

THE SOUTHERN APPALACHIAN MAN AND BIOSPHERE PROGRAM— A MODEL FOR MANAGEMENT NEED-BASED RESEARCH

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INTRODUCTION

It may seem strange to be talking about history at a science conference, especially a history that begins in the last quarter of the 20th century. But the application of science depends on a social and organizational environment that fosters the adoption of scientific knowledge. The story of the Southern Appalachian Man and the Biosphere (SAMAB) Program is an illustration of how one such organization was conceived and how it operates.

Society today is facing many difficult choices. How can we conserve the natural character and diversity of ecosystems while we satisfy the material needs and aspirations of increasing numbers of people? How can we reconcile conservation of biological resources with sustainable development? These and similar questions are challenging both our science and our social institutions at every level from small communities to a global scale.

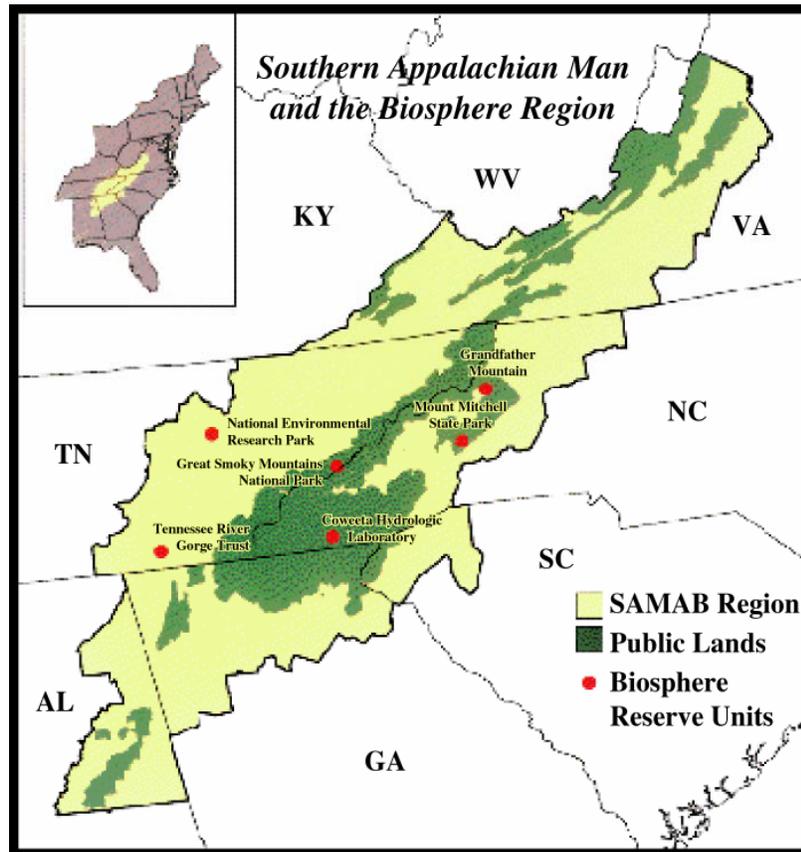
In 1968, the UNESCO Conference on the Conservation and Rational Use of the Resources of the Biosphere launched the international Man and the Biosphere (MAB) Programme, a program that proposed a network of biosphere reserves around the world. Biosphere Reserves were intended to demonstrate, by example, how to maintain a balance between conserving biodiversity, and fostering economic and social development. The short history of SAMAB is an example of a regional cooperative that is seeking that balance.

The mission of SAMAB is to promote the environmental health and stewardship of natural, economic, and cultural resources in the Southern Appalachians. It encourages community-based solutions to critical regional issues through cooperation among partners, information gathering and sharing, integrated assessments, and demonstration projects.

Organizations such as SAMAB serve an important function in the application of science by providing a link to the economic and social framework. At the international seminar on Sustainable Development of the Boreal and Temperate Forests that met in Montreal, Canada in 1997, one of the seven criteria identified as necessary for forest sustainability was “a legal, institutional, and economic framework.” SAMAB, which predated the Montreal Process by a decade, was established to facilitate the organizational and community cooperation needed to support sustainable-management objectives.

The concept of a regional biosphere cooperative began in the mid-1970s. By then, three separate Biosphere Reserves within the Southern Appalachian region had been recognized by the MAB Programme. These were places that were highly regarded for their special character and were

already protected by existing statute or regulation—the Great Smoky Mountains National Park, the Coweeta Hydrologic Laboratory of the Forest Service, and the Walker Branch Watershed on the Oak Ridge Department of Energy Reservation. At the same time, the MAB Programme was gaining wider recognition and people familiar with it began to see it as a way to encourage closer cooperation between the federal and state land-management agencies in the region.



Also in the late 1980s, outspoken visionaries in the Forest Service and the National Park Service were advocating a new paradigm for land management—ecosystem management. With its emphasis on a landscape-scale approach, ecosystem management brought to a focus the issues that extended beyond organizational and property boundaries—issues that could only be resolved by cooperation between adjacent landowners.

In 1988 a “cooperative and interagency agreement” was signed to establish the SAMAB Cooperative. Seven agencies signed the original agreement but it wouldn't be long before several more would be added. In the agreement the signatories listed four goals or functions for the cooperative. Briefly they were:

- Establish and maintain cooperative relationships with state, local and other federal entities within the region.
- Identify principal environmental and developmental issues for the region (a strategic view) and in this context identify sustainable and ecologically sound economic-development opportunities.
- Undertake regional cooperative research and resource-management initiatives and disseminate the results.
- Work with public school systems and other interested organizations to develop a land ethic that recognizes the importance of ecologically sound management of natural and cultural resources.

In the years since SAMAB was formed, its focus has been on these tasks. SAMAB now has a new strategic plan that builds on these functions, discussed later in this paper.

GETTING STARTED

The core of SAMAB is a cooperative made up of 11 federal and 3 state natural-resource agencies. The work of SAMAB is done by the participating agencies, guided by an interagency Executive Committee and carried out by the Executive Director and his Coordinating Office. Essentially the participating agencies and the Coordinating Office make things happen.

Complementing the SAMAB Cooperative is the SAMAB Foundation. The Foundation, established in 1989, is SAMAB's link to the private sector. It gives private individuals, firms, academic institutions, and communities an opportunity to participate in SAMAB projects. The Foundation was established as a 501(c)3 non-profit corporation to help channel private-sector funding into the SAMAB program.

The SAMAB experience has been adaptive in the purest sense. From the very beginning it was a learning experience. As most of you know, cooperation between government agencies isn't a natural state of affairs. Most organizations act more as rivals than as cooperators, and the mandates and programs of some agencies conflict with others. Also, there is no money in agency budgets for "coordination." The only way it happens is when agencies see a clear benefit to their programs that will come from working with others. First, the agency representatives needed to get to know each other, learn how other agencies work, find out what others are doing, and develop some trust and rapport with their counterparts. Gradually, as the cooperating agencies discussed issues of common interest and as they became involved in joint projects, the organizational barriers began to fall.

ADDRESSING THE GOALS OF THE COOPERATIVE AGREEMENT

The first goal in the SAMAB charter was to establish and maintain cooperative relationships with state, local, and other federal entities within the region. This was accomplished in several ways but perhaps the most effective mechanism was by working together on joint interagency projects. Some examples include:

- Reintroduction of the Red Wolf—Reintroduction of the red wolf into the Cades Cove area of the Great Smoky Mountains National Park was sure to arouse public concern and possible opposition. The project involved the Park Service, the Fish and Wildlife Service, and the Tennessee Valley Authority. Working together, they developed brochures, teaching aids, a video and an award-winning poster that described the benefits of wolves in the Smokies ecosystem. Other agencies pitched in with help in public relations and technical support. Although the reintroduction eventually failed, the project was well received by the public and demonstrated the value of building a foundation of good community relations. By itself, the Red Wolf project was only a first step toward SAMAB's goals. It brought some of the SAMAB agencies together in a joint project and gave the cooperative some experience in joint decision making.
- The Pittman Center Project—Pittman Center is a small community northeast of Gatlinburg, TN. In the late 1980's, Pittman Center leaders were beginning to see changes in their community that they felt threatened its character and appeal as a place to live. They didn't want to see Pittman Center become another Pigeon Forge. But small communities are at a considerable disadvantage when it comes to planning for their future. Knowing their plight, John Peine of the Park Service came to SAMAB and asked for help on their behalf. SAMAB agreed to provide support by giving technical assistance in the form of GIS maps and a small financial grant for planning. This was SAMAB's first venture in providing community assistance and it proved to be as instructive to SAMAB as it was for Pittman Center. It demonstrated how powerful community action can be once its leaders begin to work toward a common goal.

By 1992 the SAMAB Cooperative included 11 federal and 3 state agencies. Although it was clear that SAMAB projects would seldom engage all of the SAMAB participating agencies, it was also clear that cooperation could be a powerful tool.

The second goal deals with identifying principal environmental and developmental issues for the region (a strategic view) and in this context identify sustainable and ecologically sound economic development opportunities. In 1990 the first SAMAB Spring Planning Meeting was held. Its purpose was to reach out to the public and to technical experts within the region to help identify the pressing regional concerns. Although the regular meetings of the SAMAB Executive Committee have also brought regional issues to the surface, the Spring Planning Meeting is now established as the most important means of setting the SAMAB agenda.

Southern Appalachian Assessment

Issue identification must be based on more than intuition. In the early 1990's we began to realize that we needed a regional resource data base and assessment to be able to evaluate the magnitude of environmental problems and to pinpoint the places that needed attention. Several attempts were made to obtain agency support for a regional assessment without any success. In 1994 however, the Forest Service began forest plan revisions on five of the southern Appalachian forests. When the Forest Service decided to combine the "analysis of the management situation" required for forest planning into a single assessment for all five forests, it became obvious that this could become the

basis for a regional interagency assessment. It also was clear that SAMAB could become an effective mechanism for coordinating interagency involvement.

The resulting assessment was widely acknowledged as a major achievement, not only because it provided a large and timely data base for natural resource planning, but also because it was a model of interagency cooperation and public participation. The assessment data base was probably the first to be made available on the Internet and to be supplied as a set of compact disks.

Sustainability Indicators

After completion of the Assessment SAMAB decided to carry the Assessment data base a step further toward practical application. With a grant from the Economic Development Administration, and with the strong support of several SAMAB agencies, SAMAB conducted a Community Sustainability Indicators Workshop. The workshop was organized to familiarize community leaders with the SAA data base and to explore its application to indicators of community change and development. At about this time the President's Council on Sustainable Development had released its report on sustainable communities, and they were keenly interested in what communities were saying and doing about sustainable development. The workshop has served as the basis for continued work on community indicators and is a good illustration of how government agencies can effectively support community initiatives.

Broad Use of the Data

One function of a regional assessment is to serve as a benchmark to evaluate future changes in the resource situation. But a regional assessment is much more than that. It can become a rallying point for community action. An example of how this can happen is the work done by the Southern Appalachian Forest Coalition. They made extensive use of the assessment to describe areas of special interest within the region. The SAA data have also been used in many university studies, GIS classes, and student projects, as well as by the ESRI GIS software firm for development and demonstration of their software. Thus, the process of conducting and maintaining a regional assessment and data base creates and supports a large network of interacting technical specialists and users of the information. Such networks survive long after the immediate tasks of the assessment are completed.

The third goal in the interagency cooperative agreement was to undertake regional cooperative research and resource management initiatives and disseminate the results. From the start, research has been an essential part of SAMAB. The most prominent players were the Oak Ridge National Laboratory and the Forest Service Research Station. Also very important however, were the research capabilities of the Park Service and the Fish and Wildlife Service. Later these two research arms were combined under the Biological Resources Division of the US Geological Survey. Academic research is also an indispensable component of SAMAB.

Annual Fall Conference

Each year SAMAB organizes a fall conference, usually at Gatlinburg, TN, to bring researchers, land managers, and the public together to learn about new developments. Research and

development represents a continuum from the very esoteric to the practical, and all parts of this continuum can contribute to adaptive management as a learning process. At our fall conferences we welcome everyone to tell us what they have learned in their work. The emphasis at the conference has varied from year to year in an effort to bring in new participants. Last year's conference for example, focused on linking research, resource management, and community development.

Program of Work

Cooperative management initiatives as well as information dissemination might best be illustrated by the 1998-2000 Program of Work. It featured three initiatives--Native Plants and Exotic Pests; Sustainable Development; and Watersheds. Although many of the specific tasks were accomplished, these initiatives are still underway. They all involve bringing together the best available information and organizing the technical expertise of government agencies to support community action.

The fourth goal is to work with public school systems and other interested organizations to develop a land ethic that recognizes the importance of ecologically sound management of natural and cultural resources. Those of us who work in land and resource management agencies often assume that a land stewardship ethic is universally accepted. This just isn't the case. Concepts such as healthy ecosystems and sustainability must be explained and people must be convinced. Several of the SAMAB agencies have an environmental education or public outreach capability. The SAMAB Public Affairs Committee and the Environmental Education Committee have worked on several outreach projects. They include the red wolf project mentioned earlier, dogwood anthracnose, water quality, medicinal forest plants, air quality, endangered species, and other topics aimed at expanding public understanding of these concerns. Naturally, the SAMAB agencies pursue their own educational programs, but there are occasions when there are advantages in having these topics presented by a source that is not identified as having an agency agenda.

MAINTAINING THE ORGANIZATION

Maintaining an organization such as SAMAB isn't easy. Agency personnel come and go. Agency budgets and priorities change. Political support is unpredictable. And the results of interagency coordination are often intangible and difficult to quantify. Perhaps SAMAB's most important success is its continuing survival. In 1989, a part-time Executive Director was employed. Hubert Hinote, from TVA's Water Management Division was assigned to spend part of his time on SAMAB matters. By 1990 the SAMAB agencies agreed to pool funds to support the Coordinating Office and to finance joint projects. By 1991 the Executive Director position was full-time and the Park Service was providing office space for the Coordinating Office.

Over the decade of the '90s, funding and support for SAMAB had its ups and downs as projects, especially the SAA, came and went. Agency support for the Coordinating Office plateaued in 1995. SAMAB Foundation members worked hard in the mid-1990s to try to get both federal and private-sector support for SAMAB, but with little success. Most of the money that the Foundation has received has been for specific projects and covering costs of the annual conference.

Upon Hubert Hinote's retirement in 1998, Robb Turner was selected as Executive Director. The SAMAB Cooperative contracted with the Joint Institute for Energy and Environment (a partnership of the Oak Ridge National Laboratory, Tennessee Valley Authority, and University of Tennessee) to staff and operate the Coordinating Office, and moved the office to Knoxville.

A WORLD OF CHANGE

As the 20th century drew to a close, the Southern Appalachian Region and SAMAB were experiencing unprecedented change. Population growth, combined with technological and productivity advancements, greater free time, and greater affluence--especially near urban areas, areas of second-home/retirement development, and along major transportation corridors, led to tremendous new pressures on natural and cultural resources and a traditional way of life. Public pressure intensified for compatible multiple uses of the region's resources for economic productivity and recreation. At the same time there was recognition that the region's public lands harbor world-class biodiversity and irreplaceable cultural and historic resources that demand preservation. Invasive exotic plant and animal species and air and water pollution were threatening and decimating cherished landscapes, ecological communities, and species.

Throughout the '90s, efforts were made to better monitor, assess, and manage these changes, threats, and risks to natural and cultural resources, but efforts from national to local scales showed that doing it effectively required more resources than were available. Reduction in Federal and state agency budgets and staffs, though offset somewhat by technology advances, has led to a widening gap between the pace of change and our ability to monitor and manage it.

SAMAB also is undergoing change. As the member agencies adapt to changing conditions, their participation in, financial support for, and expectations of the organization are changing. Financial support for the Coordinating Office has declined from about 2 FTEs to 1.5 FTEs, with the Executive Director position now half time. Under tightening budget conditions, some agencies are more willing to entertain competitive grant applications from SAMAB than to provide support for coordinating functions--they are demanding measurable products rather than the more-difficult-to-quantify facilitation of interagency process. This is a fundamental change in outlook, from viewing SAMAB as a means of agency extension across organizational boundaries (the Cooperative role) to SAMAB as a grantee or subcontractor (a role the Foundation can play). Whereas some agencies still fully support the Cooperative and its role of facilitating interagency collaboration, some agencies would like to see SAMAB become self sustaining, supported through the Foundation. SAMAB leaders are exploring what organizational structures and functions could support both points of view.

STRATEGIC PLAN

In 1999 SAMAB began a visioning process, which became a full-fledged strategic-planning process in 2000 as the regional agency leadership challenged SAMAB to define its roles and organizational needs in the new decade. A strategic-planning committee comprising Cooperative and Foundation participants evaluated changes occurring in the biophysical, socioeconomic, and

institutional realms of the region. They produced a strategic plan with four goals--three address objectives and strategies SAMAB will follow to define and meet regional needs, and the fourth addresses organizational capacity SAMAB needs to work toward the first three goals. These goals build on the objectives of the interagency cooperative agreement as well as results and successes of SAMAB's experience in its first decade.

Goals

Goal 1. Discovery and Assessment: Understand and describe the status and dynamics of the natural, economic, and cultural resources of the Southern Appalachians and the benefits of ecosystem management and sustainable development.

Goal 2. Education and Outreach: Foster greater public awareness of the status and dynamics of natural, economic, and cultural resources in the region through innovative communication and education. Encourage use of this awareness to improve decision making throughout the region.

Goal 3. Demonstration and Application: Identify, prioritize and support opportunities for cooperative resource management, sustainable, ecologically sound economic development, and research needed to fill knowledge gaps.

Goal 4. Organizational Capacity: Develop and maintain a strong SAMAB organization that has the capacity to accomplish its mission.

Strategies

The strategies to accomplish these goals and their associated objectives take as their starting point community needs, agency priorities, existing agency programs, resource managers' needs, gaps in research, and opportunities for synergy, improved efficiency, and more effective management. Because these strategies are the bridge between long-term strategic planning and building an implementation or work plan, they are the most dynamic component of this strategic plan. The plan is a living document, to be updated annually in response to changing agency and community needs.

Cooperative leaders have sought review and feedback on the strategic plan from regional agency staff. They are now working with regional agency leaders and staff to better link agency planning and budget processes with opportunities for interagency collaboration, synergy, and leveraging of limited resources. This is a complex and time-consuming undertaking that is different among all agencies, but that is crucial for identifying and capitalizing on such opportunities.

NEW DIRECTIONS

Southern Appalachian Regional Information System (SARIS)

A project that has broad conceptual support across agencies and private partners is an effort to update and make more accessible the results and data behind the Southern Appalachian Assessment. Using internet technology and standards-based commercial off-the-shelf software, SAMAB is developing a web-based information system comprising a spatially enabled data base, an internet map server, communications software, decision-aiding tools, and other applications. Through a standard web browser a user eventually will be able to query the SAA data base and updates to it (maintained by the responsible agencies), create and manipulate maps using basic GIS capabilities, perform simple

spatial and temporal analyses and display the results, and communicate with other users about shared interests, results, and questions.

SARIS is a gateway to many distributed data sources and tools built and maintained by public and private interests, all visible to each other and interoperable because of compliance with open-system standards. SARIS and partner systems will help communities, watershed associations, students, researchers, and others view their local conditions in the context of the broader region and over time. Capabilities of the system will be modest at first, but will prototype new opportunities and applications as technology, partners, and resources permit. SARIS is a tool that will facilitate all of the goals of the strategic plan, from entering and analyzing data, to understanding its implications, to communicating that understanding and eventually applying it.

National Biological Information Infrastructure Southern Appalachian Information Node

In 2001 SAMAB and a number of partners proposed for and received funding from the USGS to establish the Southern Appalachian Information Node (SAIN) of the National Biological Information Infrastructure (NBII). SAIN will be the biological component of SARIS and will provide SARIS with additional financial support along with the benefit of experience to be gained from partners with other nodes around the country. Robb Turner is the technical director of SAIN.

A major goal of the NBII is to make accessible and interoperable the many sources of biological (e.g., biodiversity, ecosystem, resource management, museum/taxonomic, invasive species) data across the country and around the world. The NBII and SAIN will lead the way toward making available all manner of environmental and related data for integrated science and decision making, much in the vision of SARIS.

Many ecologists, earth scientists, foresters, resource managers, and planners are not yet thinking in the holistic terms of ecosystem management and sustainable development. Advances in bioinformatics have enabled major strides in fields such as genomics and molecular biology. Another goal of the NBII and SAIN is to develop environmental bioinformatics to enable major strides in ecosystem research and management.

Monitoring the Appalachian Trail Environment

SAMAB has received grants from the National Park Service, The National Forest Foundation, TVA, and the University of Tennessee to establish a Southern Appalachian prototype of what is envisioned eventually as a 2000-mile project. The goal is to monitor the range of conditions in the Appalachian Mountains that create the “Appalachian experience.” Many attributes of the Appalachians such as clean air and water, viewsheds, abundant wildlife and plant diversity, threatened and endangered species, natural areas free of invasive exotic species, and a host of historic, cultural, medicinal, and traditional resources are at risk as a result of many drivers of change in the region.

SAMAB will work with agency partners, university scientists and students, and amateur naturalists/citizen scientists to monitor and assess changes in the Appalachian environment. The Appalachian Trail and adjacent landscape will be used to focus attention and generate financial and

popular support, but the broader Appalachian environment with its many monitoring and assessment needs is the project's focus.

Experience shows that public agencies do not have the manpower or resources to effectively monitor the many resources of concern—SAMAB will work with other partners to enlist, train, and coordinate volunteer efforts in geographic communities (gateway communities) in the region and in communities of interest (hiking and birding clubs, university outing clubs, academic classes, service organizations) to monitor conditions and change along trail segments and other corridors.

We hope ultimately to have a large number of volunteer efforts in regional gateway communities and along numerous local and regional transects learning about change in the environment. Volunteer efforts can augment agency efforts, and can bring to light locations where more rigorous or expert work is needed. They also can produce an enlightened and caring citizenry that is willing and able to engage meaningfully in environmental and land-use decision making in and around public lands and other natural areas. This project directly addresses goals one and two of the strategic plan. SARIS will facilitate information management and communication for the project.

NEW ORGANIZATIONAL MANDATES AND STRUCTURES

SAMAB Cooperative member agencies are struggling to do all they need to do in the context of their own mandates with reduced budgets and staff. Some are stretched even to assign staff time to attend SAMAB meetings without seeing immediate benefit to the agency. The Cooperative faces major challenges in defining, planning for, and implementing cross-cutting projects of common interest and benefit. Federal land/resource-managing agencies (e.g., FS, FWS, NPS) have most in common and maintain most interest. Research, regulatory, economic-development, and state agencies are supportive in concept but are hard-pressed to identify common interests or benefits in the current climate. (A possible exception to this is the emerging USGS planning effort for an integrated Appalachian science initiative.) There is little or no political demand or support for interagency collaboration at present. There is continuing need to keep the big-picture, holistic, ecosystem-management concepts in mind in agency planning and decision making, but SAMAB's experience is that this remains difficult in the face of day-to-day urgencies and brush fires faced by agency staff.

SAMAB is attempting to develop the capacity of the Foundation to participate in the program programmatically and as a generator of funding. The Foundation is enhancing its board of directors and advisory board, has hired a development director, has created a 5-year development plan including fund-raising campaign, and has a phased staffing plan. Agreements with the NPS, National Forest Foundation, and USGS bring in some project funding and a small amount of administrative support. A membership campaign is underway to generate unrestricted operating funds and to underpin a campaign for larger corporate and foundation gifts to support both project and administrative costs. Models for what the Foundation eventually could be include the Chesapeake Bay Foundation, the Canann Valley Institute in West Virginia, and the Mountain Association for Community and Economic Development in Berea, Kentucky.

Conceptually, the need for SAMAB now is as great as it ever has been. The need to better coordinate fast-paced economic development with environmental sustainability is critical. SAMAB is poised to be a valuable on-the-ground experiment to test or answer key questions being asked of sustainability science. The need for more interagency collaboration in times of budget cuts seems evident. The need to engage more citizens in augmenting agency efforts to monitor and assess change and to better understand change so they can participate in decisions that cause or respond to that change is great. SAMAB has a unique history and public-private structure that should position it well for addressing complex problems and demonstrating solutions. It is slowly developing recognition for its accomplishments and its potential for future contributions.

LESSONS LEARNED AND CONCLUSIONS

The work of SAMAB continues, and there is much to learn from our experiences. A few observations may be useful to others who might be interested in a similar regional program.

Probably the most valuable contribution of SAMAB so far is that it has provided experience in working together across administrative and political boundaries. At times progress has been slow and difficult. It certainly isn't possible to make all the players happy. But those involved in SAMAB feel strongly that the work that SAMAB is doing is an essential ingredient for environmentally sound economic development and sustainability.

The government agencies that make up SAMAB are large, and communication within them is often very sluggish. It is often as difficult to work across organizational boundaries within agencies as it is to work across boundaries between agencies. It should never be assumed that those who represent their agencies on the Executive Committee or the working groups can communicate the SAMAB message to others within their agency. One of the most demanding tasks for an organization like SAMAB is to make sure that all the partners are adequately informed.

Community action projects, even with the best of intentions, must have a well laid foundation of community participation. Community leaders may need help on technical matters, but they know the best way to get things done in their own neighborhoods. Their involvement must start at the beginning.

The real value of a regional cooperative is to approach resource issues from a broad strategic perspective. When it comes to funding and implementation however, it is usually much easier to find support on a more local basis. Agencies want to fund projects. Granting institutions want to know where the money will go. Political leaders want to direct money into specific constituencies. Perhaps a modification of the old political maxim would be appropriate--"all action is local".

Finally, to get back to the theme of this conference, we all know that science is essential for good resource management and planning--science in the form of scientific knowledge and in the form of a scientific approach to decision making. Nevertheless, without an organizational framework to transfer science to application, the potential benefit of science will not be adequately fulfilled. Organizations such as SAMAB are needed to make that happen.