to identify clear funding opportunities that would enable the land grant system to address these critical environmental concerns.

The product that emerged is a template for an Environmental Management Systems approach to a range of issues. This initiative takes advantage of unique capabilities of our system:

ECOP - Extension would play a critical and pivotal role in facilitating the development of educational materials, programs and implementation processes for Environmental Management Systems.

ESCOP - Research capabilities would be targeted to address risk assessment and environmental / ecological research priorities, in consultation with EPA's Office of Research and Development

Private Sector – Built in collaboration with the private sector should provide a "reality check" on the practical and economic feasibility of developed systems, as well as building ownership and use of the environmental management systems that are developed.

CSREES and other Federal Cooperators – Collaboration with the federal agencies should demonstrate that good information and good outreach through the Land-Grant structure can enable agriculture to co-exist with a healthy environment, minimizing the need for regulatory solutions.

This proposal would establish and fund a program that stimulates interagency/university/private sector partnerships in developing proactive environmental management assessment systems that identify and address environmental risks in farming operations. This will be a joint research / extension effort to provide science-based responses to current policy issues. This program will:

- Support the incorporation of the latest research and technical recommendations into environmental management system tutorials and programs that aid producers with various scales of production in identifying environmental risks on their properties and applying the best available technology to reduce or eliminate those risks.

- Increase producer access and understanding of the latest research findings and policy requirements related to environmental risks.

- Identify limitations of existing technology in preventing environmental degradation and research needs to address those limitations as well as attempt to identify future challenges for timely research-based development of solutions.

- Utilize mini-think tanks to develop a framework for addressing each issue that is identified.

Specific proposed projects include: (1) developing a capacity to respond to national policy issues on an ongoing basis, such as responding to EPA's proposed animal waste regulations; (2) developing an Environmental Management Systems initiative, with a target goal of at least $40 million in new funding involving several federal agencies, including USDA/CSREES, EPA and NASA. These efforts would be coordinated with ECOP/ESCOP activities regarding the USDA/CSREES budget; particularly in regards to waste management Funds remaining from the SUNEI project and from the FY 2001 assessment would be used to pilot the initiative.

Environmental Management Systems

ECOP/ESCOP/CSREES Environmental Initiative Task Force

The Environmental Initiative Task Force has been charged by ECOP and ESCOP to explore how Extension and research might work together to better address interactions between agriculture and the environment. The Task Force is examining how their unique partnership with each other and USDA/CSREES can be better leveraged in working with other federal agencies, including USDA/NRCS, EPA, the Department of Interior and NASA.

1. Guiding Principles

In discussing possible new directions and activities, the following principles were developed and followed by the Task Force —

- Any new effort to address agriculture and the environment should be developed jointly by research and extension and any new initiatives should integrate both functions from the onset. Any new initiatives should build on the competitive advantage that the Experiment Stations and the Extension system have from working together.

- Any new efforts should be developed in communication and coordination with USDA/CSREES, but our thinking should not be limited to those areas or issues where CSREES has established funding resources. New initiatives should not be limited only to topics where USDA/CSREES will have funding resources that it can put on the table to partner with other federal agencies. The universities may need to work with other federal agencies directly on some projects. On the other hand, if there is the opportunity to create funding resources within CSREES that it can use to leverage funding opportunities with other federal agencies (such as within Sec. 406), then all the better.

- Any proposal for new activities would have to balance between two competing goals. On one hand, the initiative should be broad enough to take advantage of and benefit the many diverse areas of environmental expertise that exists with the Experiment Stations and the Extension system. On the other hand, the initiative should be specific enough so that it is unique and that it is has clearly identifiable purposes and outcomes.

- The final outcome of any activities proposed should result in increased funding for research and extension to address critical environmental issues.

- Proposed activities should be coordinated with the ECOP and ESCOP Legislative and Budget Committees, but any proposed Environmental Initiative should be unique and distinct from existing activities. It should be clear that this is “additive effort,” which builds on current activities but that has a unique mandate and purpose.

2. Environmental Management Systems: A New Integrating Theme

As one of its recommendations, the Task Force suggests that a new ECOP/ESCOP initiative be launched that addresses “Environmental Management Systems.” A first draft description of this initiative follows. The advantages of “environmental management systems” as a coordinating theme for a new initiative are

- It requires the expertise, activities and skills of both research and extension.

- It is central to a number of critical policy issues currently facing both USDA and EPA, and it is pertinent to other agencies as well.

- It is related to and draws on the data and experiences of a number of related areas,

including water and soil quality, waste management, nutrient management, and pesticide management. As well, it links to an array of environmental and health sciences.

- It can provide farmers and ranchers with immediate and tangible assistance in meeting local, state and federal environmental requirements. It can also assist producers and processors meet international trade requirements.

- There are extension and research programs that demonstrate our capacity to apply environmental management and the related use of risk analysis and risk management to specific agriculture and environmental problems. These successful models can serve as the starting point for expanded programs and services through out the country.

- There is already interest by farmers, ranchers and environmentalists in some of our current programs and a potential support base for expanding individual projects to a national network of projects and programs.

3. Developing a Capacity to Respond to Policy Issues

The Experiment Stations and the Extension System contain considerable expertise on the technical and practical implications of environmental policy choices. The Task Force proposes creating a "Think Tank" approach to develop a "quick response" capacity to addressing these issues. As topics or issues emerge that require a response, appropriate technical teams can be formed, including appropriate Research and Extension Administrators. These efforts would be different from any existing groups in that they would specifically address the role that the Experiment Stations and the Extension system have to play in solving or responding to the issue under study. Once a specific issue or project is addressed, the particular technical team involved would be dissolved.

A. Animal Waste

There is an immediate opportunity and need for a quick policy response in the area of Animal Waste Management. A New EPA draft animal waste regulations is due out for public comment on Dec. l5, 2000. The comment period will run for 60 days. The regional research and extension committees could be valuable in providing a scientific and economic analysis. Nearly 20 regional committees have been identified that have some role in animal waste management issues through engineering, land application, animal nutrition, and other topics. The expertise of these committees should be utilized and applied.

The current draft regulation is over 250 pages. It is expected to have a major impact on the livestock and ultimately the feed grain industry. Regional committees could be convened either face-to-face or by conference call and email to compile major scientific issues that could be raised in a focused effort. Clearly, the workload of responding to this lengthy regulation could be shared across the existing committees. An executive summary of all the committees could be prepared along with extensive specific comments as a joint effort of the land grants.

B. Plant Pesticide Rule

There has been a long debate on EPA's Rules on Plant Pesticides. The House Agriculture Committee has recently objected to EPA's recent elimination of exemptions from their draft rules. EPA's current plans could have a dramatic impact on traditional plant breeding programs and current efforts to develop environmentally friendly agronomic production processes. There may be a need to participate in a further examination of EPA guidelines in this area.

C. Timelines

There are a number of exciting and critical project areas that could be addressed in the coming

year. The most pressing opportunity will be responding to Animal Waste issues, since the public comment period will begin on December 15, 2000.

4. A Draft Initiative: Environmental Management Systems

In addition to developing a framework for quick response to environmental policy issues, the Task Force is proposing that a new initiative be developed.

A. Situation and Need

Agriculture is recognized as having significant impacts on the environment. Major programs and policies are in place and being proposed to address the negative impacts of agriculture on the environment, including:

- Stronger policies to address animal feeding operations and nutrient impacts on hypoxia and pfiesteria.
- Development of total maximum daily load (TMDL) criteria that include nonpoint sources from agriculture.
- Community drinking water protection programs that identify pollution risks from agriculture, including disease risks from microorganisms.
- Nonpoint source pollution programs that identify risks from pesticides, nutrients, oxygen demanding materials and soil erosion.

B. The Role of Environmental Management Systems

An international standard, (ISO 14001), has been created to incorporate environmental management into international trade decisions. Environmental management systems (EMS), most particularly ISO 14001, can bridge gaps in traditional voluntary approaches to environmental management by integrating environmental responsibility into the business of farming, stressing continuous improvement and providing a reliable method to document adoption of environmentally-sound practices. While farmers face challenges in developing EMS's, they stand to gain benefits beyond reduced impacts on the environment. Programs such as Farm*A*Syst, the Environmental Farm Plan and the Australian Cotton Best Management are examples of current research and extension programs that provide key components required for an EMS. Farm organizations and government agencies can play a supportive role in helping individual farmers develop effective management systems.

For most producers, the central challenge in meeting ISO 14001 involves systematically identifying the environmental impacts from their activities and developing a plan to manage these risks. According to Wall and her colleagues, the Ontario Environmental Farm Plan, satisfies basic elements required for ISO 14001:

- Identifying the environmental impacts (aspects) arising from the organization's past, existing or planned activities, products or services.
- Identifying the relevant legislative and regulatory requirements.
- Identifying priorities and setting appropriate environmental objectives and targets (which includes taking into account the concerns of public interest groups affected by the environmental aspects of the organization).
- Establishing a structure and program(s) to implement policy and achieve objectives and targets.

An Environmental Management System provides a way for farmers to apply best management standards. Using assessment worksheets, farmers have the capacity to evaluate their operations to identify areas of environmental concern. On this basis, they can develop plans for implementing corrective actions. This system of environmental management fits the ISO 14001 model. With its audit provision, ISO 14001 can provide legitimacy and credibility to this assessment framework by showing that it is being used properly and is having a positive impact.

Farmer adoption of environmental management systems depends on leadership and support from different quarters. Farm organizations can work with university research and Extension faculty to refine best management practices in an industry and develop assessment tools for farmers to apply this information on their property. They identify opportunities and stimulate interest among members in environmental management systems. Farmers may not be ready to make the leap to full-blown management systems but farm organizations can move them along in the process of increased responsibility for environmental management.

For government agencies, ISO 14001 offers the opportunity to move education to a new level of disciplined application and accountability. Wisconsin is among 10 states participating in pilot programs to evaluate the benefits of ISO 14001 for farms and other businesses. Jeff Smoller, Wisconsin Department of Natural Resources, sees ISO 14001 as a vehicle for government to more effectively address environmental concerns. It can promote partnerships to insure that best management practices reflect the most advanced research at universities and the practical experience of private sector groups in agriculture.

There are positive indicators that point to growth in environmental management systems in agriculture. The building blocks are in place. Research, pilot programs and the experience of early adopters will provide valuable feedback to shape future directions. Farmers will need to make a gradual transition. Support from both the public and private sectors will be critical to stimulating individual adoption.

Many states have current programs to address “whole farm planning.” Based on the nature of Farm Planning in each state, products from the Environmental Management Systems Initiative could be integrated into and build on current Farm Plan programs.

Extension can play a critical and pivotal role in facilitating the development and adoption of Environmental Management Systems.

C. Risk Assessment

Environmental Management Systems in turn utilize risk assessment, which provides the conceptual underpinning for evaluating and weighing environmental and agricultural production risks. Improved risk assessment and risk management are major goals of the U.S. Environmental Protection Agency (EPA) Office of Research and Development (ORD). The EPA ORD Ecological Research Strategy focuses on the single, broad goal: Provide the scientific understanding required to measure, model, maintain and/or restore, at multiple scales, the integrity and sustainability of ecosystems now and in the future. Their research is organized around four fundamental areas of research needed by the Agency and in which ORD has made significant contributions traditionally. These research areas are:

(1) Ecosystem monitoring;
(2) Ecological processes and modeling;
(3) Ecological risk assessment; and
(4) Ecological risk management and restoration.

Within this comprehensive framework, research objectives and priorities are presented in terms of what basic science capabilities are needed to maintain focused, core research competencies and for how these capabilities may be used to address high priority environmental threats.

Within this Environmental Management Systems Initiative, State Agriculture Experiment Station research capabilities can be targeted to address the risk assessment and ecological research priorities of EPA's Office of Research and Development.

D. Partnering with the private sector.

The need to develop pro-active approaches to address legitimate environmental concerns is recognized by the agricultural community. Most government water quality programs recognize the importance of private sector involvement in agricultural pollution prevention efforts, but no funding mechanism is available to support and stimulate their leadership in this area. Targeted investments to stimulate private sector activities through development and implementation of environmental management assessment systems through interagency/private sector partnerships can yield considerable returns in terms of promoting and supporting voluntary pollution prevention actions by individual producers.

There are various working research and extension projects underway that facilitate private sector involvement. Research on use of the Farm*A*Syst approach by Rick Koelsch et al published in the Journal of Extension, February 2000, Volume 38, Number 1, concludes that, "Close collaboration with livestock commodity groups proved to be the most effective method for delivering Livestock Systems Environmental Assessment (LSEA) to local producers based upon extension educator observations. Involvement of the commodity groups' leadership in the initial release of this tool within a county provided critical program support, peer promotion, and validation of the assessment process." Education strategies that use personalized self-evaluation tools, combined with feedback concerning appropriate recommendations, enhance motivation of individuals to take action. Self-assessment activity is one method of insuring active participation, a key to enhanced awareness and motivation. To be effective, this activity should be part of a systematic process to change behavior that includes learning measures to prevent health risks, goal-setting, and the provision of incentives and reinforcement.

Several federal government programs recognize the need to support voluntary action among agricultural producers. These programs include nonpoint source pollution elements of the Clean Water Act, drinking water (source water) protection elements of the Safe Drinking Water Act, the Environmental Quality Incentives Program of NRCS, and CSREES Section 406 Water Quality Grants. These government efforts do not sufficiently support the agricultural community in assuming leadership to prevent pollution by developing pro-active risk assessment and management approaches to address environmental issues.

A mechanism is needed to support increased use of private sector partnerships in developing environmental management assessment systems to identify and address environmental risks. This mechanism could be developed in the next Farm Bill.

E. Geospatial Technologies

Geospatial technologies, GIS and new computer-based decision making tools are critical components of developing environmental management systems. This initiative will coordinate and build on the current efforts with NASA to develop Extension Specialists and program delivery capability in geospatial technologies.

We have experienced a virtual explosion in the availability and use of information technology over the past decade. This is especially true in the three primary "geospatial" technologies - remote sensing, geographic information system (GIS), and global positioning systems (GPS). Often, the technology has advanced so quickly that many potential users have been left behind. Among the most prominent potential users are those involved in the use and management of Earth resources, such as agriculture, natural resource management, and urban and regional planning.

Although there are a number of obvious direct uses of these technologies, such as resource inventory, there is also a good deal of valuable science that is built on the data they yield. For example, the ability to predict El Niño events based on observations of sea surface elevation and temperature is of considerable potential value to farmers, foresters, and emergency planners. Thus, the potential benefit that might be realized will be determined by our ability to use both the science and the technology in tandem.

The gap between the "haves" and "have-nots" in geospatial technologies will most likely widen. The National Aeronautics and Space Administration (NASA) has begun to launch a new fleet of Earth observing satellites that will usher in a new era in remote sensing over the next five years. As this trend accelerates, the challenge is to find effective and efficient means for bridging that gap.

The NASA Space Grant Extension Specialist in Geospatial Technology is a pilot program to explore how best to meet the needs of farmers, ranchers, planners and others involved in agriculture, natural resource management, and rural development. It seeks to join the missions of the NASA Office of Earth Science and NASA Space Grant with the long-standing experience and existing infrastructure of the U.S. Department of Agriculture (USDA) Cooperative State Research, Education, and Extension Service (CSREES). The approach is to place an Extension Specialist in Geospatial Technology within CSREES of a Land Grant University. The specialist then characterizes the needs of the different constituencies in the state (e.g., farmers and foresters), and works with them to design solutions that meet their information needs within their budget and staffing constraints.

F. Coordination with Existing Initiatives

The Environmental Management Systems Initiative would focus on funding opportunities in USDA/NRCS, EPA and NASA. It would be coordinated with current ECOP and ESCOP initiatives regarding USDA/CSREES. Efforts would be made early on to meet with our specialists and program leaders in related areas of environmental expertise, including – animal waste, water quality, IPM, sustainable agriculture, precision

agriculture and risk management.

G. Proposal

Establish and fund a program that stimulates interagency/university/private sector partnerships in developing and delivering environmental management assessment systems that identify and address environmental risks in farming operations. This program will:

- Support the incorporation of the latest research and technical recommendations into environmental management system materials and programs that aid producers in identifying environmental risks on their properties and applying the best available technology to reduce or eliminate those risks;

- Increase producer access to the latest research findings and policy requirements related to agricultural environmental risks; and,

- Identify limitations of existing technology in preventing pollution and research needs to address those limitations.

This framework will expand the Risk Management Agency's ability to aid producers in identifying and addressing environmental risks. Resulting partnerships with national, state and local farm organizations will produce commodity-specific environmental management systems and support use of those systems by producers. Resulting programs and materials will: help individuals identify environmental risks unique to their operations and apply the latest research findings and policy requirements when developing plans to reduce pollution risks; increase the availability of local applied research and demonstration sites on practices that reduces environmental risks; and increase knowledge of local support available for taking voluntary actions to prevent pollution. Data from assessments will assist in identifying research and education priorities related to reducing agricultural impacts on the environment and support the targeting of funds to those priorities.

H. Funding

The funding level and funding mechanisms for this initiative will need to be developed in subsequent meetings and discussions. A mix of EPA, USDA/NRCS and USDA/CSREES mechanism might be appropriate. As an initial indication of scale, forty million dollars ($40,000,000) would certainly be an appropriate target.

I. Time Frame

A fairly quick time frame for this initiative would be to develop it so that it could be imitated in the next Presidential Budget cycle for FY 2003. This would require a series of meetings with appropriate agency officials prior to May 2001, as agency recommendations for FY2003 will begin about that time. Accordingly, meetings within the Land Grant Community and with interest groups would need to be underway in early 2001. Such activities in the Winter and Spring of 2000 would be consistent with a goal of including this Initiative in the next round of the Farm Bill.

5. Next Steps

Proposed activities must be coordinated with current ECOP/ESCOP/Board on Agriculture Committee processes and emerging efforts to support research and extension, such as the NASULGC Food and Society Initiative and the National C-FAR efforts.

A. Decisions and Communication within the Land Grants

- Forward recommendations to the Chairs of ECOP and ESCOP. Resolve if the proposal needs to be forwarded to all of the Directors prior to the NASULGC 2000 meetings for discussion at the meetings. Also, before the NASULGC 2000 meetings—
    - Apprise the Chairs of the ECOP Budget and ESCOP Budget/Legislative Committees regarding the proposal so that they will be in a position to consider the implications of the proposal on their recommendations for FY 2002.
    - Apprise the Chair of the ECOP Legislative Committee, as the proposal may need to be integrated in the legislative agenda, particularly for the Farm Bill.
- If the decision is made at or after the NASULGC meetings to proceed with an Environmental Risk Analysis and Risk Management Initiative—
    - The responsibilities of the Task Force will need to be extended. The Task Force may wish to augment its membership with research and Extension specialists.
    - Discussions regarding the impact of the Initiative will need to be further discussed with the leadership of the other committees, particularly the budget and legislative committees.
    - There should be coordinating discussions with Sam Smith and the participants in the Food and Society Initiative.
- A teleconference or workshop should occur with key research and extension leaders of related environmental imitatives, including water quality, waste management, IPM and sustainable agriculture. The relation of this initiative to their respective areas of expertise needs to be discussed.

B. Coordination and Communication Meetings and Workshops

- *Political Leadership*. Meetings should occur with the Transition Teams for USDA and EPA. As the political leadership of the two agencies comes into place, briefings should be provided. In the interim, meetings should be scheduled with OMB and the senior staff of the authorizing and appropriations Congressional Committees.
- *Agencies*. There should be ongoing discussions with the Administrator of CSREES and her staff. Similarly, there should be good and ongoing

communication with – ARS, ERS, NRCS, FSA and USDA's Office of Risk Management. There should be ongoing discussions with EPA's Office of Research and Development.

- *Interest Groups*. A meeting will need to be held with staff at the Natural Resources Conservation Society; they have been conducting workshops with farmers and environmentalists to discuss their respective interests in the next farm bill. There should be discussions with the leadership of the National CFAR effort. And in turn, discussions with specific farm and commodity groups, including the Farm Bureau, the National Cooperatives, the Farmers Union. As well there should be parallel meetings with appropriate environmental groups, including American Farmland Trust, the Nature Conservancy, the Natural Resources Defense Fund, and the Environmental Working Group.

6. Supporting the Initiative

Staff support will need to be provided to arrange for and facilitate the numerous meetings and discussions that will need to be held to develop this initiative. A series of small workshops will be needed around the country to develop commodity and regionally specific projects and proposals, which would be incorporated in the Initiative. A "Think Tank" could be utilized to provide the staff support for the meetings and workshops utilized to develop the initiative. Funding remaining from the SUNEI Initiative would be utilized to provide this staffing and to cover the cost of the workshop series.