FOR DISCUSSION ONLY

WORKINGPAPER

NRE ECONOMIC RESEARCH SERVICE

UNITED STATES DEPARTMENT OF AGRICULTURE

NRED WORKING PAPER SERIES

Number 50

Economic Information Needs and Analytical Capability to Evaluate Future Resource Policies and Programs - The Role of River Basin and Regional Studies

by

ROBERT B. McKUSICK

May, 1978

FOR DISCUSSION ONLY

Natural Resource Economic Division
Economics, Statistics, and Cooperative Service
U.S. Department of Agriculture
Washington, D.C. 20250

HIGHLIGHTS

- In the near future ESCS will be called upon to provide economic information related to the resource issues of conservation, water quality, land use planning, prime agricultural land, natural hazards and production potential.

- Regional analysis and river basin studies which have traditionally been used for long range planning (10-45 years) should be used more for intermediate run resource planning and policy analysis (2-5 years).

- Regional comprehensive analysis should be continued within ESCS, but with a new role of evaluating water quality and conservation practices and programs, analyzing resource policy options and developing consistent statewide and regional models and data.

- River basin analysis should be expanded beyond the original life of the study to take advantage of operational analytical systems and to address priority issues and policies.

- More information is needed to: determine the availability and production potential of resources over time for food and fiber production and environmental quality enhancement; expand resource production relationships; build flexibility in resource supply decisions; determine the influence of resource ownership on resource availability; determine effects of environmental standards on resource availability; estimate demand relationships, in particular, cross elasticities; determine producer responses and changes in land and water uses; and estimate distributional impacts of policies and programs.

- Regional analytical capability should be expanded to include: physical-hydrological models merged with economic models; more production relationships to reflect conservation and water quality best management practices; farm enterprise budgets and size of production units; commodity price responsiveness; and state and multi-state models.

- River basin studies should go "on the offensive" and do a better job of demonstrating and selling results.

- Technical leadership should be expanded to insure that sound economic principles and standards are being used to establish and maintain consistency among regional analyses and to document analytical methods and results.

ECONOMIC INFORMATION NEEDS AND ANALYTICAL CAPABILITY TO EVALUATE FUTURE RESOURCE POLICIES AND PROGRAMS - THE ROLE OF RIVER BASIN AND REGIONAL STUDIES*

Robert B. McKusick**

INTRODUCTION

Whether or not there is a river basin program, NRED, ESCS or USDA in the next 5 years, the need for society to develop an information base and analytical capability to evaluate future resource policies and programs will remain. There will be a continuing need to address such natural resource related issues as:

- water quality enhancement
- land use and Section 208 planning
- preservation of prime agricultural land
- conservation of energy and water
- natural hazards and disasters such as drought, hail, flooding
- formulation of national policies for energy, conservation, water, land, and agriculture
- production potential related to resource problems of erosion, sedimentation, irrigation efficiency, drainage, water quantity and quality, watershed protection, recreational opportunities, and fish and wildlife enhancement.

These issues relate not only to the food and fiber system but also to the total ecological system of both rural and urban America and to its natural resource base. Competitive pressures will increase on this natural resource base as the goals of society continue to change. There will continue to be conflicts in resource policy due to the public good characteristics of resources and the local, State and

*Paper presented at the ERS River Basin Program Review, September 26-29, 1977, Washington, D.C. Views expressed in this paper are those of the author and do not necessarily reflect the views of the Economics, Statistics, and Cooperatives Service and the Natural Resource Economics Division.

**Program Leader, USDA, Economics, Statistics, and Cooperative Service, Natural Resource Economics Division.

regional disparities of implementing national and State policies. Each region of the U.S. has unique characteristics, for example, rural-urban pressures, resource problem, resource availability, institutions, goals, and attitudes. These unique characteristics make the formulation of consistent national resource policies difficult. These characteristics also give rise to numerous policy options to consider when formulating policy. A case in point is the National Water Policy which was due in six months but took more than a year to develop.

One function of river basin studies is to do regional analysis with a national perspective, or at least with a regional comparative advantage perspective. Another function is to do a "comprehensive" analysis that includes the previous discussed issues analyzed simultaneously with the traditional resource problems. Comprehensive analysis implies that there must be a set of data and information to do a regional analysis, and that this information and analysis are of use to other research areas of the Division and Agency.

The emerging issues and the comprehensive analysis suggest that natural resource planning assistance and research need to be planned less around narrowly defined issues and focused more on developing data and analytical systems within the total food and fiber and ecological systems. We are concerned with the policy implications of our work not only on the agricultural sector but on all of society. Natural resource, food and fiber, and environment policies are interrelated. These policies cannot be treated separately. We can't ignore the uniqueness of specific regions nor the fact that policies are eventually implemented at both the national and regional level.

This paper discusses, within the context of the river basin program: (a) whether or not additional economic information and analytical capability is needed; and (b) can additional uses be made of the river basin analytical capability.

The paper will also:

- discuss trends in river basin analysis and national and regional resource policy
- present observations
- discuss economic information and analytical needs
- suggest flexibility necessary in river basin or regional studies for supplying information and adjusting analytical capabilities
- make recommendations related to the observations

TRENDS IN RIVER BASIN AND NATIONAL AND REGIONAL RESOURCE POLICY

River Basin Analysis

River basin studies and, in particular, the role of ESCS in river basin studies have been changing in the last 2 years. These changes include:

(1) Greater emphasis on short and intermediate run analysis (2-5 years).

Traditionally river basin studies have made long-run analyses (10-45 years). Recently these studies have been involved with 208 and water quality planning, drought, energy, national water policy, the Reclamation Act and 160-acre limitation, coastal zone management, and situation and outlook work. It makes sense to use river basin studies for intermediate run analysis because much of the base data are current production relationships (yields and inputs, costs, prices, net returns, and resource suitability and availability). In order to be more effective in doing intermediate run analysis, information and analysis will have to deal more with expected values and probabilities instead of averages; and with positive (what is) responses, as compared with normative (what ought to be), responses.

(2) Broading of work relationships to include other State and Federal agencies, in particular water quality.

Requests for future river basin studies are coming from State 208 planning agencies, agricultural departments, and natural resource and energy agencies. The results of the river basin studies are also being requested by State legislatures, water quality control boards, Federal power commissions, council of governments, and environmental groups.

(3) Greater emphasis on plan implementation and program evaluation.

There is increased pressure to get plans implemented and to evaluate the effectiveness of programs. Section 208 planning, the USDA-EPA Model Implementation Program and the Rural Clean Water Program require that plans be implemented to meet water quality goals. Authorized cost sharing legislation (Culver Amendment to Clean Water Act) supports

implementation of water quality "best management practices". With the current emphasis on rural development, implementation will be a requirement. The amount of money directed to planning without any obvious results is under severe scrutiny.

(4) Movement away from comprehensive and/or integrated USDA river basin planning

Many of the newer river basin starts are special studies, mainly as a result of River Basin Memorandum #37. These special studies are generally limited in scope, focusing on a single problem area and consisting of an inventory without analysis. I personally feel that these special studies will lead to the 1960's style of project-by-project analysis without any relationship to the region or Nation. If this trend away from comprehensive economic analysis continues, there will be no unique role for ESCS economists in river basin studies. Economic analysis of this type will be performed by the action agency economists. An undesirable trend away from developing a national or regional consistent data base and analytical system would result.

(5) Increased planning at the State level by State agencies

Because of the increased emphasis at the federal and State level for improved water quality, land use planning, and coastal zone management, the States have taken a more active role in planning.

(6) Decline in the enforcement of consistent application of the Water Resources Council's "Principles" and "Standards" (P&S).

There is beginning to be a compromise in the uniform application of the "Principles" and "Standards" (e.g. River Basin Memorandum #10). If the Water Resources Council does not take a more aggressive role in the consistent application of the P&S, the P&S will be compromised away. I do not see the WRC taking this aggressive role. If anything, the WRC is more involved with national policy (national water assessment, national water policy) and less with P&S application. The Section 80 study called for review and revision of P&S but no results have yet occurred.

Regional and National Resource Policy

Regional and national resource policy is currently in a stage of development and transition which includes:

(1) Increased emphasis on evaluating the effectiveness of programs.

At the national level we are experiencing pressure from the President and Congress to make programs accountable. The Senate Agriculture, Nutrition and Forestry Committee has requested a complete USDA land and water conservation program evaluation. This is to be an integrated evaluation of all program purposes. There is also an attachment to the 1978 Farm Bill which calls for an evaluation system to measure the effectiveness of Agricultural Conservation Practices Program. The Soil and Water Resources Conservation Act of 1978 also requires program evaluation. In order to evaluate the effectiveness of programs, information and analytical systems are needed which relate conservation and production goals, resource bases, and conservation practices. There is also a greater need for evaluations of what is happening as compared with what might or what ought to happen when conservation practices are implemented.

(2) Increased emphasis on the formulation and analysis of policy.

ESCS staff in Washington, including river basin staff, are being increasingly called upon to develop and evaluate policy options for energy, agriculture, conservation, water, land, wetlands, and fish and wildlife. These policy options must be developed and evaluated in a very short time period. Currently, ESCS and the Natural Resource Economics Division does not have a resource policy analysis program area or project. Any policy analysis has to be done as part of an ongoing research project or by research supervisors. If requests for resource policy information continue, there will be a need for a group of policy staff economists to supplement ongoing research and supervisors. This group will need to be linked with ongoing regional-national modeling work of the agency and its commodity policy analysis. This linkage is necessary to insure consistency of options and a fast turn around time.

(3) Increased staff work at the Washington level is starting to filter down to the regions.

ESCS involved the field group leaders in helping to develop options for the national water policy. The 160-acre limitation question is mainly staffed in the field. Many of the future water quality questions relating to impacts on production, income, and environmental quality will also require field input. The need for field input is based on the unique regional impact of many national policies as well as the need for public involvement at the local level. There is a problem of aggregating up from the regional level to the national level of potential policy impacts. In the future there will be even greater need for analytical and information systems which not only give national consistency to regional studies but which also recognize the uniqueness of regions which are not incorporated into national models.

OBSERVATIONS

Based on what I see as trends in resource policy and river basin studies and the analytical and information needs which compliment these trends, I propose the following five observations:

(1) River basin studies will limit their usefulness for future policy making and comprehensive analysis if the trend toward special studies continues.

Special studies will cover smaller areas which will not add up to a hydrologic river basin planning unit and will prevent the development of statewide models. These studies will have a limited perspective in determining resource problem solutions and will ignore inter-intra regional competition and demand restraints. Once a special study is completed, it will have a limited value in analyzing other resource problems. A significant reason that ESCS has been able to use river basin studies for the analysis of the drought, 160-acre limitation, national water policy, and 208 planning is that these studies were not limited to a single resource problem but stressed more comprehensive water and land management.

(2) ESCS/NRED River Basin Studies will be increasingly called upon to develop policy options, to evaluate potential policy impacts, and to make policy statements.

This is happening and I cannot foresee any reversal of this trend. In the future ESCS will be more involved in making policy statements concerning water quality standards, energy, cost-sharing, land use planning, wetlands, conservation practices, and prime agricultural land. It is essential that future research be directed to the formulation and evaluation of these policies.

(3) ESCS/NRED/River Basin Studies will have greater involvement in the evaluation of USDA programs.

ESCS has became more involved in program evaluation and this trend is likely to continue. River basin studies at regional level are doing considerable work related to conservation practices, productivity, input substitution and the tie between food and fiber production and the resource base. Because the effectiveness of resource programs is a critical issue, there will be a greater need for economic evaluation information related to what will happen after a program has been implemented or is about to the implemented. The impact of cost-sharing on program and implementation effectiveness needs to be evaluated. Financial analysis and ex post impact analysis will receive greater emphasis in the future.

(4) There will be a greater need for regional information and analysis which will be developed comprehensively.

National resource policies do have differential impacts on consumers, producers, regions, and states. Policies are interrelated and cannot be developed in isolation of each other. When formulating water quality and conservation policies, we should not ignore land use, energy prices and availability, water pricing, 160 acre limitation, and drought and flood policies.

(5) If river basin studies and regional analysis are going to continue they must be more result oriented.

Economic impact of policy options will continue to be a high priority area. Those program areas which can supply this information should continue to grow at the expense of those which cannot. Within ESCS there will be increased

recognition that river basin studies develop information for high priority research issues. However, it will require significant changes in management to allow river basin studies the time, staff, funding, and flexibility to develop information for priority issues while remaining accountable to the USDA Field and Washington Advisory Committees.

ECONOMIC INFORMATION NEEDS

Based on the information presented in the River Basin Review, the anticipated trends and the observations just suggested, what are the implications for economic information and analysis?

River basin studies are developing regional information related to the following areas:

- land and water suitability and availability
- yields, production relationships, costs and net returns by homogeneous production soil groups (SRG)
- markets, land and water use, and environmental restraints
- resource problems and solutions and their impacts on regional and national economies
- environment, fish, wildlife and recreation
- evaluations of alternative resource plans which display tradeoffs between multiple objectives and alternative plans in a four account system (NED, RD, EQ, SWB).

Other program areas in ESCS and USDA are also developing resource economic information in the following areas:

(1) Resource Base and Productivity Study -

This study is developing nationally consistent data which can be aggregated from counties to State to national totals. These data include yields, acreage and production normalized to both ESCS statistical data and SCS field data.

(2) Resource Economic Survey -

This survey will be conducted in the summer of 1978. Economic information to be collected includes resource ownership characteristics and follow up information related to resource investment and disinvestment in drainage, irrigation, land clearing and conservation, land use changes, and land transactions.

(3) SCS Erosion and Sediment Survey -

This survey is developing information for the universal soil loss equations at a State level of accuracy.

Even with the current information developed by river basin studies and the proposed surveys there remains a void in information which:

- relates onsite land use changes to offsite benefits, costs and damages, in particular, changes in water quality
- includes many points on a production function and production relationships involving both quantity and quality
- shows distributional impacts of projects, programs and policies, by regions, income groups and farm sizes
- ties regional commodity production to regional and national prices, that is, price quantity relationships which are consistent at both the national and regional level
- considers risk and uncertainty, expected values and probabilities, and the dynamics of resource allocation and valuation
- relates biological relati nships to water quality and quantity, vegetation cover and other habitats, and the impact of land and water use changes
- relates to resource management, development and conservation strategies.

Information Needs

Economic information for resource planning and evaluation is dependent on resource and commodity supply and demand. The economic framework to discuss economic information needs includes the simultaneous interaction of resource and commodity supply and demand. This framework recognizes that demand and supply are both price/cost and quantity dependent. Prices and quantities of commodities demanded and supplied are determined by the intersection of commodity demand and supply curves. Values, cost and quantities of resources demanded and supplied are determined by the intersection of resource supply and demand curves.

Resource Supply

Information needs related to resource supply include:

(1) Suitability and availability of resources over time for food and fiber production and environmental quality enhancement.

Information on the quantity and quality of the resource base and the cost to increase quantity or improve quality is needed. At what cost will resources be made available and supplied to alternative uses? Note that resource supply is both quantity and cost (marginal) dependent.

There is also a need to develop information on the probability of resource supply as related to weather uncertainty. The recent drought and its impact on water availability, both surface and ground, is a case in point.

There is a renewed interest in maintaining water flows for fishery enhancement and production, and for energy. Thus, when we consider resource suitability and availability, we have to recognize various quantity and quality requirements of alternative uses and the complementarity and competitiveness of these uses. The emphasis on the "prime" definition of resources, both physical and economic, has increased the need for a quality dimension of resource supply. These definitions and resultant policies can have a tremendous influence on resource supply.

(2) Resource production relationships as influenced by resource problems (drainage conditions, degree of erosion, flood hazard, soil productivity, and water quality, both surface and subsurface).

More production-oriented information is needed which goes beyond the one-yield-one-bundle of inputs (one point on the production function) for the "with" and "without" case. Additional information on the range of yields and related inputs which reflect resource problems and production and changes in technology is needed.

Associated with these resource production relationships is a need for related production costs, both on-farm and off-farm costs, for example, disposal of drainage water. With the current emphasis on conservation there is a need for both resource production relationships and costs which emphasize conservation and production having both a quantity and quality dimension.

(3) Flexibility of resource supply decisions.

There is a need to develop economic information which is forward-thinking with respect to irreversibility of resource management. Flexibility in planning is at the heart of the current emphasis on nonstructural alternatives. We need information on nonstructural alternatives which influence resource supply as opposed to structural alternatives, such as dams. Economic analysis of nonstructural alternatives involves institutional relationships, zoning, land use planning, and especially resource pricing, penalties and incentives to improve the efficiency of resource use and resultant resource supplies.

(4) Resource ownership and the influence on resource availability.

Resource planners and economists are starting to recognize the importance of land ownership patterns in regional models. Resources are not available for certain uses because of small holdings, water rights, federal restraints such as 160-acre limitation, and methods of operation (corporate, owner operations, leasing). Information is needed as to how ownership patterns affect resource availability and commodity supply response.

(5) Effect of evironmental standards on resource availability.

The current water quality legislation implies that changes in resource uses, in particular, land use, can improve instream water quality. Proposed legislation will provide for significant cost sharing of "best management practices" intended to keep the soil on the land and to improve water quality. In the future both the quantity and quality of resources suitable and available for agricultural production and other uses could be significantly influenced by this legislation. Economic information on both the onsite and offsite impact of environmental standards is needed. Analytical systems will have to be expanded to include the effect of land use changes on water quality in the watershed and river basins. Regional shifts in production, income and employment, and disparities of implementing these standards for example, irrigated vs. nonirrigated regions, have to be quantified. Both the private and public economic impacts of environmental standards have to be quantified.

Commodity Demand

Commodity demand is an area within ESCS which NRED has not had leadership. I personally feel we have ignored the work of the Commodity Economics Division (CED) by are not using price quantity demand relationships in our river basin studies. This may be justified given our past emphasis on long-run analysis and the fact that many project and regional production levels do not influence prices.

We have used the exogenously determined OBERS projections (developed jointly by ESCS and Bureau of Economic Analysis, U.S. Dept. of Commerce) as demand restraints for cost minimization linear programming models. The "normalized" prices that we use to value goods and services from projects and programs have not been related to OBERS production levels. It is not known if these are equilibrium prices and quantities.

If we are going to become more intermediate-run and policy-oriented, our regional models will have to do a better job of incorporating price quantity relationships. This will require a closer association between the commodity situation and outlook and demand forecast work, and future NRED resource situation and outlook work.

Information is needed on:

- influence of demand changes (such as the Russia-China wheat sales) on current and future prices
- cross elasticities and commodity substitutes and complements
- changing commodity elasticities (short run vs. long run)
- influence of trends and cycles on resource use
- price sensitivitiy of specialty crops

Commodity demand information needs includes both the demand for food and fiber, and other competitive uses of resources. Information is needed on the demand for nonmarketable and nonmonetary demands for resources, such as fish and wildlife, aesthetics, recreation, conservation and water quality. This information must be incorporated into objective functions to be "optimized" jointly with food and fiber production.

Commodity Supply

As discussed previously, river basin studies have emphasized a 10-45 year period of analysis. Projections of land use changes, yields and production levels have been limited to this period and are generally void of any tie to price sensitivity.

Information is needed on the response of producers and, water and land use changes to:

- changing commodity prices and profit expectations
- environmental regulations
- resource programs (cost sharing, price supports, and disaster relief)
- local-State-regional and national institutions (water rights and agricultural preserves)
- proposed national policies related to energy, conservation, water and land use, agriculture, and exports.

Additional information is needed on the impact of technology, cultural practices, rotation requirements, and risk and uncertainty on commodity supplies in both the short and long run.

The recent energy crisis and water shortages have reminded us of the relationship between resource prices, resource substitution, commodity production and environmental quality. More information is needed on the sensivity of resource use to changes in the relative price relationships of resources and the availability of resource substitutes and compliments.

Resource Demand

Resource demand is derived from the alternative uses of the resources. All the previously discussed information items could influence the value of resources in alternative uses. It is important to recognize that resources have opportunity costs which vary depending on the goals and objectives of society.

Examining these four categories simultaneously, we are really asking what is their impact on resource use, allocation, price, and value.

Other Information Needs

Other general economic information needs which are also related to commodity and resource supply and demand include:

- distributional information on benefits, costs and payments of resource plans, policies and programs,
- intra-inter industry flows of goods and services
- water pollution and energy data related to the quantity and quality of resource supply

ANALTYICAL CAPABILITIES

Existing Models

The field group and project leaders have discussed characteristics of operational river basin models which include:

- cost minimization linear programming models
- the decision unit as the region
- data inputs including short run production relationships (yields and inputs), resource availability, production levels, costs, prices and acreages which are projected into the future

- outputs including land use changes, cropping patterns, cost and returns, resource uses, production levels, income, employment, and environmental parameters

- models traditionally used for long run projections and planning

Why don't we take greater advantage of existing operational river basin models for research and policy priority work within the Division, in particular issues related to nonpoint source pollution, pesticides, land use planning, and irrigation? We also have to ask whether the river basins staff has shown any initiative in pushing river basin models beyond their original purpose or even if the opportunity exists? These are questions which the management team needs to address.

Additional Capabilities

Given the previously discussed issues, trends, observations and information needs, river basin studies and regional analysis should consider the following additions to their analytical capability:

(1) A systems approach to merge physical-hydrological models with economic models.

The advantage of this approach is that changes in land use directly impact on changes in resource quality and quantity which in return impact on land use. Simulation would allow us to build more positive responses into our traditional normative models. It might be possible to have the outputs of linear programing and input-output models as inputs into another system so as to predict land use changes.

(2) Increase production function work.

Functional relationships, or at least additional points on a production function should be incorporated into existing and future models. This analytical capability is required to analyze a greater range of input combinations and subsitutions, for example, conservation practices, soil loss, irrigation efficiency, and crop rotation. Additional production activities which include energy, conservation, pesticides and environmental quality coefficients should be developed.

(3) The use of more farm enterprise budgets as opposed to crop budgets.

ESCS/NRED analytical systems should recognize the effect of economies of scale and ownership on production relationships and costs. Production activities should reflect size of units, include machinery and labor inputs, tax structures, capital requirements, crop diversification and irrigation systems.

(4) Increase commodity price responsiveness

Production restraints should be endogenously determined by the model for example, quadratic programming, or at least a feed back mechanism between outputs and implied prices (recursive programming) should be developed. Economic analysis should include resource management, conservation and development influences on commodity price and regional distribution of costs and benefits.

(5) Develop State and regional models.

Many of the proposed national policies will have differential impacts on States and regions. The economic information being requested from ESCS is not only national but increasingly regional.

There is a need for State and regional models which include specific information that isn't available in national models. But, there is also a continual need for nationally consistent data and policy analysis. The river basin data, models, and analysis must be additive to State and regional models. The national models should provide nationally consistent demand restraints for the regional models.

(6) Improved turn around time to develop and supply economic information.

Better report writers are needed to supply information in a useable format. Computer graphics for map overlays, tabulations, and functional maps should also be expanded. The advantage of these graphics is that quantitative results become visual. This information would be extremely valuable in land use and 208 planning. Any expansion of computer graphics should be coordinated with related work in the Soil Conservation Service and Forest Service.

In general, ESCS/NRED should improve its analytical capability and information systems so as to develop and evaluate more strategies. These strategies would be the quantification of multiple objective planning solutions and policy options. At present we do not have a computerized system which enables us to test various strategies, develop tradeoff functions and account entries, and provide a graphic feedback to decision-makers. We have a computerized L.P. or I.O. model but that is only one part of the system.

FLEXIBILITY TO ENCOURAGE RIVER BASIN STUDIES TO BE MORE OUTPUT ORIENTED

Past criticism of river basin studies include: 1) analytical systems being developed for specific studies and then abandoned after the study; 2) reports being developed and put on a shelf with limited use; 3) lack of documentation of analytical methods; and 4) limited use of studies for policy analysis. In response to this criticism, I propose the following to make river basin studies more output oriented.

(1) Better integration of planning assistance and research studies.

River basin staff should be encouraged to seek reimbursement or appropriated funds to carry their analyses beyond the original study. But if the staff is encouraged to expand their analysis, several questions arise. If a river basin staff member develops a proposal, can it be funded under planning assistance studies, either by SCS special study or ESCS appropriated money? If the research involves appropriated money, will the field group leaders have the flexibility to do "research" as opposed to "planning assistance"? Can river basin studies be extended one year as a special study to use developed analytical systems to examine high priority policy issues?

(2) Relationship to a core resource policy group.

Should a policy group be established, or an individual be designated, to identify expected outputs and needs for policy analysis? This group or individual would need to: (a) recognize the potential value of river basin studies for intermediate run regional analysis; (b) be able to cut cross all program areas to develop information; (c) anticipate economic information needs six months to one year in advance and articulate these needs to researchers; (d) review existing and proposed

legislation for potential request for economic information; and (e) work jointly with the NEAD and CED policy program areas.

(3) Continued relationship with other agencies.

ESCS should continue its interagency water and land planning and evaluation work with FS, SCS, and State resource agencies. If, for some reason, the Water Resources Council or the river basin program is not funded, the river basin regional analysis should be continued using appropriate funds. There is currently a great demand for physical and economic information at the State and regional level. The demand is increasing for natural resource policy analysis. ESCS should not make regional analyses in isolation from the physical scientist. Yields and production relationships should be developed by the physical scientist as part of a multidisciplinary interagency team.

(4) Increased technical leadership to coordinate river basin studies with respect to output, issues, policy, economic information and analytical capability is needed.

SUMMARY AND RECOMMENDATIONS

(1) The river basin approach of comprehensive regional analysis will survive and should continue to be supported by ESCS management based on the value for intermediate run analysis (2-5 years), policy analysis, identification of emerging issues, program evaluation and the recognition of unique regional characteristics.

(2) River basin studies should go "on the offensive" and do a better job of demonstrating and selling results.

Three possible recommendations might be the development of: a set of policy papers based on existing results (like the CED Policy Review); a presentation based on the program review material to be presented to future clients; and a set of economic principles and standards for water quality and conservation program and practice evaluation.

(3) River basin studies should be used more to analyze emerging issues, in particular the areas of conservation, water quality, drought, energy, irrigation, and land use planning; and should also be encouraged to continue developing regional comprehensive resource systems.

(4) ESCS should explore the possibility of using special studies, within the existing cooperative river basin structure, to do additional analysis beyond the end of the original study.

(5) More staff is needed either to provide technical leadership at the Washington level or existing staff needs more time allocated for technical leadership.

(6) River basin studies should seriously consider deemphasizing plan formulation, in particular, recommended plans, and instead emphasize the formulation of options and strategies to solve local problems to meet national economic development and environmental quality objectives.