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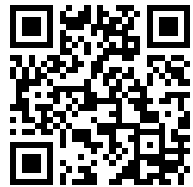
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FOREWORD

Conditions affecting U.S. agriculture and rural America are ever changing. But a series of events in the early seventies has been especially striking. These include the environmental movement, the sharp rise in energy costs, the rapid expansion in agricultural exports, and the wide concern with international food policy.

All of these developments have profound implications for agricultural economic research. Therefore, a major ERS activity was undertaken to develop suggestions and ideas that would identify emerging issues that may affect the direction and scope of ERS activities in the next decade. Early in 1976, I appointed a Forward Look Committee to plan and coordinate this activity. The members of the committee were Robert Bohall, Thomas Carlin, Peter Emerson, Harold Matteson, Richard McArdle, Roger Strohehn, and Melvin Cotner, Chairman.

The committee organized a compendium of invited and contributed papers. The present report is a slightly condensed version of the papers that resulted. These papers stimulated thought and discussion among ERS staff members during their preparation, and preliminary drafts were helpful in planning research. It is my hope that the report will promote continuing thought and discussion about the future direction of ERS research and service, both within ERS and on the part of those who look to ERS for information and analyses of problems facing rural America.

QUENTIN M. WEST
Administrator
Economic Research Service
September 1977

PREFACE

The Forward Look Committee invited papers to be prepared on a number of areas of economic research. The nine chapters of this report are based on these papers. The first chapter serves as a launching pad for the takeoff into the succeeding eight substantive chapters.

For each area, two ERS staff members were asked to prepare a joint paper. In some instances, divergent views led to separate papers. Several reviewers, of whom one or more were from research organizations or clients outside ERS, were asked to comment on each paper. This provided views on research needs from different perspectives.

A general invitation was also extended to anyone in ERS who wished to write a contributed paper on any related subject. Thirty-one contributed papers were received and submitted to a review panel for appraisal. Five papers were judged outstanding, nine excellent, and 17 were given honorable mention. All the contributed papers were classified by area and included with the appropriate chapter. Honorable mention papers are represented by abstracts.

All the papers were reproduced in unedited and unabridged form for limited use in ERS. Copies of the full text of any individual paper can be obtained directly from the author. The present report is a condensed and edited version about 70 percent as long as the original.

Any work of these dimensions takes the combined efforts of many people. The authors' contributions are noted by signed articles and reviews. Ronald L. Mighell had the principal responsibility for the substantive editing and John C. Roney and Nancy A. Winchester helped with the editing and handled the publication details for the Information Division. Clark Edwards chaired the review panel for the contributed papers. The members of the Forward Look Committee helped carry out the planning and handled administrative details within their respective Divisions. Roger Strohbehn served as the principal liaison for the committee. To all these people a debt of gratitude is owed.

MELVIN L. COTNER
Chairman
Forward Look Committee

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PERSPECTIVE

Attempts to see the future are not new. One of the most influential forward looks of the past was Edward Bellamy's *Looking Backward* (1887). The main character in this book is a young Bostonian of 30 who is mysteriously carried forward 113 years to the year 2000. From that vantage point he is able to "look backward" and see what has happened. Bellamy's foresight about technological progress was uncanny; his vision of positive changes in human nature and welfare was not.

The ERS Forward Look is less ambitious and covers a shorter time span. But when nearly 100 thoughtful people involved in economic research look ahead for 10 years or so, some penetrating insights appear and a variety of views emerge.

In Chapter 1, the first paper provides a general setting for anticipating the future. Published perceptions of the agricultural future cover a vast range from a world of want to one of plenty. As Schackle put it in *An Economic Querist* (Cambridge U. Press, 1973): "Our lives are lived on the edge of the known world. For only that world is known which has already emerged into the past ...we have to invent, to imagine...(to fill) the void of future time-..."

Taylor and Quance try to develop a background for anticipating the future structure of the market for economic research, especially for public decisionmaking.

Chapter 2 examines food and fiber needs and demands. It points to the many new forces that influence policymaking. Chief among these are the environmental movement, government food programs, trends in food consumption, and regulatory mechanisms. All need attention. The reviewers single out an important gap in coverage—little is said about fibers.

Enochian in a contributed paper stresses the need for studying changes in consumers' beliefs and values as a factor in food demand.

Chapter 3 on production potentials defines production as the result of combining inputs and technology and then carefully reviews all major inputs looking for research needs. The authors see a special need for more study of environmental problems and water resources. They also find that technology has been neglected in recent years and believe that the flow of innovation is

therefore slackening. The reviewers speak out for more imagination and think the authors have too static and narrow a conceptual view.

Chapter 4 takes us into international trade and development. Hanrahan and Kennedy focus on the new interdependence in world agriculture and discuss the resulting instability of world markets. Needed research falls under three headings: trade liberalization for developed countries, ways of handling the destabilizing effects of fluctuations in purchases by centrally planned countries, and concessional trade and assistance for the developing countries. The reviewers emphasize the problems of developing country needs and of long-range weather forecasting. Six contributed papers attest to the wide interest in the world food situation.

In Chapter 5, the discussion turns to structure, control, and use of agricultural resources. Here the assigned authors agreed to do separate papers. Boxley perceives distributive performance to be more important than production efficiency. Reimund and Martin emphasize production. Their suggestions for research priorities differ accordingly. Boxley breaks distribution into access, security, and equity and examines research issues of structure and control for each.

Reimund and Martin use a more conventional framework and talk of farm numbers, vertical integration, and specialization. They are concerned about the issue of who is going to control agriculture.

The reviewers are inclined to the view that ERS has been over-cautious in handling policy issues and should do more.

Quality of life, the subject of Chapter 6, also resulted in a split assignment. Definitional problems make agreement difficult, yet the subject is basic and consensus can be found on major problems. ERS has a mandate to tackle quality-of-life issues that affect nonmetropolitan areas and people. Stuby thinks conventional measures of quality are not sufficient and need to be bolstered with quantitative measures that get at how people themselves feel about the lives they are leading.

Doeksen, Bird and Green look through their crystal ball at energy research issues related to quality of life. They focus on community services, health, housing, and land use.

In earlier years, continuing poverty in the United States was mainly with those immigrants who were not able to adapt to new world conditions; contemporary poverty resides among those displaced by new technology. It is more heterogeneous, and less amenable to treatment.

Chapter 7 on economic opportunity in rural America deals with the problems of those people displaced and left behind by

technology. Policy issues revolve around (1) the energy crisis, (2) environmental restrictions on agriculture and industry, and (3) population trends in nonmetropolitan areas. Stinson and Cook call for forecasting models to estimate the probable effects of proposed programs.

Barkley asks why no one has really explained the recent reverse flow of population from city to country. What caused it and will it continue?

Lynn Daft has misgivings about the scope of the paper. He thinks the authors have overlooked the implications of the changing transportation network and further adjustments in agriculture beyond the energy and export problems.

Chapter 8 is a scholarly search for the clientele of ERS. Sayre and Stovall engage in some definitional exercises to differentiate between clients and beneficiaries, the direct and the less direct users of ERS research. They perceive the Executive and the Congress as the prime clients and private business, farmers, and consumers as the indirect beneficiaries. Their paper is reinforced by the discussion in the contributed papers by Blankenship and Ron-ey. The skeptical reader will have his perceptions of the problem sharpened even though his views may differ.

Chapter 9 on roles, functions, and services of ERS is a fitting climax. Crosswhite and Moore in separate papers both stress rigor and objectivity as essential; both perceive a problem in the proportion of time and effort spent on long-time research and short-time service activities. The dilemma is how to meet short-time demands without sacrificing too much in long-time basic programs.

Moore would welcome the opportunity to participate in national planning and to contribute to consumer affairs.

The five reviewers present a range all the way from the acerbic view that "ERS is not an independent research agency and would be well advised to stop trying to convince itself that it is" to scholarly statements about the need to study foreign trade and consumer problems. As we are reminded in one paper, Adam Smith wrote that "the interest of the producer ought to be attended only so far as it coincides with that of the consumer."

RONALD L. MIGHELL
Editor

Chapter 1— THE FUTURE

FORENOTE

Perceptions of the future cover a vast span from a world of gloom and want to one of hope and plenty. But there is general recognition of the need to study the future. To rephrase Santayana, those who neglect the future risk losing it; those who take thought may yet shape it.

Quance and Taylor present no agricultural outlook nor study of longrun projections. Rather they try to develop background and understanding for anticipating the future. They look at the changing structure of the economy and of the market for public decisionmaking. Following the path marked out by Schultz and Schuh they trace three stages of social growth and suggest that we are now entering a fourth stage—a kind of post-industrial society with wide implications for agriculture. They examine these implications for population, natural resources and energy, and agricultural research and productivity in an international setting. They look at the various appraisals of the U.S. Department of Agriculture's (USDA's) food information system and propose a food information matrix to reorient our economic research.

Of the two reviewers, LaFerne considers Quance and Taylor generally on target in their forward scenarios and believes that for the next decade or so U.S. agriculture will operate with reasonably well-managed abundance and scarcity. However, he finds their food information matrix too output oriented, without enough stress on international factors. He also points out that ERS does not face the future alone and calls for more interaction with other groups and disciplines.

The other reviewer, J. Coates, finds the forward look “singularly encouraging” but thinks his critical comments will be useful.

Coates suggests that 10 years is too short a time horizon and regrets the absence of studies of long-term trends in American society. He says more attention should be given to "the rich panoply of methods and techniques" for studying the future. He would also place more weight on the implications of technology, especially the possibility of selecting appropriate technology to reach social goals for the future.

Coates is impressed with the matrix idea and the notion of food rooms. The paper strikes him as an interesting beginning.

ANTICIPATING THE FUTURE

by
Leroy Quance and Gary C. Taylor*

*The main trouble with the world
today is that the future is not
what it used to be*

Paul Valery

This paper is not an agricultural outlook, a contingency analysis, or a study of long-range projections. Rather, it develops a background "state of mind" for anticipating the future, whether the issue is the size of the coming corn crop, changes in food and agricultural policy, food prices in 1985, or the growth of agricultural productivity through the year 2000.

Our tools are those of the economist. We look at the changing structure of two areas: (1) the total economy, particularly agriculture, with emphasis on major issues of uncertainty; and (2) the market for economic research in agriculture, especially for public decisionmaking.

First, we review where the United States has been with respect to agricultural and general economic development, where we are now, what the possibilities are for the future, and what major forces are shaping the United States and world societies.

Then we leave the economy itself to view the makeup of economic research and the changing supply-demand relationships for research in agricultural economics. We find the demand for research very dependent on institutions engaged in the national policy process. A major but fuzzy increase in the demand for economic research has pushed this market into disequilibrium.

Next we reexamine ERS's position in the public decisionmaking process, and advocate an information systems approach to bring more clarity and conciseness to the kind of information ERS generates about the future.

*Quance is an agricultural economist in the National Economic Analysis Division, and Taylor is an agricultural economist in the Office of the Administrator, ERS.

A NEW TRANSFORMATION OF AGRICULTURE?

Professor Schuh in a recent American Agricultural Economics Association paper (20)¹ observes that T.W. Schultz's modification of the classical and neoclassical economist's longrun analysis (21) has run its course (fig. 1). According to Schultz, there are three stages of agricultural transformation. U.S. farms, in supplying labor as well as food and fiber, would produce an oversupply relative to an inelastic demand; rapidly rising nonfarm real per capita income would result in the oversupply of labor from agriculture migrating to the nonfarm sector; advances in labor-saving technology would aggravate this situation; and the consequence would be a farm cost-price squeeze with farm prices averaging below longrun equilibriums.

At the time Schultz offered his modification, he observed that the United States was in stage III of this process. But Schultz does not give explanations beyond stage III, and there is increasing evidence that the United States is breaking through to some new stage IV, a kind of post-industrial society. If it were a closed economy, the United States might well have remained in stage III of its agricultural transformation for some years to come.

The food agricultural system does have an oversupply capability relative to domestic demand for the foreseeable future. But foreign demand for U.S. food and fiber has steadily increased in the last 10 to 15 years and is now placing the greatest pressure on food and agriculture. So we must ask: "What are the adjustment possibilities beyond stage III?"

Agriculture, as well as the total U.S. economy, is increasingly dependent on foreign energy sources and other raw materials and on foreign product markets. Thus, economists must go back to the drawing board to develop a new model of "agriculture in an unstable world."

Long-Range Analysis

A recent long-range analysis conducted jointly by Resources for the Future, Inc. (RFF) and ERS looks at alternative futures. That study analyzes food and agriculture through the year 2025 under 11 different scenarios with emphasis on the world food situation, domestic food and agriculture, and the environment (27).

The general economy characterized by a moderate Census series E population growth projection, moderate GNP growth,

¹Underscored numbers in parentheses in this report refer to items in References at the end of each paper.

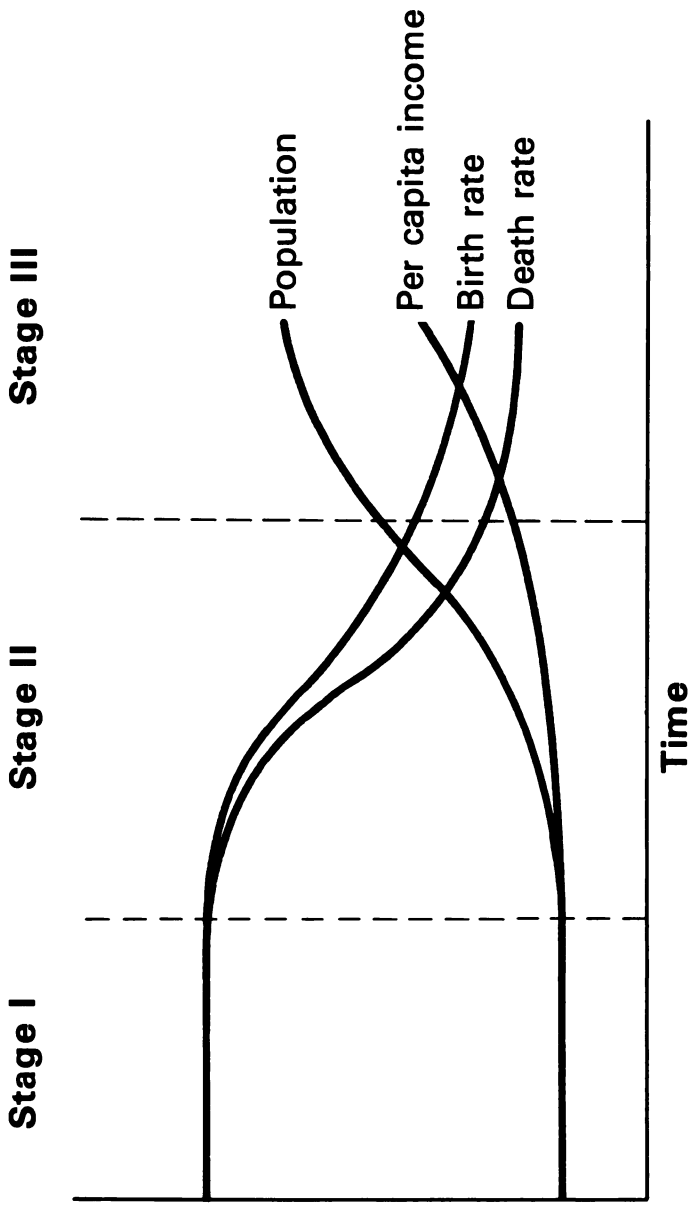


Figure 1 --T. W. Schultz's stages of social growth

increasing environmental controls on agriculture, and continuing world trade trends is used as a *base case*. A more *difficult case* is designed to test agriculture's reaction to more stringent environmental controls under high export demand conditions. Other alternatives test whether greater productivity growth, modified demand, easier environmental restrictions, or slower domestic economic growth could individually alleviate future pressure on food supplies and prices caused by the high demand-low supply attributes of the more difficult case.

Summary projections from the ERS-RFF study suggest that the recent upheavals in the national and world food and agricultural systems are shortrun phenomena (table 1). Nothing in the long-range normalized growth potential for the supply and demand for U.S. agricultural output suggests anything catastrophic except the unknowable uncertainties of nuclear war, climatic change, or recurring droughts in major countries like the USSR or India.

Table 1—Selected performance indicators of the U.S. agricultural system, 1972-74 averages and projections to 1985, and 2000, for a base case and a difficult case

Indicator	Units or base	1972-74 average	Projections	
			1985	2000
<u>Base case</u>				
Farm output	1967=100	109	123	144
Price ratio ¹	1974=100	100	95	95
Net farm income as a percent of GNP	Percent	1.78	1.90	1.66
Food prices (CPI) ²	1972=100	115	136	166
Per capita food consumption	Calories / day	3,222	3,363	3,324
Percent of disposable per capita income spent on food	Percent	16.5	15.5	12.7
<u>Difficult case</u>				
Farm output	1967=100	109	127	159
Price ratio ¹	1974=100	100	105	112
Net farm income as a percent of GNP	Percent	1.78	2.15	2.04
Food prices (CPI) ²	1972=100	115	139	179
Per capita food consumption	Calories / day	3,222	3,197	3,337
Percent of disposable per capita income spent on food	Percent	16.5	15.4	12.8

¹ Ratio of prices received by farmers for crops and livestock to prices paid by farmers for production items, interest, taxes, and wage rates. ² CPI is Consumers' Price Index.

Projected U.S. farm output is sufficient to satisfy a demand growing at about 1.5 percent a year through year 2000, with the ratio of prices received by farmers to prices paid by farmers declining modestly from 1974. On a per capita basis, Americans are projected to consume about the same 3,300 calories a day that was the average in 1972-74. Real wage increases and greater demands for labor-intensive food services beyond the farm gate would cause real food prices to increase about 44 percent by 2000. But real income gains would more than offset these food price increases, with the percentage of per capita disposable personal income spent on food decreasing from an average 16.5 percent in 1972-74 to 15.5 percent by 1985 and 12.7 percent by 2000.

These projections are in terms of a farm sector capable of operating without the supply controls and price supports of the 1950's and 1960's. The strong outmigration from farms that occurred during that period has slowed to a trickle.

It takes strong demand increases of nearly 2 percent per year, spurred by the exceptionally high Census series D population growth projection, high GNP growth, and the higher farm exports of the *difficult case* for any serious stress on agricultural production to appear as the permanent feature implied by Schuh. Farm output would rise steadily to 159 percent of 1967 output, or 10 percent above output projected in the *base case*, by 2000. The price ratio increases to 112 percent of the 1974 level by 2000 or 18 percent more than under the *base case*. And food prices increase modestly relative to the *base case* (8 percent higher by 2000). But the higher income projections in the *difficult case* sustain per capita food consumption and the percentage of per capita disposable income spent on food increases less than 1 percent from the *base case* by 2000.

The ERS-RFF study also projects that between now and 2000: (1) environmental quality will not deteriorate significantly; (2) energy related inputs should not pose significant problems; and (3) world per capita food production should improve slightly.

The above results are defensible, and they are much less pessimistic than other projections that have received some attention.

Alternative World Food Situation Scenarios

Historically, we have had a feast-or-famine attitude about the world food situation. With amazing regularity, some analysts have swung between the extreme views that agriculture has a chronic, built-in capacity for overproduction and that it has an equally durable characteristic for underproduction leading to food scarcity. For convincing evidence supporting the chronic overproduction thesis, see *The Roots of the Farm Problem* (9) and *The Overproduction Trap in U.S. Agriculture* (12). For the scarcity theme, read almost any of the current popular literature on

global food production, especially Lester Brown's *By Bread Alone* (4). And for a nearly complete swing from feast to famine, read Brown's *Seeds of Change* (3) before you read *By Bread Alone*.

The feast-or-famine scripts recognize increasing demand for food from population and income growth, but emphasize supply as the positive or negative force in the world food balance. To complete the picture, we must give demand equal weight in a kind of four-quadrant supply-demand possibility plane (fig. 2).²

Malthus originated the quadrant III *disaster world* in which only starvation is effective in holding population in check and balancing food supplies with needs. In *An Inquiry Into the Human Prospect*, Robert Heilbroner is a modern-day Malthus (10). He laments the human prospect resulting from our inability to act in time to stop horrifying population growth that will lead to catastrophic starvation and disease throughout a large portion of the developing world; and he believes that unrestricted industrial growth will eventually bring an environmental collapse.

Advocates of the technology-induced *abundance world* of quadrant IV view unchecked population growth and other rising

²We are indebted to Jean Johnson, National Science Foundation, for the original supply-demand possibility plane concept used in this paper. Dr. Johnson first developed this idea with respect to energy scenarios while she was with Forecasting International, Ltd. (13).

The World Food Situation Supply-Demand Possibility Plane

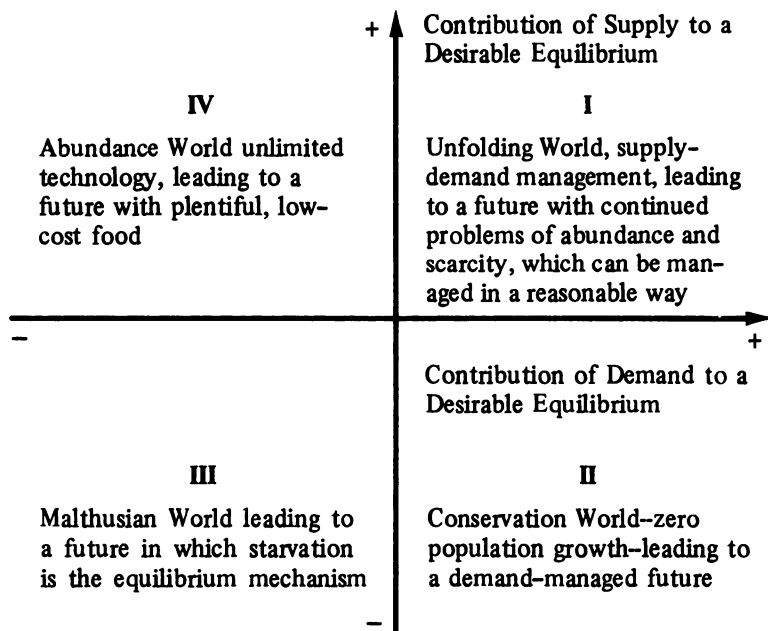


Figure 2

demand aspects as an alarm bell ringing for greater technical research in food and agriculture. Michigan State University's Sylvan Wittwer, coordinator of the National Academy of Science's food and nutrition study, advocates a "Manhattan project" in food that would rival the atomic bomb effort (17).

Hans Linneman, a Dutch economist and leader of the Club of Rome's project on how to feed a doubled world population by year 2000, is convinced that food constraints need not limit population growth in the foreseeable future. And so is Herman Kahn, in *The Next 200 Years* (14).

The *conservation* futurists in quadrant II ignore the possibilities for increasing conventional food supplies, and place emphasis on regulating population growth and conserving limited resource and food supplies. In his book, *In the Human Interest* (2), Brown advocates a population control strategy leading to a stable world population of 5.8 billion by year 2015. This compares with uncontrolled world population projections ranging from 10 to 16 billion in the same time scope.

Teamed with population control advocates are those who emphasize conservation of our limited resources. In Lewis Mumford's *Pentagon of Power—The Myth of the Machine*, energy is forcing us to adapt civilization to the machine (15). Mumford advocates that we all "plant, work, and eat."

USDA studies have thus far indicated an unfolding world of *supply-demand management* illustrated in quadrant I where man succeeds in controlling himself and his environment, a world in which both technologies and human values change. A balanced future is sought in which both quantity and quality of human existence are valued. Rather than rejecting the machine, having blind faith in science, or giving up in despair, those in quadrant I have faith in a future where science and man get on with the job of rational analysis and positive action.

FORCES SHAPING THE U.S. AND WORLD SOCIETIES

Let us now highlight briefly the major forces likely to shape the U.S. and world societies over the next decade. The subsequent papers will further develop these and other significant issue areas and relate them more specifically to the evolving needs for ERS research.

Declining Population Growth Rates

The U.S. birth rate has recently declined dramatically. Whether the rate will stay low is questionable, but in the next 10 years the burden of public expenses for primary and secondary education

will diminish. Fewer children will enter the late-teen and early-twenty age group responsible for much of the increase in crime. Fewer inexperienced young adults will enter the labor force. This trend should result in relatively greater increases in labor productivity. High unemployment among the young over the past decade may be replaced by labor shortages, a development that may put pressure on the farm labor market and other points in the food and agricultural complex (7).

The decline in the proportion of younger people in society may result in more stable and conservative attitudes. There will also be more interest in concerns of older and retired people—for example, in adequate incomes and health care and in the negative impact of inflation on persons with relatively low and fixed incomes.

Changing Locations of Population and Income Growth

The long term trend of population movement to the Western and Southern “Sun Belt” States continues. The Northeastern and Midwestern States, with an aging manufacturing sector, face increasing difficulties in financing government services (U.S. Congress, 25). In terms of manufacturing employment between 1960 and 1975, the Southwest grew by 67.3 percent while the five Mid-eastern States (New York, Pennsylvania, New Jersey, Maryland and Delaware) lost 13.7 percent (5).

The long-term migration from rural to metropolitan areas has stopped. From 1970 to 1974, 1.6 million people moved into non-metropolitan counties. These counties increased in population by 5.6 percent, while metro counties grew by 3.4 percent. “With the possible exception of a brief period during the heart of the Great Depression, we do not appear in modern history ever to have had a previous time when nonmetropolitan growth rates exceeded metro rates” (Beale, 1).

The reasons for this dramatic reversal are not well understood, but it may dramatically alter placement of wholesale and retail facilities and organization of other services.

The urbanization of rural America will place farming in greater competition—with manufacturing, energy development, rural non-farm residences, transportation facilities, and recreation—for use of land, water, air, space, and other limited resources. It may become increasingly difficult to separate food and agriculture from nonagricultural economic activity.

Concern for Living and Working Conditions

Strong national social concern for the less advantaged will apparently continue. Major food, housing, and welfare programs could be rebuilt into minimum income programs with strong

implications for many in rural areas. Spirited public debate is likely to continue on ways and means of establishing a modern delivery system for medical services in rural areas.

Controversy over health and safety standards for workers involved in hazardous occupations, including farming and other primary industries, will continue, and could cause labor cost increases in food and agriculture.

A Growing Sense of the Limits on Natural Resources

There is a growing recognition that our natural resources are limited and that resource development does not always make us better off. This is expressed in many ways. The concern with environmental quality is now institutionalized in legislation, government programs, and organized interest groups. Land use controls are moving fitfully toward the same status. There is more recycling of nonrenewable resources, such as use of municipal sewage for fertilizer. International food shortages and projections of food gaps in developing countries have reawakened concern about food production capacity. New EPA regulations on pesticides and non-point sources of water pollution could affect future returns from some farming operations. Uncertainty about these and other concerns can only be dispelled by information collection and analysis.

Energy

Energy is a special case because modern society is dependent on huge supplies of nonhuman energy for maintenance and growth. The Arab oil boycott underscored our dependence on petroleum and natural gas. The successful formation of the OPEC cartel reversed the general decline in the real price of energy that had gone on for 50 years.

Forming appropriate national policies for energy is a complex process. But two things are reasonably certain as we look beyond 1985. First, real energy prices will continue to increase and second, the advanced countries and particularly the United States will be able to shift to new energy sources without catastrophic economic disruption.

Short-term developments are more difficult to predict. Great uncertainty is likely to prevail as long as the Middle East is unstable. Environmental concerns must be dispelled with improved information and adequate safeguards. Adverse impacts on local governments and local economies from huge energy installations must be met through appropriate Federal and State programs. The impacts of rising energy costs on land use, rural settlement patterns, transportation, and irrigation must be anticipated and planned for. Competing research and development proposals involving enormous costs must be sorted out.

Transportation

Construction of the Interstate Highway System in the 1960's was significant in the dramatic reversal of population decline in nonmetropolitan counties in the early 1970's. So too, we can expect major impacts on economic and population growth from the current efforts to reorganize the nation's railroads. Billions of dollars will be spent in reconstructing major lines and in providing new equipment for improved service. Hundreds of miles of branch lines are slated for abandonment. Numerous proposals for restructuring freight rates are being considered to coordinate rail service better with truck and barge transportation. Concern about building and maintaining rural roads and bridges is growing (19).

These efforts are certain to have a significant impact on rural economies and on interregional competition in agriculture.

Social Accountability and Efficiency

Controversy will continue as we grope our way toward some form of national planning and management of the economy. The area of uncertainty between maintaining economic and legal incentives and reducing unemployment and other resource waste will be narrowed. Consumer groups will continue demands for monitoring the food system and its prices and profits. The structure of agricultural production and the ownership of land-related resources will generate controversy. To increase worker productivity and renew public confidence in government, there will be experimentation with new forms of short-, intermediate-, and long-range planning and management by workers and citizens.³ This emerging participatory democracy will place greater demands on information systems.

Agricultural Research and Productivity

Some feel that agricultural research is too important to be left exclusively in the hands of agricultural researchers. The controversy over research management and priorities was prominent in such books as *Hard Tomatoes, Hard Times* (11) and *Silent Spring* (6). More thorough studies were contained in the "Pound Report" of the National Academy of Science (17). Another study by the Academy raises the specter of declines in the rate of increase in agricultural productivity and urges emphasis on basic physical and biological research (16).

Schuh argues that since domestic prices of food and fiber are now largely determined in world markets, we must manage our agricultural research in a world context to prevent rapid escalation of domestic food costs (20).

³Current ERS experimentation with "flexitime" is an example of this quiet but significant movement. For a stimulating perspective on these and other issues, see *Small is Beautiful: Economics as if People Mattered* (22).

An Interdependent World

The world society and the U.S. perception of it has been undergoing rapid change from the "Cold War" and "imperialistic" views that were dominant for some 20 years after World War II. The relative power of both the United States and the USSR to influence world events has declined. The success of OPEC and growing third world political power have made them forces demanding more serious consideration from the developed world. Burgeoning populations and the spread of sophisticated military hardware threaten the stability of developing nations and have serious implications for developed nations.

International trade since World War II has grown much faster than the total of gross national products. Only in the last decade has the U.S. balance of agricultural trade moved strongly into the black and become a major foreign exchange earner. Further, U.S. exports have achieved a dominant position in world trade in several basic food commodities, especially grains and soybeans, as exportable surpluses from other areas have declined.

But the exposure of domestic markets to the uncertainties of weather and policy decisions in foreign countries in the absence of significant reserve stocks has generated inflationary pressures in domestic markets that at times have appeared intolerable to major consumer and labor groups. The unpredictable trade behavior of the USSR has also caused great uncertainty and apprehension for our traditional trading partners, particularly the Japanese. These considerations led to a 5-year agreement with the USSR providing upper and lower guidelines on their grain imports from the United States that should provide considerable stability.

At the United Nations Conference on Trade and Development (UNCTAD) in Kenya, June 1976, developing nations demanded progress toward more stable prices and trade relationships for a number of agricultural commodities and mineral raw materials of critical importance to the developed countries. In the coming decade, the developed nations will try to foster more stable trading arrangements with developing countries (18). Such countries need improved technology and stable markets to achieve economic growth and support expanding populations. Developed countries need assured supplies of raw materials and less risk of political instability in the developing world.

For the agricultural community the situation requires continual specification and analysis of possible options for commodity agreements, food aid, and bilateral and multilateral trading arrangements. It also means experimenting with much expanded and improved education and technical assistance forms specifically designed for developing country conditions with less

dependence on direct transfer of energy-intensive labor-saving technology from developed countries.

Inflation

American farmers have widely regarded the cost-price squeeze as a major source of their economic ills. Even during 1972-74—a period of farm commodity shortages and farm commodity price inflation—prices paid by farmers increased 32 percent while the general price level increased only 18 percent.

The degree to which inflation may reduce income and supply response of farming has received little attention in economic research. But the future consumer food dollar is likely to be weighted more heavily toward processing and services beyond the farm gate, and we may see large wage and material price inflation. Further, while we have little research on the impact of inflation in a national perspective, few agricultural economists are academically prepared to carry such analysis into an open world economy with floating exchange rates and a mixture of market and planned national economies and complex trading arrangements.

AGRICULTURAL ECONOMIC RESEARCH AND PUBLIC POLICY

The USDA food information system may be the most studied government information process in existence. During the 1970's, individual appraisals were made by Ben French (for ERS) and Karl Fox (for the President's Council of Economic Advisers), and larger institutional appraisals were made by the General Accounting Office (GAO) and Office of Technology Assessment (OTA). These were on top of those made during the 1960's by James Shaffer (for ERS) and by the Food and Fiber Commission.

The OTA recently released *Food Information Systems: Summary and Analysis*, a study that summarizes a wealth of information about USDA data and analytical systems (26).

The ERS has fared well in most recent appraisals. It is often praised and defended. A central criticism concerns whether the collection, analysis, and dissemination of information is in a concise and timely manner useful in anticipatory public decisionmaking.

Let's look to history and the current organization of ERS for clues to this problem. We present a brief summary evaluation of policy research on the U.S. food and agricultural system over three roughly defined historical periods that we call subsistence agriculture, commercial agriculture, and industrial agriculture. Then within each period we view food and agricultural policy

from three perspectives: institutions, policy goals, and policy research (fig. 3).

Under subsistence agriculture, the farm family was the principal institution and food policy was mainly family food policy. There were few conflicts between policy goals or areas. Our economic ancestors developed the first-generation policy model—a farm-management decision model.

The technological revolution in agriculture brought forth commercial agriculture. Each farm family began to supply more and more people with food, and food policy became commercial agricultural policy. The three policy areas began to separate but there was such a large overlap that no serious conflicts came about.

This was the heyday of the “farm bloc” and of close coordination between legislative, administrative, and economic research agencies. Most of our agricultural data series began and agricultural policy research separated from farm management research. Agricultural economists began studying the relationships between food policy, farm policy, and rural welfare. Toward the end of this period, and the beginning of the next, the National Food Committee on Food Marketing and the Food and Fiber Commission did their work.

As agriculture has industrialized, national food policy is no longer the same as commercial agricultural policy. Not only have policy goals diverged but data series are less adequate and basic concepts and processes for conducting policy research are split apart.

The Shaffer study seemed to identify the farm problem, at least in its recognition of a complex food and fiber system, with more pressing social needs than our traditional agricultural policy research embraced (23). But the 1969 ERS conference, called to search out alternative research programs, proved ineffective.⁴ The 1973 reorganization of ERS was a bold step toward realigning research for a complete food and fiber system perspective, without sacrificing attention to commodity sectors and economic development of human and natural resources. Kenneth Farrell identified the ERS policy setting in his 1976 AAEA Presidential address:

The most basic feature of the current policy setting is agriculture's growing social, economic, and political interdependence...The economics and politics of food and agriculture are no longer just those of the “farm bloc” or the agricultural establishment, but also those of many diverse groups who lay joint, competitive

⁴This was probably because the new research efforts emerging from that conference overemphasized the producing sector and lacked an adequate food and fiber system perspective (29).

Food and Agricultural Policy in Retrospect

I. INSTITUTIONAL MODEL

<p>Subsistence Agriculture Food Policy = Family Food Policy No conflict Agricultural institutions</p>	<p>Commercial Agriculture Food Policy = Commercial Agricultural Policy Heyday of farm block legislative, administrative, BAE relationships</p>	<p>Industrialized Agriculture Food Policy, Family Food Policy, and Commercial Agricultural Policy Shifting relationship between old allies</p>
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II. BONNEN MODEL (GOALS)

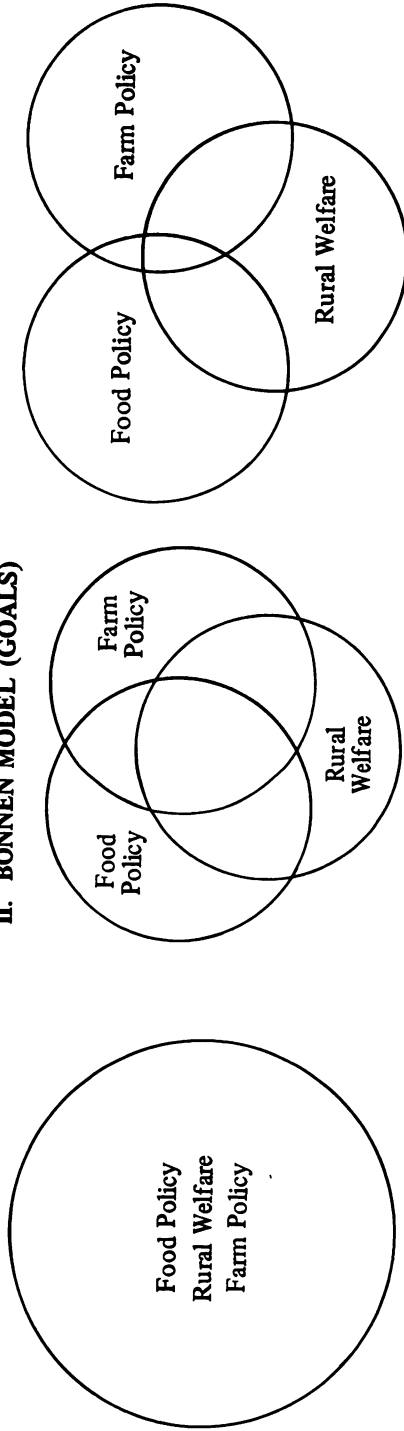


Figure 3

claims upon resources used by agriculture or are impacted by economic performance of the food and agricultural complex (8).

Natural and historical tendencies toward individualism in the conduct and management of economic research in agriculture seem to have prevented us from keeping pace with changes in the food and agricultural complex. We conduct economic analyses of limited sector, market, or policy goals, but our policy research efforts do not encompass the entire food and agricultural system and do not focus on explicit indicators of the performance of the system.⁵

A Food Information Matrix

The 1973 reorganization was a significant move in reorienting food and agricultural research to meet a complex system with many interdependent parts and markets. But our “institutional boxes” are still getting in the way. We have done a reasonably good job of organizing for, planning, completing, and disseminating the results of research relating to specific issues and in coordinating across program areas. But we have failed to define and build a policy research program where change in almost any sector or market can have significant impacts on statistical indicators of national food policy goals.

The limiting element in our research program is the absence of a food information matrix as an overview concept. Such a matrix should encompass all dimensions of food and agriculture and show cause and effect linkages with identified indicators of food policy goals (fig. 4). The matrix dimensions would include: (1) *subject matter area*—farm inputs, meat animals, land use, rural living, consumption, etc.; (2) *issue*—food prices, productivity growth, nutrition, etc.; (3) *discipline*—technical sciences, economics, political science, history, etc.; and (4) *time*—shortrun outlook (quarterly forecasts for the next 2 years), intermediate-run projections (annual projections, 2 to 4 years into the future), and long-range projections (simulating alternative futures focusing on 5-, 10-, and 25-year benchmarks).

Each length of run would have its individual scenarios with dimensions for appropriate uncertainties and issue analysis. Appropriate linkages should be provided between the planning horizons, and scenarios would increase in precision and frequency of revision as the length of run shortens. Figure 4 illustrates the food information matrix. When a particular matrix cell is selected by choosing a sector, issues, and a time dimension, the cell content identifies questions relevant to that issue. The matrix output

⁵George Brandow emphasized this point in his ERS Bicentennial Lecture, September 8, 1976 (28).

Food Information Matrix

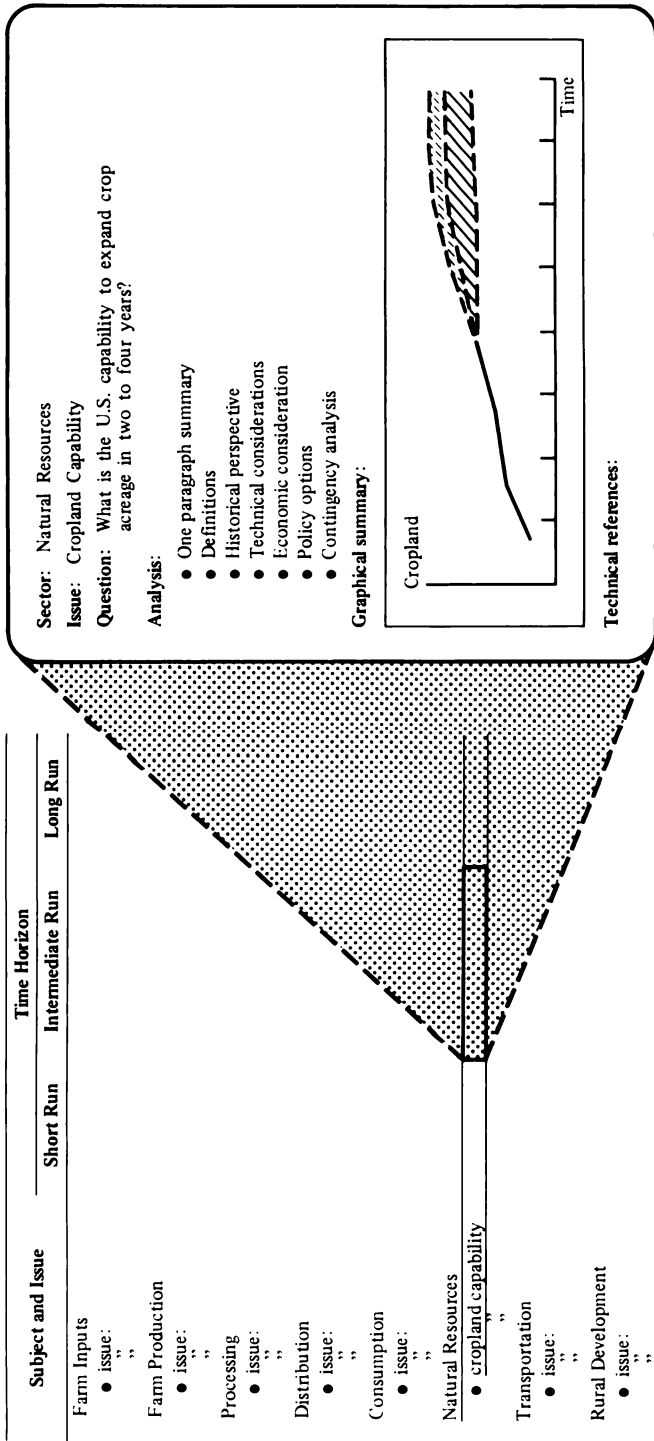


Figure 4

would summarize ERS's latest analysis of that question according to a standard format.

Matrix output would be concise, not more than two pages of published text or 5 minutes of video tape. As published text, the matrix output could be contained in loose-leaf notebooks for easy revision. A second, more visionary but perhaps more useful output mode could be "food rooms" in ERS, the USDA Administration Building, the Executive Office Building, and the Senate or House office buildings. These food rooms would contain displays describing the food information matrix, viewing chairs, and a television screen connected to a video tape bank. The viewer, selecting an issue, would receive a 5-minute analysis designed to give a precise definition of the concept under question, a historical perspective, alternative possibilities, a sensitivity analysis of policy options, and references to technical ERS research.

Development of the food information matrix might not involve any program reorganization. Most research and analysis required is already being conducted. Timely revision of matrix output could become an accountability factor in annual work plans. The information matrix would be a tool for more effectively coordinating, packaging, and disseminating the agency output. It could be a way of fulfilling the role of providing the "big picture" that George Brandow suggested in the seminar following his ERS Bicentennial Lecture on September 8, 1976. The development of the information matrix would also identify gaps in data and analytical systems requiring new research efforts.

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Review of: ANTICIPATING THE FUTURE

by
J. Coates*

The advent of the ERS forward look papers along with the associated management and staff endorsement of the concept of a forward look for ERS is singularly encouraging. The reviewer is perhaps more useful in highlighting gaps and inconsistencies than in celebrating virtues. Consequently, while the emphasis in these comments will be on gaps, the substantial good sense, positive orientation, and general value to the Department of what is already presented should not be overlooked. The following comments are not necessarily in the most significant order.

I doubt that a decade is the correct unit for this anticipation of the future. Long-term structural changes in the U.S. economy occur on a 15- to 40-year time cycle. The research agenda and new look may itself be anticipated over 10 years, but the horizon for its consequence should be over several decades.

The paper is deficient in not probing more directly the rich panoply of methods and techniques for studying the future that are directly applicable to the ERS mission. For example, what are the roles of Delphi, cross-impact analyses, interpretive structuring modeling, technological forecasting, scenario building, and so on? I believe a more deep-seated understanding of these methods and their application to defining new roles and missions is of major importance.

The paper gives incredibly short shrift to the role of science and technology as a basic driver in the whole future economy, including agriculture.

An appropriate strategy for beginning to anticipate the future would be first to address a series of long-term trends of American society, and second, as a subset, those that directly impact on agriculture. These lists might run anywhere from 50 to 200 items each. Long-term trends mark boundary conditions and constraints; they mark possible places for discontinuities, which perturb the economy; and they represent opportunities for directive change. Out of that study of long-term trends would come a series of future scenarios, a set of normative goals, a set of research and development goals, and a subset of potential missions for USDA.

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In general, the paper does not cut deeply enough to the bone in its thinking and in raising issues. For example, a central opportunity for ERS would be to undertake major studies on: new roles and missions for USDA from now to the year 2000; and redesigning and restructuring USDA for the year 2000.

In general, I sense that the economic orientation of the authors is relatively mainstream or conventional. I do not see, for example, mention of such material as Oscar Morganstern's critical problems in contemporary economics. Morganstern highlights the shortfalls of economic research on issues relating to law, society, and political systems.

The paper fails to systemically critique the implications of making appropriate technology a social goal for the future. It is clear that externalities of technology and their management are becoming a dominant concern throughout the economy. One would find it difficult to grasp this from the paper. It is clear that with regard to externalities, nonmarket as well as market considerations enter into the story.

Similarly the economy, perhaps increasingly even the agricultural economy, has become highly integrated and interdependent. These considerations are not brought into the discussion. The growth of consumerism, possible impacts of foreign trade, foreign relations, and so on are not discussed.

The authors talk about an information system, presumably one with a strong policy focus, but fail to differentiate between information and data.

They also neglect to identify new research needs and how to deal with problems of split responsibility within USDA and with outside agencies. A central question is the ventilation of the process. How do you step outside the philosophical, professional, bureaucratic orientation of the Department? How do you bring in parties-at-interest to form a new perspective? Essential to understanding is how one deals with dissent, uncongenial opinion. The embrace of these harsh elements is the crucial stumbling block on which any planning is likely to founder.

The material discussing the RFF's alternative futures is interesting in indicating that little suggests doomsday, except nuclear war, climatic changes, and periodic droughts. Even assuming this is correct, what are the implications for agency planning? By taking base cases or most-likely cases one runs up against what is almost a fundamental principle of the future business, that the most likely is the least likely to occur. Furthermore, "doomsday" is not the only alternative to an equitable balanced future. The paper does not really get at the discussion of a rich enough range of alternatives.

The authors come down rather heavily in their four-quadrant

scenario against Sylvan Wittwer's "Manhattan Project" orientation to agriculture research and development. Rather than a back of the hand, it might be better to talk about implications, cost, and outcome of that grand strategy. It might well be that a Manhattan project would have a vast potential payoff.

To what extent is the present intensive use of energy and other inputs in agriculture a result of plans, policies, and programs of the USDA? What are the lessons out of that? To what extent is transportation both an economic opportunity and a bane in the countryside? I find the paper talking about land-use controls, but no attention to land-tenure systems or to banking, no attention to the effects of inheritance on farms in America, no discussion of vertical integration, no sense of John Kenneth Galbraith's fundamental observation that large corporations act to stabilize. The list just begins to scratch the surface.

On the question of the interdependent world, the authors take the most conventionalized view, and it seems to me that at this point one should be looking at alternative futures of the world. What are the implications of international trade for agriculture and what are the implications for research? What happens if India turns inward the way China did? What if regionalism comes to the fore? What happens if there is selective interdependency?

I was impressed with the matrix idea near the end. Incidentally, the discussion of constituencies does raise the question of how the Department should be relating not only to its traditional constituencies but to new ones, and to public interest groups. The notion of food rooms is attractive and is something worth probing. The existence of these two "bright ideas" immediately raises the question of how many more bright ideas are there that have not come forward and what mechanisms should be used for evoking them.

In summary, I find the paper an interesting beginning. The thinking about anticipating the future is relatively circumscribed in its orientation. It does not reflect a self-examination of the Department and the agency. It does not take a structural view of the future and really brings to bear few suggestions for how future techniques might be used by USDA or ERS.

Review of: ANTICIPATING THE FUTURE

by
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Quance and Taylor's "Anticipating the Future" addresses a host of factors that will shape the social setting of the next 10 years. They cite divergent views of the future direction, and extent of economic research and its bearing on recent and impending changes in the U.S. and world economic setting. They identify the forces likely to shape the future U.S. and world societies. They try to relate past changes to subsequent changes in the content of economic research, and in the formulation of public policy for agriculture. This view of the past is then used to imply continuing changes in demand on economic research to meet the needs of an increasingly industrialized and internationalized agriculture. Food policy, farm policy, and rural welfare are seen as parts of a complex policy arena to be serviced by researchers in agricultural economics.

Considering the authors' stated objective of developing an awareness or state of mind for anticipating the future—as opposed to providing an outlook, a contingency analysis, or a study of long-range projections—I would affirm the paper to be on target and an important discussion of issues relating to our research future. But the authors do yield to temptation and provide alternative scenarios for the years 1985 and 2000. These alternatives help develop an awareness of the wide range of future possibilities and give an effective lead into a discussion of views and philosophies on alternative world food situations that range from vast surpluses to starvation and famine deficits.

Although the authors allude at the end to a food information matrix, which presumably would serve ERS as an organizing or overview concept, the paper is more output oriented than it is a balanced tool for foreseeing the big research issues. I think they missed an opportunity to help us with a system for putting all the factors together to anticipate the future in which we will be operating. Some think that reading the future with any significant precision is impossible. How do the authors feel about this? Can we really organize the concepts in this discussion of factors shaping the future to help us to zero in on the most likely scenario?

The first major section of the paper is a useful discussion of how far we are moving into a new economy for agriculture. Are

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we in a new era in which world food demand will continue to press on our capacity to produce? This section presents divergent views and points up the inadequacy of existing theory. It is an interesting mixture of observation and advocacy. I generally agree with the authors that during the next decade we will be operating in Quadrant I with "supply-demand management leading to a future with continued problems of abundance and scarcity which can be managed in a reasonable way." But I came to my conclusion by another route, perhaps from my own tendency toward "the average."

The second section provides a good catalog of the forces shaping the world and U.S. societies. Changes are cited in major forces like population growth and distribution, awareness of limitations on natural resources, energy availability and cost, and interdependence of world communities. The discussion of the state of these forces and their possible implications is comprehensive and furnishes a sound basis for further study. I do have two specific suggestions for possible improvement.

First, taking my cue from the Schuh citation that "domestic prices of food and fiber are now largely determined in world markets," I feel that too little attention is given to these forces as they shape the world (as opposed to the U.S.) society. The question is addressed in the paper, in a special subsection on "An Interdependent World." However, I am arguing for added emphasis. For example, the two sections on population are domestically oriented. Changes in the level, makeup, and distribution of world population are of overriding significance and may be the key to whether the world will go toward feast or famine. Changes discussed elsewhere are also U.S. oriented.

Second, I would have appreciated some speculation on the relative importance of some of the major forces shaping the world and U.S. societies during the next decade. Which are likely to preoccupy agricultural economists during the next 5 to 10 years? Are there specific ways in which these factors can be expected to affect the scope and content of our research? What will typical agricultural economists find themselves doing, and for what key people and groups will they be providing economic information?

I agree with the picture, in the final section, of an increasingly complex setting for policy and for economic information as we move toward a more open (world) economy with further progress in industrialization. We do not have to anticipate this—it is upon us. We need an organized framework through which we can anticipate changes in the agricultural setting and maintain flexibility and continuing strength to meet the new, emerging demands. To repeat, while I endorse the concept of the proposed food information matrix as a useful organizing-disseminating sys-

tem, we need a more effective mechanism to foresee the future and its demands on us. The food information concept is necessary but not enough for our most efficient performance as agricultural economists.

Finally, ERS does not face the future alone. Many economists and other scholars are wrestling with the same uncertainties. The authors refer to some of them. It is important to interact as fully as possible with these other concerned parties. Many examples can be cited of groups with whom we should be working or at least maintaining a continuing awareness of their activities. The Resources for the Future (RFF) group is a good example, since it jointly developed the alternative futures estimates discussed in this paper. Another group that shares our concern about the future of the economy is in the Office of Technology Assessment (OTA) of the U.S. Congress. It was created by the Technology Assessment Act of 1972 to help the Congress anticipate, and plan for, the continuing consequences of technology, and began functioning in January 1974. It is concerned with seven principal areas: energy, food, health, materials, oceans, transportation, and national research and development policies and priorities.

The point is that anticipating and reading the future effectively will require a much broader perspective than the one traditionally taken in agricultural economics. There are many groups around that are very capable and very interested in helping us and in having our help.

Chapter 2— DOMESTIC NEEDS

FORENOTE

Research needs for food and fiber extend far beyond conventional supply and demand issues. Manchester and Handy point to the many new forces that influence policymaking. The environmental movement brought attention to the hazards of pesticides and food additives, for example. The war on poverty gave us the hunger lobby, food stamps, and more.

The cost of domestic food programs has tripled in 5 years. Federal contributions to these programs now account for the equivalent of 4 percent of total U.S. food expenditures.

Trends in food consumption are influenced by changes in population, incomes, life styles, services, away-from-home eating, and the like. In retailing, the supermarket movement is virtually complete and patterns of firm size and operation are stabilized. Much analysis is still ahead in the regulatory field with concern focused on pricing. Federal marketing orders are under scrutiny on this score. Impact analyses form a new area of regulation, with studies required for pollution, inflation, and a variety of administrative actions.

Reviews. Three reviews warmly praise and sharply criticize the Manchester-Handy paper. Rachel Dardis regards it as an excellent perspective for food but short on fibers. She observes conflicts in the objectives of domestic food programs and stresses the need for consumer information. Research results should be in nontechnical language.

Hanes considers it a "thought provoking paper." He objects to the term "supply and demand pricing" and suggests "cobweb" pricing as a better substitute. He thinks the authors strayed

beyond the assignment in getting into pricing but commends them for doing so. He believes with them that it is the economist's "responsibility to use the theory that is applicable" and modify it when it is not, rather than to complain about its inadequacy.

Mayer praises the paper for the "painstaking detail" characteristic of ERS. He perceives a tendency in both universities and ERS to develop narrow specialization in response to service pressures and immediate rewards. This needs to be guarded against. He believes ERS should tackle more issues that are sensitive to public opinion and provide full and careful explanations.

Contributed papers. Four contributed papers relate to food and fiber needs. Enochian discusses consumer beliefs and values. A variety of forces that affected the under-30 age group in the 1960's ushered in new lifestyles and a new set of values that need study for the future.

Carpenter, Arthur, and Stuby look at the prospect for declining meat consumption and rising consumption of textured vegetable substitutes for meat.

Hutchinson analyzes trends in transportation structure and their implications.

Nightingale addresses the implications of further automation in food processing and purchasing.

DOMESTIC FOOD AND FIBER NEEDS AND DEMANDS

by

Alden C. Manchester and Charles R. Handy*

INTRODUCTION

It has become a part of conventional wisdom that the controllers of agricultural policy have changed. The agricultural establishment no longer determines what policy issues will receive attention. The sixties and seventies have seen many new groups come forward in policymaking.

The environmental movement came early. Starting with clean water and clean air, it soon embraced the wilderness, recycling containers and other materials, saving endangered species, and the abolition of chemicals. Chemicals began with DDT and other pesticides, and grew to include heavy metals, food additives, and many others. No policy issues deemed to have environmental aspects can be seriously considered now without an input from the organized environmentalists.

The war on poverty of the mid-sixties created a diverse set of public and private institutions with a strong interest in the struggle. One part of this movement was the so-called hunger lobby. Its major concern was the Food Stamp Program, but child nutrition got a share of attention. Through alliances with other interest groups, principally labor, it came to have a key role in most agricultural and food policy legislation.

The events of 1973-74 gave a dramatic boost to the international hunger lobby. Perceptions of the problem and solutions range from the apocalyptic to the eternally optimistic.

Consumerism grew rapidly in the sixties and flowered in the early seventies, particularly on food issues. The 1973 boycott was the first baptism of fire for many of today's national consumer leaders.

The food-related consumer issues include:

- Current retail prices in real terms.
- The stability of prices over time, and the factors affecting costs and prices.
- Availability and supplies.
- Quality and safety.

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- **Variety.** Here there is a tradeoff with price, since an infinite variety of foods would raise costs beyond acceptable levels.
- **Nutritional content.** There is a wide variety of views on this subject, including proposals to improve the nutritional content of the American diet by reducing consumption of sugar, animal fats, and additives.
- **Assurance of an adequate diet for low-income consumers,** through food stamps, donated food, or cash income supplements, and an effective food-delivery system in low-income areas.
- **Adequate, accurate consumer information.**
- **The impacts of technological change on food costs and prices, quality, safety, and availability.**
- **Profits in the food system—**are consumers being “ripped off?”
- **The impacts of changes in merchandising methods and other practices on costs, prices, and competition.**
- **Government regulation of food production, processing, and marketing.** Does it raise or lower prices? Does it improve performance? Does it provide the information that consumers want, need, and can use?

There are no new issues here. All of them have been around for years. But the emphasis changes. ERS has adjusted and will need to continue to adjust its research program to reflect the changes.

Most consumer movements favor regulation. But recently, an antiregulation movement has gained momentum. Its advocates argue that in a free society no one can really favor more regulation as a general proposition.

DEMAND FOR FOOD AND FIBER AND ASSOCIATED SERVICES

This section is concerned with the major forces affecting the demand for farm products. ERS is responsible for understanding and measuring the demand for them; for forecasting the future courses of supply, demand, and prices; and for analyzing the impacts of a wide variety of policy changes. The volatile environment since 1972 has placed considerable pressure on traditional measures and models of demand.

To improve consumption-behavior forecasting, we need data for individual households and firms from cross-section or time studies to supplement data available from aggregate sources such as National Income Accounts and ERS estimates of per capita consumption data. The aggregates cover up many changes within

income groups. ERS is also interested in distributional effects of economic developments and policy changes. We can only get at these with data and models that do not assume average effects for all members of the population.

Trends in Food Consumption

Per capita consumption of all food (retail-weight equivalent) fell steadily from 1950 to 1965, grew modestly until 1971, and then declined through 1975. Since 1950, the share of animal products in total food consumption has been a remarkably stable 43 to 44 percent, but this general level masks many divergent trends for specific foods.

Per capita consumption of beef and poultry has risen sharply since 1950 and fish consumption has also increased, but at a slower rate. Consumption of veal and lamb has dropped while pork fluctuated but has shown little trend. Egg consumption has fallen over 14 percent since 1960. Although the per capita consumption of dairy products also has declined, especially fluid whole milk and butter, the use of some dairy products is rapidly growing. Consumption of low fat milk has nearly tripled since 1960, while cheese has increased 47 percent and yogurt has risen even more.

Per capita consumption patterns also vary widely for crop products. While the consumption of animal fat is declining, the use of vegetable oil is growing rapidly. A decline in fresh fruit and vegetable consumption bottomed out around 1963 and since has remained steady or increased slightly. In contrast, processed fruit and vegetable use has shown a steady but moderate increase since 1950. Consumption of potatoes is down; however, the use of frozen potatoes has grown almost five-fold since 1960. Per capita consumption of flour and cereal products has declined moderately since 1950, while consumption of sugar and sweeteners has risen. Nearly all the increase in sweeteners comes from more corn sugar and syrup consumption.

Aggregate data indicate the U.S. population's intake of protein is more than adequate, but USDA's Household Food Consumption Survey of 1965 found 21 percent of the households had poor diets and 10 percent of all household diets did not supply the allowance for protein. Data from the upcoming 1977-78 (April 1-March 31) Household Food Consumption Survey will be useful in judging the current adequacy of the U.S. diet throughout the population.

Forces Affecting Food Consumption Patterns

Many forces affect consumers' need and demand for food, fiber, and associated services. Most aggregate demand models include changes in total population and disposable income as

independent variables. But we need a better understanding of the effects of the changing distribution of the population and income between age groups, household size, and sex. We also need measurements of how demand shifts with changes in lifestyles, consumer attitudes, technology, and new information about nutrition, health, and food safety.

Population characteristics. The Bureau of Census estimates that the U.S. population will grow from 213 million in 1975 to 234 million in 1985 and to 245 million in 1990 (medium projections) (13). This translates to an average annual growth rate of only 0.9 percent. In addition to the overall growth rate, the changing composition of the population has significant effects on consumption.

During the next decade, the 25-44 age group will increase three times as fast as the general population. At the same time, the 5-17 age group will drop sharply as the postwar baby boom works its way through the population. The youngest and oldest age groups will also grow much faster than the total population. The 5-and-under age group is expected to increase about a fourth by 1985, while the 65-and-over group will go up a fifth. The population will grow somewhat older; the proportion of women will increase as they continue to outlive men; and there will be a big increase in the number of young families.

Household and family sizes have been dropping rapidly in recent years. Average household size declined nearly 12 percent from 1960 to 1975 and over 6 percent from 1970 to 1975. By 1990, it may be down another 9 percent. Average family size decreased about 7 percent from 1960 to 1975 and 4.5 percent from 1970 to 1975.

The growth in one- and two-person households is the most significant portion of this change. The two main components of the change are: the increase in the elderly living alone and the increase in young people living separately from their parents.

Changes in household size and the age-sex distribution help explain and predict changes in total food expenditures (8) and per capita food consumption (6 and 12). Persons of different ages and sexes have different food needs and habits. Small households consume more food per capita than larger ones since certain economies of scale in food purchasing and use are given up. They also eat away from home more often. For one-person households, food away from home accounted for 40 percent of all food expenditures in the diary portion of the 1972-73 Consumer Expenditures Survey (14). For two- and three-person households, 27 to 28 percent went for food away from home, while four- and five-person households spent about 25 percent away from home and larger households about 21 percent (14). For nearly all

income groups above \$8,000 per year, more than half of the food budget was spent away from home.

Changes in household composition had more effect on per capita expenditures for food for use at home than did changes in the quantity of food purchased in half the years between 1960 and 1974. For a number of kinds of food, changes in household composition also help explain a significant portion of the changes in per capita consumption. These food groups include fluid milk, ice cream, meat, potatoes, fruits, and fats and oils. Some other groups have shown greater increases in consumption than would have been expected. These include cheese, poultry, vegetables, dry beans, peas and nuts, and sugar and sweeteners. Eggs and cereal and bakery products have actually declined in per capita consumption.

Income. One of the strong forces affecting consumption behavior has been the dramatic increase in real per capita disposable income. The 1974-75 recession and inflation brought a painful pause to this rise, but real per capita disposable income grew 3 percent in 1976. Between 1975 and 1985, ERS projects real per capita disposable income to increase 20 percent or 1.8 percent annually.

The rise in real family income has been even more rapid—due largely to the growing proportion of wives in the labor force. In 1975, about 43 percent of wives worked, but in homes in the \$25,000-or-more income class, the ratio was about 54 percent. During the next 10 years the distribution of family income will become more concentrated in the upper income brackets. In 1975, only 14 percent of families earned \$25,000 or more (table 1). By 1985, the Conference Board projects that the number of families earning over \$25,000 in 1975 dollars will come to 30 percent.

Because of the low income elasticity for food, continued growth in real income will have a larger impact on the demand for specific types of food, additional services, and eating out than

Table 1—Percentage distribution of families and real family income by income class, 1975 and 1985

Income class (1975 dollars)	1975		1985	
	Families	Family income	Families	Family income
	<i>Percent</i>			
\$25,000 and over	14.1	32.0	30.1	54.0
\$15,000-25,000	30.6	38.0	32.1	30.0
Under \$15,000	55.4	30.0	37.9	16.0

Source: Linden, Fabian (7, chart 1 and table 1)

on the overall quantity of food. With time becoming an increasingly valuable resource, demand should continue strong for new food products stressing quality, variety, and convenience in both preparation and cleanup. Microwave ovens are now selling more than a million a year. But, while incomes are rising, so are taxes and expenditures for basics such as housing and medical care. Thus, many consumers will continue to limit food expenditures.

Lifestyles. Changing lifestyles are less well documented than population and income changes. The first thing to be said is that most Americans follow a standard American middle-class lifestyle. Purchasing and consumption behavior is heavily conditioned by the common base of information and attitudes. In this kind of society with a dominant lifestyle, changes in the dominant lifestyle over time have obvious effects on consumption behavior. The boom in casual clothing reflects the same change in lifestyles as the rapid growth in fast-food establishments.

Another change in ways of life is the growing popularity of home gardening. A recent national survey found that nearly half of all U.S. households have a vegetable garden. This is not just a reaction to higher food prices but reflects a heightened awareness of food issues concerning quality, nutrition, and health.

Quality, services, and prices. Population, income, and lifestyle changes generally point to increased demand for quality and services more than for quantity. But the goods and services for which food expenditures are measured are mixed together.

A small amount of research has looked at some of the variations in services and quality relative to prices of food (9), and the demand for processing and marketing services (16).

In cross-section surveys where quantity or price data are available, more analyses of this type are needed. Aside from the intrinsic interest in the question, separating the effects of quality and services from those of quantity changes will allow the analyst to use expenditure data as a stand-in for quantity data with substantially more confidence in the results.

Offsetting forces. The unusual food-price increases since 1973 caused shifts in consumption patterns of individual foods that moderate the forces discussed above. Demand fell for highly-processed convenience foods, snacks, and soft drinks and led to increased demand for vegetable protein extenders, cheese, dry beans and peas as consumers searched for lower cost sources of protein. Separating per capita expenditures for different foods revealed that from 1960 to 1972 there was a steady shift to more expensive foods, but that a significant reverse shift to less expensive foods occurred between 1973 and 1974 (8).

A force with lasting influence on food consumption habits may

be the growing concern with food safety. This has spilled over from organized interest groups to a broad cross section of society. A University of California study on consumer food shopping found that:

Shoppers seem to divide food into two nutritional categories, natural foods which are good for you and manmade foods which are bad. Most believe that additives, sugar, artificial flavoring, coloring and processing are the antithesis to nutrition. Processing in particular is seen as robbing food of its natural nutrition...(17).

This concern coupled with stricter food and drug regulations may limit the development of many "fabricated" food products.

In monitoring consumer satisfaction with food products and services, ERS found that while satisfaction with food products in general increased more than 2 percent from 1974 to 1976, satisfaction with prepared or convenience foods fell over 5 percent. Survey participants said they were less satisfied about the healthfulness of convenience foods.

Away-from-Home Eating

Forces affecting food consumption patterns have had more impact on the away-from-home than the at-home food market. The away-from-home market is sensitive to changes in income and household size. Food expenditures in this market would have increased nearly 9 percent between 1960 and 1975, solely because of the increasing proportion of small households, if we assume that the relationships in the 1972-73 Consumer Expenditures Survey diary data held. Furthermore, the fast-food segment of this market has reduced the cost of eating out, made it more convenient, and improved the quality control of its product.

An ERS study placed the size of the total away-from-home market at \$35 billion in 1969. Assuming the ratio of sales in eating places to those in the total away-from-home market were the same as in 1969, the 1975 away-from-home market was estimated at about \$65 billion, or 6 percent of personal disposable income (15). If real per capita disposable income grows 20 percent between 1975 and 1985 and the same proportion is allocated to eating out as in 1975, the total 1985 away-from-home market would be about \$85 billion measured in 1975 dollars.

The BLS Consumer Expenditure Surveys (14) show that between the survey of 1960-61 and that of 1972-73, the portion of personal consumption expenditures for food allocated to away-from-home eating rose from 17 to 27 percent. Constant dollar sales from 1963 to 1973 rose 48.3 percent—a 4.5-percent annual rate. During this period, fast-food establishments' share of this market went from 13 to 27 percent, while the restaurant and

lunchroom share fell from 62 to 47 percent. However, since 1970, restaurant, cafeteria, and lunchroom sales have outpaced fast-food establishment sales. This may reflect the movement of the teenage population bulge of the 1960's into older age brackets and the desire for more service, variety, and higher quality. Many fast-food firms are responding with fancier decor and seating areas, along with expanded menus.

DOMESTIC FOOD ASSISTANCE PROGRAMS

The domestic food programs nearly tripled in cost in the last 5 years. Drastic changes took place in structure and in impacts on the Federal budget, on taxpayers, on nutritional levels, on the markets for farm products, and on the income levels of the poor.

Emergency distribution of surplus food during the 1930's has expanded into a family of related programs aimed at improving the nutritional status of infants, children, and low-income families. Current operations include: (1) the Food Stamp Program; (2) National School Lunch and Breakfast Programs; (3) a Special Milk Program; (4) a Special Food Service Program for children during the summer and in day-care centers, nursery schools, camps, and other nonresidential institutions; (5) several programs providing needy mothers, infants and children with nutritionally rich supplemental foods; and (6) Commodity Distribution programs serving disaster victims, Indians on reservations, schools, hospitals, institutions housing low-income persons, the elderly, and other authorized food services.

In the past 10 years, the School Breakfast, Special Food, and Supplemental programs were initiated to supplement existing programs for the nutritional needs of poor families. Also, shifts were made in the primary programs because of changes in (1) agricultural and economic conditions, (2) priorities for food and nutrition, and (3) the Federal Government's role in achieving these goals.

Structural changes in the USDA food and nutrition programs during the past decade include:

1. Family food programs have shifted emphasis from diet supplementation to a full nutrition concept.
2. In 1974, the Food Stamp Program became a national approach to food assistance for families.
3. National income and other standards for program participation replaced varied State and local standards.
4. Greater emphasis was given to assuring that children from low-income families have access to free- or reduced-price school or other institutional food services—and the Federal Government

has borne an increasing share of such costs.

5. Foods available under the agricultural price stabilization and surplus removal programs have become limited—accelerating shifts in Federal contributions from commodities to cash grants or purchase vouchers, such as food stamps.

With more participation and benefits, and higher food prices, the Federal cost of food aid programs rose from \$2.2 billion in 1970, to \$7.4 billion in 1975.

The food and nutrition programs make a measurable share of the total market for food. Federal contributions in 1975 were equivalent to 4 percent of total U.S. food expenditures—up from about 1 percent in 1969. If family purchases of food stamps and spending by children and States for school meals and milk are included, total program expenditures were equivalent to about 6 percent of total U.S. expenditures for food at home and away from home.

The Federal Government will provide about \$23 billion in public assistance and other income supplements in fiscal 1977. This excludes retirement (Social Security) and unemployment programs. The largest item of public assistance-income supplement expenditures is for food and nutrition programs.

The research needed to provide the basis for policymaking falls in three broad areas:

1. Economic impact of current and alternative food and nutrition programs upon food stamp households, school lunch students, and participants in other food programs and the effects on diets of participants.

2. The effects of present and alternative food assistance programs on domestic demand for food, food prices, employment, and income, and the effects on costs and effectiveness of farm and export programs.

3. The interactions between food assistance programs and other public assistance and income support programs, such as Aid for Dependent Children and Supplemental Security Income.

The food programs are likely to need ERS research for many years. The Food Stamp Program may well be converted to a cash welfare program within the next 5 years. Successor programs will need preliminary analyses and aftermath studies of the effects. Child nutrition seems firmly ensconced as a permanent program. Analysis there will deal with less cosmic issues than abolition of the program.

MARKETING

As marketing is included in the chapter on Structure, Control, and Use of Resources, comments here will be brief. After years of

rapid structural change in the food manufacturing and distribution sectors, the next decade may be one of relative calm. By the late 1960's, food manufacturers had largely completed a consolidation and diversification movement that transformed much of the industry into national or multinational firms. These firms emphasize nationally-advertised brands, continuously develop new products, and maintain costly sales networks. Some small regional processors survived the consolidation movement by specializing in the efficient production of limited product lines and by relying on private labels.

The food distribution sector has also largely completed its adoption of the supermarket. Independent retailers have survived in competition with retail food chains by affiliating with voluntary and cooperative wholesale arrangements. The advantage of the large chains centers on superior preretailing organizations and private label products. Independents and small chains lack some of the cost advantages of the big chains but are more flexible and offer a larger selection of nationally promoted products.

This general pattern of specialization between large and small food manufacturers and distributors will probably characterize competitive behavior in the next decade. Large diversified food processing firms will continue to add and spin off products in a constant search for new opportunities. Further automation will continue as computers and sensors are miniaturized to control processing, handling, and shipping operations. Higher supermarket density and slow population growth will cause intense competition to increase market share and sales per store. Central preparation of produce and meat and electronic checkstands in conjunction with the universal product code may increase productivity.

Despite the variety of food store types, national brands, and private labels, some segments of the population are not well served. This includes those desiring natural and less processed foods and simpler, more personalized distribution. Recent legislation would encourage direct farm-to-consumer markets. What are the potentials, strengths, and weaknesses of such alternative systems?

The inner city is another area where the present system has not served well. Some cities, such as Newark, have lost 50 percent of their supermarkets.

PRICING

Commodity Pricing

Pricemaking is the heart of any marketing system. This is especially true for perishable products where supply conditions

change daily or hourly. The static concepts of price theory provide a beginning in understanding the pricemaking process, but full understanding can come only with recognition of the dynamic character of the process. The concept of the equilibrium price is a convenient abstraction, but one must go beyond it to understand the process which makes one price "right" at a given moment and "wrong" the next moment.

At the outset, it is necessary to recognize that in agriculture we have a type of supply-and-demand pricing, not to be confused with the quoted-price system prevalent in most manufacturing industries (1). Under supply-and-demand pricing, the seller offers his available supply of goods for sale at whatever price the market will bring. Under the quoted-price system, the seller names a price at which he is willing to sell and takes orders.

The objective of any type of pricing system is to establish the price for each commodity (strictly speaking, for each type, size, grade, and quality of the commodity) that will equate supply and demand, that is, clear the market, at a given time. It should establish that price with a minimum expenditure of effort on the part of buyers and sellers. Furthermore, it should minimize uncertainty by holding down distortions of the price structure—the relationships between: (1) prices of different grades and types of the commodity, (2) prices of substitutable commodities, (3) prices of the commodity at different geographic points, and (4) prices of the commodity at different times.

To accomplish these objectives perfectly would require impossibly complete knowledge of present, potential, and forthcoming supplies and demands. Thus, a realistic goal is not complete elimination of variations in prices and distortions of price structure but their minimization.

Most livestock, both feeder and slaughter animals, are now priced in a decentralized marketing system. A considerable volume of meat is traded on a formula pricing system. Numerous instances of vertical integration in the livestock-meat industry result in internal determination of product values rather than market-determined prices.

Many questions have arisen in the industry about these changes in the pricing process. Are prices reported at central markets applicable in decentralized trading? Producers feel that marketing agencies no longer represent their interests in the bargaining process and that they themselves have inadequate market information and expertise to participate in the new bargaining situations. Meat packers continue to use the *National Provisioner* "Yellow Sheet" as a basis for trading, but admit that its prices may not accurately represent their products. This inaccuracy of the "Yellow Sheet" is attributed to the quotation of nominal

rather than actual prices and inaccurate description of a typical sale. Many retail chains take physical possession of large volumes of meat in central warehouses rather than at the retail stores. This has an important effect on their bargaining position in meat packing, by making possible larger purchases.

Product pricing procedures under alternative marketing institutions must be understood in order to know where, from whom, and how to collect and analyze prices and other market information.

Part of the pricing problem is perceptual. Pricing systems are alive and well in most agricultural industries despite rumors of their demise. But they may not conform to the economist's image of open market pricing. This means that researchers need to know how the system works and how it is changing. For some commodities and some industries, our knowledge is good. For others it needs updating.

Pricing systems will continue to change as market organization is modified and the firms in the market develop new strategies. ERS needs a continuing watch of these changes. What are the pluses and minuses involved in such changes? What are the major tradeoffs between the efficiency of the pricing process and its accuracy? The tools for examining such questions are rudimentary.

The role and function of futures markets in the pricing process is probably better understood by the specialists and less understood by the rest of the research community than most other aspects of the food and fiber system.

Some possibilities for major change in pricing systems have been examined (3). These include centralized remote access markets (electronic exchanges) and mandatory reporting of transactions to the market news service. Further exploration is necessary.

Food Pricing

The process of demand creation through differentiation of products in the past 75 years has changed many foods from "commodities" to differentiated products. In trade parlance, commodities are those products either unbranded or weakly branded where prices are subject to the fairly full play of changes in supply and demand. Prices of commodities fluctuate more widely than those of differentiated products.

The only items still sold as commodities at the retail level are perishables, and not all of them. Fresh fruits and vegetables, broilers, turkeys, eggs, and meat are almost the only products left in the commodity category.

Milk changed from a commodity in the 1960's. Fresh meat changed somewhat in 1969-70. Partly in response to studies which

showed that meat could be more profitable to retailers if it were merchandised more like other products, the spread between wholesale and retail prices for beef moved to a new level in 1969 and pork in 1970.

Retailers have long been fond of stable prices. Their customers have kept them well aware of the undesirable attributes of prices that go up. And retailers had no trouble in perceiving that, if the price went down today, it was quite likely to go up in the not-too-distant future...which encouraged a certain reluctance to lower prices. It has long been true that retail prices follow wholesale prices more promptly when they are rising than when they are falling.

The developments of the late sixties and early seventies—culminating in the 1972-75 experience—encouraged this reluctance. Boycotts, high-price charges, and then price controls all contributed. Retailers are now more sensitive and less likely to lower prices promptly when wholesale prices go down—despite efforts to make them see the error of their ways.

Retail food distribution is becoming more diverse in terms of the variety of sources available to the consumer and more concentrated in control by large firms. If the retail firm becomes large enough to have a procurement policy other than that of accepting what sellers offer at quoted prices, it begins to influence the organization and operation of supplying markets. With supermarkets accounting for over half of retail food sales, the procurement and pricing practices of retail organizations have a major impact upon processors and producers of farm products.

REGULATION

In recent years, consumers and firms have been increasingly critical of government regulation and of the authority and capacity of the regulatory agencies to deal with problems. The President, Congress, State legislatures, and the regulatory agencies themselves are actively considering reforms. Proposals range from the complete abolition of regulation through changes in regulatory procedure to the extension of regulation into new areas.

Oddly, “regulation” is in ill repute just when “consumer protection” and “environmental safeguards” have become watchwords.

Recent food and clothing price increases and rising costs at every stage in the food chain have focused renewed attention on the efficiency of the food and fiber system. Regulation occurs at every stage of the production, processing, distribution, and retailing of food and fiber products.

The most currently visible USDA regulatory activities may be the Federal market orders for fruits, vegetables, and milk.

Although marketing control programs for fruits and vegetables have been in effect for many years, they have recently been challenged on several fronts. The antitrust agencies have raised questions concerning the impact of market-order programs on consumers and the programs' possible relationship to monopoly behavior of agricultural cooperatives. Consumer groups have blamed the market-order programs for increased retail prices for some fruits and vegetables and want representation on the committees that administer the orders.

Federal milk marketing orders have come under increased public scrutiny in the past few years. A key concern is focused on the price results of the order programs. Critics suggest that orders are no longer necessary and are keeping prices at an artificially high level. Various government regulatory agencies (USDA, Federal Trade Commission, the Department of Justice), consumer and producer groups, research institutes, and congressional committees are studying Federal orders.

Formerly there was little concern for research on marketing orders—they were established and maintained by democratic producer vote and were, *ipso facto*, beneficial to producers. However, we now find ourselves deluged with consumer-oriented FTC and other agency requests for cost-benefit studies of orders, a subject that had never before been of interest to anyone, except economists.

The Federal market orders are highly visible, but other regulatory activities also have potentially significant effects on the functioning of the food and fiber system and research on them will continue to be important to ERS in the next decade.

A growing area in recent years is that of impact analyses of the effects of regulation. First came environmental impact studies of the effects of pollution and other environmental regulations on costs, prices, income, and related variables. Now economic impact statements are required by Executive Order for a wide range of administrative actions. Several proposals now before Congress would require cost-benefit analyses for every regulation issued by the executive branch and for every legislative proposal sent to Congress. If anything like these bills comes to pass, the present small-scale activity of preparing impact statements will develop into a large demander of economic analysis.

Questions of whether or not food prices are "too high" have come to the front in the last few years. Formerly, the question was hardly ever considered. The usual question was: Are prices too low to enable farmers to live in dignity or to obtain an adequate supply of a given product?

The "too high" problem arises in a legal sense from the provision of the Capper-Volstead Act that requires the Secretary of

Agriculture to take legal action against a cooperative that has unduly enhanced prices. The recent USDA task force effort on this with respect to fluid milk needs to be followed by longer term research efforts to put the question into a manageable analytical framework and to provide guidelines for administration of the Capper-Volstead Act.

The more general question of high prices is certain to be a consumer issue of importance in the next decade. The theory available to deal with such a problem is that provided by welfare economics. It is less than adequate, rooted in static concepts and oblivious to the costs of adjustment by producers and consumers. The new effort in analysis of price instability problems could give some handles.

Food safety regulation is coming to the fore. Both the environmental movement and the consumer movement converge on the food and fiber system with food safety concerns. Regulation of pesticides, additives, growth stimulants, and a wide variety of other safety-related problems, create added costs and uncertain benefits. Outside of pesticides, almost no research is now being done on safety. The Food and Drug Administration, which has a major responsibility in this area, has no capability in economic analysis and no plans to create any. Consequently, there is both an opportunity and a responsibility for expanded ERS economic analysis.

INFORMATION

The forces leading to rapid growth of highly processed foods, away-from-home eating, and large diversified processors and distributors, have created a lack of confidence among many consumers. They are demanding information to help them make better informed purchase decisions. Food manufacturers spend large sums on advertising food products, but over 70 percent of those consumers interviewed in recent nationwide surveys expressed moderate to strong dissatisfaction about the reliability of such advertising (5). In recent years, many additional forms of shopping information have become available to consumers at point of purchase. These include unit pricing, open dating, nutritional labeling, and listing of major ingredients. Other proposals include: drained weight labeling, complete ingredient labeling, mandatory item pricing, and labeling of waxes used on fresh fruits and vegetables. Tighter regulation of nutritional claims in food advertising may soon be adopted.

The rapid increase in programs for disclosing product information has also increased the need for evaluating these programs. How much information can be assimilated? How does infor-

mation disclosure affect the behavior of consumers and marketing firms? Several studies have evaluated the costs and benefits of consumers' knowledge, use, and attitudes toward unit pricing, nutritional labeling, and open dating (10).

Consumers generally have a favorable attitude toward these food shopping information aids and more are using them. Consumer surveys in the early 1970's indicated that 40 percent used open dating and in 1976, a nationwide ERS survey found 90 percent doing so (11). However, shoppers have been confused by the variety of open date codes and most found the information difficult to understand.

Research shows that consumers strongly support information programs but many use this information only sporadically. These studies find little evidence that information aids alter purchase behavior. Questions about how much information can be assimilated and used by consumers and about its cost need further study.

Benefits to consumers from information disclosure programs also come indirectly from altered conduct of marketing firms. Padberg concludes that:

The implementation of a program requiring disclosure of basic information about food products tends to exert a new sensitivity and discipline on the market largely because of the responses of food manufacturers and distributors. The open disclosure of facts tends to constitute a public commitment on the part of the firm and make it rational for the firm to implement programs to fulfill this commitment (10).

Open dating improves freshness and quality with easier stock rotation and quality control. Nutritional labeling improves formulation of food products and becomes a force in competition between brands. Unit pricing discourages deceptive pricing practices between different size containers. Research designed to modify existing information programs and develop new ones must consider the impact of disclosure on firm conduct as well as on the consumer.

IMPLICATIONS FOR ERS

What does all this mean for ERS in the next decade? Obviously no one can prescribe a complete research program with assurance for that long. The world moves too rapidly in unexpected directions. What one can say from looking at this set of problems is more relevant to the general posture of ERS than to specific research plans.

ERS research should have two principal thrusts—monitoring and analysis of specific problems. Save for outlook and situation work, monitoring is largely a sideline activity in ERS. From time to time, a gentle bow is given in this direction under the heading of economic intelligence, but it is not highly regarded in a profession devoted to so-called hard analysis involving the full panoply of accepted research methods.

The lack of attention to monitoring has a number of causes, as Farrell points out (2). Not the least of these is a disposition to regard numbers (data, statistics) as the only kind of intelligence worth serious consideration. Yet, some of the most important economic intelligence deals not with numbers but with descriptions of what people and firms are doing.

Since economists seem predisposed in favor of hard numbers and hard analysis, ERS needs to make a conscious effort to expand and improve monitoring. In what follows, we hope to identify some areas where monitoring is called for. We would expect that such monitoring would lead to more formal analysis in many instances. Situation reports and other analyses would cover a broader range than just the supply-demand-price constructs. ERS must continue to give careful attention to statistical data in the future, but it must not focus all of its monitoring activity on statistics.

One particular monitoring operation already in place is the continuing survey of consumers' food-related attitudes and behavior. It will be a means of tracking the public perception of issues that might lead to new or different regulation. At the same time, it will provide tracking of consumer behavior in many food-related fields.

Data for a panel of households are available commercially, which would provide, for each member of the household, information on each meal eaten at home or away from home for a 2-week period in each quarter. Combined with disaggregated population and economic projections, these data could shed new light on the changing demands for agricultural products in the away-from-home market.

A major area for monitoring is in the strategy and behavior of business firms. This requires a flow of information from trade publications and direct contacts with industry and with other government agencies regulating or servicing the industries. Monitoring of this kind provides the basis for an informed viewpoint on the nature and state of competition in specific industries and markets.

In addition to monitoring activities, ERS will need to expand analysis of the impact of specific programs on domestic consumers' needs and demand for food. Domestic food assistance

programs need much more program evaluation and research support. So do existing and proposed regulations of the food and fiber system. Cost-benefit studies of market orders and certain provisions of the Capper-Volstead Act have already been mentioned.

Another regulatory question with potentially large impact on the demand for specific foods is that of food safety—particularly the use of chemical additives. What should be the standard of food safety? At what cost? These and other policy questions will require much more analysis. This kind of research could follow the multidisciplinary format proposed by the recent ERS workshop on technology assessment. Finally, ERS needs to communicate its research findings to a clientele that is increasingly consumer oriented.

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Review of: DOMESTIC FOOD AND FIBER NEEDS AND DEMANDS

by
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The paper provides an excellent perspective on current and future research needs of ERS with respect to food. Fibers receive only limited mention. The section on food consumption is the most comprehensive while that on regulatory activities underlines its growing importance. Cost-benefit analysis, food safety, and consumer information are likely to be important future research areas.

GENERAL COMMENTS

If the ERS clientele has been expanded to include consumer groups then research on basic consumer rights in the marketplace should be undertaken. These include the right to safety, the right to information, the right to choose, and the right to be heard. The last refers to the provision for consumer input in the development of regulations for producing and marketing consumer goods and services. Decisions about labeling, grading, safety, and marketing regulations should incorporate consumer as well as producer input.

I agree completely with the authors about the importance of monitoring research activities. Monitoring performs two important functions: it keeps ERS in touch with current developments and provides information on the impact of previous policy decisions. It alerts ERS to changes that may require investigation and helps to determine future research needs.

I have no doubt that devotion to econometric techniques will continue. However, the forecasts of the past few years indicate the dangers of over-reliance on hard analysis. The major problems are the validity of the underlying assumptions and the availability of good data. Simplification may result in models with limited predictive power if significant variables are omitted.

Communication of research results also counts. Communication to consumers should be expanded and tailored to the needs of different groups. Information should be put in non-technical language without the assumption common to many government publications that the reader is also a specialist in the area.

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SPECIFIC COMMENTS

I realize that it was not possible to include all research areas and that failure to mention or discuss certain areas may reflect time and space constraints facing the authors rather than the neglect of such areas. This reservation should be borne in mind in what follows:

Fibers

The fiber area receives only limited attention, though it is certainly important to farmers, processors, and consumers of textile products. Research on fibers is also significant with respect to the following:

Regulation. Flammability standards for textile products will continue to have a major impact on the cotton grower and the consumer. There are also regulations affecting the health and economic well-being of the cotton grower and the cotton processor at the mill.

Information. Interest in performance labeling and care labeling has increased.

One advantage of combining fiber and food research is the similarity of many of the consumer issues. Interest in consumer protection has generated demand for safer foods and fibers and more consumer information. However, safety costs money and the additional benefits must be weighed against the additional costs. The consumer is exposed to fiber identification labeling and nutritional labeling but such information must be stated more clearly in terms that will be understood. The development of care labeling and performance labeling reflects the inadequacy of fiber identification labeling as an information device. Nutritional labeling, too, appears to have been designed more for the nutritionist than for the consumer.

Demand for Food and Fiber

The growth of convenience foods, gourmet cooking, and fast-food chains is a reflection of changing lifestyles. Of particular interest here is the use of timesaving goods and services by different socioeconomic groups.

Domestic Food Assistance Programs

The three research areas outlined in the paper do not really address the basic issues which are:

- What are the objectives of the food assistance program?
- Do these objectives conflict? If so, how are they to be reconciled?
- Is the program the most cost-effective one for obtaining the desired objectives?

Thus in the case of the food stamp program one could cite two

major objectives: improvements in consumer welfare through an in-kind program, and improvements in farm operators' welfare by increasing the demand for food. However, there is a basic conflict between the objectives. If constraints are too great, program participation will be low, and all objectives will suffer. In contrast, if the in-kind provisions impose little constraint on consumer choice then consumer diets and the demand for farm products are similar to those resulting from a cash program. The primary justification for an in-kind program will have been removed.

Consideration should also be given to changing objectives over time. In periods of rising farm income and rising food prices the objective of increasing the demand for farm products may be less important than that of assisting the low-income consumer.

Finally, the cost-effectiveness of different methods of achieving desired objectives should be subject to continual review. The real danger with in-kind programs is that the agency conducting such programs tends to become biased.

Production and Marketing

Food is important in the consumption process because food prices significantly affect consumer welfare. Competitive conditions at all levels will continue to interest the consumer. The reluctance to lower food retail prices in face of declining wholesale prices is perceived as an exercise of market power rather than concern on the part of retailers for potential consumer reaction when prices are increased later. Research in this area, including increased use of food specials when wholesale prices are declining would serve to indicate the degree to which food retailing has moved from price to nonprice competition.

Regulations

This area may be divided into four categories: regulation of consumer products, regulation of the environment, regulation of the worker environment and economic conditions, and regulation of the market system under which goods are produced and consumed.

Most of these categories have been discussed in the paper. However, regulations affecting labor were not discussed. These would include not only occupational health and safety, such as use of pesticides in crop production and cotton-related dust, but also government policy with respect to employment and welfare, such as minimum wages, income maintenance program.

The regulation of the market system has been discussed with respect to various marketing orders. But of greater importance are such things as price controls, export controls, and import controls. The issue is a sensitive one and there will be conflicts of interest between producers and consumers—both of whom are

included in the clientele of the ERS. Objective research on the consequence of controls should include estimates of the gains and losses to each group from the imposition of controls in both the short and the long run.

I concur completely with the authors that all regulations should be assessed with respect to costs and benefits and that there is likely to be a continuing demand for such analyses in the future.

Information

Information is one of the four major consumer rights and is likely to remain so. There is need for extensive research related to consumer behavior in the marketplace—in particular, consumer information processing. Many informational programs are unsuccessful because of high educational and time requirements. The cost of obtaining information in many instances far outweighs the benefit. If information is poorly presented or is time-consuming to use, as in care labeling of textiles and nutritional labeling, then it is likely to be underused by consumers.

The possibilities of mandatory, as opposed to voluntary, information programs should also be investigated. Mandatory programs may sometimes be required to standardize the terms used and to clarify consumer information. At times the benefits from mandatory labeling, such as those from drained weight labeling, may be less than the costs. Research on costs and consumer usage is important since the demand for information is frequently unaccompanied by a recognition of its cost or the consumer's ability to use it correctly.

A third area concerns the economic education of consumers. Consumers need to be informed of the economic consequences of programs and policies. Unless consumers are informed, their input in the decision process is of little value. Information is necessary for proper exercise of the consumer's right to be heard, and agencies responsible for obtaining consumer input should also be responsible for educating the consumer.

Finally, there is the whole issue of grading, including determination of grades and their usefulness to producers, distributors, and consumers.

Review of: DOMESTIC FOOD AND FIBER NEEDS AND DEMANDS

by
John K. Hanes*

Alden Manchester and Charles Handy have a thought-provoking paper. They provide a comprehensive catalog of many factors likely to account for future changes in food consumption. However, fiber appears only in the title.

A cataloging of the factors likely to account for future changes in food and fiber consumption is only a first step. The next step should be an organized effort to provide disaggregated numerical measures of domestic food and fiber needs in the years ahead. As a third step, ERS should develop a "balance sheet" or "input-output model" of food and fiber needs and the resources that will be required to fulfill those needs.

Although the authors did not stick to the assigned topic, I commend them for going beyond and bringing in material on pricing and the effects of pricing systems.

Most of the major issues confronting the food and fiber divisions of ERS during the past 3 years have been related to pricing and pricing systems. Of the 11 consumer issues listed in the introduction of the paper, we see that six are related to the operation of pricing systems.

I would like to clarify some of the terminology and concepts, expand on the basic premise presented by the authors, and suggest a tighter conceptual framework.

I will begin by focusing on the first sentence of the second paragraph in the section on pricing:

At the outset, it is necessary to recognize that in agriculture we have a type of supply-and-demand pricing, not to be confused with the quoted-price system prevalent in most manufacturing industries.

I agree that a clear distinction should be made between the two general types of pricing systems. However, I must object to the term "supply-and-demand pricing." All pricing, quoted or otherwise, is supply-and-demand pricing. I suggest that the descriptive term "cobweb pricing" be substituted, but would accept most any other suitable term. In what follows I will use "cobweb pricing."

Clark used the term "quoted price" to characterize the pricing of manufactured goods. However, the important distinction that

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he was making is that in quoted-price manufactured markets, quantity is a function of price (an elasticity concept). The seller names a price at which he is willing to sell and takes orders. But in cobweb markets, price is a function of quantity (a price flexibility concept). The sellers offer an available supply of products at the current market price. Clark also makes the point that simply quoting a price did not imply that the seller had the power to change the market price.

Thus, I would argue that retail supermarkets have the characteristics of Clark's quoted-price markets. However, to maintain any other distinctions that the authors consider to be important, I will use the term "quoted-price type" when referring to markets for agricultural products that approach the type described by Clark.

It would be convenient to view the work, as the authors do, as consisting of cobweb-price type markets for agricultural commodities and quoted-price markets for manufactured goods. Unfortunately, the world is not that simple. Most agricultural products are first sold as commodities in cobweb-price type markets but reach the consumer, as differentiated products, in quoted-price type retail stores. We are usually critical of retailers for not adopting more responsive pricing policies that are sensitive to price adjustments in the primary agricultural markets.

But why should the retailer be more sensitive in responding to price changes in commodity markets? By the time the differentiated agricultural product reaches his store it has almost all of the characteristics of a manufactured product. Why would he choose to follow a different pricing policy for canned goods than for pots and pans, or for cheese than for paper goods?

The retailer does not know that he is following a quoted-price type pricing policy, or that most of the items sold in his store are initially purchased by processors in cobweb-type markets. Consumers and retailers do know that food prices are much more variable than the prices of fountain pens and pots, but they do not like it. Each price change imposes decision costs on consumers and pricing costs on retailers. Thus, both consumers and retailers have a stake in maintaining stable prices.

As consumers and retailers strive for stable prices in the product markets, this imposes burdens on the commodity markets from which these products must come. Price variation is required for the proper functioning of the commodity markets and when prices are restricted at the retail level the price changes that are required to accomplish specific adjustments are magnified in the commodity markets. Price stability in the retail markets means more instability in the primary commodity markets.

We may also observe that consumer prices in the away-from-

home food market are even more stable than in retail food stores. Restaurant and carry-out food prices are more responsive to the general price level than to the prices of agricultural commodities.

An exception to this price dilemma is contract production. Contracts provide a mechanism for processors, who must sell to customers operating in quoted-price markets, to avoid some of the vagaries of the primary cobweb-type markets. But, even here there cannot be complete price stability because of the biological nature of farm production.

Each pricing system is unique to the specific commodity or product involved and exhibits a unique set of characteristics and problems. An explanation of current prices requires the use of a mixture of different concepts for complete understanding. For example, the grains price analyst deals primarily with stock concepts; the cobweb theorem is a useful device to illustrate annual price changes, and he does not expect current prices to be related to current costs of production. On the other hand, the dairy price analyst deals primarily with flow concepts; the cobweb theorem is not very useful, but he does expect current prices to be closely related to the *real* economic costs of production.

Why did the authors of the paper raise the issue, and why have I focused so much effort on delineating the mixed cobweb-quoted-price type markets that exist in the system? The implications as I view them are these:

- As away-from-home-eating continues to increase, a larger proportion of agricultural products will be consumed in the ultimate quoted-price market. Adjustments will be made in the meat content or product mix offered to the public, but we cannot expect responsive price adjustment in this market.
- There will be continuing pressure from the large diversified processors and integrated distributors to develop and promote differentiated agricultural products. This means that a continually increasing proportion of agricultural products will be sold to the consumer in quoted-price markets.
- Consumers will continue to press for stable prices and retailers will become even more fond of stable prices.
- Suppliers of away-from-home food market and integrated distributors will rely more and more on contracts, or develop other institutional arrangements, to protect themselves from the risk and uncertainty of the commodity markets that are destined to become more and more unstable.

This is not intended as warning of impending doom for the current pricing systems. I still agree with the authors that the "Pricing systems are alive and well in most agricultural industries despite the rumors of their demise." But, as ERS takes a forward

look and identifies issues likely to arise in the coming decade, I would suggest that an evaluation of pricing systems should be high on the priority list.

The problem in regulatory efforts is not in the basic theory of welfare economics as the authors say, but in ourselves as professional economists who must deal with real world problems. We cannot stand by and assert that textbook theory does not fit the problem. It is our responsibility to use the theory that is applicable and modify the theory in cases where it does not apply.

As it now stands, textbook welfare theory is simply price theory framed in a welfare orientation. The theory interprets the price-quantity results of static price models in terms of gains and losses to economic participants. If you agree with the implied content of demand curves and supply curves and the price-quantity results of price theory, then you must agree with the welfare theory interpretation of these results. To say that welfare theory is restricted primarily to price-quantity results is an acceptable criticism. But, to imply that welfare theory is not useful because it does not answer all of our questions is not acceptable.

Any time we pass judgments or reach conclusions about the impact of price results of economic participants, we are either making use of classic welfare theory or we are simply developing new theory to fit the situation.

Review of: DOMESTIC FOOD AND FIBER NEEDS AND DEMANDS

by
Leo V. Mayer*

The Manchester-Handy paper reflects the painstaking detail which the sponsoring agency strives for in carrying out its missions under the Reorganization Plan of 1961. Its weaknesses may arise more from the history of the agency than the professional characteristics of the authors.

No government agency that has experienced the pain of abolishment and reincarnation can soon regain its full self-confidence and authority to seek out and interpret sensitive public issue without fear of retribution. And confidence and authority is essential for a research agency. Academic communities learned that long ago; government research agencies more recently (6, ch. 3).

As stated by the chairman of the Forward Look Committee:

We want to reexamine the technical-socioeconomic conditions that are emerging to determine (1) relevance of our research program; (2) implications for change in our research program to better respond to new issues; and (3) how we can improve the information flow from analyst to users.

The Manchester-Handy paper touches on all three elements. It mentions with some antipathy the new pressures on the agricultural establishment from the environmental movement and the hunger lobby. It states that ERS has adjusted and will adjust its research program to reflect the changed importance of the issues. It closes by noting that ERS has two principal activities—monitoring and analysis of specific problems—and observes that “ERS needs to make a more conscious effort to do more monitoring and to do the job better.” I shall offer a somewhat different view, while recognizing that as a user of ERS information, my perspective is different.

Monitoring and analysis of agricultural and food problems are the bread and butter of agricultural economists. To do more has always been the goal of analysts in each of the institutions with which I have been associated. In the university, the goal was sought by expanding the stable of graduate students and in gov-

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ernment by fighting for budget slots. But one can question what this expansion achieves. In the universities, it ends up with post-doctoral people each having a lot of knowledge about a narrow issue which, in most cases, will become valueless rather quickly as he enters a world interested in broader issues. The greatest immediate payoff may come through his ability to give an indepth seminar to his prospective colleagues at another institution.

In the government, the system creates narrow job specialization so that agencies have personnel with a great knowledge of each major issue area. The printed reports of the agencies, however, reflect no more than a small proportion of the accumulated knowledge. To gain access to the larger portion, one must set up personal contact with the specialists. Given the time constraints of both sides, it is a process with rather limited results. It works reasonably well within the executive branch where a set of specialists can be convened on almost any subject in short order. But to those in other decision arenas, the possibilities are fewer.

What this argues for in my judgment is not more monitoring or more analysis, even though both would be useful, but more interpretation to the interested publics of the changes that are found, changes that affect their future and often perplex and antagonize them.¹

Permit me to illustrate with examples from the Manchester-Handy paper. The authors observe that "a recent national survey found that nearly half of all U.S. households have a vegetable garden." After a few words about heightened public awareness of food issues, they drop the subject. But this observation deserves much more interpretation. Does it mean that as food consumers find other sources of supply for their food needs, elasticity of market demand for these food products may relax? If so, future food price increases may run into far more consumer resistance than formerly.

Perhaps consumers took seriously one noted agricultural economist in 1973 who suggested that if they didn't want to pay high food prices, they could stop buying food. Americans have long been known for their ingenuity; abundant food may be one national characteristic that they are far less willing to give up than agricultural policymakers are aware.

Changes of this type and magnitude are important to the public. Monitoring by a Government agency is commendable but that alone does little for a public that may not understand the technical aspects of the issue. The public needs interpretation.

Let me take a second example. A little later, the authors

¹For other arguments leading up to this point, see (3).

observe that "domestic food programs nearly tripled in cost in the last 5 years..." Cost is an important public issue. But of at least equal importance are the characteristics of the millions of people who have taken part in the program. Why have they found it necessary or beneficial to participate? Why in a nation with nearly the highest average standard of living in the world, can such large numbers of people not pay their own food costs? Are average disposable income figures misleading or is the Government providing a part of the population with food so that they can buy and enjoy other consumable items? Are the recipients of food assistance programs really deficient in terms of both food and nonfood consumables? These are the kinds of questions that public policymakers pose.

Trends in such programs should be monitored and analyzed, but the interpretation is where the greatest deficiency lies. It is a deficiency that extends to other areas as well—food marketing, pricing, regulation and even production information. The antagonisms of food processors toward food regulation, for example, might be diminished if the efforts of consumer groups were seen within the context of a nation that has really become literate and informed in the past two decades. Access to the electronic media from childhood may have brought forth a generation which, in far larger numbers than ever before, treats each food dollar spent as a vote for or against some processor. If Presidents can be dislodged from office and congressional chairmen sent into retirement by public attitudes, food products are going to be subject to buyer rejection if the public sympathizes with the criticism of its contents.

These realities also affect my reaction to the Manchester-Handy paper. To be of maximum usefulness to the public today, ERS must handle many issues that are sensitive to public opinion. With a background of intense congressional reaction to previous research efforts, it is understandable that tighter limits may exist on sensitive research areas. But this is where the problems are: food reserves, estate taxes, disaster assistance, export controls, dairy marketing programs, intrasectoral farm income distribution, food aid, and more.

The objective of research on such issues should be to handle each factually, with a careful and full explanation of the issue to the public. Monitoring and developing statistical descriptions of each issue are essential. Analyzing the probable impact in terms of future exigencies is useful, but interpreting what each issue means to the many publics is the step that will provide the greatest payoff in terms of public service. Perhaps if the agricultural research community can approach such issues with candor, it can turn the future from a Manchester-Handy choice of adequate

consumer food supplies *or* farmers living in dignity, to a choice of a greater measure of both for each group. It's a goal worth pursuing.

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FOOD PRICES, CONSUMER BELIEFS AND VALUES

by
Robert V. Enochian*

The selection of food by individuals, how it is purchased or produced at home, and the ways it is handled are governed by relative prices and a number of beliefs and values. In making food choices, each individual balances costs; nutrition; health and safety considerations; pleasure aspects, including eating quality and convenience; environmental and resource concerns; and moral factors, including beliefs about killing animals and concerns for others less well off than himself. In combination, these factors determine the aggregate demand for food.

The hypothesis of this paper is that the weights given each of these factors by American consumers are changing and that, therefore, the aggregate demand for the type and form of food may shift. If we can identify and forecast the probable importance of these factors, more timely adjustments and decisions can be made by the food industry, by public regulatory agencies, and by policymakers.

A NEW SYSTEM OF VALUES IN THE UNITED STATES

In the 1960's a new ethic emerged in the United States. The outward signs of this ethic were the changed clothing and lifestyles of the under-30 population. These changes were precursors of a changing system of values that is now influencing a growing proportion of Americans. This system of values is characterized by a distrust of our institutions; by the rejection of some aspects of materialism; by a reduction in some kinds of consumption, particularly those which are thought to adversely affect personal health and the environment; and by an antitechnology and anti-waste bias.

Many feel that there is a conspiracy between industry and public regulatory agencies to promote industry welfare at the expense of consumer welfare and safety. This anxiety is accompanied by a desire to "return to nature" in backyard gardens or farming communes; an interest in organic foods that contain no pesticide residues, preservatives, colorants, or other additives; a growing inter-

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est in the home preservation of foods by canning, drying, or freezing; an interest in buying food in bulk, when possible, directly from the farmer, or harvesting with one's own labor; an interest in reducing consumption of animal products; and, finally, a growing interest in consuming no more than is necessary for good nutrition.

Higher food prices also result in the adoption of many of these practices by a seemingly growing number of consumers.

IMPACTS OF CHANGING VALUES AND INCREASING FOOD PRICES

Will the adoption of these practices have significant impacts on food demand, or are they fads that will disappear in a short time? Only time will enable us to tell for sure, but it is not too early to begin to try to identify what is most likely to occur.

Some consumers seem willing to pay more to get food that is free of pesticide residues, preservatives, and additives, and even food that has been grown without the use of "chemical" fertilizers.

Food industry representatives try to allay the anxiety over food safety by stating that there is no scientific basis for claims that industry practices are unsafe, and by labeling those who make such claims "food faddists" or "organic food nuts." Regulatory agencies tend to impose food safety standards that are more stringent than necessary. These approaches probably do a lot of harm by delaying responses that may be more credible. The anxiety and discontent will not stop until credible evidence is openly presented and the public is allowed to enter the debate in the formulation of policy.

Questions that beg for answers are: what are the risks? What will lower tolerances for insecticide residues cost? What are the alternatives and costs of disallowing certain types of preservatives and additives? ERS could not only develop measures of the impacts of lower tolerances for residues, additives, etc., but also could provide information that would influence the levels that consumers would be willing to accept.

The home growing and preservation of fruits and vegetables and direct buying from the farmer are also increasing. Factors other than costs also influence these practices, including the pleasures associated with acquiring food in this way and a dissatisfaction with the eating quality of fruits and vegetables acquired through regular commercial channels.

An example of the interest in direct buying is that at a recent opening of a new farmers market in San Jose, California, ten thousand shoppers showed up and in 2 days purchased over 15

tons of fresh apricots alone, as well as large quantities of other fresh fruits and vegetables direct from the growers. The California State Departments of Agriculture and of Consumer Affairs are encouraging this type of selling by sponsoring a direct marketing program. Under the program, consumers may call a toll-free number to find the nearest location where they can buy different commodities directly from farmers, either already harvested or that they can harvest themselves. Because these products move into consumption or into storage via home canning and freezing, food that might otherwise be wasted because of a lack of demand through regular commercial channels contributes to total available food supplies.

A recent ERS study of home gardening concluded that the perceived better quality of homegrown produce and the recreation or hobby aspects were the primary reasons for growing vegetables at home.

A recent event supporting the notion that Americans are not willing to ignore the food needs of the rest of the world was CARE's 1975 "Empty Plate Campaign" which urged Americans to skip one meal a week and send the money that meal would have cost to CARE. The 1-year campaign collected \$853,239.

How much each of these practices now contribute to total food supplies, as well as the physical and economic limits of these practices as means of increasing food supplies, can be determined.

ERS RESEARCH ROLE AND METHODOLOGY

It is still too soon to tell whether these practices will have a significant impact on the methods used for producing and marketing food in the United States. It is not too soon, however, to try to forecast how important some of the practices will become, and what their impacts will be under different assumptions. Such forecasts would be useful to the agricultural research community, to regulatory agencies, and to legislators.

To make such forecasts, more information is needed on the present importance of these practices, what is causing them, whether the causes are valid and will continue, whether there are counter developments taking place that will reduce their importance, and what the physical and economic limits to their adoption are.

Few or no data are currently available to indicate the importance of the changing practices. USDA annual consumption data, which are based on supply and utilization estimates, are gross figures that do not identify forms or sources of food supplies. These data would have to be developed from other sources.

USDA's decennial household food consumption survey could be used to identify trends in the different forms in which foods are purchased. This could be supplemented with surveys of different industry groups. Information on attitudes concerning additives, preservatives, residues, organic foods, and the willingness to share food supplies with other nations could be developed by consumer surveys, as could information on buying practices, home preservation, and other present and anticipated practices.

The results of these studies could be used for making recommendations on appropriate research in production, processing, marketing, and human nutrition. They could also be used to develop more effective extension and education programs on the relationship between the kinds of food consumed and nutrition and health, on requirements for home or small-scale food production in urban areas, on home food-preservation methods, and on providing more credible information regarding food safety. Finally, the information could be used to develop policy recommendations regarding the encouragement of home and urban gardening, bulk selling, direct marketing, waste reduction, and the use of pesticides and additives.

Abstract of: THE POTENTIAL FOR DECLINE IN RED MEAT CONSUMPTION

by

Edwin Carpenter, Louise M. Arthur, and Richard G. Stuby*

This paper proposes a new approach to estimating the potential decline in red meat consumption that may be caused by substitution of textured vegetable protein (TVP) products. The market penetration by TVP products may be conditioned by three factors—advances in TVP technology, traditional microeconomic variables, and longrun changes in consumer tastes and preferences. Only the first two have received much attention. Yet, a survey procedure for acquiring data to indicate changes in consumer tastes and preferences is now known.

A limited set of data from a nationwide telephone survey of attitudes toward predator control illustrates the kind of information that can be obtained by such techniques. A sample of 2,041 respondents were asked how much it bothered them that farm animals were killed for food. Thirty-nine percent responded, "It doesn't bother me;" 57 percent, "I don't like it but they (farm animals) are an important source of food;" and four percent, "I don't want them killed, even for food." These responses indicate that a majority of the respondents have attitudes that are inconsistent with their behavior; that is, they do not like the idea of animals being killed, but they do recognize the importance of meat as a source of food. The question then becomes whether people who are bothered by animals being killed for food might exercise the option of consuming TVP products in place of natural red meat and thus bring their behavior into closer agreement with their expressed attitudes.

These data alone cannot answer this question. However, they do generate hypotheses for future research. For example, the data suggest that young people (18-25 years) have more reservations about killing animals. What is not known is whether this attitude will change as they become older. By analyzing the responses of various age groupings at consecutive points in time, demand changes for red meat may be predicted. If the younger age cohort sustains its attitude and has meat substitutes available, downward shifts in red meat demand would be anticipated. Or, if attitudes shift as the cohort ages, the age-associated tastes and preferences would not be expected to change the per capita consumption of red meat.

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Abstract of: TRANSPORTATION TRENDS AND AGRICULTURE'S MARKETING STRUCTURE

by
T.Q. Hutchinson*

This paper discusses the potential impact of three significant trends in transportation on the market structure of agriculture. A generalized research approach is offered for the problem areas defined.

The Changing Rail-Rate Structure

Changes in the regulatory climate imply more use of variable rail rates (prices) structured to favor holding grain stocks close to production points. These, in turn, suggest a new grain marketing structure and increased risk for owners of grain inventories.

At least part of the rail rate variability (seasonal and peak rates) is intended to reduce peak period shipments. Grain harvest, historically, has created seasonal peaks and sporadic export demand created other peaks. Railroads can now recover additional costs stemming from peak demands and may be able to capture a share of the returns commonly associated with grain price uncertainty.

Railroad Equipment Changes

The trends toward large (100-ton) covered hopper cars for grain shipments and toward outside private ownership of these cars suggest increases in average firm size. Large firms are best able to: finance shipments made in multiples of 100 tons, finance the inventories implied by such shipments, and finance or assume the risks of owning or leasing fleets of covered hopper cars.

Small firms will serve local markets while a few substantially larger firms will fill export demand and the needs of grain-deficit regions. The changed structure, again, implies a redistribution of returns from grain production and marketing.

Change in Ocean Vessels

Grain exports now go in vessels capable of carrying 108,000 long tons and some vessels of 500,000-long-ton capacity exist. Present U.S. port facilities do not permit exporters to take full advantage of the savings available through use of these vessels. Since these savings amount to 50 percent or more, it seems likely

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that a dry-bulk superport will be constructed in the not too distant future. Research points to Hampton Roads, Virginia as the location of this port. This would shift the focus of grain exporting from the New Orleans-Baton Rouge, Louisiana area, with consequent changes in domestic transportation patterns and internal price relationships.

Research is Needed

The author believes that these changes in market structure and conduct have implications for public policy and public investment decisions. The ERS researcher should ascertain desirable adjustments for producers and desirable public actions to assist in making the adjustments. High among the needs are improvements in market information gathering and dissemination.

Abstract of: AUTOMATION IN FOOD MARKETING

by
Ray W. Nightingale*

This paper addresses automation in food marketing in the context of the continuing enlargement of the services sector of the economy relative to manufacturing. Predictions range from termination of the industrial age, to expanded industrialization fueled by superior management opportunities.¹

The opposing views stem from different perspectives on the nature and role of technological innovation. Automation of labor-intensive tasks has occurred mostly in manufacturing and extractive industries but the continuing growth of the services sector suggests a declining role for automation. Hence, economic growth seems threatened.

The managerial and "tool" components of an innovation are not readily separable and become less so as attention is focused on technology in the services sector. If new tools are to continue to increase productivity, an entirely new generation of tasks must be partially or fully automated. The skills augmented or displaced by automation will be less the manual (assembly) or the strictly clerical (data processing) and more those related to information assimilation, interpretation, and use.

The food distribution segment of the services sector has tended to seek productivity gains by the transfer of labor-intensive tasks to the customer through such innovations as self-service supermarkets and fast-food service establishments. Now electro-optical scanning devices are being employed in supermarketing to automate tasks previously requiring human skill. By machine-reading product information from bar-codes imprinted on products and shelf labels (and ultimately shipping cases and commercial documents) these scanners increase speed and accuracy of data assimilation and provide a base for automated information processing.

By seizing on this new technology to improve competitive positions in industry, management may bring about changes in food-industry structure and performance. Automation of routine and

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¹*The Coming of Post-Industrial Society: A Venture in Social Forecasting*, Daniel Bell, Basic Books, 1973; "Management and the 'Post-Industrial' Society," *The Public Interest*, 44: 69-103, 1976.

repetitive tasks in recording retail sales transactions or ordering will alter the working lives of many.

ERS can contribute to understanding of the nature and role of technological innovation and to orderly food industry growth by objectively identifying and assessing likely impacts of automation.

Chapter 3— PRODUCTION POTENTIALS

FORENOTE

What are the production potentials of American agriculture now that the food situation seems to have changed abruptly? What are they for the years ahead? Skold and Penn define capacity as the combined result of the means of production and available technology. This leads them to a detailed review of the fixed and variable inputs and the status of agricultural technology.

They find little slack in the cropland base, but room for analysis of incentives for land conversion and of competitive uses of land. Water resources, both surface and underground, present many economic problems, some acute. Among the various inputs reviewed, energy and environmental problems stand out.

The state of technology is unsatisfactory because we have been rapidly using up our existing store of knowledge and perhaps neglecting to support new research. Climate and weather need more attention. We need to improve the predictability of next year's weather and that beyond. All this is crucial to studies of reserve food stocks and related policy problems.

More knowledge is needed about the uncertainties of agriculture and how to deal with them. More information is wanted about crop responses on different soils to varied quantities of inputs.

The three reviewers commend the authors for a fine job of laying out some of the main issues but each has some reservations.

Bromley feels that the authors take too static a view, useful and informative, but limited. He calls for more imagination about new technology and legislative actions. He thinks that the ERS

tendency to be a Congressional Research Service has caused a neglect of a larger audience.

Roy Gray thinks the whole profession has become too engrossed with mathematical models—to the point of overlooking many real problems because they do not fit a model.

Reinsel believes Skold and Penn look at the problem too much in physical terms and should give more emphasis to prices, markets, and weather. He asks what is being done to stimulate changes in technology that might hold off the Malthusian wolf.

Green's contributed paper on research to answer energy questions presents a concise review of historical trends in energy use in agriculture and makes specific suggestions for a concentrated energy research program. Agriculture is concerned with direct farm uses of energy; with the indirect use in industries that make fertilizer, pesticides, and farm supplies; and with the use of energy in the processing and consumption of agricultural products. He points out the need for research to identify and develop alternative energy sources and energy conservation methods. He suggests formation of an energy group in ERS to build a consistent analytical capability such as a national-regional input-output framework for energy data.

Abstracts of three contributed papers directed to specific problems are included in this chapter. Gene Lee concentrates on the need for energy research in agriculture. He suggests interdisciplinary cooperation in exploring the feasibility of solar energy and other energy sources.

Taylor is also concerned with energy, but his focus is on conservation and prevention of energy waste. He sees the desirability of programs to stretch present supplies.

Robison and Simunek consider improved measures of accounting for capital formation and financing in agriculture. Research on this subject would lead to more effective organization and operation of farms and thus increase production capacity.

PRODUCTION POTENTIALS IN U.S. AGRICULTURE

by
Melvin D. Skold and J. B. Penn*

INTRODUCTION

The United States had long been accustomed to an abundant and growing food supply far in excess of national needs. Then came the world-wide events which abruptly changed our perspective on the domestic and world food situation. The series of major shocks in the past few years calls for a new examination of the situation.

Rapid changes in the U.S. food and fiber system included: near cessation of outmigration from agriculture, drawing down of grain reserves to near all-time lows, recommitting of our land reserves, development of new rules governing trade and exchange between countries, and an apparent leveling off of long-sustained growth in productivity.

The purpose of this paper is to examine the current domestic food situation and to look ahead over the next decade or so at one aspect of that situation—our ability to produce.

Since some confusion exists about concepts in previous studies of capacity to produce, it will be useful to clarify the context in which we examine the subject.¹ We view capacity as the combination of available means for production of food and fiber—the stocks of capital and land, and the technology at the given time. Production at any time may be at capacity or at less than full capacity. Expansion or contraction of capacity occurs over time. Increased productivity is one means by which capacity is able to expand. Growth of the capital stock is necessary for additions to plant and equipment and for technological innovations; thus, technological advance is viewed as increasing productivity and capacity.

The establishment of definitive concepts of capacity, capacity utilization, productivity, and efficiency, and rigorous measures of

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¹Agriculture may be defined in a narrow sense as "farming," or, in broader terms, as the entire food and fiber chain from production to consumption. Production occurs in many places throughout the food system, but our discussion is limited to the traditional farming sector.

such concepts, are not the objectives of this paper. Other efforts are underway to treat these complex problems.²

The factors of production are viewed as constraints on present or potential production at capacity. For example, fertilizer or fuel shortages prevent full utilization of present capacity; capital shortage constrains capacity expansion over time. The level of output is thus directly linked to the availability of inputs; and input supplies become the focus for output levels.

This paper treats the natural resources, other production resources, technological factors, and climate in the agricultural production process. The final section attempts to draw together the major implications for future ERS research.

PRODUCTION RESOURCES

Land

Most agricultural production is land based. Although production varies with the complement of other inputs applied, it is essential to know the amount and quality of land available.

Land use adjustments that affect ultimate output can be categorized into three types: crop specialization, shifts within the cropland base, and land use conversions (27).

Crop specialization. It is possible to obtain significant output increases from a constant cropland acreage by shifts to most favored crops. Before 1972, the acreages of several important field crops were restricted by government programs. Consequently, acreages of nonrestricted crops expanded on the cropland withheld from the controlled crops. Between 1969 and 1975, the acreage planted to the seven major crops (corn, oats, barley, sorghum, soybeans, cotton, and wheat) accounted for nearly all of the increase in acreage of the 20 principal crops (table 1).³

The acreage planted to all feed grains increased only modestly but corn acreage increased at the expense of oats and barley, while sorghum remained a constant proportion of the total feed grain acreage. Corn is higher yielding than the crops it replaced and has greater feed-equivalent value. Consequently, the 9-percent increase in composite yields between 1969 and 1975 can be attributed to crop specialization (the shift from oats and barley to corn). Since this shift in cropland intensity has for the most part

²For example, see the proceedings of a workshop sponsored by the American Agricultural Economics Association Statistics Committee on "Agricultural and Rural Data: Improvement of Concept and Operation," Arlington, Virginia, May 4-6, 1977.

³The 20 principal crops include about 90 percent of cropland used for crops, nearly everything except fieldseeds, fruits and nuts, and commercial vegetables.

Table 1—Acreage and yield of major crops, 1969 and 1975

Item	1969	1975	Change 1969-75
<i>1,000 acres</i>			
Crops planted:			
20 principal crops	290,994	333,128	42,134
7 major crops	217,180	257,901	40,721
Feed grains	115,347	123,089	7,742
Corn	64,264	77,902	13,638
<i>Corn equivalent bushels</i>			
Composite yield:			<i>Percent</i>
Feed grain	62.8	68.4	8.9

Source: (34)

concluded, further contributions to output from this source cannot be expected.

Shifts within the cropland base. The second type of land use adjustment is that from shifts in the cropland base. In 1969 there were 117.5 million acres of cropland not used for harvested crops (table 2). This included 41 million acres of summer fallow. By 1975, cropland not harvested had receded to 62 million acres, about half of which is cultivated summer fallow. A marked reduction occurred in idle cropland, cropland used for soil improvement crops, and cropland pasture. Thus, another important part of the increase in output since 1972 has come from taking up the slack in cropland acreage.

The common assumption that the entire cropland base is available for harvested crops, after consideration of required cultural practices and the enterprise structure of farms, is questionable. In 1967, nearly 67 million acres of Classes IV-VIII soils were used as cropland in a tillage rotation (30). Most of these lands must be managed to cope with serious erosion or drainage problems, and

Table 2—Cropland use, 1969-75

Year	20 principal crops	Cropland not harvested	Summer fallow
<i>Million acres</i>			
1969	290.9	117.5	41.0
1970	293.2	109.3	37.4
1971	306.0	97.9	33.6
1972	295.1	106.8	38.2
1973	320.2	81.9	31.4
1974	328.6	65.1	27.0
1975	333.1	62.0	30.4

Source: (8, 34)

require frequent idling or soil improvement crops. Cropland pasture is associated with livestock enterprises. Summer fallow is a required cultural practice for vast acreages of wheatland in the 17 Western States.

Most of the output increases due to crop specialization and shifts within the cropland base have taken place, occurring during the 4 crop years since 1972. Similarly, the shifts in the cropland base are largely over. Summer fallow is stabilizing at around 30 million acres, and another 30 million acres are needed for soil improvement crops and cropland pasture.

Land use conversions. The third category of adjustment is that of possible land use conversions. In 1967 it was estimated that about 265 million acres of land in soil Classes I-III was in pasture and range, forest, or other uses (30). The estimates took no account of tract size, ownership, and other problems associated with land use conversions. More recently the Soil Conservation Service (SCS) evaluated the post-1967 changes in land use and considered the relative convertibility of such land to cropland use. Conversion potential is described as high, medium, and low. SCS determined that 65 million acres of Class I-III land has a high potential for conversion to cropland under 1974 commodity prices, production costs, and development costs (table 3). Thus, if these relationships were continued, SCS would expect eventual conversion of these additional acreages.

Similarly, conversion to cropland of the nearly 20 million acres determined to have medium potential under 1974 conditions would be expected to occur at a slower rate. The 85 million acres included in these two categories amounts to a substantial reserve.

Competition for land. Agriculture is not the only claimant for land. Urbanization, highways, and recreational uses are responsible for a constant erosion of the agricultural land base. Between 1950 and 1970, urban areas took about 13.5 million acres of rural land to accommodate an increase of 53 million in the urban population—about 0.25 acre per person. This rate has been declining (17), and varies between regions (44). Urbanization trends are expected to continue, although some reversals have

Table 3—Cropland potential of Class I-III land not presently in cropland

Potential	Acreage
	<i>Million acres</i>
High	65.5
Medium	19.9
Low	146.2
Zero	48.0

Source: (31)

occurred. The amount of agricultural land lost annually to urban uses is small; but as with a leaky faucet, the effects are cumulative.

In some areas, surface mining has become a major concern. While important to the local areas affected, land losses from the total farm production base are hardly measurable (20).

Competition for land from such forces as urbanization and surface mining become policy issues because of the dramatic, and often irreversible changes they make. The amounts of land threatened each year may be small, but the issue is continually of policy interest.

Land use planning. Many efforts are underway at local, State, and Federal levels to introduce land use planning. A common concern is the preservation of the farm production base. Typical are the problems of the Land Inventory and Monitoring Division (LIM) of SCS (32). The LIM effort identifies "prime" and "unique" farmlands. "Prime" farmland is that which is capable, by reason of quality, growing season, and moisture supply, of producing sustained high yields of crops under modern management. "Unique" farmland is especially adapted to specialty crops, such as citrus, cranberries, fruits, and vegetables. Most State and local land use planning efforts are less farm oriented but have similar classification problems.

The two primary objectives of agricultural land use planning are: to appraise and maintain production capacity, and to provide a basis for allocating limited resources to reclamation, productivity maintenance and enhancement, and output expansion. Up to now, land-use classification and planning oriented to physical criteria have fallen short in providing the necessary information to implement either objective. Aggregate production capacity can be measured by using physical criteria but this neither permits additivity between commodities nor intercommodity comparisons. For example, should prime corn land be preserved at the expense of prime wheat land?

Meeting the second objective is impossible without considering economic criteria. The introduction of economic analysis into agricultural land-use planning would also introduce value measures. Even if the resource allocator chooses not to use the price system as an allocator of resources, money as a "unit of value" makes the system additive (26).

Resource ownership. Ownership of the Nation's agricultural resources also needs attention. Increasingly, land is being owned and controlled in small uneconomic parcels by individuals whose goals are not directed toward optimization of agricultural returns. As this is the subject of another paper, it is not treated here.

Nonpoint pollution. Regulations that also affect the intensity of land use are the environmentally inspired measures to control nonpoint pollution. Sediment losses, higher under intensive management systems, not only carry soil into streams but also residues of fertilizers and pesticides. Streams are polluted and salinity levels increased in water destined for further irrigation and other uses. Measures to limit soil losses receive emphasis in controlling nonpoint pollution.

Control measures include adoption of cultural practices that limit soil erosion to 5 tons an acre or less. Crop rotations, cover crops, and various conservation tillage methods are partial solutions, each of which has implications for land use. Other measures emphasize ways to reduce the pollutants in sediment. Cancellation of selected pesticides, stringent controls on others, changes in fertilizer formulations, levels of use, and application techniques are likely. These pollution control measures imply increased production costs (4).

The potential effects on costs and yields of current trends in environmental controls have been projected. They vary among crops. Projections of current trends indicate increased production costs of major crops from 1 to 5 percent. Significant yield reductions are most likely in cotton and fruit and vegetable production. Projections assuming more stringent controls indicate costs of production could increase 2 to 16 percent among crops with yield decreases ranging from 4 to 14 percent (2).

The projected yield decreases would mean pressure on land use changes. The same output levels could be reached only by expansion of the amount of land used.

Needed research in this area should consider the combined effect of various environmental protection measures. More comprehensive studies of the tradeoffs between environmental improvement, food costs, and farm output are needed.

Water

Availability of water for irrigation is another important issue affecting production. Statistics on the extent of irrigation vary, but about 50 million acres of land receive some irrigation water (29) and over 90 percent is in the 17 Western States. Agencies of the Federal Government have developed much of this irrigated acreage. Federal programs and projects have also raised agriculture's production potential by providing flood control and by draining land.

Surface water. The Bureau of Reclamation (BR) is the principal agency associated with irrigation development. According to BR statistics, about 9 million acres of land receive full or supplemental irrigation from their projects (table 4). Most are in

Table 4—Irrigation acreage by Bureau of Reclamation projects, selected years, 1950-74

Year	Full irrigation	Supplemental irrigation	Total
<i>1,000 acres</i>			
1950	2,288	2,789	5,077
1955	2,607	3,655	6,262
1960	3,488	3,412	6,900
1965	3,731	4,281	8,012
1970	4,037	4,533	8,570
1974	4,216	5,040	9,256

Source: (1)

the 17 Western States. The Federal Government's role in irrigation development has increased; Federal irrigation accounted for 21 percent of the acreage in 1949, and 25 percent in 1969. The remaining irrigated acreage is from self-supplied farms, cooperatives, districts' commercial institutions, and State and local governments (22).

The Federal Government is also heavily involved in flood protection and drainage, mainly with the Army Corps of Engineers (Corps). As of 1971 nearly 54 million acres had benefited from major flood control and drainage projects of the Corps, with another 37 million acres to benefit from projects in progress. Of this 90-million-acre total, 49 million acres are cleared and suitable for farming and nearly 13 million acres more will be when cleared. The Corps has also been involved in projects in the Western States which lead to expanded irrigation storage capacity. In addition, irrigation projects are in process in the Eastern States (22).

The Department of Agriculture also has a major role in resource development. The Agricultural Stabilization and Conservation Service (ASCS) has helped in improving drainage on 52 million acres and in building over 80,000 small irrigation reservoirs. The Soil Conservation Service under PL 566 had contributed \$2.3 billion (as of 1971) under its small watershed program and \$166 million for improving stream channels for drainage and flood protection (22).

In the 1960's, Federal water resource development began to be challenged through some organized efforts. The justification for these projects on the basis of increased farm output when surpluses existed was questioned. Also, urban-industrial growth now competes with agriculture for water use in the Western States. So far, nonfarm water users have been accommodated by relatively painless shifts of water (sometimes surplus) from agriculture. But future competition will intensify. In addition, inquiries have arisen

about the extent of the environmental degradation resulting from these projects.

Further projects have been authorized that are expected to bring another 750,000 acres under irrigation by 1985 with 650,000 more by 2000.

Studies of the Federal Government's role in water resource development have resulted in policy recommendations that need economic analysis. Attempts have already been made to integrate many of them into water resource planning efforts (18,40). Among the policy recommendations: future water programs should shift emphasis from water development to preservation and enhancement of water quality; planning for water development must be linked to planning for water quality and coordinated with land use planning; more efficient use of water in farming, industry, and domestic and municipal uses is essential; and sound economic principles must be adopted to encourage better use of water resources.

Ground water. Most nonFederal irrigation mines from underground aquifers. Some 27.6 million irrigated acres received at least some ground water in 1974. An additional 7.3 million acres received water from surface sources that required some on-farm pumping. As with other irrigation, most of the acres are in the 17 Western States (29). Federal agencies have not been directly involved with most ground water irrigation development, but commodity programs of the Department of Agriculture have helped to create a climate favoring private development. Acreage restrictions encouraged expansion of output from acreage cropped, and additions to farm cropland base often brought a larger acreage allotment. The rapid expansion is evidenced by the number of irrigation wells pumping from the Ogalalla aquifer, which increased from 22,000 in 1950 to 145,000 in 1974 (28).

Public concern has been expressed about the allocation of ground water over time. Since, for the most part, ground water is a stock rather than a flow resource, it should be used when the marginal value products of its use are the greatest. Ground water irrigation greatly enhances the production of previously dry cropland and often facilitates conversion of noncropland to cropland.

Such irrigation development was questioned in an era of surplus food and fiber production. A complication is that State and local governments rather than the Federal are responsible for regulating ground water development and the rates and conditions for development vary greatly. The lack of uniform regulations on the exploitation of water stocks is a matter of increasing public concern.

Since 1972, an added dimension to the pumped irrigation water problem has emerged. Pumping requires large amounts of

energy to lift the water to field level and often to distribute it. Electricity is the most important source of power, followed by natural gas (29). With new commodity-energy price relationships, earlier estimates of the economic life of underground water aquifers are outdated.

New research must consider factors that affect the rates at which ground water stocks are exploited and identify policy variables that can be used to control development rates.

Purchased Inputs

Statistics that suggest recent faltering of long-term upward trends in agricultural productivity have been viewed with alarm. This prompted the National Academy of Sciences (NAS) to form a Committee on Agricultural Production Efficiency. In its report (3), the Committee noted that public support for research and development in agriculture had declined; that most productivity increases in the next decade will result from the more complete adoption of known technologies (about 20 years are required for development and adoption of new technology); that biological limits are being approached for some farm products; and that societal constraints on input availability to agriculture are important determinants of future production levels, productive capacity growth, and efficiency. This last area, future input availability to agriculture, will now be examined.

Capital and credit. In recent decades, American agriculture has increasingly substituted capital for labor on farms. The ramifications are many. This has meant a low rate of entry of young beginning farmers, an increasing average age of all farmers, a continued decrease in farm numbers, and an increase in farm size.

The preliminary balance sheet of the farming sector (January 1, 1976) showed assets of \$594 billion and debts of \$90 billion—a debt to asset ratio of 0.15 to 1. In the aggregate, the sector is economically healthy, but many individual farmers are not. The balance sheet figures reflect the debts and assets for all farmers and although all farmers have assets, not all have debts. For farmers with debts the percentage of debts to assets is more like 35 percent. A recent Federal Land Bank Study (12) of new borrowers indicated that more than a fourth had debts equal to 50 percent or more of assets.

Credit sources for agriculture include a few categories of traditional lenders (table 5). Little equity capital has flowed into agriculture in the past. Farm families have exhibited thrift and frugality in living to generate capital, and shortages of equity have often seriously inhibited technological adoption. Capital needs will intensify in the future for machinery purchases, farm improvements, other capital items, and real estate purchases.

Table 5—Real estate and nonreal estate debt outstanding by type of lender, U.S., 1975

Lender	Real estate		Nonreal estate	
	<i>Bil. dol.</i>	<i>Pct.</i>	<i>Bil. dol.</i>	<i>Pct.</i>
Commercial banks	6.30	12.2	19.08	49.7
Farm Credit System	16.18	31.2	11.26	29.3
Life insurance companies	6.89	13.2	0.0	0.0
Dealers and individuals	19.00	36.6	6.35	16.6
Farmers Home Administration	3.53	6.8	1.70	4.4
Total	51.90	100.0	38.39	100.0

Source: (12)

Although the percentage of the land sold each year is fairly constant, the recent dramatic increases in land prices have stepped up capital needs for that purpose. Projections suggest that need will continue to rise.

The Farm Credit System, which held 34 percent of the outstanding debt in 1975, estimates its loans outstanding will range from \$57 billion to \$59 billion by 1980 and \$90 billion to \$100 billion by 1985 (12).⁴ The capital needs of the entire economy are expected to burgeon in the next 15 years, and agriculture will have to compete more than ever with nonfarm uses of funds.

The NAS study (3) noted:

The ability of the present farm organization structure to obtain capital and the traditional financing institutions to provide the amount and kind of credit needed can be questioned. A number of alternatives to meet financing needs are already being tried. Changes in structural arrangements...can be observed; for example, larger farm units, financial partnerships, farm family corporations, other forms of corporations, vertical integration, contract farming, farm input supplier credit, leasing of machinery, and changes in amount of and type of rental arrangements...The farmer may lose some of his control over decisionmaking...

The traditional financial institutions may not be innovative enough to meet increasing credit needs. On the other hand,...major institutional adjustments have been made. Perhaps new institutional structures will have to be invented.

⁴These projections were based on the following assumptions: the farm credit banks will have a 39-percent share of the market; 35 percent of the total capital flow will be debt financed; technological change will proceed at the same rate as the preceding 6 years to 1980, and at the same rate as the preceding 15 years to 1985; the annual rate of inflation will be 4 to 7 percent (12).

Fertilizers. The fertilizer industry has gone through many ups and down in the past 35 years. Before World War II, only seven firms manufactured anhydrous ammonia in the United States, but by 1969, there were at least 85. This rapid growth resulted from technological advances in fertilizer production and rapidly expanding demand. Domestic demand for nitrogen was strong and the prospects for increased use in the developing nations (LDC's) from the Green Revolution promised further markets. Production capacity expanded, but the demand expectations were not realized and by 1968, capacity far exceeded use. Prices fell, plans for further expansion were dropped, and some antiquated plants were closed and dismantled.

Fertilizer use in the LDC's has grown, droughts in various countries of the world in the early 1970's have led to increased fertilizer importation, and developed nations have expanded food production in response to growing world demand. Fertilizer demand rose faster than anticipated, and once again pressed on available production capacity. This, coupled with short natural gas supplies (the raw material used in producing ammonia and nitrogen fertilizer) and environmental problems, led to acute shortages in 1973 and 1974 and a rapid increase in fertilizer prices.

The current situation appears to be again one of increasing capacity as new plants come on line and prices decline from previous highs (38,39). Total nutrient application in the United States has been increasing rapidly and continued strong demand for fertilizers is anticipated (table 6).

Table 6—Total fertilizer material use and primary nutrient use, U.S., selected years 1960-75¹

Year ending June 30	Total use	Primary nutrient use				Index (1967= 100)
		N	Available P ₂ O ₅	K ₂ O	Total	
		1,000 tons			Percent	
1960	24,887	2,738	2,572	2,153	7,464	53.4
1962	26,615	3,370	2,807	2,271	8,448	60.5
1964	30,681	4,353	3,378	2,730	10,460	74.9
1966	34,532	5,326	3,897	3,221	12,445	89.1
1968	38,743	6,788	4,453	3,793	15,034	107.6
1970	39,591	7,459	4,574	4,036	16,069	115.0
1972	41,206	8,016	4,873	4,332	17,221	123.2
1973	42,536	8,295	5,085	4,649	18,029	129.0
1974	NA	9,157	5,099	5,083	19,338	138.0
1975	NA	8,608	4,511	4,453	17,571	126.0

¹ Includes Puerto Rico.

Source (39)

Total fertilizer nutrient use in the United States has more than doubled since 1960. Several projections of future use have been made by the General Accounting Office (GAO) (38). The fertilizer industry, USDA, and the Tennessee Valley Authority (TVA) each have projected the annual U.S. demand for nitrogen in 1980 (below). On the basis of announced and planned plant expansions, the United States should be able to meet the highest of these projected demand levels by 1980.

Projected U.S. Demand for Nitrogen by 1980

<i>Source</i>	<i>Million tons</i>
Industry	13.5
USDA	12.3
TVA	12.5

The GAO report concluded that some shortages could continue depending on availability of raw materials, production, weather, and the relative prices of crops and fertilizer. The limited natural gas supplies loom as a major uncertainty and could reduce nitrogen fertilizer production. Uncertainty of future supplies limits plant expansion and regulation has favored plant locations in areas where unregulated gas is available. However, these are often far from the areas of application.

The longrun situation for phosphates is more optimistic. Estimates of production capacity for 1980 are well above estimated U.S. demand. Phosphate exports have grown steadily since 1971. Continued growth in exports will depend upon long term contracts and foreign and domestic price levels. Problems to watch include availability of phosphate rock, shortages of equipment, and increased environmental controls in stripmining rock. Four to five years is required to obtain and put mining equipment into use.

The United States now receives over half its potash from Canada. The fertilizer industry estimates that, through 1980, supplies will be adequate. However, availability will depend on increasing Canadian production and maintaining free trade between the countries (38).

Altogether, the fertilizer situation appears favorable for the next 10 to 15 years, although short term disruptions could occur. Once inventories are reestablished, future shortages will depend primarily on weather, relative crop and fertilizer prices, and the supplies of natural gas. Capacity should be adequate through 1985 for phosphate and nitrogen, and potash supplies will be adequate at least through 1980.

Machinery and equipment. The increasing use of machinery in agriculture since the shift from animal power to tractors has led to greater output per man but the overall impacts on productivity (such as timeliness of operations) are more difficult to assess. The movement to larger and more powerful tractors and equipment continues. The average horsepower per 1,000 acres increased from less than 3 in 1950 to almost 7 in 1969, but then fell slightly with the increase in harvested acreage, as land idled by Government programs returned to production.

Machinery has been associated with a number of problem areas in agriculture in the past including increased capital investment; displacement of labor from farms; adverse effects on yields from soil compaction; increased farm consolidations enabling superior managers to control and operate a greater land base (hence upward pressure on land prices);⁵ and energy consumption and conservation in production, storage, conditioning, and handling.

A recent development related to machinery is minimum tillage. Minimum tillage has been defined as "the application of new farm production technologies to reduce soil manipulation practices to the minimum consistent with local soil, climate, and economic conditions" (23).

A 1974 estimate indicated minimum tillage practices are in effect on as many as 33 million acres. An assessment (23) of the longrun effects of its continued adoption concluded that by the year 2000:

- Annual harvested acreage could increase by 20 million acres and crop production by 5 percent, mainly from increased multiple-cropping made possible by minimum tillage.
- Labor savings could amount to 350,000 man-years annually, with an imputed value of \$1.6 billion.
- Energy savings in machinery operations could amount to the equivalent of 850 million gallons of fuel, or \$275 million annually.
- Increased use of chemicals could cost \$300 million annually.
- Annual soil losses from wind and water erosion could be reduced by 50 percent or more.
- Environmental pollution from increased pesticides and herbicides could be a major social concern.
- The impact on numbers and sizes of farms remains in doubt.

The data on machinery costs are fragmentary, but do support

⁵A recent example is the replacement of crawler-type tractors with 4-wheel drive tractors in the Northwest Palouse wheat area (25).

an expectation that farm machinery investment and operating costs will decline under minimum tillage.

This new technology offers some advantages but also has disadvantages such as increased pesticide use. Tradeoffs will face decisionmakers looking at future economic research.

Energy. The agricultural system in the United States developed around cheap fossil fuels. An abundance of low-priced energy made possible many of the technological advances of the last 40 years; for example, mechanization increased yields through pesticide use and artificial crop drying, efficient transportation systems, and so on. The fuel shortages and price increases of the 1973-74 oil embargo brought a new awareness of the wide extent of energy use.

According to recent estimates, farm production accounts for about 3 percent of domestic fossil fuel consumption, and the total process from food production to food consumption only 12 percent. Thus, production agriculture uses relatively little of the total energy consumed, and even when the total food system is considered, the amount is still small.

Though absolute energy consumption is small, significant efficiency gains are possible throughout the total food system. There is growing concern not only for increased conservation, but for energy development that may destroy farmland and compete for other resources, especially water.

Crop production is inefficient in the conversion of solar energy; this has been suggested as an area for large efficiency gains. Increased attention by plant breeders to development of plants that convert solar energy more efficiently is likely. More recovery of the solar energy now lost in the stems and roots (about 50 percent) of plants is also probable.

Many recent analyses of energy utilization in agriculture have focused on technical efficiency ratios. These are useful bits of knowledge, but we should not abandon economic efficiency criteria in favor of energy criteria. As relative prices change, there will be substitution between fuel types and development of new sources. Current energy prices probably result more from monopoly power than from physical scarcity of fuel.

Cautious optimism suggests that the price mechanism may effectively ration short-term supplies, encourage increased efficiency, and help develop other energy sources. As this occurs, the comparative advantage in production between regions of the country will be altered (35). Questions have been raised, however, as to the efficiency of the pricing system in accomplishing the desired goals, especially longrun versus shortrun goals. Government policies aimed at lowering current energy prices to consumers have been tagged as counterproductive. But the pricing

system, if unregulated, would permit huge windfall gains to current energy producers, and ignore distributional impacts on consumers.

Solar and nuclear sources have potential for the future. However, we do not yet know what technical possibilities may develop with new energy sources. Sole reliance on physical efficiency criteria may be inappropriate and could lead to misdirected research and wasted research resources. Both efficiency and economic criteria must be considered concurrently.

There is widespread optimism on the ability of the world to cope with the energy problem. But this view is not shared by all. Energy is a serious problem that goes far beyond any one sector of the economy. The effects on agriculture will be determined in large part by the national policies that are adopted. Standby allocation schemes are in place for vital functions such as food production, but the high degree of economic interdependence diminishes their value, except in the short run (24). Having fuel available is of little use if tires, spare parts, and other inputs are not. The longrun impacts are likely to come from overall increased prices and changing relative price levels. Understanding these impacts will be a necessary part of monitoring the economic performance of the food and fiber system.

Environment. During the 1960's, the non-GNP portion of the implicit U.S. social welfare function was accorded higher priority. Environmental concerns came to the fore and were recognized as externalities to individual firm decisions. A recent review concludes that impacts of current environmental legislation will not retard aggregate growth rate, or affect jobs or prices significantly (11). However, some studies have shown other effects. Forster (7) finds that water pollution control rules would not have much effect on beef production but are regressive because of economies of size in compliance. Gilliam and Martin (9) found that banning antibiotics in animal feeds tends to increase production costs, ultimately borne by producers or consumers.

Several important agricultural pollutants have been identified, including animal waste, fertilizer nutrients in water, dust and noise in urban areas, movements of vehicles on public roads, pesticide leaching, and food processing facilities' effluent discharges. An urgent need is for data on effects of alternative tolerance limits which would aid development of criteria for acceptable limits. Research on measuring the economic costs associated with pollution and its control is needed to provide timely information to policymakers.

A related area of concern is health and safety in agriculture. As with environmental questions, regulations are being imposed with little reliable data on need or economic impacts. The costs

are becoming larger and more burdensome to individual firms.

Such regulations and restrictions may affect efficiency and lead to underuse of existing capacity. The cost of compliance competes for capital that could be used for expansion of capacity. Regulations also involve equity and efficiency tradeoffs. With concern also increasing about world food production, these tradeoffs need careful study. The concern about quality of life manifest in the growing volume of regulations is turning into concern about the basic elements of world food supply and productive capacity.

TECHNOLOGY

A source of capacity growth is the development and adoption of new techniques in the production and processing of food. A recent worry is that this development has slowed, in part because of decreased funding for research and development. Another growing concern, noted above, is that capital for adoption of new technology may not be adequate, thus constraining capacity expansion. It is hazardous, if not impossible, to forecast technological developments. Some examples now in the development stage are offered below.

Crop Improvements

One of the major sources of productivity has been in improved crop yields. The NAS study (3) noted the slowed increase in crop yields per acre and seemed pessimistic about the likelihood of future breakthroughs of similar magnitudes to previous ones.

Corn. The tripling of corn yields in the two decades after 1950 was due to continued improvements in varieties, fertilization, and cultural practices. A leveling off in the rate of yield increase is evident with an inflection point during the mid-1960's. This is consistent with the process of innovation. The transition from one rate of output to another that is due to progress in developing and applying new production technology takes on the characteristics of an S-shaped curve. Corn yields may not reach 100 bushels per acre by 1980 because of the lack of unadopted technology, higher input cost, and planting on less profitable land.

Wheat. Wheat yields averaged about 15 bushels per acre until the mid-1950's, except for the inclement weather of the 1930's. Improvements in varieties, fertilization, and management practices more than doubled yields, which reached 33.9 bushels per acre in 1971. Since then, yields have averaged lower, partly because of unfavorable weather. Growth in national average wheat yields may be checked as farmers plant on marginal lands, adjust cultural practices to higher cost inputs, and deviate from usual fallowing and conservation practices. Yield projections

through 1980 allow only for a recovery to 1971 yield levels. A somewhat lower than historical rate of improvement could be expected through the end of the century with yields perhaps reaching 45 bushels.

Soybeans. Yield increases have been no less dramatic for soybeans, from about 11 bushels per acre in the mid-1920's to 28 bushels per acre in 1975. Most projections show a slow upward trend but higher production costs and use of relatively lower quality acres may keep yields below 30 bushels by 1980.

Some recent reports have indicated that improvements in soybean yields from two technological breakthroughs may be imminent. An Iowa State agronomist has developed a foliant-applied nitrogen fertilizer that has the alleged potential for increasing soybean yields by 30 to 60 percent. This technology is being patented and could be adopted in some soybean production areas within 3 to 5 years.

Research on varietal improvement and hybridization may also result in another lift in soybean yields. A commercial firm recently reported development of a hybrid variety but years of development and testing will be required before widespread adoption is attained.

Cotton. Cotton yields have more than doubled their pre-1940 levels of 200 pounds per acre. They approached the point of inflection on the S-shaped technological transition curve during the 1950's and appear to have reached a new level in the 1960's. Thus, without substantial improvement in varieties or cultivation practices, cotton yields may only fluctuate around their current level of about one bale (480 pounds) an acre.

Livestock Improvements

Cattle. Beef production has risen to a level several times above the pre-1930 levels of 6 to 9 billion pounds. The sharp rise in output since 1940 is due to low production costs and improved management practices. Increased consumer income, changes in consumer tastes and preferences, and population growth are responsible for demand increases. If feed supplies are plentiful, cattle production could continue to increase. The rapid increase in per capita consumption of the 1950's and 1960's declined during the early 1970's, but is likely to be regained. A major productivity gain could result from further success with reproductive performance (twinning) in beef cattle.

Hogs. Pork production has fluctuated substantially, even in periods of steady corn prices. The trend runs from 6.5 billion pounds in 1910 to 13 billion pounds in 1970. Recent performance shows less response by hog producers to price changes than in the past. Per capita consumption is expected to continue leveling off for the remainder of the decade at around 67 pounds.

Dairy. Annual milk production has fluctuated around 120 billion pounds since the early 1940's. Improvements in output per cow have been offset by declining cow numbers. Per capita consumption of dairy products has declined sharply for the last 30 years, from a peak of over 800 pounds (fat solids basis), to a level of about 500 pounds. However, more of the nonfat solids are now utilized for human consumption. Continuing shifts in consumers' tastes and preferences are an uncertain factor in future demand for dairy products.

Poultry meat. Production has increased five-fold from 1947 to 1966, reaching 10.5 billion pounds. Substantial improvements have been shown in poultry breeding and management. Most broiler production is on a contractual basis in large efficient units. Per capita consumption has leveled off at about 50 pounds since 1970. If per capita consumption remains about constant, longrun production will grow only with population—probably about 1 percent a year.

CLIMATE AND WEATHER

Climate is a primary determinant of the capacity of any nation to produce food and fiber. Climate had not been a major concern until recently when it caused perturbations around the world.

Before these disturbances, increased food production was largely regarded as a problem of matching technology and science to the given conditions, with average weather taken for granted. In the last 50 years (up to 1970) the earth has experienced the most favorable agricultural climate since the eleventh century. A controversy now swirls around whether the recent climatic changes are mere aberrations or the beginnings of a return to an unfavorable climate (37).

The implications are staggering. Even if the climatic deterioration is much less than frequently suggested, the impacts could still be enormous. Climatic fluctuations affect all components of the highly interrelated food production ecosystem. Changes in food production can be caused by the effects of weather on pests, pathogens, and weeds as well as by the direct effects on crops. Crop plants under environmental stress are more susceptible to damage caused by attacking or competing organisms (36).

Until recently, it was commonly thought that the same advances in technology that increased productivity also reduced the vulnerability of crops to the vagaries of weather and climate. Recent evidence, however, questions this and suggests that the exceptionally favorable growing conditions of the fifties and sixties were instrumental in the U.S. yield gains of that period. This

question is of paramount importance as it underlies major agricultural and food policy decisions in such important areas as commodity programs, long-term grain agreements, grain reserves, trade policy, and price stabilization mechanisms.

A recent study (36) by the Institute of Ecology of the Kettering Foundation examined the above question and concluded:

The study supports the hypothesis that a future recurrence of certain past climatic fluctuations or weather sequences in U.S. and Canadian food-producing regions would indeed have a significant impact on North American food production.

This finding, coupled with expansion on marginally arable lands and the possible ban of widely used pesticides deemed damaging to the environment clearly could affect our productive capacity, even if the climatic deterioration is less severe.

The recent concern with climate has underscored the fact that our fundamental knowledge of climatic processes and mechanisms is not sufficient to permit forecasting climate. Reliable forecasts of climate even one growing season ahead would be extremely useful, and predictions of trends one to two decades ahead are sorely needed for national policy planning.

IMPLICATIONS FOR ERS PROGRAM OF RESEARCH

Throughout this paper the issues relating to future agricultural production have been discussed. Now we attempt to outline briefly the implications of these issues for the ERS program of research. In doing so, mention is not made of many ongoing and useful studies and areas of research. Research is going ahead in many of the areas discussed in this paper. Other areas are neglected. All need to be evaluated in terms of the amount of ERS resources devoted to them. Most of the problems foreseen cut across the present organizational structure. Organizational efficiency is not considered here, unless the suggested research problem calls for a more closely integrated effort than is now being applied.

The preceding discussion mentioned the effects of economic, technical, institutional, and climatic factors on output potentials. A further factor is stability or degree of certainty associated with the future. Uncertainty stems from international markets of questionable reliability for both inputs and products. In addition, uncertainty relates to Government policies about the environment and about resource development and production adjustment.

Each of these sources of uncertainty may greatly affect the return at which output occurs and the level of capacity at which the farm production plant operates. Thus, the effect of uncertainty is itself an important research question. Still, its role in the research issues discussed below should be kept in mind.

Land Availability, Productivity, and Use

Most of the cropland "slack" has now been absorbed into crop production. Further expansion of the cropland base must come from land use conversions. Sizable potentials have been identified, but actual conversions will depend on the economic climate and incentives. Since land use is closely associated with output potentials and needs, land resource development studies need to be closely tied into agricultural and food policy studies.

Cropland availability. In recent years attention has focused on questions of cropland availability. Pressures exist to shift the reliance of our livestock industry toward more forages. Studies are needed to examine the production possibility frontier between grain and forage production relative to the derived demands for both products.

Evaluating productivity. Many land use planning efforts designate "prime" farmland, defined with physical criteria alone. Conditions may arise where the optimum complements of purchased inputs are not available to achieve the designated yield potentials. Much more knowledge is needed about the response of crops on various kinds of soils to varied amounts of selected critical inputs. "Prime" land designation may need to consider the soil's ability to produce desired crops with a minimum of purchased inputs. This suggests interdisciplinary research—economists working with agricultural scientists, urban planners, and others.

Policy integration. Natural resource development policies and commercial agricultural policies have evolved along separate paths. With continuing emphasis on supply response to meet potentially highly variable demands, these sets of policies should be more closely coupled. ERS should take the lead in initiating an integration of research that demonstrates the interrelationships between all Federal Government policies that affect agricultural production and the food system.

Environmental Regulations

More comprehensive analyses are needed of the interactions between nonpoint pollution problems and agricultural capacity. Cropping systems that limit soil sediment losses may limit output potentials. Pesticide and fertilizer restrictions also affect output levels. Estimates of the output effects of these measures are based on limited data that permit only fragmentary analyses of the

impact of withdrawing specific chemicals on selected crops. More comprehensive analyses of the tradeoffs between environmental quality and agricultural output and quality are needed.

Water Use Efficiency

Development policies recommend more attention be given to economic efficiency in the use of water. Emphasis on water quality impacts on farming practices in high runoff areas and on irrigation practices is necessary. Specific kinds of research that should be considered include:

Water response studies. Knowledge of the response of alternative crops to water under varied soil and climatic conditions is needed. Development of such information requires the joint efforts of ERS researchers with soil scientists in ARS and Land Grant Universities. Such information is necessary for improving water-use efficiency on farms and in gauging what uses of water in agriculture are least efficient. This bears on water reallocations in areas that are experiencing nonfarm competition for water.

Water resource planning. ERS has not been much involved in appraising the economic justifications of irrigation development, flood control, and drainage projects by other departments of the Federal Government. If economic analysis plays a more important role in project planning and evaluation, much opportunity for economists and lawyers in ERS exists.

Competition for water. Future competition for this scarce resource is destined. Economists are appalled at the maze of institutions governing the allocation of water, which they must cut through to propose economic policies to improve the existing reallocation mechanisms. Identification of "surplus" water allocated to agriculture, and knowledge of inefficient uses of water within agriculture must be included in these policies.

Allocation of ground water. Management of ground water, if it occurs at all, is at non-Federal levels of government. However, some economic problems are influenced by national policies and are imminent, for example, the effects of energy policies and prices on production costs for pump irrigation. Not only will short-term costs be affected, but also the long-term economic life of underground aquifers.

Purchased Inputs

Fertilizer. The outlook for fertilizer for agricultural production over the next decade is generally favorable. Continued monitoring of the availability and price situation is needed. Sporadic shortages are not ruled out, nor are significant price changes. Research on the role of natural gas and the impact of changes in Government regulations on its price and availability should be

expanded. Alternative technologies for fertilizer production also require further examination.

Energy. The complexity and interrelatedness of this area with other focal research areas pose difficulties. However, the general areas of uncertainties are primarily due to Government policy actions, impacts of which will be reflected in prices and availabilities. Future energy impacts may be subtle and involve changes in the mix of resources in production agriculture. Possible sporadic and localized shortages are not to be ignored, and the "ripple effects" of any changes occurring in the general energy situation need study.

Capital and credit. Possible future capital needs are not going unnoticed, especially in the public sector. ERS has proposed a major effort for fiscal 1978 with two major components: analysis to aid in the resolution of specific policy and program issues and development of background data and analysis of rural credit markets. The overall objective of this proposed research is to provide more adequate support for decisions that policymakers and program managers must make in designing and implementing Federal credit programs affecting rural areas. Specific objectives include:

- Development and maintenance of a comprehensive description of the rural capital situation.
- Examining the impact of government programs in providing funds and facilitating private fund flows.
- Analyzing alternative Federal policies and programs for affecting the availability of capital in rural areas.

Weather and Climate

The entire area of the effect weather and climate have on agricultural production sorely requires research attention. The need for improved short-term agricultural weather predictions remains acute, and that for better information on intermediate and long-term patterns is urgent for policy planning.

Within ERS, increased attention must be given to the incorporation of weather into our analytical tools. Conventional models are too amenable to "normal" weather assumptions. Methods for incorporating varying weather assumptions into the existing techniques need to be devised, or perhaps new analytical constructs will be required.

Ongoing programs would benefit from more direct consideration of weather information. Employment and assignment of climatologists in specific areas in ERS might be beneficial in getting more direct consideration of weather influences.

Technology

ERS has a renewed emphasis on technology assessment

relating to provision of food and fiber. However, an area not traditionally treated by ERS has been the allocation of public funds for research and development purposes in agriculture and the food system. Recent proposals such as the Wampler Bill considered in the 94th Congress could have significant implications for ERS. The influence of the allocation of public funds on trends in productivity would appear to warrant increased research attention, even without a legislative mandate to do so.

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Review of: PRODUCTION POTENTIALS IN U.S. AGRICULTURE

by
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The Skold-Penn approach was to start with a definition of productive capacity, to define productivity increases as actions that increase capacity, and then to define productive factors as potential constraints to full utilization of capacity or in the case of capital to capacity expansion. Output is thus directly linked to the availability of inputs and input supplies become the subject of focus for output levels. This is a static view of capacity, an overly restrictive view of productivity increases, and an "engineering view" that has led the authors to a narrow conception of the economic problem, and to a mechanical listing of supplies of various inputs. It is somewhat like the geologist with the lists of "known reserves" or "supplies" of lead, zinc, copper, coal, and the like.

This is often informative and indeed useful but it goes less than half way. For it is not the supplies of land, *or of* fertilizer, *or of* water, *or of* energy that are critical to our capacity to produce. Rather, it is the way these factors are combined that determines our real productive capacity. And, it is how various inputs are combined that raises the most interesting economic issues for the next decade—or more.

It seems to me that the way to approach problems of future productive capacity is to recognize three crucial aspects: physical availability, legal sanctions, and economic matters. Each will be discussed in turn.

PHYSICAL ASPECTS

To pay adequate attention to the full range of physical aspects of the future food and fiber potential, the analyst ought to move beyond the current agricultural plant and its inputs. What of new food and fiber items not now widely used, but of possible significance? What about protein derived from forage crops as a supplement in human diets? What about the potential for protein from pond-raised fishes? Where are the new breakthroughs in food and fiber chemistry that promise to crack existing "constraints?" This

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is the sort of forward look that is central to any serious quest for improved economic research management.

At what structure of relative prices does protein from aquaculture become truly competitive with mammalian protein? Only five lines in the report mention cotton but I am struck by the totally new environment of cotton against synthetic fibers from petroleum products. What is the prognosis for relative prices? Will cotton become more or less competitive? What new breakthroughs in animal breeding are important? Is the beefalo going to work? What about the beef grades and the high energy content of grain-fattened cattle? Are there no important economic research issues there?

The overconcern with constraints leads to a pessimistic view of future productive capabilities. This approach blinds us to a whole range of technological possibilities that could have a profound impact on our ability to feed and clothe ourselves. Resources are more than constraints—they are also opportunities.

LEGAL ASPECTS

The paper refers to environmental legislation, and other legal strictures. Yet nowhere was the legal system examined as a facilitative mechanism. What are the likely legislative actions on the horizon that may improve our comparative advantage with respect to other producing nations? What about the possibilities of a world grain reserve? The legal structure of society—both statutory and case law—is a central element in determining the “production possibility frontier” yet it was virtually ignored.

Little attention was paid to the possible forms that a national land-use bill might take. Such legislation will come, though when is uncertain. Little thought was given to the difficult problem of nonpoint pollution control in terms of the sorts of economic issues raised by several possible control schemes.

ECONOMIC ASPECTS

Finally, I miss an imaginative discussion of the many economic issues inherent in this topic. The market system is at once a set of incentives to do certain things, and a set of sanctions against doing other things. There was little prognosis as to expected relative prices for any number of combinations of both inputs and outputs, and hence little effort to identify important research problems. While I do not wish to belittle the excellent list of research suggestions at the end of the paper, I believe that it is possible to go much further.

As an example, the era of large (subsidized) irrigation projects in the West is drawing to a close. Future irrigation will certainly cost more for the direct beneficiaries. What are the economic issues here? What crops might be the hardest hit? What regions? What are the income distribution implications of this? Will the old agricultural regions of the Southeast enjoy some windfall? The same questions arise in the area of water for energy production in the West. What are some likely scenarios? What are the economic implications of each? I fully appreciate the time constraints under which the paper was prepared, but I do believe that more definitive guidance could have been provided.

SUMMARY

The Skold-Penn paper does a fine job of laying out some of the relevant issues, but I feel that it was prepared with the wrong audience in mind, and from an overly narrow conceptual foundation. Many of the facts are surely well understood by those within the agency (for whom the paper was intended); more importantly it is unclear to me that these facts contributed to the development of the research items listed at the back of the paper.

As indicated earlier, the particular conceptualization of the problem led the authors to ignore large areas of needed research. I suspect that their conceptualization of the problem is a result of the tendency within the agency to be a compiler of facts, rather than a wellspring for ideas. I may be entirely wrong in this, but the matter relates directly to the three issues raised in the Cotner cover letter concerning the purpose of the "Forward Look." The three issues are: relevance of the ERS research program, implications for change in the research program to better respond to new issues, and ways to improve the information flow from analyst to user.

I applaud the ERS effort to assess its role over the next decade or so, and I do so particularly because I perceive that the agency has become much too involved as a "Congressional Research Service for Agriculture," and is also at the beck and call of the executive branch. Of course, only the politically naive would really expect otherwise, but the capacity and ability of ERS to do truly imaginative anticipatory thinking and research on important issues has been sacrificed for the job of providing numbers on demand. While I appreciate the political problems of saying "go away and leave us alone for a spell," it would seem that there must be several places in the agency where more of this sort of activity could take place.

When we begin to talk of the flow of information from analyst to user we must first assess who is the user. If the user is deemed

to be only Congress and the executive branch, this gives rise to one set of guidelines as to what sort of research will be conducted, and how quickly new research will "respond to new issues." But if the user group includes economists in a variety of teaching and research roles then another research program would result. I believe that the research suggestions in this paper are entirely consistent with the notion that the one and only user of ERS research is the Federal Government. Since I perceive this to be the prevailing attitude within ERS, I wish to emphasize that I am not being as critical of Skold and Penn as I am of the environment in which they work.

Those of us in the academic community have also felt strong pressures to be "relevant," "accountable," and the like, and State governments have extracted a greater toll in increased work loads than has the Federal Government. Yet I firmly believe that the pressure to be just a public-sector consultant for industry and government must be assiduously resisted. We are, first of all, research scientists, not consultants.

Review of: PRODUCTION POTENTIALS IN U.S. AGRICULTURE

by
Roy M. Gray*

Skold and Penn are to be commended for doing a good job of discussing the future supply potential of U.S. agriculture.

They discuss three land use adjustments that could affect output levels: crop specialization, shifts within the cropland base, and land use conversions. They conclude that shifts in the first two were almost completed by 1976. The crop mix has adjusted to relative prices and practically all the land in the cropland category has been returned to production since the removal of acreage restrictions in 1972.

For the third category, land use conversions, the authors interpret the data from the SCS 1975 potential cropland study. According to this study, about 85 million acres of land in capability classes I-III have high or medium potential for conversion to cropland. Skold and Penn conclude that this acreage represents a substantial reserve for potential augmentation of the cropland base. However, it must be remembered that the land planted to the 20 principal crops increased by more than 40 million acres between 1969 and 1975. This increase is equal to almost half of the 85 million acres of class I-III land of high and medium potential for conversion and represents less than a fourth of the acreage planted to these crops in 1975. Remember also that this reserve land would have to be converted from other uses to be available as cropland.

The discussion of land-use planning in this paper is oriented primarily to its influence on production capacity. The authors overlook the conversion of agricultural land to other uses in urbanizing areas, even though such development creates the greatest public demand for land-use planning. If a major land-use planning activity develops in the United States, it is likely to be oriented more toward the maintenance of open space and the quality of life around populous areas than toward the maintenance of agricultural capacity.

A further topic of discussion, nonpoint pollution control, *could* have a major influence on the supply response of agriculture. Most studies have shown that erosion can be controlled at a rea-

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sonable cost.¹ These studies show differences in costs of controlling erosion between crops and between areas. Nationwide, however, the cost does not appear to be prohibitive.

An activity which may have a depressing potential is the possibility of limitations on nitrogen and phosphorus fertilizers, and on pesticides and herbicides. A recent ERS publication, U.S. Dept. Agr., Tech. Bul. 1550, shows that, in a selected area, farm income could be reduced by as much as 20 percent if restrictions on fertilizer use caused a 60-percent reduction in the application of plant nutrients.

The discussion of water use and the continued availability of water in agriculture is timely and relatively complete. The authors note some recent policy recommendations of the National Water Commission on the role of the Federal Government in water resource development. These are: future water programs should shift emphasis from water development to enhancement of water quality; planning for water development must be linked to water quality and coordinated with land use planning; more efficient use of water in agriculture and industry and for domestic and municipal purposes is essential; and sound economic principles must be adopted to encourage better use of water resources. Implementation of these recommendations could have a significant adverse impact on U.S. agricultural productive capacity.

The rapid decline in the ground water from the Ogallala water formation is already affecting some areas as is the increased cost of natural gas and electricity for pumping. Allocation of water rights under the appropriation doctrine, prevalent in the West, has probably had more impact on the efficiency of water use than any other single factor.

A thorough study of this institution is likely to be a fertile area of economic research for the next few years as demands increase to reduce return flows from irrigated land and as the cost of pumping increases.

IMPLICATIONS FOR ERS PROGRAMS OF RESEARCH

The authors have done a good job of summarizing future research needs. They have identified three major areas: land avail-

¹For a good discussion, see *Model of Soil Loss, Land and Water Use, Spatial Agricultural Structure and the Environment*, Card Report 49T, Iowa State Univ., July 1974, *Implication of Application of Soil Conservancy and Environmental Regulation in Iowa and a National Framework*, Card Report 57, and *Trade Offs Between Farm Income and Selected Environmental Indicators*, U.S. Dept. Agr., Tech. Bul. 1550, Aug. 1976.

ability, productivity, and use; water response studies; and water use efficiency. One is led to ask, "Why haven't these questions been addressed to the extent that is needed?"

I think the answer has two parts. The first is that these are not questions that can be answered with elegant and complex mathematical models. The profession in recent years has placed emphasis on the use of models. A review of the *American Journal of Agricultural Economics* for the past 7 to 8 years makes obvious agricultural economists' preoccupation with models. Any publication or journal article that does not devote its longest chapter to methodology is suspect. As long as this attitude exists it will be difficult to get good researchers interested in an activity that does not lend itself to modeling. It is easier and more fun to manipulate a computer than to gather data.

The other part of the answer is the distaste for the problems and red tape associated with the use of survey questionnaires. As long as it takes 6 months to a year to get a survey form approved for use, researchers will continue to avoid this approach. It cannot be dodged, however, if data related to input response and water efficiency are to be collected.

Five areas of research related to resource use and productivity seem to me to be important. They duplicate in part those described by Skold and Penn. They are:

Development of response functions. This has not been a popular area of research in recent years. Again one of the reasons is that it cannot be done with a complex mathematical model that is impressive to other members of the profession. Physical scientists have provided data that probably are adequate for fertilizers but not for irrigation water and nonpoint pollution control. Many questions remain unanswered about the use of minimum tillage, a measure that shows great promise in controlling erosion from croplands. Adoption of this practice is not as rapid as it could be. Is this because of institutional resistance; because of the capital costs of changing equipment; or because of lack of knowledge about yield response? It is easy to say that providing response data is in the realm of the physical scientist and let it go. But is that enough?

Analysis of the impact of input price changes. Supply response to changes in input prices could have a significant impact on the level of farm output. The research that ERS has underway at Stillwater, Oklahoma, on the Firm Enterprise Data System (FEDS) would seem to provide a sound base for further work in this area.

Analysis of the impact of the structure of U.S. agriculture. In the future, will the United States have a large corporate agricultural structure using massive equipment and

requiring ever increasing amounts of capital for entry into the industry? Market control by agricultural firms may be a major determinant of supply response if present trends continue. How will society respond to a corporate agriculture if this does occur? *Hard Tomatoes, Hard Times* is an indictment (not altogether fair or deserved) of the trend toward a more commercialized agricultural structure. It is indicative of the attitude of part of urban society toward agribusiness and agriculture.

Regional analysis of resource availability. Regional studies are needed to assist in the farm adjustments that certain areas must make because some resources are no longer readily available. In the late 1950's irrigation water was considered almost a free good on the Texas High Plains. In the 1980's the High Plains will face a major adjustment if the economic life of the Ogallala underground water formation comes to an end.

Examination of the relative efficiency of various inputs, given changes in relative input costs. For many years, it has been efficient to substitute capital and energy-intensive technology for labor in farm production, but the increased cost of fuel and other inputs could change this. The sociological and economic implications of such changes are likely to have a significant impact on the producers of food and fiber and will present a real challenge to researchers.

Review of: PRODUCTION POTENTIALS IN U.S. AGRICULTURE

by
Robert D. Reinsel*

Concern over ability to produce and the economic issues surrounding the production potential of U.S. agriculture are primary subjects for research in ERS. Skold and Penn look at the subject largely in terms of physical availability of resources and provide little guidance for research priorities. They suggest that input supplies are the primary subject of focus. They largely ignore time and markets. They treat weather only in a long-term context and discuss competing goals only as a side issue in discussing energy and the environment.

The six areas they suggest for future research are: land availability, productivity, and use; environmental regulations; water use efficiency; purchased inputs; weather and climate; and technology.

I believe a better sorting out of the questions concerning application of scarce research resources would group research areas in a reasonable context of time, goals, costs, and benefits.

Time is a major factor or constraint in any discussion of production potentials. Given time and changes in prices the resource base can be modified. The question is: Over what length of time and at what set of relative prices will the adjustments occur?

Within the context of time and prices, we are constrained by institutions, regulations, goals, and values. Input suppliers, farmers, processors, distributors, consumers, and policymakers all have axes to grind.

The relevant economic questions are those with answers that will keep us from straying too far from our objectives. The objectives most frequently stated are: adequate domestic supply of food and fiber; reasonable prices to consumers; equitable incomes to producers; and continuation of the family farm structure. Further goals imposed on us by other interests include: self-sufficiency in national defense; safety for agricultural employees; a clean environment; a modest rate of inflation with continued economic growth; and a positive balance of payments.

Production potential issues arise when we bump against the boundaries imposed by these goals. To provide input useful to policymakers, we should explore the conditions or sets of circumstances that might lead us into areas of goal conflict. We need to

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understand the process by which we would arrive at conflict, the actions that would prevent it, the rates of adjustment possible, and the beneficial and harmful effects of corrective action.

A primary factor, and one over which we have the least control, is weather. What kind of shortrun weather could develop that would put us into serious short-term problems with regard to feeding our people or meeting export commitments? How should we react to such a situation? What kind of insurance in terms of stocks or import-export agreements should be developed? What kinds of dislocations are acceptable?

Similar questions can be asked of the longer term. What would be the outcome of several years of unusually good (or bad) weather? What kinds of policies might be needed?

Pests are a factor over which we have some control, yet in 1970 we faced serious economic problems because of the corn leaf blight. Suppose something similar had occurred in 1974. What might have been done to lessen the shock?

Environmental improvement pushes against the goal of adequate production at reasonable prices. What are the long term consequences? How should we pay the cost?

Farm labor is being brought under collective bargaining legislation. The input, processing, and distribution industries are fully unionized. What measures are available to prevent major food production problems from arising?

Any discussion of capacity to produce must include the effect of technology on productivity. Without increases in output or slowing of population growth, we will ultimately encounter the Malthusian solution.

What is being done to stimulate changes in technology that will keep us from encountering this frontier? How will such technology be financed?

The agricultural sector now has excess resources, both human and capital. But many of these resources are underemployed. What production gains would be possible by bringing the use of these resources to the level of efficiency of the most efficient operators?

The processing and marketing systems ultimately specify the time, place, and form of delivery of food and fiber to the consumer. Efficiency and waste in this system modify the output potential from the farm plant. Market signals in this area are assumed to provide self-corrective pressures. How well do these signals work?

The growing interdependence of economic, political, and social systems in the world suggest strongly to me that agriculture's ability to produce hinges on our ability to have these systems interact in concert rather than in conflict.

A RESEARCH PROGRAM TO ANSWER ENERGY QUESTIONS IN AGRICULTURE

by
John W. Green*

Mechanized energy used in agriculture became measurable about 50 years ago. Before that time, human labor and livestock were the dominant energy sources. The number of horses and mules on farms decreased from over 20 million in the mid-twenties to about 7 million in 1950, and the Department of Agriculture stopped counting them. Human labor dropped from 21 billion man-hours in 1940 to less than 6 billion in 1974. In the same period, however, the acreage worked increased by a fifth and total farm output more than doubled.

In place of human and animal labor, farms now use energy-powered machinery—5 million tractors, 3 million trucks, 1 million grain combines and cornpickers, and many other specialized units. Mechanized farm equipment is now so versatile that there are different types of harvesters for virtually every kind of grain, vegetable, and fruit crop. To power such machinery, farms currently require over 28 million gallons of petroleum fuels a day.

Two other aspects of modern farming that involve high energy use are irrigation and crop drying. Although some irrigation systems rely on gravity, most pump water from wells. To power the pumps and pressurized distribution systems takes the oil equivalent of almost 6 million gallons a day.

Crop drying has grown rapidly in the last 20 years. It is used for many crops, but particularly for corn: more than half of the nation's corn crop is mechanically dried. Liquefied petroleum gases and natural gas are the principal energy fuels used in drying and over 4 million gallons a day are consumed.

Between 1950 and 1975, the consumption of electricity on U.S. farms for production purposes increased from 15 billion kilowatt hours a year to 39 billion. Three-quarters of the 1975 total went for crop irrigation. The balance was used for such purposes as cooling and ventilating barns, powering milking machines, heating lamps, and other labor-saving devices.

In sum, the intense application of energy, coupled with the ever growing sophistication of farm equipment, has expanded

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agricultural productivity enormously. The number of acres per farmworker tripled between 1950 and 1975, from 117 to 353.

Beyond the on-site use of energy in agriculture, large quantities are employed to provide products that are essential to modern farming. These include livestock-feed materials, pesticides, and chemical fertilizers.

Businesses that supply farmers with livestock feed use the oil equivalent of 2.5 million gallons a day. Natural gas is the principal fuel, providing half of the energy needs.

Pesticides also use energy. Beginning with DDT in World War II, numerous organic compounds have been developed to control disease organisms, insects, and weeds. The three principal kinds of chemical pesticides used by farmers—insecticides, herbicides, and fungicides—are mainly petroleum derivatives. They derive from such products as propane, butane, and naphtha and are processed through several stages. Energy is required to provide the raw material as well as to provide the heat used in pesticide formulation. The overall use amounts to almost half a million gallons a day.

A major reason for the steady improvement in crop yields has been chemical fertilizers. A 60-percent increase in total crop production occurred between 1950 and 1975, even though cropland in use declined slightly. Corn is an excellent example of the beneficial use of fertilizer: yield per acre has increased by 150 percent.

Consumption of all types of fertilizers in the United States grew from 8.7 million tons in 1940 to 47 million tons in 1974—more than a fourfold increase. Moreover, the use of the primary nutrients—nitrogen, phosphate, and potash—increased even more rapidly, due to higher concentrations.

During the past 2 decades the relative cost of energy for farm purposes has actually declined as a percentage of all expenditures. Between 1950 and 1975 direct energy costs declined from 8.5 percent to 5.7 percent of total U.S. farm production expenditures.

Like other industries, agriculture is seeking ways to offset some of the increases in energy costs by improved efficiency. For example, farmers are buying more diesel tractors, which use only three-fourths as much fuel as gasoline tractors for an equivalent amount of work. In recent years as many as nine out of every ten new tractors purchased have been diesel-powered. Other methods of conserving energy in farming are:

- Reducing crop tillage, and herbicide and pesticide application by being more selective;
- Increasing the energy efficiency of irrigation systems by improved scheduling and other operational procedures; and
- Reducing dependence on manufactured fertilizer by greater use of animal wastes and by crop rotation.

Although less than 3 percent of U.S. energy is directly consumed in farming, another 9 percent is used by agriculture-related industries and final consumption activities.

DISCUSSION OF LITERATURE

Several recent articles show that U.S. farming methods are intensive, and perhaps inefficient, users of energy; that food production costs are higher in the United States than in countries with less energy intensive production methods; and that existing production resources may be inadequate to support projected levels of population. The impressive agricultural production level in the United States has been obtained through large inputs of fossil fuels. Energy inputs are going to become relatively more expensive and may cause significant changes in agricultural production methods and rural lifestyles. This is not a surprising conclusion for agriculture or any other production methodology.

The policy implication is that, since fossil energy is scarce, we should modify our production methods. But obviously we cannot simply substitute a mixture of gasoline, fertilizer, pesticides, and insecticides for corn in human diets. Irrational policies result from assuming that one kind of energy is the same as any other kind and that all units of labor are equally productive. If our ultimate goal were to conserve all fossil fuels, we should concentrate our population in Arizona and let them absorb their energy needs from the abundant sunshine. Any productive process measured in terms of energy input versus energy output will be energy consuming because of the thermodynamic law of entropy.

Becoming energy efficient as measured by caloric input-output ratios is not a useful policy goal. Efficiency as an evaluative concept of agricultural production has meaning only when measured in value terms. Efficiency measured in terms of the conservation of raw energy is not consistent with any useful objective function for either producers or consumers. Efficiency so measured would imply that producers and consumers do not respond to relative prices, do not have preferences, or do not generally prefer more to less. This does not mean that other qualitative criteria may not be pertinent. But it may be necessary to continue production of some foodstuffs to maintain dietary balances, even though they appear less efficient.

Production costs of food in different countries mean little when considered in isolation. The relative efficiencies in producing food, machinery, and other goods must be determined in different countries in order to explain imports and exports. A country that has a comparative cost advantage in producing food will

find it profitable to export food to other countries. The fact that the United States is a leading exporter of food and fiber suggests that we have such a cost advantage.¹

The energy crisis has radically altered consumers' perspectives. No longer do people believe that our resource shortage and other problems will be solved through the genius of American technology and management. It is recognized that our resources are not unlimited and that further gains in productivity will be harder to achieve.

LOOKING TOWARD THE FUTURE

The importance of energy issues at the national and regional levels over the next decade cannot be overemphasized. Concerns are likely to center on conservation of energy use, development of more energy efficient processes, and allocation of scarce energy sources.

Agricultural managers and researchers will be asked to identify processes that are energy intensive and to develop ways of conserving such use. Agricultural experts will be expected to provide answers concerning the impact on output and prices resulting from many alternative proposals for decreasing energy use.

Agricultural professionals must also discover, develop, and measure the impacts of new production methods. These new techniques may replace existing energy-intensive methods as well as provide new ones. Private industry may play a lead role in innovation, but government professionals will take the lead in impact analysis.

Public sector professionals will also be called upon by Congress and the Federal Energy Administration (FEA) to provide information on fuel allocation procedures, especially in the event of another oil crisis or a natural gas shortage. These criteria and procedures will be more acceptable and workable if they are based on detailed, regional knowledge of energy flow and utilization.

Energy inputs will become more expensive. More expensive energy means changing relative input mixes. The USDA and the land grant institutions will be expected to provide the basic data necessary to make management decisions.

Beyond the direct effects resulting from conservation, technology and allocation changes, there will be indirect effects on all

¹More than a fourth of total U.S. agricultural acreage harvested in 1974 represented production for export.

sectors of the economy. Therefore, any analytical framework developed must be capable of outputting both types of effects. The framework should also be compatible with analytical systems available for other sectors of the economy to minimize question response time and maximize returns from research investment.

ORGANIZATION OF A RESEARCH PROGRAM

Cervinka, Pimentel, and Whittlesey provide examples of recent attempts to measure energy coefficients in specific stages, but accurate energy input-output data for the whole food supply chain are generally not available. With the shortage of input-output data on agricultural production and processing, and the fact that energy shortages are not going to disappear, the time has come to develop comprehensive statistics on energy use.

The U.S. Department of Agriculture, through its Economic Research Service, is a logical choice as the lead Federal agency. Working through its own capabilities and in cooperation with State land grant institutions and other research organizations, ERS can develop a comprehensive data base designed to answer questions concerning energy use by specific sectors, and to help formulate policies for energy conservation and utilization. Since the 1973 energy crisis considerable work has been done by the State agricultural experiment stations; this work should be integrated into an overall energy data base.

ERS has responded to energy policy issues several times by combining available information with the judgment of staff researchers. But now concern over energy use in our country has produced (mostly through the Energy Research and Development Administration (ERDA), FEA, Commerce², Interior, and the Environmental Protection Agency (EPA)) an aggressive, comprehensive program to provide information and answer questions on energy use. The USDA should develop a capability to play a lead role for agriculture.

The energy studies that ERS is undertaking under present commitments do not add up to a balanced program of research, nor do they provide sufficient information for policy decisions. There is little reason to expect adequate balance and depth if energy research remains under traditional areas.

²The Department of Commerce has been designated as energy data coordinator and has over 200 staff people working on energy-related matters.

THE RESEARCH APPROACH

The ERS Energy Board has considered and rejected the combination of all energy related research into a single organizational unit in favor of the designation of two separate energy research groups. Such a decision will not produce the comprehensive data base needed to answer future policy questions.

Instead, ERS should request permanent funding for one cohesive energy research unit consisting of a policy-oriented group and a data-analysis group.

The policy-oriented group should be located in Washington and should consist of the present Energy Board plus program area leaders and project leaders concerned with energy. A continuation of the *ad hoc* approach will be necessary until the data-analysis group can develop data for an automated system designed to simulate energy use in the production and consumption process. Eventually, impacts of scenarios suggested by Congress and others, and refined by the policy group, can be quickly obtained from the automated system.

The data-analysis group should consist of a program area leader or project leader in Washington and a number of researchers in appropriate field locations. Part of this group should be located in the field for two reasons: first, to put it closer to the land grant institutions where the "nuts and bolts" research is being done and second, to insulate it from the political and administrative pressures in Washington. The field locations should have sophisticated data processing capabilities available, as well as demonstrated capabilities in input-output analysis.

The data-analysis group should organize its energy data system around a highly detailed national-regional agricultural input-output framework. Such a detailed framework (500 or more highly disaggregated regional agricultural production, processing, and marketing sectors), concentrating on nonenergy linkages, is not currently available in ERS. Therefore, it must be completed and used as a base to which energy coefficients can be attached. Since the technical production and energy coefficients are highly inter-related, they could be generated simultaneously.

The input-output framework serves at least three major functions. The first is as a highly detailed structure for evaluating existing State and Federal research results and designing research programs to provide new data. Specific research results could be evaluated and entered into the framework to portray one or more production, processing, or marketing linkages.

The input-output framework's second major function is as an analytical tool. When a sufficient amount of basic information has been collected, the input-output framework can be used to

evaluate the impacts of alternative policy scenarios.³ The policymaking subgroup should play the major role in developing the scenarios, allowing enough lead time so that scenarios are available when the framework is considered complete enough to be usable.

Since input-output is not an optimizing tool, it would be appropriate, once the basic regional and interregional linkages have been identified and quantified, to develop other tools such as linear programming or econometric simulation models.⁴ Ultimately, an interregional linear programming model, regardless of where it is developed, would be expected to answer energy production and processing efficiency questions. It may be necessary for the Department to develop policies encouraging, for example, regional production of certain agricultural commodities at the expense of less energy efficient regions.

Substantial amounts of more commonly used statistical analyses would assist in developing inputs for the basic input-output and optimizing frameworks. The greatest contribution from these analyses would come during the scenario development or policy formulation stage.

It should be emphasized that the input-output framework is static, and concurrent estimates of historical energy use situations will be needed as benchmarks. Historical benchmarks will be used for price-elasticity and cross-elasticity evaluations of alternative energy sources and production methods, as reference points against which to compare results of alternative policies, and to generate matrix coefficients representing future linkages.

The input-output framework's third major function is as a visual-display tool. The linkages between the various sectors are easily explained by using the input-output matrix. Inputs and outputs and their connections in the input-output framework are easily understood by noneconomists, especially in physical terms. Comprehension becomes more difficult when values are attached to the flows but the capability to shift easily between physical and monetary flows aids in understanding physical and monetary energy movements.

One of the great analytical abilities of the input-output framework is to measure secondary, as well as primary, impacts. The input-output framework enables one to follow scenario impacts all through the economy and then to generate multipliers related

³The research involved in collecting the data may take several years and could certainly be viewed as a continuous process.

⁴Existing research teams within ERS could make a contribution here; for example, the Cost of Production Study Team involved with the budget generator at Oklahoma State University.

to income, employment, output, household consumption, and so on. Since agriculture is a basic industry, a strong argument can be made for protecting its energy supplies and input-output could be an invaluable tool in providing information to support fuel-supply arguments.

INTERDEPARTMENTAL COORDINATION

The USDA should design its research program to complement, not duplicate, the efforts of other Federal agencies.

Within USDA, coordination between agencies should involve collaboration on the technological assessment of energy-related activities. For instance, a small, interagency research team should investigate alternative energy sources such as the sun. This team should include physical and social scientists capable of evaluating both the physical and economic feasibility of such energy sources.

It should also be kept in mind that forest production and wood processing are important agricultural activities. Forest Service technicians could be called upon to provide input-output coefficients and contribute, through the policy group, to scenario development.

Research should be conducted to determine the energy efficiency of various food preparation processes. Considerable research is being done on this by private industrial manufacturers of various food preparation devices. Such research could be monitored and brought into the input-output framework where appropriate, perhaps through the use of a separate food preparation matrix. Therefore, it is recommended that the data-analysis group include one or more technically trained home economists to monitor and organize such research programs.

The efforts of the Kansas Agricultural Stabilization and Conservation Service (ASCS) offices provide a model of how that agency could function as a monitor and clearinghouse for energy use at the farm level. During the farm fuel crisis the Kansas ASCS, with the encouragement and assistance of Kansas Senators, did an excellent job of tracking fuel shortages, forwarding fuel supply reports to their Washington headquarters and to Congressional representatives, and assisting in arranging for relief to fuel-short farmers.

The fuel crisis has also generated interest in the processing of agricultural wastes to generate energy and for other uses. Concern is being expressed by agricultural experts, however, that such an effort on a large scale would have a severe impact on soil tilth and erosion. The Soil Conservation Service (SCS) can contribute to the USDA effort by analyzing the impact of these and other new technologies.

PROGRAM COST AND COMPLEMENTARITY

The research program outlined above would be expensive, costing ERS \$2 to \$5 million over a period of 10 years. A year would be required to develop the program in detail and to formulate a staffing plan. This could be done, at the ERS level, by the Energy Board with assistance from input-output technicians. The high cost must be balanced, however, against the large potential payoff. The Bureau of Economic Analysis (BEA) within the Department of Commerce decided several years ago to make such an effort and now continues to benefit from the development of its national input-output framework. While USDA contributes to their framework, the level of regional detail is inadequate to answer the energy policy questions likely to face the Department over the next decade. The primary concern of the research program described here should be to provide data appropriate for energy policy analysis.

The research effort described above would complement several efforts at the Federal level. As noted, it would complement the national input-output modeling effort in BEA. The effort would also aid efforts to make the Nation self-sufficient in energy by increasing domestic energy supplies and by initiating energy conservation measures. The program of the Federal Energy Administration would be complemented by information useful in determining allocation formulas and in developing policies designed to insure the fuel supplies necessary for agricultural production, processing, and marketing. If speculation about the reorganization of Federal energy-related departments and agencies is realized, USDA will be in a position to contribute to any organizational framework designed to investigate energy use in agriculture.

CONCLUSIONS

The time is right for USDA, through the economists within ERS, to take an active role in developing a framework capable of quickly answering the energy questions that will be asked over the next decade and beyond. The USDA must aggressively seek Congressional funding to develop such a research capability. EPA, ERDA, and FEA have preempted some of USDA's capability to furnish guidelines dealing with fuel allocation and supply, energy self-sufficiency, energy conservation, and agricultural production. Some of their suggestions, especially in the energy conservation area, have been unacceptable to the Department.

The energy issue touches all aspects of the ERS organization. Energy-use alternatives present natural resource questions which must be answered and which will influence the energy sources

ultimately available to agriculture. Natural resource-use creates impacts on our rural communities and affects the quality of rural life. Energy use decisions obviously affect agricultural production processes and the supply, prices, and export of foodstuffs.

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Abstract of: ENERGY RELATED RESEARCH FOR AGRICULTURE: NEW DIRECTIONS

by
Gene K. Lee*

Since 1776, U.S. agriculture has gone through two technical revolutions—from hand labor to horses, and from horsepower to mechanical power. Agriculture has become increasingly energy intensive. Now we are about to enter a third revolution in agriculture—transforming farming to factory-like practices that will further intensify energy uses just when we are confronted by energy shortages.

We need to reexamine the economic reasoning underlying the utilization of fossil fuels and look for new energy resources. This paper proposes some energy-related research areas for the coming decade.

First, we need to develop systematic energy-use data in agriculture. This is particularly needed for physical energy use and costs in the entire food system—from production through marketing to consumption—at both the national and regional levels.

Second, in light of the developing transformation from farming to factory-like practices, economists should examine whether economies in the intensive use of energy are feasible under the existing energy situation.

Third, technology needs to be developed that can utilize more flow resources such as solar energy and derived energy from farm products. Man may have to turn his technology around and make gasoline from corn or from other commodities rather than making nylon from oil.

Fourth, energy-related research requires cooperation and the combined attack of representatives from various disciplines.

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Abstract of: MONITORING FARM CAPITAL FORMATION AND FINANCING

by
Lindon Robison and Richard Simunek*

This paper is concerned with improving measurement of capital formation and financing in farming. Net capital formation is one of the variables that determine output potential and measures of net capital formation indicate how that potential is changing. Increases in the capital stock beyond those required to replace depleted capital expand the potential, if other factors are constant.

A capital flows statement for the farming sector is suggested for measuring net capital accumulation, and a capital finance account is suggested for monitoring the internal and external funds used to finance capital formation. These proposals are not new. However, changes suggested in this paper would improve their accuracy and usefulness.

Depreciation charges are examined. The authors propose using replacement cost rather than book value depreciation and including the difference between book value and replacement cost depreciation in the savings estimate. After these changes, net capital formation as recorded in the capital flows account, plus the change in financial assets held, equals the new definition of saving (internal funds) from the capital finance account plus capital borrowings (external funds). Valuations of depreciation charges in the capital flows and finance accounts is a concept requiring further study.

Finally, the paper illustrates the variability in use of external funds and their availability to finance net capital accumulation. For example, data from the 1970 Agricultural Finance Survey show that about half of the farm operators held no debt; they relied entirely on internal sources of funds. Data on debt from the same survey show that for farm operators who did use external funds, loans from the Farmers Home Administration and from individuals and businesses were more important for the low-income, young farm operators than for higher income, older farm operators. These differences influence the level and rate of change in output capacity obtained by the different farm operators.

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Abstract of: ENERGY WASTES IN THE FOOD AND FIBER SECTOR

by
Harold H. Taylor*

Since the turn of the century, much of the increased farm productivity in the United States has come from the substitution of low-cost fossil energy for high-cost labor and animal energy. However, since 1962 agricultural productivity in terms of energy inputs from nonrenewable resources has been relatively constant while the volume and cost of these energy inputs have been rising at increasing rates. Currently, about 16 percent of all U.S. energy is used by the food and fiber sector and most of it is from nonrenewable resources. It is possible that the United States is approaching a "plateau" for intensive agriculture and further production increase will not happen without penalty.

On the farm, energy is used in various forms for fuel, cultivation and transportation, and farm living. Also, energy is used to manufacture, deliver, and maintain such inputs as fertilizer, pesticides, farm machinery, tractors, agricultural steel, fencing, and irrigation.

Beyond the farm and before final use, energy is used to transport farm products; to dry grain; to process foodstuffs; to make paper, glass, steel and aluminum containers; to distribute processed and packaged food products; to build machinery, trucks, and trailers; and to store foods in distribution centers and markets.

Energy is also used in the storing and cooking of foods either in the home or in eating establishments. This includes the energy consumed in manufacturing refrigerating and cooking equipment as well as in its operation.

There are many essential areas in the food and fiber sector where economists of the Economic Research Service are qualified to evaluate, develop, and analyze alternative energy utilization programs and to establish guidelines for prevention of energy losses.

It should be remembered that food and fiber not properly utilized in final form not only represents the energy lost at that time but also all the energy that produced, modified, transported, and stored the food and fiber from farm to consumer.

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Chapter 4—

FOREIGN TRADE AND DEVELOPMENT

FORENOTE

Not since before World War I has so much of our peacetime farm production gone abroad. About a third of our grain output has been exported in recent years. In their paper, Hanrahan and Kennedy explore the new interdependence in world agriculture, identify issues in commercial and concessional trade, and discuss the instability in world markets associated with interdependence. They also recommend an ambitious program of research.

They consider research for commercial trade under three headings: for developed countries, for centrally planned countries, and for developing countries. They examine the need for liberalization of trade controls and point to the problems that need analysis before trade barriers can be relaxed. Some problems affect the European Community, others Japan, still others the United States. Linkages between agriculture and trade policies complicate negotiations between the three areas. They suggest more analysis of domestic issues in each area to break through the present impasse.

Recent experience with the profound destabilizing effects of large variable purchases by the centrally planned countries points up the difficulties of trade unless we can work out better information systems and better ways of trading.

The developing countries have become a major factor in international agricultural trade. Politically they are seeking more radical reform of the international order than implied in trade liberalization. Many would like to see a move in the direction of greater management of commodity trade and a major redistribution of income between rich and poor nations.

Our aid to developing countries takes two main forms: concessional trade in food and assistance for agricultural development. An important problem is whether food aid is a disincentive to agricultural development. Price instability in internationally traded commodities is cited as a major issue. Here research should extend through a whole series of matters including weather forecasting and reserve stocks policies in various countries.

Reviews

Three reviewers, Dalrymple, Gregory, and Schutjer, react to the main paper. Dalrymple regards it as a "well-organized, well-written paper," but thinks it does not go far enough on development in developing nations. He shares the authors' concern about the need for research in food aid and believes more analysis is needed on the disincentive aspect of food aid.

Gregory agrees that the Hanrahan-Kennedy paper is excellent but feels that the issue of development has received inadequate attention. He also mentions weather as a priority item and emphasizes the need for collecting and maintaining pertinent data series as a basis for continuing analysis. He endorses the need for a stronger mandate to do work in this area.

Schutjer blesses the authors for a particularly good job of identifying research needs for commodity trade issues. He thinks their focus on centrally planned economies "is exactly right." He agrees with most of the paper but takes strong exception to the authors' view that research in agricultural development in developing countries can be undertaken as a byproduct of the regular country and commodity reporting system conducted by the U.S. Department of Agriculture. Closer contact with local details is needed.

Contributed Papers

The six contributed papers in this chapter mark the wide interest in foreign trade and development. Those by Schoonover, Steele, and Willett precede abstracts of the other three.

Schoonover provides an interesting discussion on policy issues for the centrally planned countries. This supplements and extends the Hanrahan-Kennedy paper with more detail.

Steele deals with research on grain reserves. He discusses the research now underway in ERS and suggests what more is needed. He points out the need for increased weather research and how its results fit into grain reserves analysis.

Willett concentrates on the "unique role that ERS can, and... should perform" in foreign trade research. ERS has a special capability for supplying objective information and analysis on world food issues. The future is uncertain and opinions divide

sharply between the Malthusian pessimists and the technological optimists. Willett is inclined to join the optimists. He also asserts that weather studies are important. They belong with the climatologists, but need economic interpretation. Climatologists have reached no consensus, but we need to keep listening.

In the three abstracted papers, Kost discusses forecasting agricultural trade, Manfredi concentrates on P.L.-480 programs, and Lea considers more general ways in which ERS can help meet future food demands.

EMERGING ISSUES IN AGRICULTURAL TRADE AND DEVELOPMENT

by

Charles E. Hanrahan and Richard M. Kennedy*

INTRODUCTION

Our purpose is to identify the international issues in agricultural trade and development likely to confront the United States in the coming decade. Our theme is that the important issues requiring research will emerge from the increased interdependence that now characterizes the world's agricultural economy.

We first explore the nature of that interdependence as it relates to the United States. Second, we identify issues that arise from commercial U.S. agricultural trade with the developed, centrally planned, and developing countries. Third, we examine issues that bear on concessional food trade and agricultural development assistance. Fourth, we treat the problem of instability in world agricultural markets. Throughout, we extract from the discussion research recommendations on issues we believe are of present and future concern to ERS.

INTERDEPENDENCE IN THE WORLD AGRICULTURAL ECONOMY

The U.S. agricultural economy has become heavily dependent on other countries as markets for its food and fiber output. Strong foreign demand caused exports of wheat, feed grains, and soybeans to increase sharply in the marketing year 1972-73 and with the exception of 1974-75, these exports have continued their upward trend. The United States markets a substantial portion of its agricultural output abroad. About a third of U.S. grain output has been exported in recent years, accounting for slightly more than half of world grain trade. These exports include over 60 percent of the U.S. wheat crop and about a fourth of corn production.

Agricultural exports contribute much to farm incomes, are increasingly important in the U.S. balance of trade, and strongly influence the level of consumer prices. Farm income has reached

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record levels since 1972. The surplus in the agricultural trade account grew during the 1960's but it did not exceed \$2 billion, while from 1972 to 1975, it rose to more than \$12 billion. Export demand has exerted strong upward pressure on food prices, and consumers are more involved in public debate on agricultural trade and development issues.

While the U.S. economy has come to rely heavily on foreign agricultural trade, other countries have become increasingly dependent on the United States as a source of supply for food and agricultural products. Despite concerted efforts to increase domestic self-sufficiency and control imports of food, the European Community (EC) and Japan continue to be large and stable commercial buyers of U.S. agricultural commodities. With increasing frequency the USSR, China, and other centrally planned economies have also entered U.S. markets to purchase food supplies. These large but sporadic purchases have been a major source of price instability in the world grain market.

Collectively, the developing countries constitute the largest commercial outlet for U.S. farm exports, accounting for 42 percent of the total in 1975. These markets will grow as their foreign exchange earnings rise and economic development accelerates. Many poorer developing countries with too little foreign exchange earnings to operate in commercial markets depend on the United States for concessional supplies of food.

Interdependence also extends to helping the developing countries increase their own food production through transfer of technology and investment in agricultural and rural development. The United States devotes an increasing portion of its bilateral foreign aid program to increasing agricultural production in the developing countries and also makes contributions through international organizations such as the World Bank, the United Nations Development Program, the Food and Agricultural Organization (FAO), and the regional development banks. The United States has pledged \$200 million to the International Fund for Agricultural Development (IFAD), one of the institutions recommended by the World Food Conference.

Such U.S. aid has been justified because it helped poor countries meet critical needs for agricultural commodities which they could not afford to import commercially, or because it promoted economic growth which generated an effective commercial demand for agricultural commodities. But the recent controversy over competition between U.S. vegetable oils and palm oil imports from Asian and African countries dramatically illustrates that such investment and technological change in the developing countries may also transfer comparative advantage and heighten competition in world commodity markets. Conflicts of interest

may arise more frequently as developing countries improve their agriculture and press for access to developed country markets. The potential benefits and costs from the transfer of technology have barely been explored.

Interdependence in the world's agricultural economy is also the source of the price instability with which policymakers have contended since the beginning of the 1970's. Examples of destabilizing events abound. The U.S. decision to draw down its grain stocks contributed to increased variability in world wheat and feed grain prices. Protectionist policies in the European Community and elsewhere forced adjustments onto the exporting countries. Export embargoes encouraged Japan to seek supplies of soybeans elsewhere. Russian forays into U.S. markets pushed up food prices and caused a severe contraction in the U.S. live-stock industry. Most international agricultural events and issues bear on the problem of price instability. The following pages explore some of the issues raised by international efforts to enhance stability in world commodity markets.

COMMERCIAL TRADE

The growing significance of agricultural trade to the U.S. economy underlines the importance of U.S. efforts to negotiate, in the Multilateral Trade Negotiations (MTN's), more liberalized access for exports to developed-country markets. As tensions between East and West have relaxed, the United States has looked to the centrally planned countries—the USSR, China, and Eastern Europe—as commercial markets for agricultural exports. Many of the developing countries are also becoming important commercial markets for U.S. food and fiber exports.

Developed Countries

In the current round of MTN's, the main objective of the United States is to obtain freer access for its exports through the reduction, or elimination, of tariff and nontariff trade obstacles that impede expansion of trade with Europe and Japan. The United States also seeks to strengthen the rules that, under the General Agreement on Tariffs and Trade (GATT), govern the use of export subsidies, safeguard procedures, and access to supplies.

For the United States, freer access to these and other developed-country markets is the international complement to domestic policies of full production and a more market-oriented agriculture. In the European Community and Japan, domestic policies are also directly linked to trade policies. Domestic goals and perceptions of national interest result in trade policies that diverge from those of the United States and often result in contrasting

negotiating positions. Thus, to understand the issues involved in efforts to liberalize agricultural trade requires a consideration of the domestic agricultural policies of the major participants in the MTN's.

U.S. domestic policy has sought to maximize farm income, assure stable consumer prices, and minimize Government involvement in, and expenditure on, the farm sector. An elaborate system of price supports, acreage controls, marketing quotas, and other devices has been designed to maintain farm income. Under the Agriculture and Consumer Protection Act (1973), target prices that trigger direct payments to farmers have been added to price supports as a means of maintaining farm income.

For the United States, multilateral trade liberalization aimed at expanding trade flows is the international means for achieving domestic policy goals related to farm income. Consumer prices can be stabilized through more orderly international marketing of agricultural commodities. Channeling surplus production into expanding export markets rather than accumulating stocks can also help keep Government expenditure on behalf of agriculture to a minimum.

The United States has made progress toward more liberal world trade in agriculture. A majority of the tariffs authorized in the 1930's have been reduced by 50 percent or more, and import quotas are in effect for only a few commodities: dairy products, cotton, peanuts, and sugar (a global quota). Quotas on meat were administratively suspended in 1973, but recently they have been formally imposed under the meat import law. Export subsidies for wheat, feed grains, and other commodities have been terminated or suspended, although the legislative authority exists for their reintroduction under certain circumstances.

Despite an impressive record of support for trade liberalization, some trade regulations remain and export controls were used when strong export demand pushed up consumer and producer prices. The price destabilizing effects of expanding exports created pressure by labor unions, livestock producers, and consumers for cancellation of soybean contracts with Japan in 1973; and for delay, followed by partial cancellation, of grain sales to the Soviet Union in 1974.

Export controls raise issues that are difficult to reconcile about the tradeoff between consumer interests in stable and low food prices and producer interests in low-cost inputs and high farm prices. They create doubt among foreign customers about the reliability of the United States as a source of supply and about its commitment to trade liberalization. Export controls can also contribute to the reduction of foreign market shares. The cancellation of soybean contracts in 1973 was at least partially responsible for

Japan's negotiating a contract with Brazil in 1974 for the production and purchase of soybeans. Dissatisfaction with export controls also led in part to the grain accord between the United States and the USSR discussed below.

In the European Community the system of variable levies, minimum import prices, price supports, and export subsidies which comprise the Common Agricultural Policy (CAP) protects European farmers against competition from producers in the United States and elsewhere. The EC views the CAP as the major component of a tripartite domestic agricultural policy that also includes structural policies to facilitate the creation of larger farms and to enhance the mobility of farm labor, and social policies to create nonfarm employment in rural communities and provide income and security to retired farmers.

Linkages between domestic agricultural policies and trade policies complicate the negotiating process in the MTN's. The major participants in the MTN's have taken the position that domestic agricultural policies are not proper subjects for trade negotiations. Yet, the United States identifies variable levies and export subsidies in the CAP and State trading in Japan as major barriers to the expansion of trade in agricultural commodities. The EC for its part is sensitive to the direct relationship that exists in the United States between high price supports for domestically produced dairy products and quotas applied to dairy imports. The Japanese are concerned about U.S. domestic policies, such as those that led to the use of export controls, that affect their access to food supplies in world markets.

In contrast to trade liberalization, the European Community has proposed various administrative mechanisms, including Intergovernmental Commodity Agreements (ICA's), as means to regulate trade in agricultural commodities. The EC proposal for an ICA on grains with buffer stocks to support minimum and maximum prices and purchase and supply commitments illustrates this approach. The Japanese apparently would like to make similar administrative arrangements that will assure them access to supplies at stable prices.

Compromise will be required if the apparent impasse that now exists in the MTN's is to be overcome. To achieve its objectives of expanded trade through improved access, the United States may have to offer improved access to its own markets for certain commodities. With the removal of trade barriers, some commodity sectors will experience adjustment difficulties and need assistance in making the transition to a more competitive international climate.

Such concessions may be a necessary but not sufficient inducement to persuade the EC to reconsider its position on the CAP.

Meanwhile, the significance of the U.S.-USSR agreement on grains, essentially a supply and purchase agreement not greatly dissimilar from agreements proposed by the EC, will not have been lost on either the Europeans or the Japanese. Alternatives for regulating world agricultural trade that lie between more liberalized, market-oriented reforms advocated by the United States and more administratively managed commodity markets advocated by the Europeans and Japanese may need to be seriously considered.

The foregoing discussion of U.S. agricultural trade with its traditional commercial customers indicates research along two inter-related lines.

First, the direct linkages between domestic agricultural and foreign trade policies suggest that much more research attention be paid to the domestic goals and policies of foreign countries. Domestic policies will affect the extent to which individual countries are prepared to rely on trade to supply some of their food and fiber. Not only are domestic agricultural policies important, but fiscal and monetary policies can also affect the extent to which countries are prepared to rely more on international markets and less on domestic self-sufficiency to meet food and fiber needs. Recent research on the impact of dollar devaluation on the demand for U.S. exports raises issues about the relationship between more general economic policies and agricultural trade (7,12,13).

Descriptive surveys of policies of various countries have limited usefulness. What is required is to identify and specify critical policies and to incorporate them as variables in quantitative analyses of the supply and demand for agricultural commodities in foreign markets. Efforts underway in ERS to improve analysis of demand for U.S. agricultural exports in major foreign markets will require research that can better specify such policy variables for individual countries. Without such knowledge, we are not likely to improve either shortrun or longrun estimates of foreign demand for U.S. agricultural exports.

A second and related area of research concerns the economic consequences of trade liberalization for the United States and for its major trading partners. Extensive lists of tariff and nontariff barriers of the developed countries have been compiled (1,2), but few estimates of the level of effective protection they provide have been made. As noted below, the level of effective protection that trade barriers afford the developed countries also has implications for the expanding trade and development of the developing countries.

Little research has been done on the consequences of reducing or eliminating trade barriers for a host of economic variables

including, but not limited to, resource use, employment, production, prices, and balance of payments. Moreover, the sectoral adjustments that might accompany trade liberalization are poorly understood. The policies, positions, and proposals advanced by other participants in the MTN's and in other international forums need to be examined for their impact on the economies of major trading nations.

Centrally Planned Countries

U.S. efforts to expand exports to the centrally planned countries were helped along by the USSR's policy decision in the 1970's to meet the needs of its growing livestock sector by importing grain when domestic supplies were limited by poor crops. In the 1950's and 1960's, U.S. sales to the Soviet Union had been curtailed as part of the cold war policy of containment. During that period, the USSR was a net exporter of grain, and, in the event of short supplies, slaughtered livestock or rationed supplies. In the marketing year 1972-73, the USSR imported 20 million tons of U.S. grain. In 1974-75 and 1975-76, the Soviets again entered the U.S. market to make sizable purchases of grain.

The U.S. experience in trading with the USSR since 1972 demonstrates the interdependent nature of the world agricultural economy and raises some important issues about trade with the centrally planned economies.

First, large but variable purchases, such as those made by the Soviet Union in 1972 and again in 1975, can have a profound destabilizing impact—and not only in the United States. Widespread effects on output, prices, and income are felt on a worldwide basis. The considerable upward movement of grain prices generated mainly by the Soviet purchases in 1972 forced a severe adjustment in U.S. livestock as grains were bid away from livestock production to the export market. Consumer prices for food and livestock products were pushed up to record levels.

Second, the experience in trading with the USSR illustrates the extent of consumers' interest in, and influence on, agricultural trade policy. It was primarily the labor unions in their stated roles as consumer representatives that forced the temporary stop on grain exports to the USSR in 1975 and the subsequent U.S.-USSR grain agreement. Livestock producers concerned with higher feed costs added to public pressure to limit exports, while contraction in the livestock sector contributed to higher consumer prices for beef and other livestock products. This reinforced consumer demands for export controls.

Third, the experience in exporting to the Soviets points up the difficulties encountered when market economies trade with centrally planned economies. Inadequate information on the agricul-

tural economy of the USSR and other socialist countries creates uncertainties in exporting countries about import needs and intentions. This lack of information, coupled with the procurement monopoly held by State trading agencies, gives the centrally planned country an advantage in dealing with private sellers in more market-oriented economies and can result in an "asymmetrical distribution of the benefits of economic exchanges" (14).

All of these factors—concern about the price destabilizing effects of unregulated grain sales to the Soviet Union, political pressure applied by producer and consumer groups, and the peculiarities of dealing with a State trading system—culminated in the signing of the U.S.-USSR grain accord in 1976. This agreement removes some but not all of the uncertainty from our trade with the Soviets. The Soviet Union can still be a destabilizing influence in the world grain market. Although the quantities of grain that the Soviets can purchase from the United States can be limited to 8 million tons, they can still purchase unlimited quantities in foreign markets and put indirect pressure on U.S. grain supplies and prices.

Because the Soviets and other centrally planned countries rely on State trading, it may be necessary to give serious thought to alternative domestic marketing institutions and to other international trading arrangements than those codified in GATT. Research is needed to identify and assess such alternative marketing institutions, which could range from closer Government oversight of exchanges with centrally planned economies, to a marketing board acting as the agent for U.S. producers and trading companies. In addition, rules and regulations that differ from those codified in GATT may need to be devised to integrate the USSR and other centrally planned countries more effectively into the world agricultural economy.

Developing Countries

Growth in developing countries' commercial demand for U.S. agricultural exports is not entirely a recent phenomenon. An ERS study of the experience of 66 developing countries from 1957 to 1964 showed that an increase in per capita income of 10 percent was associated with a 25-percent increase in agricultural imports. This compares with an 11-percent increase in medium-income countries, and an 8-percent increase in developed countries (8). More recently, the rapid growth in 10 developing-country markets has been documented by Parker (9).

Despite their dependence on foreign trade, the ability of many developing countries to export has been constrained by the domestic and trade policies of the United States and other developed countries. Many developing countries are actual or would-be exporters of a large number of agricultural commodities. These

include not only tropical products, but also those that compete with such U.S. exports as wheat, rice, oilseeds, livestock products, cotton, and fruits and vegetables. They depend on these and other exports of primary commodities for foreign exchange to service and repay debts and to purchase capital goods and other imports essential for development.

In response to developing country interests in increasing foreign exchange earnings through exports, the United States has offered more liberalized access for certain products by the reduction of tariff and other barriers to trade on a most-favored-nation or preferential basis. For example, the 1974 Trade Act provides for a generalized system of preferences (GSP) designed to accord the developing countries duty-free access for many export commodities. Although intended primarily to open U.S. markets for developing country manufacturers, some 300 agricultural products are included on the list of eligible commodities. The impact of the GSP on U.S. agriculture is as yet uncertain, and some commodity groups are seeking exceptions from the list, which may be granted to domestic commodity groups who establish that they will be adversely affected by duty-free access.

Many developing countries doubt that trade liberalization will generate enough foreign exchange to accelerate their economic development. They are dubious on both economic and political grounds. Instability in world markets for primary export commodities contributes to wide fluctuations in foreign exchange earnings and increases the economic risks of relying on more liberalized trade to accelerate economic development. Moreover, changes in trade policy by the developed market economies have not yet substantially enhanced access to their markets.

Politically, the developing countries are seeking a more radical reform of the existing international economic order than is implied by trade liberalization. Many are concerned about their inability to influence the forces that govern world commodity markets under existing international arrangements. Liberalized access for products of export interest is but one element of a comprehensive program to create a new international economic order based on a redistribution of income from rich to poor countries. The developing countries, led by the Group of 77, have proposed an integrated commodity program designed to achieve their foreign exchange and development goals through the international management of commodity markets.

This integrated program, as presented in Nairobi at the Fourth United Nations Conference on Trade and Development (UNCTAD) Session on commodity problems, contains seven major elements: ICA's for primary products of export interest to developing countries, a common fund to finance buffer stocks of key

storable commodities, intergovernmental purchase and supply agreements, indexation of the prices of developing country primary exports to the prices of imports, compensatory financing when real export earnings decline, improved access for products to developed country markets, and relocation of primary processing industries in the developing countries.

The United States has indicated a willingness to discuss commodity problems and at Nairobi presented a four-point program of its own on international commodity problems. These four points stress the promotion of adequate public and private investment in developing countries, the improvement of trade conditions for individual commodities, the stabilization of export earnings of developing countries, the improvement of trade conditions for individual commodities, the stabilization of export earnings of developing countries, and measures to encourage processing of primary products in those countries. The United States, however, opposed the general thrust of government intervention in commodity trade as implied by the Integrated Program for Commodities (IPC).

Thus, the United States has agreed to participate in UNCTAD's individual commodity meetings, but has not made a prior commitment to take part in the negotiations. Likewise, with respect to the common fund, the United States is participating in the preparatory meetings, but has deferred the decision on participation in the negotiating conference. The United States has also taken the position that individual commodity agreements should be considered on a case-by-case basis.

The willingness to discuss commodity problems with the Group of 77 implies that the United States will be seeking areas of common interest and constructive responses to proposals made by the developing countries. Research on the various aspects of the integrated program and alternatives to it is needed for effective U.S. participation in the dialogue within UNCTAD. The main source of controversy is over the means the developing countries wish to pursue to achieve their goals of increased foreign exchange earnings, accelerated development, and more equitable international income distribution. How this controversy will be resolved will affect the efficient allocation of the world's resources and the equitable distribution of world income.

Many of the key commodities for which agreements are proposed are competitive with U.S. products; other agreements include commodities which are significant imports in the U.S. economy. Consequently, research by agricultural economists in ERS should focus initially on the implications of the integrated program and on the alternatives to it for U.S. and world agriculture.

Because of U.S. commercial interests in expanding markets and accelerating economic development in the developing countries, and because of the U.S. commitment to furthering trade liberalization, research should emphasize two parallel lines of inquiry: (1) the ability of elements of the integrated program to meet the foreign exchange, development, and equity goals of the developing countries, as well as the potential impacts on producers, consumers, and governments in both developed and developing countries of more highly regulated commodity markets; and (2) the economic consequences of alternatives to the integrated program, such as price-stabilizing ICA's for internationally traded agricultural commodities and more liberal access to developed-countries' markets for developing country agricultural exports.

Specifically, research should be directed to: the ability of ICA's to increase foreign exchange earnings and accelerate development in the developing countries; domestic and international effects of ICA's on resource use, employment, output, income, prices, and so forth; impacts of purchase and supply commitments on U.S. and world production and trade pattern; the benefits and costs of alternative compensatory finance arrangements; the feasibility of relocating primary processing activities in developing countries; and the potentials of trade liberalization as an alternative to international commodity market management for meeting the foreign exchange and development aims of the developing countries.

CONCESSIONAL TRADE AND AGRICULTURAL DEVELOPMENT

Some additional issues emerge from the further consideration of economic relations between the United States and the developing countries. Two in particular, concessional trade in food and agricultural development assistance, will be of continuing importance in the coming decade.

Food Aid

With increasing commercial exports and the absence of stocks, the opportunity cost of providing concessional supplies of food to poor countries has risen since 1972. Nevertheless, the U.S. food aid program has survived the stress of food shortages and has become a permanent part of our foreign aid program. Legislative authority for the food aid program expires in 1977, but it is unlikely that food aid will be phased out. Some developing countries will continue to rely on concessional trade in food to meet emergencies, to supplement domestic supplies, or to support their economic development.

Conventional wisdom and some empirical evidence suggest that, in general, food aid for purposes other than to meet emergency requirements dampens farmers' incentives and retards agricultural and economic development in recipient countries. This situation would undoubtedly prevail if food aid were merely a device for donor countries to dispose of surpluses and a cheap means for recipient countries to avoid allocating sufficient resources to agricultural and rural development. But the volume of food aid has declined dramatically as the opportunity costs of providing it have increased, and recipient countries, in view of the tightness of supplies and high import prices, are more aware of the risks involved in relying on food aid as their major source of supplies and of the need to provide incentives for domestic production.

We assume that the United States is committed to providing humanitarian food aid when natural or other disasters threaten people with death, malnutrition, and starvation and that grants of food to meet such emergencies will continue to be provided as needed. We emphasize here the issues involved in selling food on concessional terms to developing countries that cannot purchase supplies in commercial markets and the issues involved in using food to promote economic development. Higher opportunity costs for food and the linking of food aid to agricultural and rural development and population control raise some new research questions. Because USDA is involved in administering the U.S. food aid program, it is appropriate that ERS conduct economic research on the issues that program raises.

The benefits and costs to donors and recipients of food aid versus alternative forms of foreign assistance need to be weighed in deciding on the volume of food aid to be made available on concessional terms to poor countries. While it is true that food aid has largely ceased to be a surplus disposal program, nevertheless certain commodity groups continue to have a real interest in the continuation of the food aid program. Strong commercial export demand has at times limited the quantities of wheat and feed grains available for concessional export, but substantial volumes of rice, cotton, and dairy products are being marketed through P.L. 480. Thus, the impact of alternative food-aid levels on employment and income in affected commodity sectors needs to be measured. In the absence of large stocks, commodities must be purchased on the domestic market for resale through P.L. 480. Consequently, the effect of alternative levels of P.L. 480 aid on consumer prices in the United States is also an important consideration.

Current legislation conditions the availability of food aid on increased investment in agricultural and rural development and

population control in recipient countries. The implications of this requirement need to be investigated in the context of specific developing countries. Additionally, research is needed to determine how best to minimize or eliminate the disincentive effects of food aid in receiving countries (5). Systems for distributing food aid within developing countries to better meet the needs of the rural and urban poor as well as those of vulnerable population groups need to be designed. Using food aid to provide employment in public works or to build emergency stocks are examples of ways to use food aid that may be appropriate in particular countries.

Agricultural Development Assistance

Projections of food supply and demand point to large and growing deficits of food in the developing countries (3,4,6). While their food needs are now being met by commercial and concessional imports, the longrun burden of financing imports to meet projected deficits would be well beyond the capacity of many developing countries. The longrun ability and willingness of the United States and other exporting countries to supply such large quantities of food on concessional terms is doubtful. Thus, the developing countries themselves will need to achieve substantially higher levels of food production. Longrun efforts to increase per capita food use depend also on improving food distribution systems and slowing the rates of population growth.

There is still some controversy about the adequacy of natural resources to produce enough food for a growing world population. The neo-Malthusians argue that limitations on resources to produce food cannot be overcome. The weight of the evidence, however, is that the world does have sufficient resources (3,4,10), although the supply price of devoting new land and water resources to food production may be higher than in the past. Technology and inputs to increase production in the developing countries either exists or can be developed.

What governments do in both developed and developing countries about their agricultural policies will largely determine the success of efforts to increase food production on a worldwide basis. We alluded above to domestic and trade policies of developed countries which bear on the developing countries' ability to participate in commercial trade or to exploit comparative advantage in particular lines of production. Concessional trade policies also risk interfering with developing countries' efforts to increase agricultural output, but these risks may be discounted to some extent by using food aid in development programs. We have suggested that this is an important area of research.

Of equal or greater importance for expanding food production are the domestic agricultural policies of the developing countries

themselves. Many developing countries follow policies that are adverse to increased agricultural production and improved distribution. Policies that favor industry over agriculture or that keep food prices low to urban consumers are examples that may increase input costs and depress producer prices. Monetary and fiscal policies can also influence the terms of trade between agriculture and the rest of the economy and discourage increased output. The net effect of all such policies is to dampen incentives for farmers to invest in technological innovations, thus slowing their generation by research institutions.

On the other hand, many countries pursue policies that are conducive to agricultural development. Food imbalances in specific countries contribute to a growing awareness that food production should be increased. Heightened sensitivity to the risks involved in relying on either commercial or concessional trade to cover food deficits also contributes to a more positive attitude toward agricultural development.

It is in this international policy setting that we turn to issues related to agricultural development assistance. Such assistance affects U.S. producers and consumers and certain U.S. political objectives. Schuh has suggested that U.S. consumers have an economic interest in agricultural development abroad because increased world food output in the long run will result in lower food prices (12). Consumers stand to benefit if restrictions do not impede trade in such commodities.

If agricultural development assistance results in increased employment and incomes abroad, then U.S. producers stand to benefit too from an increased demand for those products in which they have a comparative advantage. Conversely, such assistance could also lead to enhancement in comparative advantage abroad, putting some U.S. producers at a competitive disadvantage.

The palm oil controversy is a case in point. Multilateral investment—to which the United States contributes—in Asia, Africa, and Latin America has prompted increased production and trade in palm oil and has thus heightened competition for U.S. vegetable oil producers and processors. Although palm oil is the most recent example of such conflicts of interest, the potential exists for livestock, fruits and vegetables, and other products.

The example of palm oil also illustrates the potential tradeoffs that exist between U.S. producer and consumer interests.

We derive two lines of research from the foregoing discussion. Not all research that needs to be done for agricultural development assistance is listed; rather we identify the areas in which ERS has either the resources or a comparative advantage in doing the research and making a contribution to public information and policy-making.

First, research is needed on the relationship between govern-

ment policies in developing countries and efforts to assist in their agricultural development. This research could come as a byproduct of regular country and commodity work and is not dissimilar from research discussed above on the uses of concessional food aid in agricultural development. Specifically, analyses should be made of: the effects of input and product price policies on food production, consumption, and trade in particular countries which are recipients of U.S. agricultural assistance; the employment and income distribution impacts of technologies made available through the assistance of the United States in bilateral or multi-lateral programs; the impact of monetary and fiscal policies on output, income, and employment in developing country agriculture; the role of domestic income growth and distribution in stimulating agricultural development; and the interrelationships between agricultural development and general economic policy and how these will affect commercial purchases of U.S. agricultural exports.

Second, research is needed on the effects of technology transfer and investment in developing country agriculture on comparative advantage, on the location of production, and on competition in world agricultural markets. These effects are important both now and in the long run. Little is known about them, although recent experience in world markets for oilseeds suggests that substantial adjustments can result.

Closely linked to the above is research on the welfare effects on U.S. consumers of increased agricultural production in developing countries. This research could be broadened to relate increased production both to welfare on a worldwide basis and to effects on stability of prices and supplies. Such research would provide measures of the consumer surplus that is likely to result from increased availability of raw and processed agricultural commodities.

INSTABILITY

The major issue with which U.S. agricultural policy has had to contend since the early 1970's has been the price instability of internationally traded agricultural commodities. This issue is likely to be of continuing importance throughout the coming decade. A large part of the price instability was due to the virtual liquidation in 1972 and 1973 of U.S. grain stocks that had accumulated as a result of price support programs. The acquisition and release of these Government-held stocks exerted a stabilizing influence on fluctuations in supply and demand for food in the United States and world commodity markets. This was an unin-

tended consequence of Government policy to support farm incomes by supporting commodity prices at above market-clearing levels. The set-aside program, suspended in 1973 for major food and feed products, also dampened variations in supply and moderated price variability.

Factors other than domestic agricultural policies have contributed to growing price instability in world commodity markets. Agricultural production is subject to unpredictable variations in weather with consequent destabilizing effects. The decline in world food output in 1972 was due largely to droughts in South Asia, much of Africa, the Soviet Union, and elsewhere.

Government policies of other countries intensify the destabilizing effects of the disappearance of stocks in the United States. Protectionist policies in developed importing countries force the burden of adjustment to higher commodity prices onto exporting countries. The USSR has become an exporter of its own domestic agricultural instability by venturing periodically into world markets to purchase supplies of grain rather than restricting consumption in periods of deficit. The U.S.-USSR grain accord has mitigated some of this price instability, but its longrun stabilizing effects are at best uncertain.

Most of the issues identified in this paper relate to international efforts to achieve greater price stability in world markets. Trade liberalization, in addition to accomplishing U.S. domestic goals related to farm income, consumer prices, and Government expenditures, can be an important contributor to greater stability of supplies and prices. In the absence of trade restrictions, fluctuations in supply due to weather variation could be offset by trade flows between surplus and deficit regions. But policies designed to protect domestic agriculture stand in the way of trade liberalization and force adjustments to instability onto other countries.

Greater regulations of international commodity markets, as proposed by the European Community and Japan in the MTN's or by the Group of 77 in UNCTAD, are also intended to moderate the instability of prices of internationally traded commodities. But major disagreements over the extent to which international commodity markets should be managed preclude for the moment successful negotiation of comprehensive schemes for regulating international markets. The economic consequences of managed commodity trade are not well researched and if managed improperly, such commodity agreements can actually work to destabilize prices by untimely buying and selling of commodities.

The difficulties of managing commodity markets through price stabilizing ICA's are multiple. Among them are: determining the size of stocks needed to affect the market; decision rules govern-

ing release and acquisition of stocks; and cost-sharing formulas in international schemes. In addition to these largely administrative difficulties are questions concerning the effects of ICA's on producer incomes, consumer welfare, and government budget expenditure.

Of particular concern has been the problem of instability in world grain markets. Numerous proposals have been made for international agreements on reserve stocks of grain, but negotiation of an international system of grain reserves has been stalemated in the International Wheat Council in London.

Much research has been carried out on the problems associated with national and international grain agreements, including some excellent work on basic issues of stock size, decision rules for acquisition and release, and cost-sharing formulas. Some other issues have been neglected or only superficially addressed. Three aspects of international reserves schemes fall into this category and need additional research. These are: the effects on producers and consumers of the costs and benefits of commodity stocking arrangements; the ability of stocking arrangements to stabilize prices in a world characterized by continuing tariff and nontariff barriers to agricultural trade; and the extent to which stocks will affect the growing needs of developing countries for food.

CONCLUSIONS

Throughout this paper we have attempted to identify and elaborate important issues in agricultural trade and development that will confront the United States over the coming decade. We have also suggested some broad research questions that these critical issues raise.

The research agenda suggested by our consideration of commercial and concessional trade, development assistance, and the instability problem is ambitious. ERS can play a critical role in carrying out economic analysis of these issues along the lines we have recommended, informing the public on the economic consequences of alternative resolutions of trade and development issues, and assisting decisionmakers in weighing the advantages of alternative trade and development policies.

ERS has made important contributions by collecting and disseminating country and commodity information and in clarifying many of the issues raised in this paper. However, its role has been constrained by the fact that agricultural trade and development issues are at the core of U.S. foreign economic policy.

The first responsibility for dealing with these issues rest with the Department of State, which has only limited resources and

expertise to devote to agricultural trade and development problems. Within USDA, the Foreign Agricultural Service (FAS) is charged with the responsibility for dealing with foreign trade and development matters. Its staff appropriately has been more concerned with program support than with economic analysis of trade and development issues.

Consequently, the State Department and FAS frequently call upon ERS to provide quick staff support to respond to trade and, especially, development issues that arise in such forums as the FAO and the World Food Council. The depth and quality of such responses often leave much to be desired when the issues raised are not supported by a body of long-term research. The U.S. Government's approach to international agricultural trade and development issues should benefit more from the analytical capability that agricultural economists within ERS or in collaboration with the agricultural economics profession could provide.

Enhancing the contribution of ERS to the analysis of important emerging trade and development issues will require first a stronger mandate to do such research and, second, allocation of adequate professional resources to get the job done. Identification of important issues is only a first step in getting research underway. Organizational considerations are outside the scope of this paper, but strengthening the capacity of ERS to analyze the important trade and development issues is a logical next step.

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Review of: EMERGING ISSUES IN AGRICULTURAL TRADE AND DEVELOPMENT

by
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Hanrahan and Kennedy have a well-organized, well-written paper. I find little to disagree with in what they say, but some in what they do not say. Specifically, their discussion of development in less developed countries (LDC's) is rather brief and limited.

As members of the Foreign Demand and Competition Division, (FDCD) their treatment of LDC development seems limited to the "official" FDCD perspective: the implications to U.S. trade. However, I cannot chastise them too much because I believe that they have a broader vision, one that is implied at several points in the paper.

To follow the format of their section on concessional trade, one can start with the question of food aid and then consider agricultural development. The authors put organizational considerations outside their scope, but I feel no such constraint and believe its critical importance requires more emphasis on organization.

Food Aid

I share the authors' concern about the importance of research on food aid. It is incredible that so much money could be spent on such a program as P.L. 480 with so little analysis. Some work has been done, particularly in the 1960's, but recent work has been very limited.

This lack of recent research is most unfortunate. Legislative authority for the program, as the authors state, expires in 1977. Moreover the program has recently been subject to renewed criticism by economists and others, particularly with respect to possible disincentive effects (1,2). David Hopper, a distinguished agricultural development specialist, recently wrote:

The food generosity of the industrial countries, whether in their own self-interest (disposing of food surpluses) or under the mantle of alleged distributive justice, has probably done more to sap the vitality of agricultural development in the developing world than any other single factor (3).

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Several years ago I might have disagreed with Hopper; now I am not so sure. His interpretation may be correct for many countries.

The problems are largely organizational. The many agencies involved in the P.L.-480 program represent varied interests. With highly divided authority, no one is really in charge, and those who have relative authority are not interested in the developmental side of the program or in research on it.

A former director of the Food for Peace Program, for example, provided little encouragement for a project on the developmental aspects of food aid that was initiated in the 1960's.¹ He had one agricultural economist who occasionally did some analytical work. The present coordinator, who is more analytically inclined, does not even have one analyst: his staff is totally tied up in operational matters.

There are ways of operating a P.L.-480 program to minimize disincentive effects (4,5). Clearly, more research could be done. But who should sponsor it and who should do it? ERS has not had much involvement in the operation of the P.L.-480 program. The little research it has done on P.L. 480—while of a helpful descriptive nature—is hardly on the cutting edge of current analytical questions.

Agricultural Development

The authors do a nice job of outlining the importance of trade, both concessional and commercial, with developing nations. In addition, they point out some of the relationships between development and trade. These are important matters, and ones in which ERS has significant research competence.

They also note the importance of policies within LDC's, and within developed countries, which constrain trade options in the LDC's. I fully agree with these points. These are subjects on which ERS has not done a great deal of work. Moreover it is my impression that FDCD is now doing less than it did in previous years. This downward trend, if correct, is puzzling. Evidently, such work has not been given very high administrative priority.

Beyond these two important points, the authors do not say much about other aspects of agricultural development. I suspect that this is largely due to a shortage of time rather than any lack of realization of other issues. A full listing, let alone a discussion, would be a long and difficult task which I, too, will not attempt.

Delineation of which development research tasks ERS should tackle in the coming years is also a difficult task. The authors

¹Subsequently summarized in (5).

suggest only a few and these generally have some kind of link with trade. My own bent is toward agricultural technology—its generation, application, and effects. Research on the research and technology process is likely to become increasingly important. The same is true of marketing and post-harvest losses in LDC's. Yet beyond one or two individuals, I perceive little involvement in these LDC issues elsewhere in ERS.

ERS has a long tradition of competence in applied statistical matters—in the compilation of data and in projections of food needs. But beyond this and the trade area, the list of recent accomplishments in the LDC development area thins out.

With little work underway in agricultural development outside of the areas noted above, few individuals in the organization are able to make good proposals for future research work. Moreover, if a funding agency such as AID does not perceive a substantial body of existing talent, they are unlikely to rush to provide financial resources. This is not to say that there are not ERS economists who are knowledgeable and interested, but their talents and energies are directed to other tasks.

This comment leads me to a final point: that of resources and their allocation within ERS.

ERS Resources and Allocation

ERS has had only limited resources of its own to study agricultural development within the developing nations. Virtually all of the *formal* allocations have gone to the analysis of LDC development in terms of foreign demand and competition.

AID funding has had ups and downs—mainly downs in the case of ERS since the late 1960's. Another limitation is that AID does not have active programs in all of the LDC's. Some are excluded from new activities because they are more developed, with relatively high incomes (for example, Brazil and the OPEC countries), or because of political reasons (for example, India).

Why have essentially no regular ERS resources been allocated for research from an LDC perspective? I doubt that it is because of any lack of interest on the part of the ERS administration. Rather it probably reflects a more general USDA-wide policy of not using appropriated funds for international research unless a substantial, and usually short-term, benefit to the United States can be shown² This is an administrative determination, and as far as I have been able to determine no statutory limitation exists. Of

²One might argue that virtually everything having to do with the improvement of LDC agriculture would eventually be of some significance to the United States. but the linkages might be difficult to demonstrate to the satisfaction of a Congressman with immediate domestic benefits high on his priority list

course this determination has been heavily influenced by congressional proclivities.

How do we break out of this situation? A study team on agricultural research organization, part of the current National Academy of Sciences-sponsored world food and nutrition study, has recommended that the research funds provided USDA be increased, and that at least some of them be available for research on international issues. Whether this will lead to any Congressional action is of course another question, though it may attract some public attention.

In the interim, one might wonder if the USDA administration could provide a few research positions for projects which might not be considered of substantial immediate benefit to the United States without running into serious problems with Congress.

The longrun costs of not taking such action, as I suggested earlier, could be substantial. Without a base of well-known and competent researchers experienced in LDC needs, it is difficult to argue for additional funds or to compete with other groups for them. Even if financial resources expanded, the supply of human resources may be inelastic in the short run.

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Review of: EMERGING ISSUES IN AGRICULTURAL TRADE AND DEVELOPMENT

by
Wade F. Gregory*

Overall, the Hanrahan-Kennedy paper is excellent and I generally agree with the implications drawn, but feel that the issue of development received inadequate attention. The authors did not overlook this important topic, but space prevented them from giving it more attention after they had developed what they considered to be the more important issue of trade.

Hanrahan-Kennedy show that trade issues involve the whole world, which is generally broken into three groups: the developed countries, the developing countries (LDC's), and the centrally planned countries. They choose to follow present ERS emphasis and concern by devoting most of their paper to issues of trade, thus giving major attention to the developed countries. In the ERS Forward Look, I suggest that greater attention needs to be given to development issues and to the LDC's.

My review will focus on three questions: Why do we need more emphasis on economic development and the LDC's? What are the priority research needs? And, what is required to meet those needs? The arguments are based heavily on U.S. interests, and not on development for its own sake.

First, the LDC's as a group are now a major market for U.S. agricultural exports. Collectively, they constitute the largest commercial outlet for U.S. farm exports, amounting to 42 percent of the total in 1975. Including P.L.-480 and concessional sales, LDC markets are even more important. Thus in terms of market size the LDC's deserve more emphasis in ERS research. For both fiscal 1976 and 1977, only about 15 percent of FDCD personnel were assigned to LDC country work.

Second, the LDC's include some of our most rapidly growing markets. The largest percentage increases in agricultural exports have been to the centrally planned countries, Africa, Asia, and Japan in that order, with the smallest increases in Western Europe and Canada, followed by Latin America.

Third, over the last few years, the primary source of instability in foreign import demand for U.S. agricultural products has been weather. For many developing countries, weather-induced crop

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shortfalls are a chronic problem because of their heavy dependence on the uncertain monsoon. The LDC's often turn to the United States as a residual supplier; hence, this portion of U.S. export demand is highly uncertain.

Fourth, most reliable projections indicate a growing gap between LDC food production and food needs. At the same time, most LDC's are making strong efforts to close this gap, and AID, the World Bank, and others, are providing billions of dollars each year to help them. If these efforts are successful, they could seriously reduce U.S. export demand. On the other hand, if the gap grows as indicated in some projections, the United States with its free and open markets may experience large and continuing price increases for food relative to other items.

Beyond the dollars-and-cents issues, the United States must be prepared to deal with the LDC's as equals. They are a growing force in world politics, and if we are to protect our own interests, we must understand them better.

And, of course, the moral and humanitarian arguments are powerful in the United States. Very likely we would not be permitted to ignore the developing countries even if they were not important to us.

Two of the major determinants of agricultural imports by the LDC's are their overall levels of economic activity (economic development) and their levels of agricultural output (agricultural development). Yet ERS is doing almost nothing in either of these areas.

Research is needed to identify and measure the changes that occur during the development process; for example, changes that affect the patterns and amount of trade, and in turn are affected by the trade itself. Arthur Mackie of ERS found that there is a definite relationship between growth in income and trade and that future expansion in the demand for U.S. agricultural and other products will continue to be closely tied to economic conditions in other countries of the world. His findings, made over 10 years ago, were just a beginning. Not much has been done in this area of research since then, yet much needs to be done. Mackie concluded:

Estimates of trade potentials for any future period will vary with whatever economic conditions are projected for the different countries...Market outlets for an increasing part of American agriculture will become more and more dependent upon the rate of economic progress in other countries...Such an analysis, however, should be an essential part of any long-term trade projection study designed to yield estimates of foreign demand for particular U.S. farm commodities. (U.S. Dept. Agr., For. Econ. Rpt. 24, April 1965).

Unfortunately, apart from the technical assistance activities backstopped or carried out by the Foreign Development Division, there is little or no development work being done by ERS or the USDA. What is going on is more in the realm of technical assistance to the recipient countries than in research. The end result is that there is now little or no research underway that contributes to a better understanding of the development process. This suggests a very important gap in the Forward Look for ERS.

Research is needed to identify the developmental programs and policies that are likely to be instituted by the major countries and to understand how they function, their costs, who will benefit, and under what conditions they will become operative. From the viewpoint of U.S. agriculture, with its high dependence on foreign markets, information from these studies is essential. It is needed to estimate export demand when determining acreage levels for crops highly dependent upon export markets; to determine output fluctuations for major countries, regions, and the world in developing storage rules; and to determine the size of food reserves needed for disaster relief and food aid programs, as well as that needed in designing self-help programs. Furthermore, such information would facilitate preparations for trade negotiations and discussion of commodity agreements and other trade-related issues.

Much of the development work that has been done by others is concerned with the production process—growing, harvesting, marketing, financing, and developing new production technologies. Much less has been done on the impact that government policies and institutional factors have on levels and changes in output. However, evidence seems to be mounting that these latter aspects are as important as the former. Hanrahan and Kennedy recognize this when they say: "Of equal or greater importance for expanding food production are the domestic agricultural policies of the developing countries themselves."

Weather-induced output fluctuations can cause big changes in the level of imports or exports. Yet, little is known about weather-yield relationships, how farmers face weather risks, or how governments will react to actual and anticipated weather-induced output changes. A knowledge of weather-yield relationships is as useful and necessary to ERS for making trade projections as it is to a developing country putting together an agricultural development plan. It is also useful to know the costs and benefits of actions to modify weather in any discussion of trade policy.

Another area demanding high priority is collection and analysis of appropriate price series, which for LDC's are often very limited. It will be difficult and may prove to be impossible to construct many price series for long time periods but the effort

should be made. This difficulty should not interfere with the collection of current price data.

A point often overlooked is the interdependence between U.S. consumers and LDC producers, particularly for tropical products such as coffee, tea, bananas, spices, sugar, and for some fresh fruits and vegetables during periods when U.S. production is minimal.

The above suggests many specific questions. Is the supply price of agricultural output rising, constant, or decreasing? How will it change over time?

What is the net impact on U.S. trade balance of LDC's which increase their incomes through development and export of agricultural products that compete with and capture part of U.S. export markets, but in so doing become bigger importers of other U.S. products?

How does food aid affect agricultural production in recipient countries? How do the costs of food aid to the donor country compare with the benefits gained by the recipient country? Do those costs and benefits change as the world goes from a food deficit to a food surplus situation?

There is general agreement that LDC's must greatly increase their own food production. What will be the impact on U.S. agriculture if they are successful and world food commodity prices decrease?

To paraphrase Hanrahan and Kennedy, the reason that trade and development issues are important research topics for ERS is the high degree of interdependence between U.S. agriculture and agriculture in the rest of the world. They did a good job of describing the interdependence and of showing that the United States can only have a vigorous and prosperous agriculture with high levels of agricultural exports. But, for me, they did not adequately emphasize that high levels of U.S. agricultural exports also depend on the developing countries.

Unless additional resources are assigned for research on the LDC's and development issues, there is little or no need to go beyond the Hanrahan-Kennedy paper. Resources presently committed to developing countries are barely enough to do the essential data collection and staff work tasks which now constitute the major activity of those assigned to developing country work.

It is unlikely that ERS will be able to do much work directly in foreign countries; therefore, its efforts should be oriented to those types of research that can be carried out in Washington. This will place major reliance on secondary data and ERS should give increased attention to the organization and maintenance of data series and a data base that will quickly and easily provide the information needed for development and trade research.

The data problem is obviously not confined to the LDC's. Kenneth Farrell recognized this by stating in his Presidential address to the American Agricultural Economics Association: "We...need to vastly improve our data and knowledge bases concerning foreign agriculture, trade and policy institutions." He also commented that the quality of policy analysis "is dependent upon the current stock of 'research capital' " and that "there has been deterioration" in this stock of capital. A similar concern was voiced by Quentin West, Administrator, ERS, in his testimony before the Office of Technology Assessment on Food Information Systems:

The economic models and supply-demand price equations which had performed satisfactorily in the more stable conditions of the 1950's and 1960's had little value in light of the changes which occurred in the domestic and world markets when the size of the 1972 world grain crop became known.

The Office of Technology Assessment Food Information Systems Report OTA-F-35 suggests improvements that ERS should make:

- Strengthen its ability to analyze, evaluate, and interpret current world information on a monthly basis during the crop growing and early harvest season;
- Increase its ability to analyze current world weather data and interpret their significance in terms of probable crop production in the current season; and
- Develop world models of production, utilization, trade, and price for more important agricultural commodities, especially grains, which permit timely evaluation of new data on a monthly basis during the growing and early harvest season.

Decisions concerning the kinds of development and trade data that ERS should collect and maintain probably depend upon the relative attention that ERS is going to give to solving *ad hoc* immediate problems, compared to committing resources to activities that seek to discover basic economic relationships that provide an understanding of how various factors interact. This latter type of activity would give attention to developing both structural and quantitative relationships and requires a much greater quantity and variety of data than service work. This more basic research is, in fact, essential if we are to perform our staff functions adequately.

I concur with the Hanrahan-Kennedy conclusion that for ERS to keep abreast of the important emerging trade and development issues, it must first be given a stronger mandate to do such research, and second, adequate professional resources must be allocated to get the job done.

Review of: EMERGING ISSUES IN AGRICULTURAL TRADE AND DEVELOPMENT

by
Wayne A. Schutjer*

The authors do a particularly good job of identifying research needs for current commodity-trade policy issues. In my view, the focus for research on the interrelations of domestic economic, agricultural, and trade policies in both market and centrally planned economies is exactly right.

A second set of research issues goes beyond the price and income effects of commercial agricultural-trade policy. These issues arise because the interrelatedness of the world agricultural system includes transfers of capital, technology, and management capacity as well as of commodity and agricultural inputs. Direct private foreign investment in U.S. food-related manufacturing activities in 1974 exceeded \$1.3 billion. Similarly, a comparison of sales of free-world foreign affiliates of manufacturing firms with exports of manufactured products indicates that in 1971 affiliate sales exceeded free-world manufacturing exports.

This suggests that direct private foreign investment is being used as a substitute for commodity flows. The interrelatedness of our national food system with those of our major trading partners raises important research questions about plant location, employment creation, investment for modernization, and domestic control.

ERS has work in progress on the extent and nature of U.S.-based multinational-corporation investment in the food systems of other nations. Following the Foreign Investment Study Act of 1974, ERS has also become involved more directly with coordinating research related to direct private foreign investment in the U.S. real estate and food systems. As a Government agency, ERS's access to data not generally available to nongovernment researchers provides a clear comparative advantage in research on the magnitude and structure of international capital flows in the food system.

A third set of research issues are longer term. As a unit of USDA, ERS can provide a direct input into discussions of priorities for the national food system. The Nation places competing demands on our agricultural productive capacity: we require

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products for low priced domestic food supplies, for commercial export, and for programs designed to meet humanitarian needs at home and abroad. Economists within ERS might well examine the tradeoffs between the competing demands. For example, does the creation of dependent grain markets in Japan and Western Europe constrain national flexibility to maintain adequate supplies for domestic and humanitarian uses in times of short supply?

The authors correctly identify a number of important research issues facing those responsible for planning and implementing agricultural development programs in the LDC's. Once again the policy focus proposed is appropriate. I find myself, however, in general disagreement with the authors' view that research on these issues can be undertaken by ERS economists as a byproduct of the regular country and commodity reporting system of USDA.

My own view is that ERS has little, if any, comparative advantage in agricultural-development policy research. First, policy analysis beyond the most aggregate level of model building requires access to the field as well as interaction with host-country scholars and institutions on a regular basis. Second, useful policy analysis requires detailed knowledge of the associated production technology. Host-country economists, economists in the commodity-based international institutes, those in the International Food Policy and Research Institute, and those in land-grant colleges with active international programs are better situated to conduct such research.

Guiding examples are the Rice Policy Study being conducted by Stanford University in Southeast Asia and the study by International Rice Research Institute economists on constraints to increase rice production in Asia. Without frequent interaction with local scholar collaborators and firsthand knowledge of Asian institutions, the studies would be presumptuous and the results would have little policy impact.

By drawing upon the data base generated by Foreign Agricultural Service reports and primary research undertaken by economists in other institutions, ERS economists provide an important input into U.S. foreign concessional trade policy and the AID country-review process. They have a real comparative advantage in this integrative and interpretive role and in more fundamental research relating to commercial agricultural trade.

SELLING TO CENTRALLY PLANNED COUNTRIES—RESEARCH ON EMERGING POLICY ISSUES

by
David M. Schoonover*

Importance of the Market

The centrally planned countries have emerged in the 1970's as major new markets for U.S. agricultural products. As recently as fiscal 1970, shipments to these countries accounted for only 2.5 percent of total U.S. agricultural exports and 1.5 percent of the value of U.S. grain exports. By fiscal 1976, shipments had jumped to 14 percent of total U.S. agricultural exports and 24 percent of U.S. grain exports. The value of total U.S. agricultural exports to centrally planned economies rose from \$156 million in fiscal 1970 to a record \$3.2 billion in fiscal 1976.

Within the centrally planned area, the market for U.S. agricultural products has grown unevenly. The most consistent growth has been in Eastern Europe. U.S. agricultural exports to the East European market have risen from \$139 million in fiscal 1970 to \$1.2 billion in fiscal 1976. Exports to the USSR have been more irregular, jumping from almost none to nearly \$1 billion in fiscal 1973, next dropping by half in 1974 and 1975, and then rising to \$2 billion in fiscal 1976. Exports to the People's Republic of China (PRC) have been still more erratic, climbing from zero as recently as fiscal 1972, to \$889 million in fiscal 1974, then falling to a negligible amount in fiscal 1976.

Grain accounted for nearly 90 percent of U.S. agricultural exports to centrally planned countries in fiscal 1976. Grain typically has accounted for the largest share of exports to the USSR and PRC, but generally less than half of those to Eastern Europe. Oilseeds and oilseed meal have been major exports to Eastern Europe.

In the 1970's, the centrally planned countries have played a major role in the variability of U.S. exports of farm products, particularly grain. In a direct sense, they accounted for almost half of the quantity increase in U.S. grain exports in fiscal 1973, two-thirds of the decrease in fiscal 1975, and almost all of the increase in fiscal 1976. In an indirect sense, purchases elsewhere by the centrally planned countries affected non-U.S. supplies and caused purchases from the United States by third world countries to fluctuate.

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Perhaps more importantly, the centrally planned countries have shifted the demand curve for U.S. exports of grain and, to a lesser extent, oilseeds. With U.S. and foreign stocks at low levels, this has resulted in major changes in prices as well as in quantities exported. Consequently, the values of U.S. exports have increased much more than the quantities exported. If exports to centrally planned countries should stabilize or grow more consistently, the price and indirect effects would be lesser concerns.

Greater Need for Research

In view of the newness of the agricultural market in centrally planned countries, the demonstrated variability of that market, and the large change in export revenues when agricultural exports shift as a result of that variability, there ought to be a much stronger program of research in ERS on the centrally planned countries and on our trade policies with them.

Initial logic would suggest that research should focus first on the food and fiber sectors of the centrally planned countries and on the probable implications of U.S. agricultural trade over the next decade or so. Some studies of the feed-livestock economies of Eastern Europe and the USSR have been carried out, but further work is needed to produce models suitable for systematic updating of forecasts and projections.

The pressing need for a systematic evaluation of U.S. policy alternatives lends a special sense of urgency to trade-policy research. However, work should proceed at the same time on more basic research on the centrally planned economies. The program of research on the centrally planned countries would generate projection and forecasting models that could point toward the need for further research on U.S. trade policy toward the area.

Trade-Policy Research

Research by ERS on trade policy should examine alternative U.S. policies dealing with centrally planned countries, review other economic and foreign policies that would facilitate implementation of the principal alternatives, and evaluate the alternatives in terms of their impacts on affected groups. In addition, trade policy research should evaluate the longer term effects on U.S. agricultural exports of transfers of U.S. technology, management, and ownership to centrally planned countries.

A number of export policies could be pursued. One basic policy is to offer a free U.S. market for foreign buyers, including the State trading companies of centrally planned countries. Other policies involving more restriction or control include export duties, export quotas, commodity agreements, or restraints, such as licensing or discretionary controls. These policies, in turn, could be subdivided into country-specific restraints (or bilateral agree-

ments) and global restraints (or international agreements). On the other hand, policies involving more trade expansionary activities include export subsidies and other export promotion measures. These also could be country-specific or global.

The alternative policies would result in different gains and losses received by various groups. The groups affected include U.S. crop producers and their input suppliers; intermediate users, such as processors or livestock producers; final users in the United States; taxpayers in the United States; foreign customers by major types; and competing foreign suppliers. The policies also would act differently in terms of relative depletion of natural resources and energy. Some consideration also should be given to delayed and indirect impacts on various groups. A principal objective of trade policy research would be the economic evaluation of the gains and losses projected for the specified groups under alternative export policies.

A weakness of such evaluations is that they may be speculative and lack precision. On the other hand, the information used for policy decisionmaking often is even more imprecise. A debatable question is whether the results of the policy research also could be made available to the general public. Providing the best possible information for public debate would argue in favor of public release. On the other hand, political differences, and the controversial nature of the evaluations, could lead to restraint on public release.

One important set of policies that should receive special attention is the alternative export marketing systems for dealing with State trading companies of centrally planned countries. These range from the current export oligopoly (for grains and oilseed), or a government monopoly board (or both) on the one hand to increased competition on the other.

In addition to alternative export policies, policy research also should examine related associated policies. For example, the effects of the various policies could be analyzed under assumptions of high or low levels of grain or other commodity stocks in the United States or other countries. An associated policy requiring timely provision of production and trade forecasts by the centrally planned countries to the United States also could be examined. Some export policies require specific associated policies to become effective. Export quotas could require a mechanism for price equalization between sellers to domestic and foreign markets; an international commodity agreement could require production controls; a bilateral commodity agreement could be operative only with the ability to impose a discriminatory foreign economic policy; and discretionary controls require strong domestic political authority. On the other hand, export

subsidies tend to be associated with higher taxes and surplus production.

The transfer of U.S. technology, management, or ownership into the food and fiber economies of centrally planned countries is a special area requiring policy research because of the long-term implications for exports of U.S. farm commodities.

Research on Food-and-Fiber Economies

Research on current and expected situations in the food and fiber economies of centrally planned countries and analyses of their probable impacts on foreign trade are ongoing needs that are likely to continue to be of considerable importance over the next decade.

Research emphasis should vary between regions. Developments in the feed-livestock economy are the dominant influence on U.S. agricultural exports to two regions—USSR and Eastern Europe. In contrast, in the People's Republic of China, the direct needs of the human population for food and fiber create the principal demand, and internal agricultural production provides the principal supply. In this context, the principal focus of ERS research should be on growth and development of agriculture, especially production and distribution of grain, through changes in resources, technology, organization, and economic incentives.

Basic Analytical and Projection Models

Active research projects are needed on the feed-livestock economies of the USSR and also of Eastern Europe. As noted earlier, some preliminary research has been done (see References section). The first priority now is for country models that will permit regular and systematic updating of data, intermediate-term prognoses, and projections; models flexible enough to incorporate new policy developments, additional data, and more refined analyses. Ideally, the models should be automated to permit frequent testing of alternative assumptions on policies or performance, but automation is not now an absolute requirement. In the meantime, the preliminary USSR and East-European regional research needs to be updated to incorporate implications of 1976-80 plans.

The basic components of the feed-livestock economy models are historical analyses and projections of: demand for livestock products and grain; production and trade of livestock products; requirements and use of grains, oilmeals, and other feeds in production of livestock products; production of grains, oilseeds, and other feeds; and foreign trade in grains and other feeds. Models are needed for the USSR and eventually for each of the seven major countries in Eastern Europe, although initial priority should go to the three northern countries—Poland, East Germany, and Czechoslovakia. An integrated model also should be

developed to fit individual country models into an overall East European system.

At the current stage in the PRC, principal considerations are food demand-and-supply relationships and changes in these relationships as agriculture is developed further, urbanization increases, and income patterns change. The research task consists primarily in the projection of production of grains and other foods; the consideration of alternative demand projections; and the analysis of foreign trade policies and alternatives. The production projections depend heavily on developments in resources, technology, and incentives. Refinement of the analysis also should consider distributional impacts. Potential PRC import demand in the fiber area also is of considerable importance to U.S. agricultural trade and should receive emphasis.

Most data series on the PRC are estimated. Initially the research program must develop and document more fully these basic data series. In many cases, it may be possible to improve data series through research on selected less-aggregated units.

Short-Term Forecasting Models

The basic research effort on PRC demand-supply relationships could contribute to the understanding of short-term, as well as long-term, developments. The short-term determinants of agricultural imports, however, are not known. An attempt is now underway to construct a forecast model for PRC agricultural imports, considering such variables as current-year production forecasts, relative foreign trade product prices, external financial position, and selected policy variables.

Upgrading of the short-term trade forecasting effort on the USSR and Eastern Europe could be facilitated greatly by the feed-livestock research and projections models. However, this involves additional models and judgments. The principal components are: (1) forecasting crop production—primarily an analysis of the influence of weather variables and some policy variables; (2) forecasting internal demand for feeds and livestock products; and (3) forecasting external demand for grain, oilseeds or other feeds, and livestock products.

It should be possible from the feed-livestock models to spin off simplified short-term trade forecasting models, that could continue to be adjusted by judgment. Short-term demand forecasts, however, could benefit greatly from systematic analysis prior to the judgmental stage. Short-term forecasts of the production of grain and other crops would be outside variables generated elsewhere.

There is a great need for better forecasts of production of crops, especially grains, in all the centrally planned countries. Efforts are underway to develop grain forecasting models and siz-

able resources are involved. The Large Area Crop Inventory Experiment (LACIE) project conducted jointly by FAS, National Aeronautics and Space Administration (NASA), and the National Oceanic and Atmospheric Administration (NOAA), for example, involves both satellite remote sensing techniques and weather-yield regression techniques in an effort to develop forecasts of wheat production in the USSR. This effort may be extended to other centrally planned countries. Agricultural agreements with the USSR and some East European countries lay the groundwork for possible reporting of crop production forecasts to the U.S. Government directly by other governments. So far, none of these efforts has been sufficiently successful to eliminate the need for crop forecasting work in ERS.

Whatever the origin of crop production forecasts for the centrally planned countries, however, they are likely to be the most influential variables in the short-term trade forecasting models. An important task for ERS during the next decade will be to carefully evaluate the work done by others in crop forecasting, and to perhaps provide guidance, as well as compare and adapt for ERS use the more successful work of others. In the absence of satisfactory work elsewhere, ERS will need to use substantial resources to improve crop forecasting until better analysis becomes available.

Other Research Areas

The development of projection or short-term forecasting models focused on feed-livestock economies or agricultural supply-human demand relationships is the backbone of the research needed on the food and fiber sectors of the centrally planned countries. Such models should serve decisionmakers as the key generators of information on agricultural import needs and prospects of these countries. Research on other areas also is needed, however, and this research could contribute to an understanding of the import and export of other commodities and of more fundamental changes in agricultural development, which perhaps eventually could affect agricultural trade patterns in the centrally planned countries.

Work on commodities of secondary trade importance could include analyses for fibers, fats and oils, sweeteners, fruits and vegetables, beverages, and tobacco. An analysis of trade implications for cotton in the three regions would be especially useful—in terms of import needs of the PRC and Eastern Europe, and in terms of export availabilities and competition for the USSR.

Additional suggestions for basic areas of research on the centrally planned countries would include many secondary research areas.

Obviously a list of such research areas could be made longer—

or shorter—indicating that there are a number of problems of considerable research interest, in addition to the first-priority concerns. Feasibility of attaining useful results also must be considered, however, and the feasibility differs greatly among areas.

Finally, it should be noted that research feasibility rests heavily on the availability of data. Much work still needs to be done on the compilation or derivation of basic data series. This is especially true for the PRC and other Communist Asian countries where the publication of most types of data has been highly irregular or completely lacking.

Summing Up

There is an increased need for research on our trade with the centrally planned countries because of the major role they have played in the 1970's in the variability of U.S. agricultural exports, as well as the generally larger share of our exports that they have taken. A sense of urgency should be given to research on U.S. trade policy with respect to the centrally planned countries, for the purpose of evaluating alternative policies in terms of gains and losses received by various groups. Research on the food-and-fiber sectors of the centrally planned countries should move ahead at the same time. In this regard, priority should be given to the development of projection and short-term forecasting models on the feed-livestock economies of the USSR and Eastern Europe and the agricultural supply-human demand relationships in the PRC. A key requirement of these models is their suitability for regular and systematic updating.

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GRAIN RESERVES—IMPLICATIONS FOR RESEARCH AND FORECASTING IN ERS

by
W. Scott Steele*

Widespread concern over instability in food supplies and prices is a result of a complex series of developments in world agriculture. These include the problem of repeated production shortfalls, the precipitous drawdown in grain stocks, and the rapid rise in grain prices.

Despite renewed interest by many governments in developing stabilization measures to improve world food security, progress has been slow in implementing a world grain reserves program.

The United States took the lead in initiating discussions to establish an international system of nationally held grain reserves. Technical discussions conducted by representatives of the principal grain trading nations began in a preparatory group of the International Wheat Council (IWC) during February 1975 and have been continuing since. At the September 1975 meeting of the IWC, the United States launched its proposal for an international grain reserve system which would establish a global reserve of 30 million tons of food grains. While the United States was hoping to bring about such a reserve system at an early date, it now appears that it will be some time before all the issues are resolved. Talks on grain reserves in the IWC reached an impasse because of conflicting views of the United States and other grain exporters. The United States has placed major emphasis on food security while the other exporting nations have sought price stabilization.

Repeated attempts by various Congressmen to enact legislation establishing a U.S.-held grain reserve have not been successful either. It remains to be seen whether the 1976 elections have changed the political reality of grain reserves. Nevertheless, with or without grain reserves, the U.S. government will be involved with the problems inherent in the grain reserves issue.

Grain reserves is a two-sided proposition. On one hand, if the political climate (nationally or internationally) changes and grain reserves receive more political support, there will be a need for further research on developing a grain reserves policy and a program to carry out the policy. On the other hand, if controversy over grain reserves continues and no conscious policy is devel-

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oped, policymakers will be faced with a high degree of risk and uncertainty about supplies and prices of basic foodstuffs. To reduce this risk and uncertainty, ERS and other government agencies will be called upon increasingly to make forecasts not only of next year's supply, demand, and price situation around the world, but also forecasts of that situation over extended periods of as much as 5 years.

This longer range forecasting is difficult to deal with and ERS, and the profession at large, is only beginning to recognize its importance to policymakers. Even with grain reserves as a buffer against instability, extended forecasts will be necessary. The consolation is that with grain reserves the margin for error would be reduced. Forecasters would enjoy the luxury of having a range in which their forecasts would more probably fall.

On the first issue of research for grain reserves policies and programs, there will be a need to continue and perhaps expand our current research efforts in this direction. For several years, ERS has been heavily engaged in analyzing various aspects of the following questions: What instabilities and impacts arise from the lack of grain reserves and who gains and loses from them? How large should grain reserves be? What rules and operating procedures should be used to govern the buildup and release of reserves? What will a grain reserves program cost and who will bear the cost?

ERS has been particularly involved in developing analyses which have been useful in the development of U.S. Government positions on grain reserves. ERS has also developed or adapted models for use in ongoing analysis of grain reserves. These models include the stochastic supply and demand model developed by Sharples and Walker, the multiobjective optimization model by Eaton and Steele, and Polysim model developed by Ray. These have played an important role in developing a number of analyses useful to policymakers.

To determine what research is being done in universities and other institutions and to identify future research needs, ERS was instrumental in setting up a conference on grain reserves in April 1976 which brought together many prominent researchers. Two sessions were held: one dealing with world, and the other with national, grain reserves. The proceedings of the conference have been jointly published by ERS and the National Science Foundation.

The analyses presented at the conference were broadbased and diverse. Generally speaking, the researchers engaged in analysis of grain reserves have been occupied in developing different types of models which could be used for policy analysis. Models so developed include stochastic supply and demand models, single and

multiobjective optimization models, systems dynamics, and multi-model simulation. So far, these models have been employed in answering a number of the common questions about grain reserves, including what levels of reserves are required to meet certain operating rules or performance criteria, and what are the costs and benefits of grain reserves.

Many researchers have indicated that they have had to guess about policymakers' needs. This apparently comes from the lack of interaction between policymakers and researchers on the issues. Until policymakers clarify their ideas on grain reserves there will not be any clearcut direction for research on grain reserves.

Nevertheless, there are several directions which the research could take. The first is to continue with the model development process. By developing and improving models, the necessary tools will be available when the time comes to answer questions raised by policymakers.

The second is a fairly broad area where more basic research is needed. The most important item is the determination of the possible impact of climatic change on the need for and size of grain reserves. The unusual weather patterns of the past several years have led to concern about whether global shifts in climate are taking place. A number of meteorologists are suggesting that we have had relatively good weather for several decades and that there is likely to be greater variation in future weather.

If these prognostications are true, there could be serious impacts on agricultural production, food supplies, and prices. Grain reserve needs, based on variations in grain production over the past several decades, would be inaccurate. Research on climatic change should thus be given high priority in terms of its potential contribution to developing a grain reserves policy.

Another major question that needs analysis is how the operation of a grain reserves program will affect resource allocation and production response in agriculture. Since the operation of a grain reserves program will affect price movements, this, in turn, will affect farmers' decisions to plant. If too many reserves are accumulated and the price range for buying and selling reserves is set too narrowly, there may be a lack of incentives and the desired production response may not be obtained.

A third area for research deals with the role the private sector should play in a grain reserves program. There is much controversy and a great lack of information and analysis on this score. Some questions relate to the levels of reserves the private sector would be able to carry in the absence of government intervention. Others are concerned with how grain reserves would be acquired and released, and what role the government would play.

What happens in the absence of a grain reserves policy? With-

out a grain reserves buffer against price instabilities, the jobs of both forecasters and policymakers will be difficult. The question is: How could we deal with this situation?

Much of the uncertainty in grain prices has come from foreign sources. Most of the severe fluctuations in U.S. markets in recent years have been the result of variations in trade with the centrally planned countries, especially the Soviet Union. The Soviet Union caught the world by surprise with the magnitude of their shortfalls in grain production and the size of their purchases in world markets. These purchases resulted from erratic and severe fluctuations in grain production, and Soviet policy changes with regard to levels of grain that would be imported.

Other importing countries are also capable of jolting grain markets as a result of shortfalls in grain production, not to mention the impact on markets of shortages or surpluses of supplies in exporting countries. Without a grain reserve to buffer these jolts we will be faced with recurring price instability, and policymakers will be under pressure. In these circumstances, it is likely that ERS will be increasingly looked to for forecast and extended-forecast information on how developments in foreign countries will strike the United States.

What should ERS do to improve its capability for dealing with a highly unpredictable world?

ERS now depends on a cadre of country and commodity analysts to keep in close touch with developments in foreign countries that are likely to affect the demand for U.S. farm commodities. This expertise is our first line of defense and needs to be maintained and strengthened, but more is called for. ERS needs to spur the development of an analytical country-trade forecasting system capable of making short-term and extended forecasts of trade flows.

This trade-forecasting system should have a country-commodity orientation so that significant changes taking place in major importing and exporting countries can be analyzed and forecasted. Such a trade-modeling system will give ERS a much greater capability for consistently and systematically tracing economic developments in the world not only for the United States but for our trading partners as well.

Since a trade-forecasting model is only as good as the coefficients in the model and the data and information that are supplied to the model, research is needed in two major areas. These two areas are weather and trade policy. They are the ones in which shocks to the trade-forecasting system will be most felt in the absence of grain reserves. Without taking these two areas into account it will be virtually impossible to improve the accuracy of trade forecasting. Thus, the necessity arises for economists to

interact closely with meteorologists and political scientists in developing the necessary research.

Statistical relationships between weather and crop yields must be investigated and specified for incorporation into forecast modeling. Shortrun weather influences on crop yields are significant. The relationship between weather and crop yields in a predictive model needs to be identified for the major importing and exporting countries. This is particularly important for the Soviet Union, where crop yields vary greatly from one year to another.

The other area related to forecasting, in the absence of grain reserves, deals with shortrun policy changes of importing countries. This ties in closely with the weather-crop yield research in the sense that when a country experiences a shortfall in grain production, and has no grain reserves, it has two options: use the world market, or reduce grain consumption. Again, this has particular relevance to the Soviet Union but could apply to other countries. The major question that needs analysis is what factors importing countries take into account before purchasing in world markets. After the factors are identified, they need to be systematically monitored and analyzed on an ongoing basis to minimize the element of surprise.

THE ROLE OF ERS IN FOREIGN TRADE AND DEVELOPMENT

by
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A judgment from the recent past is that foreign trade is likely to be one of the most dynamic areas affecting U.S. agriculture and the U.S. food situation in the next decade or so. Agricultural development and the growth and stability of world food supplies will continue to be an area of great concern around the world. The practical issues are complex, and there are wide differences of opinion as to their nature and likely outcome. These problems need to be discussed in ERS to reach enough consensus to provide guidelines for the allocation of ERS resources and for ERS research. Other papers in this series catalog the many important issues affecting U.S. agriculture in relation to foreign trade and development and discuss the kinds of research needed. This paper concentrates on the *unique* role that ERS can, and should, perform in these areas.

Foreign trade and development issues include:

1. The likelihood of continued food shortages and high food prices; that is, the basis for optimism or pessimism about the future prospects for the world food situation;
2. Possible changes in climate and weather patterns, and their effects on world agriculture;
3. The instability of prices of internationally traded agricultural commodities, and the related question of "food security" and grain stocks;
4. U.S. Government aid programs related to world food problems and agricultural development in other countries;
5. International trade liberalization;
6. Commodity agreements, including proposals for a new, comprehensive system of international trade in commodities, made in the U.N. Conference on Trade and Development (UNCTAD). The UNCTAD proposal reflects the broader discussions of a "new economic order" and the transfer of resources from richer to poorer countries; and
7. U.S. "food power," and the USSR.

Issues No. 1, 2, and 3 above are of such potential, all-embracing importance that discussion is carried on in both popular news media and specialized publications, as well as in many

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national and international forums. No. 7 also has been widely treated in popular media. ERS has made important contributions to these discussions. Nos. 4, 5, and 6 are technical issues, mostly discussed by more specialized groups. ERS has made some contributions to these discussions, but has a potential for much more.

It is undeniable that the future of the world food situation is very uncertain. Reasons for the uncertainty, aside from the complexity of the problem, include the unreliability of much of the basic data, and the fact that unpredictable decisions of many governments will be critical in determining the outcome. When the future is uncertain and the issue is especially important and has a large emotional content, and fundamental and conflicting interests are involved, there is bound to be a wide range of opinions. These are characteristics of the world food situation, and there is a wide range of opinions about prospects. A large part of the opinions can be classified in two groups. One group, because of their Malthusian emphasis on limited resources, limited potential productivity, and unchecked population growth, is deeply pessimistic about possibilities for improvement. The other group is much more optimistic about the potential for technical improvements and better use of resources to produce enough food.

The latter group has much the better of the argument. A view that widespread malnutrition and starvation are inevitable is not justified. A number of detailed studies by competent analysts, including some in ERS, have concluded that the world has sufficient resources and technical knowledge to feed its people adequately. However, these studies have all emphasized that to overcome hunger, governments around the world must assign higher priority to agriculture. They must adopt appropriate policies to ensure that enough resources are invested and used efficiently to produce sufficient food and distribute it to all.

ERS has made major contributions to clarification of the issues concerning the world food situation and prospects. Although, as indicated above, there have been a number of competent studies of the prospects, ERS (in cooperation with the Foreign Agricultural Service—FAS) is the only U.S. organization with a continuing responsibility and capability for collecting, analyzing, and reporting the basic information on world food production, distribution, supply and demand factors, and government policies.

Internationally, only the Food and Agriculture Organization (FAO) has a comparable charge and capability. But FAO has sometimes been handicapped in achieving an independent objectivity because of its ties to each of its member governments. Moreover, FAO is now shifting emphasis toward more action-type technical assistance activities. This will place an even greater

burden on ERS to stay on top of the rapidly changing food and trade situation around the world. Additional resources clearly are needed for this basic intelligence collection and analysis activity in ERS.

One aspect of the future world food situation that has been rather widely discussed is weather, which I have listed second among current issues. Some prominent climatologists have said that the world is likely to face worse average weather, and more variable weather in the future than in the recent past. Weather still has major impacts on agricultural production around the world and, if their judgments are correct, the problems we face are greater than those indicated in the studies by economists referred to above. The reason for this is that the economists have generally not listened very closely to the climatologists. Although the climatologists have by no means reached a consensus on the characteristics of future weather, and have not yet provided us with an adequate basis for modifying our views of the future, we must listen attentively. The National Defense University's Strategic Research Group has undertaken a study of the probabilities of future changes in weather and climate and will seek to find and pinpoint whatever consensus there may be among the climatologists on these vital issues. ERS personnel will be participating in this critical study. Although the technical issues of climatology are the province of experts, the broad background of ERS in following world food developments and prospects provides the essential, unique framework in which the problems must be examined.

Issues No. 3 through 7 in my list differ from 1 and 2, in being concerned primarily with policies of governments. The question of the contribution of ERS to such policy issues will be treated in the remainder of this paper.

ERS is frequently called upon by the State Department and FAS to provide quick staff support in the analysis of trade and development issues that arise in such forums as the FAO and the World Food Council. ERS has also contributed elaborate and detailed analyses of international trade and agricultural development policy issues, but these analyses have been very limited. I believe that this need not be the case in the future. However, the problems ERS faces in optimizing its contribution to U.S. positions and decisions in these matters are formidable.

Although many government agencies and private groups are concerned, foreign policy matters tend to be dominated by the Department of State. And although the State Department's foreign policy experts are aware of world food problems and related agricultural trade and development issues, they have only very small staffs to deal with them. It is impossible for such small

staffs to bring the necessary wealth of detail and depth of experience to the analysis of the problems.

On the other hand, the focus in USDA has been on U.S. agriculture. The responsibility for representing USDA in foreign trade matters has been largely given to FAS, whose analytical staff has necessarily been focused more on program support than on long-term analysis of policy issues. USDA has had relatively little input to consideration of development policy issues, for which the primary responsibility is assigned to AID and the State Department.

In short, with few exceptions, the U.S. Government's appraisal of international trade and development issues has had little help from the agricultural economics profession in general, or ERS in particular. Even when ERS might have been ready, willing, and eager to help with answers, we often have been unable to even find out what the specific questions were. This is unfortunate because the tools of agricultural economists and the unique capabilities of ERS can be very helpful in illuminating critical aspects of such issues.

I think there are two possible approaches, not necessarily alternatives, to improvement of this unfortunate situation. One approach is formal and organizational, and involves trying to obtain formal recognition of ERS as having an analytical role to play in U.S. official consideration of foreign trade and development issues. This would require ERS membership on various policymaking committees. Because this would be contrary to precedent, and would upset established relations, it might be difficult, but it should at least be investigated.

The second and informal approach lies within the present capability of ERS. Without it, the formal, organizational approach would be unproductive. ERS must decide that it will devote adequate resources to doing a thorough, workmanlike job of analyzing foreign trade and development policy issues and to announce to all concerned that in the future it will be analyzing such issues. The strategy I propose is simple: choose important issues, do competent analysis, and be visible.

The choice of general issues is usually obvious. I have made a list at the beginning of this essay. Other papers in this collection may have some variations on my list. The list of general subjects to work on can easily be refined by following current events in the international and foreign world, by inquiries, and by discussion. However, the refining of the issues to precise questions, relevant to actual policy decisions being considered, will require direct access to the forums of policymakers.

Competence is the heart of the matter. On it will depend the reputation and the seeking out of ERS assistance in foreign policy

matters. As in all other ERS areas, this will require a central core of highly competent analysts. There must be a group assigned to a continuing concern with U.S. foreign trade and aid policies, and with agricultural development and trade policies in foreign countries. We have such a group now, but it is minuscule in relation to the complexity and importance of the issues. At present we cannot safely announce to the waiting policymakers that we are working on detailed and competent studies on the major issues I have listed, and will complete them in time to be of use.

There is room in trade and development activity for *ad hoc* teams, made up of economists from various parts of ERS, universities, and other organizations. But the basic requirement is for a greatly enlarged, highly competent core group to organize the research, to have ongoing responsibility for day-to-day changes in nuances of the issues, and to provide the multitude of essential personal contacts with people concerned with world agricultural trade and development in many organizations in the United States and overseas.

The size, composition, and detailed organization of an enlarged ERS core group for research on foreign trade and development policy issues is beyond the scope of this essay. However, I can think of no more important commitment for ERS to make at this time.

Abstract of: FORECASTING AGRICULTURAL TRADE

by
William E. Kost*

Increasingly both FAS and ERS are called upon to evaluate the current economic situation and its impact on trade. We need to improve our analytic capability in forecasting world trade and in evaluating the impacts of alternative futures for various parts of the world on one another. The use of models systematically identifying important factors affecting production, consumption, price, and trade, with their associated data and explicit assumptions, would help minimize personal subjectivity in the analyses and increase consistency within a world context. By explicitly incorporating policy variables into such models, one can evaluate the consequences of alternative policies on trade. Focusing attention on areas of weakness can aid in establishing future research priorities.

A word of caution is in order. Any modeling effort can only supplement the commodity and country expertise in FAS and FDCD. Expert judgment cannot be replaced, but models can provide a base solution that will serve as a focal point for the experts' judgment. This frees some of the analysts' time, allowing them to concentrate more on areas where their judgment is not only useful but mandatory. Any successful modeling design must incorporate a substantial portion of the analysts' knowledge about the particular subject matter area and situation. Thus a formal modeling system allows some continuity of knowledge to be maintained over time, particularly when it is integrated into the existing trade forecasting system.

One aspect of our analysis is U.S. agricultural trade. However, even when entertaining questions about U.S. agricultural exports one must consider major markets and major alternative supply sources. Therefore, any effort must develop a structural, dynamic world trade modeling system, that will focus on the major U.S. export agricultural commodity sectors. Since these are inter-related, the work can be limited, in large part, to the world grain-oilseed-livestock sector.

A world trade modeling system can be viewed as consisting of three interrelated types: a net trade model, detailed market models, and a trade flow model. Such a system, composed of separate

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but related models, is flexible and provides information keyed to questions asked. The analysis of any issue would be based on a model component that closely matches model detail with the detail required by the problem.

This approach to trade modeling provides a quantitative, internally consistent base around which trade forecasting can be organized. It puts our knowledge about world behavior in a logical, orderly framework and provides a design for establishing future research priorities. Such an approach implies that a working international data base will have to be created. This would provide USDA with a comprehensive, user-oriented world agricultural data base, which associated with a world modeling system, would place the Department in a central position in this field of research. We would have a better grasp of the future world agricultural trade outlook and would also know more about, and have more impact on, any related outside research.

Abstract of: MEETING FOOD DEMANDS OF PROJECTED WORLD POPULATION

by
Dallas M. Lea*

The rapidly increasing world population reached 4 billion people in 1975 and is projected to double to 8 billion in the next 40 years. Most of the increase is occurring in less developed countries (LDC's) where there is already considerable malnutrition, so that condition may become even more acute. ERS has participated in a program of technical assistance to increase food production in many of those countries for a number of years and has experienced both success and frustration. Internal institutional and economic constraints have often prevented the increased production from reaching the hungry masses.

In the interest of overall national development, many who are concerned with agricultural programs see the need for going beyond production programs to make a broader attack on the problems of agriculture and rural economies in LDC's. Within the next decade or so, ERS may be called on for increased inputs into the AID program in LDC's but the emphasis will probably be on institutional improvement and development rather than technical assistance to increase agricultural production. These institutional changes will be many and varied. Some of them are:

- Creating banking systems and other financial institutions to facilitate market exchange and provide credit;
- Developing marketing, storage, and transportation systems for agricultural and related products;
- Developing processing plants for agricultural products and building fertilizer manufacturing plants;
- Investing more in such facilities as schools, roads, and hospitals;
- Providing expertise and training to operate government bureaus, such as agricultural extension services;
- Creating economic research service agencies to collect data and analyze agricultural problems;
- Creating Farmers Home Administration agencies to provide low-interest credit to small farmers and landless rural workers; and

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- Assisting LDC's in developing foreign trade as their agriculture becomes more commercialized and they develop other types of industrial production.

Efforts to increase food production in LDC's will continue, but ERS participation in the AID program is likely to be more oriented toward institutional improvements, rural development, and increasing employment and income, all as a means of distributing the fruits of increased food production more widely through market channels within LDC's.

Another way that ERS can be of assistance is to help multi-lateral assistance agencies identify fundable development projects in LDC's that need capital to put new land into production as the population crunch becomes greater in future years. These countries are now farming less than half (1.3 billion acres) of the 2.8 billion acres of farmable land available to them. An enormous amount of capital will be required for clearing, draining, developing irrigation systems, farm operations, and the like, when the time comes to put more and more of that reserve land resource under the plow.

Abstract of: ERS AND THE P.L. 480 PROGRAM

by
Eileen M. Manfredi*

ERS should become more involved in analysis of the operations of the P.L.-480—Food for Peace—program and its overall effectiveness. Present ERS support for the program is largely peripheral.

ERS involvement should focus on three areas: establishing economic criteria for country selection, developing economic criteria and ranking countries for repayment terms, and making analytical studies of the effects of the program on the recipient countries and on U.S. agriculture.

The resources of the P.L.-480 program are limited; hence, economic criteria are needed for country selection to further Congressional intentions expressed in recent legislation that food aid should go mainly to food deficit countries. Much of the information is available but needs to be organized for this purpose.

Various economic characteristics of potential recipients can be considered, such as food needs, economic development, market potential, and economic performance. We should look at numerous variables including the level, annual variability, and long-term growth in: total GNP, per capita income, population, investment in agriculture, food production and stocks, food and total imports, exports and total foreign exchange earnings, export price trends, capital overflows, international reserves, credit availability, and domestic agricultural policies.

Congress has expressed concern about the level of P.L.-480 repayment terms. ERS, now responsible for recommending repayment terms, should set up comprehensive, easily ascertained economic indicators to rate countries in terms of ability to repay. Such indicators should be separated into short-term ones—the type of credit offered, initial payment, currency use payment, grace period and initial interest rate; and long-term ones—type of credit, total repayment period and continuing interest rate. Flexible repayment terms, based on changes in economic conditions in the recipient country, might be tried.

The economic effects of the food-aid program need analysis. The relationship of food aid to total economic aid and the contribution of the P.L.-480 program to overall economic growth in the recipient country can be studied. We should look at the

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impact on the budget, investment, employment, output, and income distribution in the recipient country. Of special interest is the effect of our food aid on the receiving country's agricultural prices, food production, and shifts between crops. Also, of paramount importance to the overall analysis of the P.L.-480 program is its effect on U.S. producers, consumers, and taxpayers.

Chapter 5—

STRUCTURE, CONTROL, AND USE OF RESOURCES

FORENOTE

The authors of the main assignment for this chapter agreed to disagree slightly and presented two separate papers.

The first paper by Boxley abjures prediction in economics as an impossibility. Instead he holds that focusing on processes may help shape the future. He perceives distributive performance as more important than production efficiency, whereas Reimund and Martin emphasize efficiency.

Boxley breaks distribution into three parts—access, security, and equity—and examines structure and control for each. A structural question for *access* is the number and type of opportunities for entry and what threshold level of assets is needed for success. *Security* has to do with growth potential, survival, and lifetime accumulation. *Equity* involves the distribution of wealth and income between classes, geographic areas, and generations.

The public now claims more control over agricultural resources for open space, recreation, and other environmental matters. Boxley sounds a warning about irrevocable legal controls and says that, though political processes favor gradualism, bolder changes may be necessary.

Reimund and Martin try to develop a framework for viewing emerging issues pertaining to structure, control, and use of agricultural resources. They view structure as a set of economic units and arrangements for combining inputs into goods and services to meet demands of final markets. They discuss declining farm numbers, increasing vertical integration between stages of production

and distribution, increasing concentration of production, and specialization. Not only domestic trends in population, transportation, and the like, but the emergence of multinational firms all react on structure.

Some of the emerging issues relate to production technology, constraints on resources, and the location and control of inputs. We may expect further rapid changes in transportation, communication, and energy through all stages of production.

One set of issues concerns shifts in control of production decisions away from the farm to processing, distribution, and input stages. They foresee a continued trend toward fewer and larger farms and with controls outside the farm.

The recent shift from surplus to deficit agriculture because of world market changes raises questions of stability and performance. How do we adjust to these demands?

Finally, Reimund and Martin call for a blueprint to conceptualize the various elements of supply, control, performance, and their relationships as a basis for appraising economic research.

Reviews

The three reviewers found much to commend but also had some difficulties. Dahl says that it is at once clear that there is no consensus on just what social and economic conditions will prevail in the future or where we should focus research effort. He thinks Boxley is right in considering distribution as a more relevant performance concern than economic efficiency. He then goes on to discuss current economic research on structure and also suggests another category of "futurists," those who "combine trend analysis with divine inspiration." Lastly he suggests a new orientation for ERS research—a continuous monitoring system to keep track of trends and permit earlier corrective action.

Gustafson was at first confused by both papers, but on reflection found some useful insight in the contrast between them. He feels that Reimund and Martin discussed the more obvious factors causing changes in structure-control but missed some more subtle influences, for example, Federal policy and its conflicting and unintended consequences. He regards Boxley's argument for emphasis on distribution issues as persuasive, and thinks the breakdown to the three subgoals of access, security, and equity is a real contribution. He concludes that ERS has paid too little attention to research on policy questions.

Marion found both papers interesting, although "their organization and imprecise foci were the source of some frustration." He was initially bothered by Boxley's reluctance to forecast, but found it "a refreshing contrast to the technological determinism...frequently evident in the writings of economists." He endorses Boxley's point about the need to consider new and mod-

ified institutional arrangements, including those which bring bolder changes. Lastly, he thinks ERS has avoided sensitive research and has played safe with descriptive analysis. He suggests that, perhaps, it is time to change.

Abstracts of two quite different contributed papers come under this chapter heading. Each is worthwhile in its own way. One by Wunderlich is a stimulating speculation about the future status of real property in agriculture. Several novel and useful ideas appear. One is the concept of property as an information system.

The paper by Lewis and Wells takes a forward look at the cash receipts estimates for the Nation and States. These estimates are the mundane nuts and bolts that keep many more dashing series from falling apart. As base data they often receive less attention than they deserve.

STRUCTURE, CONTROL AND USE OF AGRICULTURAL RESOURCES

by
Robert F. Boxley*

...there are two basic types of futurist: the seat-of-the-pants prophet who hastens to publish his intuitions, hunches and brilliant deductions, and the slide-rule seer who projects known trends.

The first kind is much more fun, probably because he finds the distant future easier to deal with. Nobody gets very depressed over the problems of 2500 AD. The second kind, chained to his statistics, is happier in the near future. Next week wouldn't be too soon for him, and anything further off than three years from now he regards as fantasy.

*Michael Kernan
The Washington Post
July 8, 1976*

I have several problems with the question of the state of ERS 10 years hence. Foremost is the impossibility of successful prediction in economics. Shackle sums up the argument in the words of Ludwig Lachmann: "The impossibility of prediction in economics follows from the fact that economic change is linked to change in knowledge, and future knowledge cannot be gained before its time" (21, p. 27). I hold that the only significant future is now; we are today what we are because of decisions made in our yesterdays. By the same token, the problems and opportunities of the future are being created by decisions of today.¹ In this paper I will focus more on the *processes* that help determine future states. It is possible that we can anticipate the future by considering second or third order effects of actions taken today, but even that is

*Agricultural economist, Natural Resource Economics Division, ERS. The author thanks W. D. Anderson, J. Peter DeBaal, Karl Gertel, Jim Lewis, Carmen Sandretto, Reuben Weisz, and Gene Wunderlich for their inspiration and comments.

¹A further consideration is that as the bicentennial year has inspired most of my colleagues to become prognosticators, I am not sure I have much to add. For a prognosis of the future closely related to this paper see: Wunderlich (27). For a general overview of likely structural development see: Farrell (8).

risky. Certainly the process of intertemporal change will be shaped by the structure of the economic and social systems in which it occurs and by the initial and later patterns of control over the process held by the various actors.

My thesis is that structure and control are simultaneously determinants and goal objects of the future; and that goal conflicts exist. The most useful preparation for the future, therefore, is to understand these conflicts and to seek a balance in goal-oriented research.²

MEANINGS

Webster defines *structure* as "a manner of organizing; something composed of parts; the arrangements or interrelation of all the parts of a whole." These senses fit the economist's use of the term to describe the way firms, farms, entrepreneurs, and the like add up to an economy.

Control implies the authority to direct or regulate. The authority may stem from ownership or leasehold rights; votes, bribes or proxies; intimidation and suasion. Control implies an actor with power to decide and act. Therefore, control may be viewed as affecting resource use through acts of choice and decision.

The direct relationship between structure and resource use, by contrast, is mechanistic, and may affect either firm or market efficiency. Economies of scale and technical externalities arising from structure may result in economies for the resources used by the firm; and similarly a structure may promote efficiency in marketing and price setting.

In economics we treat structure and control together almost as if they were hyphenated. Structure provides the framework within which control is exercised. Structure also affects control: in the number and kind of entrepreneurial opportunities; in the ways by which power is accumulated and exercised; and so on. Control, too, eventually affects structure: through the process of firm growth and decline; through laws and regulations; or through revolutions. In fact, structure and control jointly determine the *process* by which decisions are implemented, production achieved, and returns distributed.

In the past, the Economic Research Service carried on research on structure and control issues, usually in small static segments. But still we need a better understanding of such issues as the processes of firm growth, the conditioning effect of structure on eco-

²After this paper was completed, I heard Paul Barkley deliver his paper "A Contemporary Political Economy of Family Farming" (*J*). Barkley has much to say that is relevant to structure and control research in ERS.

conomic behavior, and current information on the distribution of ownership, control, and wealth.

GOALS, STRUCTURE, AND CONTROL

What about goals? Presumably the need for policy arises because of social concern about the present state or future course of structural or control developments. Are there legitimate social goals for structure and control?

Efficiency

The economist usually responds to that question in terms of efficiency as the paramount public policy goal.³ Efficiency as a goal in economic analysis of structure and control issues, however, seems to have led to blind alleys with respect to policy.

Consider the major structural question of economies of size (16). Apparently there are no major diseconomies over a large range of farm size (13). However, the fact that 200,000, 100,000 or even 10,000 farms *could* supply our food needs with no substantial difference in efficiency does not supply an answer to the policy question of how many farms *should* supply our food (11).

In recent years some economists, partly in the context of environmental externalities (7), have contributed to structural concepts through the "property approach" to economic efficiency (9). But Wunderlich points out that this has not gone much beyond some policy truisms (27).

With respect to control, the major economic efficiency issue had come to a dead end with the failure of the so-called Mink study. This was an effort to empirically identify the inefficiency that received theory said existed with share leasing (17). Only the recent theoretical work of Cheung and others has found a way out of the impasse, although that way does not necessarily change the implied extension or policy advice (6).

Apparently society does not share the economists' infatuation with efficiency (12). Political expressions of efficiency goals tend to be negative; as in opposition to inefficiency from big government or as a consequence of breaking up large corporations. Efficiency sought as a public policy is usually accompanied with explicit safeguards for other goals (as in public utility regulation or antitrust legislation). Moreover, it is difficult to believe that the continuing flow of congressional bills to assist family farms or to

³Stigler identifies three economic goals of which the "first and most ancient" is maximum output (22). The tendency stems, undoubtedly, from our micro-economic training and the ease with which an efficiency function can be specified. On this point see: Leontief (14).

help young farmers is motivated primarily by economic efficiency considerations (20).⁴

Thus, I see a dual dilemma if we define structure and control research in economic efficiency terms: (1) efficiency questions are not necessarily the most important research problems and (2) Congress and the public do not see structure or control policy issues in terms of efficiency goals.

Distribution

The main social concern for structure and control would seem to be distributive—including considerations of income, wealth, and power. I suggest three major distributive goals: access, security, and equity.

Access. Conflicts begin with the question of access or entry into agriculture. The heart of the pure competition model is freedom of entry and exit. This once was a hallmark of farming. In the fundamentalist view, the one qualification was a willingness for hard work; the agricultural ladder provided the means. Family aid might help skip a few rungs and was tolerated but the use of inherited nonfarm wealth to enter farming was contrary to the spirit of the family-farm tradition.

This philosophy of free access can be found in several pending congressional bills that would provide farming opportunities to young men whose main qualifications are a desire and willingness for hard work (24). Therein lies the rub. The “guiding hand” of the competitive model also had a backside that helped bar access to those undeserving and to quickly weed out the incompetent. The legislative draftsman must not only devise a similar rationing device but additionally—if the spirit of the program is to be realized—must design the policy instrument to bar those not needing assistance.

A structural question with respect to access is the number and type of opportunities that are or ought to be available; a control issue is the threshold level of assets required for a reasonable chance of success. The current proposals mainly address the threshold question without seriously considering the structural question of the number and type of opportunities. The consequence might be only a wealth transfer at taxpayers’ expense.

One traditional access point to farming has been at the lower end of the economic scale. This is less frequently viewed as an important route today (8,23). The proposed “young farmers” legislation, for example, assumes that beginning farmers must start

⁴Senator Abourezk inserted an article in the Congressional Record July 19, 1976 which noted there had been 206 bills introduced in the then current Congress on the issue of inheritance taxes (24).

large.⁵ Yet, starting small may be the only route for some. In the question of "black capitalism," for example, it appears that land, mostly in small holdings, is still a major capital asset relatively widely held among black entrepreneurs (5,15).

Security. There are a number of individual and collective concerns about structure that might be labeled as "security." Security involves market alternatives, growth potential, survival rates, and degree and predictability of control.

For some individuals security concerns are at the other end of the life span from access, and relate to the time and condition of exit from agriculture. The accumulation of wealth in firm assets as a retirement fund means that any threat to asset values is also a threat to retirement security or plans to transfer wealth. This leads to problems in the planning and design of land use programs such as open space or agricultural land preservation.

Some of the early reaction to vertical integration appeared related to concern over the transfer of entrepreneurship and prompted research designed to measure such shifts (10). Recent efforts to establish "a national policy to restore competition to the agricultural industry and to protect the existence of the family farm," might be viewed as an attempt to achieve structural "security" through legislation (20). Kangun and Moyer have pointed out two general failings of such approaches (12). One is the problem of recreating an atomistic society in a complex world where a small step toward pure competition may not result in an improvement in welfare and may cause substantial social harm (12). A second problem is the consistent failure of antitrust regulation.

Equity. Some of the security concerns overlap with social concerns for equity. The "antimonopoly" bills just mentioned also have an equity dimension, as does much of our concern about wealth and income concentration.

Equity touches classes, numbers, amounts, distribution, and time. Much of the current discussion is about the definition of class. Proposals to amend the Internal Revenue Code to regulate tax-loss farming are concerned with definition of farm and non-farm classes.⁶ State preferential assessment laws seek—with small success—to distinguish between farmers and speculators.

Some of the most challenging equity questions deal with the intertemporal distribution of wealth. Raising the present level of exemptions for estate tax purposes to make it easier to keep the farm in the family also makes it easier to keep wealth in the fami-

⁵The McGovern bill would provide for purchase of farm units (land and buildings) at costs up to \$200,000. S 2589, 94th Cong. 1st Sess.

⁶For example, the Farm Tax Equity Act, HR 7907, 94th Cong., 1st Sess.

ly. Perhaps this is desirable, since the Internal Revenue Code provides ample means for the very wealthy to keep their wealth concentrated. Economists might well ponder, however, the contribution of the combination of preferential, property, and inheritance tax laws to the creation of a landed-estate class in this Nation.⁷

PREPARATION FOR THE FUTURE

Society can choose from a wide range of structure and control arrangements for the future. Being relatively unhindered by efficiency constraints, we can simultaneously pursue a number of goals. We can even choose something of everything—large and small sizes of farms and, factory, family, and hobby types of farms. In fact, a desirable policy criterion may be to design for diversity (27).

The discussion so far has been in the context of goals for structure and control policies. Obviously, however, farming is only part of society and other social goals exist. One difficulty for the policy-oriented economist is to know how much weight to assign to various goals: issues such as alien investment in rural lands, corporate farming, and absentee ownership generate more public concern than warranted when assessed in strictly economic terms or from a narrow agricultural perspective. If the concern persists after the analyst has shown there is no economic problem, one response is to label them as “isms”—populism; rural, urban, or environmental fundamentalism—reducing both the status of the concerns and the chance of responsible professional dialogue about them.

We may sometimes assume goal constraints that rule out some alternatives. Aid to beginning farmers, for example, might preferably take the form of public land ownership with lease-back to young farmers rather than a purchase program that would mainly provide windfall gains to present landowners.

The use of agricultural resources is also becoming an end for other policies, as in the preservation of open-space, scenic, and other natural qualities of the landscape. The public is making larger claims to control over agricultural decisions, either by asserting public regulatory powers, or by acquiring control through voluntary programs such as agricultural districts. Phil Raup has expressed concern about the long-term consequences of making legal dedications of land that are more “irreversible” than

⁷For a perceptive discussion of the way “programs” define “policy” see: Moynihan, Daniel P. (18).

most physical use changes (19). Concern might also be expressed about inheritance or other tax policies that lock farm families into long-term use or control dedications.

Economists need to look further ahead in examining new or modified institutional arrangements. We have the major analytical tools (primarily capitalization theory) to predict the first and subsequent order effects of program changes. Homesteading, credit, and preferential tax assistance all involve subsidies. From past experiences with price support and commodity subsidy programs we have a base for anticipating what will or will not work and what the distributional consequences are likely to be (3).

The political processes in the United States favor gradual change. It is less risky and permits more flexibility. But such an approach to a structural or control change may be less effective or too expensive. The price of an easement in land, for example, may approach the cost of outright purchase. In preferential property taxation the public acquires so little control over land use in exchange for the tax reduction that the programs may fail to attain their objectives. We need to be bolder and consider more rapid changes. Simultaneously, we need to work toward a more sophisticated property system that can more precisely quantify rights (27).

The Morality of Process⁸

Leontief wistfully talks about reaching "the bedrock of invariant structural relationships" but says that, on the relatively shallow level of current economic analysis, even the more constant structural relationships, in terms of which the system is described, change rapidly. The result, he notes, is consistently indifferent performance by economists in practical applications (14). Barkley, in his AAEA paper, also calls for a better understanding of basic structural and control relationships (1).

Barkley argues that economists have ample work within economics and interdisciplinary research can wait. I would argue, however, that understanding social institutions requires a greater coordination of law and economics. Most legislation is written by lawyers, and economists are infrequently consulted in its design. Law emphasizes stability and marginal changes and tends to lag behind social issues. Over time, however, the surest way to achieve social goals would appear to be through lending direction to structure and process. I believe the same prescription applies for future ERS research directions.

⁸I take this heading from Bickel's observation (2, p. 123) that: "The highest morality almost always is the morality of process."

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STRUCTURE, CONTROL, AND USE OF AGRICULTURAL RESOURCES

by

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In 1968, Shaffer wrote: "The food and fiber sector is in the process of a radical transformation. The key to this transformation is industrialization" (7). He called attention to the continuous transition from subsistence farming to the present level of industrialization with corresponding changes in the economic organization of food production.

Examples are the influx of the nonfarm capital into certain types of farming, the increase in ownership of farm production resources by nonfarm firms and individuals, the movement toward unionization of farm labor, and the increased formal coordination of farming with other production stages through contracts and vertical integration. The central aim of structural research in agriculture is to understand the processes through which these organizational changes occur and what they mean to the full range of institutions and market rules.

The purpose of this paper is to develop a framework for viewing emerging issues pertaining to the structure, control, and use of agricultural resources. One approach to the problems of structural change in the food and fiber sector is to view the sector as a set of economic units and institutional arrangements that have the function of combining inputs into goods and services to meet the demands of final markets. *Structure* is the way in which the economic units and institutions are organized to perform this function. *Structural change* is the process of reorganizing the economic units and institutions.

Structural change is largely a reaction to changes in final-product markets and input-factor markets. Let us examine them both.

FINAL PRODUCT MARKETS

The most fundamental development in markets for food and fiber products has been a long-term trend from local to regional and national markets. This trend has been a factor in much of the structural adjustment over the past 20 to 25 years. A few of the major structural changes associated with the regionalization and nationalization of markets are:

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- Declining numbers of local independent businesses in the input supply, processing, and merchandising stages;
- An increasing share of market-control by large national or regional marketing firms;
- Increasing vertical integration among stages of the sector, including the farm production stage; and
- Increasing geographic concentration and specialization of production.

Among the more important factors responsible for the regionalization and nationalization of markets are changes in population characteristics, improved transportation systems, and technological advances in food processing and distribution.

Between 1950 and 1970, the total U.S. population increased over a third. Urban population increased more than 50 percent and rural population declined about one percent. The percentage of population classified as rural declined from 36 to 26.5 percent.

The U.S. consumer has become more urbanized and more affluent. This has led to a shift in consumer food demand from raw commodities to more sophisticated products and services. Affluence has also given the consumer more discretionary purchasing power and reduced the proportion of his income spent on food. Consequently, the food sector has shifted from a commodity to a consumer product merchandising orientation.

Mass markets provided the incentive for developing large national and regional processing-marketing firms. Such firms have changed regional production patterns for several commodities. They have established greater control of product characteristics and have been innovators in developing new ways of coordinating farm production with their needs. These situations had accompanying impacts on independent localized firms as well as producers.

Improvements in the transportation system have facilitated the regionalization and nationalization of markets. The development of the modern interstate highway system and the growth of high-speed long-haul trucking, for example, have contributed to the locational shifts in agricultural production by altering inter-regional competitive relationships. Other innovations in transportation, such as piggy-back movement of loaded truck trailers by rail, have had a similar effect. Improvements in transportation have enhanced the competitive position of areas that have the productive capacity to supply mass markets on a regional or national basis at the expense of areas producing for local consumption.

Regionalization and nationalization of markets will not be confined to the United States. Globalization of agricultural markets is a logical extension of the domestic trend, and is fast becoming

an accomplished fact. Recent developments in the international oilseed economy are evidence of this.

Another indication of this extension is the emerging influence of multinational firms on the food and fiber sector and the frequent transfer of technology. The relocation and coordination of agricultural production on an international scale would parallel the influence that national marketing firms exert on location and coordination of domestic production.

INPUT FACTOR MARKETS

Emerging issues for agricultural resources and inputs include: changes in production technology, the institutionalization of agricultural resources and inputs, resource use restrictions, and the location and control of inputs.

Agricultural resources must be evaluated in terms of changing production technology. A history of man's advance in the use of resources and inputs divides into a number of stages. The delineating feature of each stage is a new set of production techniques. The first stage of hunting and fishing involved direct appropriation from nature. Then came a pastoral stage with herding and the domestication of animals. Subsequent stages were characterized by a more settled life, the growing of crops, and the development of handicrafts and specialized trades, along with the growth of towns. The present industrial stage involves the use of modern power-driven machinery.

We may expect more rapid transitions in the future because current technology has a built-in capacity for rapid change. The basis for this includes increased research and development budgets and the ever increasing networks spanning the United States. These networks include transportation, communication, and energy as well as the less obvious national systems of processing and distribution firms, food chains, department store chains, national capital markets, and credit organizations, all of which have their own information networks and control systems. Large amounts of public funds and resources have gone into this development. All of these factors have eliminated the local differences that once existed. The resulting uniformity has implications for economies both in terms of the introduction of innovations and the rapidity of their occurrence (*1*).

While there is concern over some of the structural changes occurring in parts of agriculture, new technology continues to be developed through public investments; and changing technology is one of the primary factors that influence structural changes. Is this a paradox?

Land, labor, and capital have been the basic inputs for agriculture. The use of these inputs became institutionalized very early. Wealth and social position have been closely related to holdings of landed property. One of the few dynamic models that undergraduates formerly studied was the "agricultural ladder," a rationalization of farm tenancy as an important step in the ladder leading to an owner-operator situation. The "family farm" in the United States is highly valued. For many years the operator and family have contributed a high proportion of the total labor on the farm: the major source of capital entering production agriculture between 1870 and 1950 was from savings and reinvestments generated internally from the farm business (9).

The current characteristics of producing units are quite different from those of 1950. Technological innovations, specialization, and industrialization are rapidly changing the relative value, optimum mix, and quantity of resources and inputs required for efficient production units. Most of the changes have increased capital; there is evidence that the total investment in farm production is expanding faster than equity capital can be generated from farm earnings and depreciation (2).

One important point about farm inputs is the institutional adjustment lag that often exists. Many established institutions cannot adjust fast enough to utilize new production technology. These institutions tend to be a function of past technology and are not adaptable to current production problems. We know surprisingly little about agricultural firm adjustments. We do know, however, that institutional lag and the difficulties involved in separating and recombining the resources and inputs lead to adjustment problems.

Important emerging issues pertaining to resource use involve externalities and the competition for resources from other sectors of the economy. We are all aware that environmental impact effects have been left out of most cost-benefit calculations on agricultural production and growth problems. Matters pertaining to environmental impacts are now continuing features of public policy (8). Unintended second- and third-order impacts are likely to develop in connection with technological changes. The very magnitude of future innovations may cause serious economic problems, all of which pertain to structure and limit agricultural resource use.

The competition for land and energy resources from the non-farm sectors of our economy also limits their agricultural use. Limitations on resource use raise structure and performance issues in a number of ways because they emphasize the value lost and the cost associated with inefficient operations.

Emerging issues involving the location and control of farm

inputs result from changes in market situations that bring about changes in ownership and control of input resources and in changes in resource needs of farms. These matters are closely connected and will be discussed later.

The shift from local to regional and national markets created a common market for all producers, and local producers found their markets taken over by "outsiders." The globalization of markets for agricultural commodities may have similar impacts. Herein lies a whole series of emerging issues.

The amount of capital required by farmers is likely to continue to increase. External sources of capital can be expected to enter the farm production stage, with the owners of this capital demanding some control. Clearly, this has strong indications for structure. Furthermore, large farms may have advantages because economies of size might exist that will attract outside capital.

ORGANIZATION TO MEET CHANGING MARKET AND RESOURCE NEEDS

A number of concerns have been expressed about the changing structural organization of agriculture. Some kinds of agriculture, such as broilers, processing vegetables, and fed cattle, are less tradition-bound than others, such as feed grains and cotton. In fact, there are wide differences in structural characteristics. However, the increasingly visible role of large food processing and distributing firms, other nonfarm interests in coordinating farm activities, and the continuing decline in the number of farms—especially small family-farms—have been the primary causes of these concerns.

Much of this organizational change has been in response to the changes in final demand markets and resource needs outlined above. As consumer demand has shifted from raw commodities to sophisticated products and services, the input, processing, and distribution stages have developed new technologies and organizational forms. This has created stress on the organization of the production stage and, in turn, has caused changes in the basic relationships between the stages of the system. Some of the fundamental issues concerning the structure of the food and fiber sector stem directly from these changing interstage relationships.

Control-Decisionmaking Issues

One set of issues concerns shifts in the control over agricultural production away from the farm sector to the processing, distribution, and input sectors. Traditionally, coordination of the farm sector has been accomplished through open market transactions

in which the pricing mechanism is the primary coordinating device. Under this system, individual farmers make the basic decisions concerning what and how much to produce, and the resource combinations to employ in production.

Over the past 15 to 20 years, however, contract production and vertical integration have become more prominent means of achieving coordination among the stages of the food system. These techniques entail a more direct and visible form of control over the farm sector by nonfarm stages than is exerted in open market coordination.

Some of the specific issues being raised by this shift in control are reduction in farmers' access to markets, the shift from market to administered pricing, and diminished opportunities to enter farming. If substantial control over farming is achieved by the oligopolistic marketing sector, additional issues may involve undue restrictions on total production of food and fiber products and increased consumer costs.

All of these issues boil down to the fundamental questions: is the viability of our traditional farm sector, dominated by independent, family-owned and operated production units, threatened by the incursion of the marketing and input stages into the decisionmaking process at the farm level? And, will a highly concentrated, vertically coordinated food and fiber sector be able to respond to future consumer needs on equitable terms?

Efforts have been made to retard the encroachment of nonfarm interests on the farming sector. At the Federal level, several family-farm bills have been introduced into Congress. A number of States have enacted laws to prohibit or restrict farming by corporations, and several other States have similar legislation under consideration. The objective of legislating who can or cannot engage in farming is to preserve the atomistic structure of the farm sector.

This approach regards the independent family farm as something that has been good and should be saved. It does not, however, consider the changing role of the farm sector in a dynamic, industrialized, urbanized society. The farm sector's role in our food and fiber system is to convert inputs, largely produced by other sectors of the economy, into agricultural commodities which, in turn, become raw materials for the processing and distribution stages. When the production sector is viewed as the supplier to the processing sector, the processing sector's role clearly includes direct involvement in the production decision process. The farm sector can no longer be considered as the dominant stage of the food system with the processing and distribution stages serving only as vehicles for moving farm output to final consumers. Given this change in the role of the farm sector, there

are emerging questions concerning the efficiency of its traditional independent, atomistic structure.

There is scarcely any doubt that if the food and fiber sector is to respond progressively to the changing needs of the future, it must rely heavily on technological innovations. The trends in the characteristics of these innovations suggest sizeable capital expenditures, increasing scale, and greater coordination among the sector's stages. Thus, the overall effect is likely to be an increase in both the level of concentration and the degree of inter-stage coordination. The problem, in terms of future performance, is to arrive at a structural relationship that will enable the sector to deal with these emerging needs efficiently and, at the same time, prevent the accumulation of detrimental market power.

Performance Issues

As indicated above, we began by viewing the problem in terms of satisfying the current and future demands of the final markets. We have alluded to the different ways of supplying the demands of the final markets, including a competitive economy guided by market forces and some form of control or planning that deviates from the competitive approach.

In the end, decisions made in our business and political system will have much to do with what part of the problem of supplying final markets is solved by each method. This means both a mission and a problem for ERS and other research institutions. The charge is to supply information to policymakers concerning the current situation and the consequences of the various forces employed, as well as those that may later be used to affect the structure, conduct, and performance of the food and fiber sector. The problem is that these political and business decisions affect the structure as well as the conduct of firms. A two-way flow exists between structure and conduct; both are affected by outside forces and each is affected by the other. The job of research is more difficult because structure and conduct continue to change. The research problems and priorities are elusive, complex, and difficult to formulate, and the goals that are set for structure and conduct must relate to good performance. Hence, we must attempt to specify what good performance is in the food and fiber sector.

Economic performance is partly subjective because monetary goals are not totally compatible with other social goals. Nevertheless, our view of the problem of satisfying the demands of the final markets is subject to certain constraints. The fact that these constraints change from time to time will be discussed later.

In specifying the goals of good performance, we largely follow Scherer (6). Good performance involves the elements that allocate production and create efficiency in the use of agricultural

resources, as well as maintain progressiveness and innovativeness on the part of producers of goods and services. It also facilitates desirable adjustments to changing technology, and distributes income on an equitable basis.

The production allocation and efficiency element involves the problem of what, how, and how much to produce, so that agricultural resources are fully utilized in an efficient and economic way. Production must respond to the demands of consumers, and be consistent with proper social, environmental, and ecological constraints. This element of good performance involves many of the well-aired issues regarding the question: Who will control U.S. agriculture (4)?

Continuation of the trend toward larger and fewer farms, increased control of agriculture by the food processing, marketing, and farm-supply industries, and nonfarm investors can be expected. Future public concern will involve two fundamental questions: is agriculture's organization essential to meet the expanding demands of the final food and fiber markets on which much of our increasing living standards hinge? And, is the expected integration in agriculture compatible with socially acceptable competitive objectives?

The second element of good performance, maintaining progress, suggests that producers of goods and services should be creative, progressive, and innovative in the utilization and development of new technology, as well as in the preservation of social and environmental factors that are consistent with the longrun growth of per capita real income. Recent changes in food and fiber supply and demand conditions have imposed new constraints and placed this performance goal in a new light. Before the 1970's, substantial surplus production of food and fiber in the United States meant that efficiency was not a problem. As then described by Raup, "in the spectrum of societal goals, efficiency in resource use is diminishing in discriminating power as a guide to a desirable structure of agriculture" (5).

All this has changed, primarily as a result of the influence of world markets. Among other things, this situation leads to two emerging issues. First, will we have the resources and the productive capacity to afford the inefficiencies that could be tolerated in times of plenty? Second, how stable are the world markets? How far and under what conditions can the United States rely on foreign markets?

This last issue concerns the problem of the foreign political and economic frameworks which the United States hopes to affect, but does not control. There appears to be no way that the United States can isolate itself from world economic conditions and the policies of other countries. Because of this, U.S. con-

sumers may pay more for food and fiber products and public concern over inefficiencies may increase. Related additional issues which might arise involve tax policies, farm programs, unionization of labor, and other matters.

These problems are also associated with the third goal of adjusting the structure to changing conditions. The operations of producers of goods and services in the sector should facilitate the full employment of agricultural resources and cooperate with the solution to problems involving the necessary adjustments of resources, particularly human resources. Adjustment problems concerning technological changes are among the most difficult to understand and solve. We do not even know if growth and development in production agriculture primarily involves the growth and adjustment of old farms, or the entry of new ones. Much of our statistical data allow only comparative static analyses at highly aggregate levels. The data are more revealing in cases where shifts in the location of production have occurred. We observe that new firms established in new areas of production are much larger and in a better position to utilize the latest production and organizational technology (3). On the basis of this observation we hypothesize that typical structural changes in the production stage occur as a result of new firms entering agriculture.

Adjustment problems appear to divide human resources into two groups. One group includes those producers who can and do make changes and adjustments. For them monetary returns to new technology in agriculture are often substantial. The other group includes those producers who, for various reasons, cannot adjust within the same line of production. Many of these may experience great social and economic hardships. Thus, significant implications for income distribution problems exist because agriculture is an industry that faces a rather inelastic demand. In view of the wide scale and scope of future technological and structural changes, the adjustment problems of human resources may become a major issue.

Whether or not adjustment becomes much of a future issue is uncertain because the problem has been with us for a long time. In the opinion of some, we have never been very serious about seeking a solution to the adjustment problems in agriculture and have paid lip service to the problem in the name of rural development programs.

One problem in our economic system is that the innovator does not bear much, if any, of the adjustment costs that result from the economic changes caused by the effects of changing technology. This is a desirable characteristic from the standpoint of nourishing new technology and innovations, but it does lead to some problems in terms of dealing with resource adjustments.

Adjustment problems will always exist, but if changes in organization and production technology occur at an increasing rate, as some suggest, the adjustment problems in the food and fiber sector may have to be more effectively coordinated with the general economy than in the past.

The fourth goal of good performance is equitable distribution of income in that producers of goods and services secure adequate, but not undue, rewards far in excess of those needed to allocate the proper use of resources and inputs. Issues and activities related to this element of good performance have received an increasing amount of attention in ERS in the past few years.

Conduct Issues

Given the goals of good performance, changes in the structural relationships among stages of the food and fiber sector lead to problems concerning the conduct of the sector. A major reason is that standards of conduct for firms within the sector become institutionalized into market rules, which Shaffer defines as "the set of rights and obligations established by law, custom and covenant which define the relations among members of a community in respect to the exchange of goods and services" (7). As the markets which agriculture serves change, and as the sector advances technologically, relationships between stages change to accommodate the new demands and resource requirements. Market rules, or standards of conduct, which may have served well in previous situations become obstacles to increased efficiency and improved performance under the new market and technological conditions. This is institutional lag, in which the rules specifying how the game is to be played are still enforced even though the game has changed.

The rules of conduct that are being applied to the food and fiber sector are applicable to an earlier era, one which was characterized by small-scale firms, localized markets, and independence among stages.

The shifts in final demand markets, discussed previously, and the increased level of industrialization required to serve these markets have necessitated larger firms and a higher level of coordination between stages. Interstage conduct problems have developed between the farm sector and the input and marketing sectors as a result of farmers' reluctance to change interstage relationships. Emerging issues will be concerned with attempts to enforce rules of conduct designed to perpetuate the farm sector's atomistic structure and independence from other stages. Various aspects of these issues focus on whether such enforcement has a detrimental effect on overall food and fiber sector performance, as well as whether it overlooks true conduct problems, such as price fixing and unfair competition.

There is an urgent need for a new set of conduct rules and policies for the food and fiber sector. These standards must recognize the structural changes brought about by changing market and technological conditions and allow for the adoption of efficiency increasing innovations. They must also ensure that these efficiencies are passed on in the form of reduced consumer prices or increased farm prices, and facilitate a solution to problems involving the necessary adjustments of resources, particularly human resources.

IMPLICATIONS FOR ERS

There is a broad spectrum of emerging problems and issues involving structure, control, and the use of agriculture resources. These are complex matters: the area includes the entire set of economic units and arrangements that collectively have the function of combining resources and inputs into goods and services to meet final market demands.

One problem in terms of developing research activities and priorities is that we lack a blueprint that conceptualizes the various elements of structure, control, and performance and their relationships within the dynamic framework that exists in the food and fiber sector. Such a blueprint would facilitate additivity and allow us to assess the total dimensions of the research task as well as progress in structure and adjustment research. The development of this conceptual framework may be a prerequisite to ERS doing a topnotch job of research involving issues that relate to structure, control, and the use of agricultural resources.

We have touched on some of the necessary ingredients of this model, including the basic conditions of supply and demand, various aspects of structure, conduct, and performance. We have discussed some of the functional relationships and feedback effects that exist between structure, conduct, and performance. In this framework, we suggest the testable hypothesis that the structure of the food and fiber sector is related to the conduct of firms and to performance. Thus, we believe that the characteristics of firms in the food and fiber sector affect the use of agricultural resources, costs of production and services, consumer expenditures, and so forth. To test this hypothesis, we need to know more about the behavior of firms that make up the dynamic structure. We need to go beyond the number and sizes of firms and their intrafirm functions. We must understand their behavior in terms of the linkages and the interrelationships involved and the forces that affect changes in the structure.

We have specified the elements of good performance to con-

ceptualize some of the characteristics of suitable conduct and structure in an attempt to relate these matters to emerging issues. An adequate treatment is not possible until the broad goals of agricultural policy have been specified. Researchers must assist policymakers by determining the functional characteristics of structural changes, the forces affecting structural changes, the emerging trends, and alternative consequences of the various structural configurations.

We have emphasized the point that economic efficiency in the production stage is becoming relatively more important as an element of good performance. The answers to questions pertaining to the economic efficiency of various types and sizes of production firms associated with different forms of linkages, market coordination, and within various structural configurations would be valuable in guiding decisions that will be made in connection with emerging issues.

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Review of: STRUCTURE, CONTROL AND USE OF RESOURCES

by
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The Economic Research Service is to be commended. Few organizations are bold enough to review and openly discuss how changing socioeconomic and technical conditions might and should affect their future programs.

Yet it is at once clear from the papers by Reimund and Martin and Boxley, that a consensus on what those conditions are is difficult to achieve.

Reimund and Martin, following a popular but vague lead by Shaffer, argue that the food and fiber sector should be viewed as a collective set of economic units and institutional arrangements undergoing industrial transformation. They point out that this sector is undergoing radical shifts in production technology in an effort to meet a broad and expanding regionalization of final demand.

To support a thesis that the food and fiber sector is increasingly behaving as a "firm," they cite increases in vertical integration and concentration within the sector. This has centralized control away from farms and raises serious, but elusive concerns about conduct and performance relationships.

They find no meaningful "blueprint" of dynamic structure, conduct, and performance relationships that can guide future research by ERS, and suggest that priority attention be devoted to its drafting.

Boxley, in a separate paper, believes long-range economic prediction is futile, but that the dynamic "process" by which change occurs may be the key to judging future states. His concept of "process" appears to be influenced by "structure" and "control," but the reader is left guessing.

The issue of harmony in societal goals quickly becomes the true focus of the paper. He questions "efficiency" as a meaningful analytical shibboleth in an affluent economy, and identifies distribution (access, security, and equity) as the relevant economic performance concern in this country. I think he is right and believe such an orientation may be more useful than any recitation of trends and patterns of change.

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Boxley concludes with an appeal for interdisciplinary work that melds economics and law to better achieve distributive performance goals. It is not quite implied that ERS should become the Economic and Legal Research Service.

My comments relate to issues raised by both papers. First, I will refer to some of the current economic research on structure and control to highlight some of my own research biases. Further, I will look at a third category of "futurists," those who combine trend analysis with divine inspiration! Finally, I will suggest a new orientation for ERS.

Structure and Control Research

We are all aware of the strong interest in the structure and control of the U.S. food system. Organizational adjustments, involving concentration and integration, have been pronounced in recent years. Respected observers of these trends have raised warning flags and laws have been drafted and enacted by State and Federal legislators. Much of the legislation has been piecemeal and uncoordinated. And where economists have been asked to contribute, they have often responded with tired efficiency-based analyses of limited value or have merely offered non-analytical opinions.

One of the most important regional efforts in years, the North Central research project NC-117, began in 1974 to address the research needs associated with the organization and control of the U.S. food system. The ideas underpinning this research grew out of meetings of the old North Central Regional Committee, NCR-20, and were associated with the writings of Shaffer and Mueller.

The thought was to develop a unique group of cooperating scholars from the executive and legislative units of the Federal Government, and from the agricultural experiment stations. This effort would go far beyond the usual limited regional project.

The new NC-117 was to be an undertaking where researchers who were not willing to devote substantial effort (at least half a man-year) or who refused to commit themselves to the regional project objectives were discouraged from membership. And, it would have a staff of full-time researchers at one location to lead the supplementary work done at other locations. A list of prominent scholars was soon associated with this effort: Shaffer, Mueller, Breimyer, Rhodes, Helmberger, Cook, Marion, Padberg, Farrell, Armstrong, Farris, Knutson, and others.

Mainly through the dogged efforts of Mueller, NC-117 became a reality. ERS supported the study, both with manpower and money. Various government units and experiment stations made sizeable commitments.

The most popular research focus among the researchers was the "systems approach"—the current methodological vogue—as a

means of describing various subsectors of the food complex. Hopefully, this massive descriptive effort would help suggest an understanding of *why* the food sector is organized and operates as it is. I am not sure that we are much closer to the “why” than before, but some insights regarding “what” are unfolding.

Some researchers on the committee showed special interest in the market structure dimensions of the system. Others had an interest in certain legal aspects of the problem, but until recently most of this work was addressed to “what the law is” rather than how the law can be changed to realize selected performance results.

The research by NC-117, by USDA, and by other researchers has been descriptive. Shaffer pointed out nearly a decade ago that most marketing—in fact, agricultural economics—research has been piecemeal and nonadditive. We have not been able to make many useful statements about the food and fiber system as a whole. Signals of change came from the production economist who studied representative farms and the commodity-oriented marketing economist who used efficiency models to view selected dimensions of a geographic segment, while the land economist vanished to reemerge as the “resource economist” whose new field of interest included everything from air to noise. The agricultural policy expert became interested in agricultural trade and foreign economic development and we lost the “integrating” insights of this true general agricultural economist.

The North Central Regional (NCR) committees were disbanded and the American Agricultural Economics Association became unwieldy, its journal filled with mathematical tidbits that said virtually nothing about the dramatic changes occurring in the economic system that its members supposedly study.

In short, we have not kept up with changes in the food and fiber sector. Our data are based on the economic system of a quarter century ago and the modes of analysis current when economists could be typed as production, marketing, prices, land economics, or policy specialists.

A Look to the Future

We want to describe the food and fiber sector, but not just in an occasional cross section. Rather, we must develop a monitoring mechanism that permits continuous description and identifies changes and trends much earlier—and not just for farming. This monitoring network should avoid excessive interagency data dependencies that confound the policy-support research of ERS and the methodological research of the universities.

A comprehensive monitoring system would reduce the need for special studies now largely devoted to data gathering and save resources for data analysis. A modernized data system might

include a merger of Statistical Reporting Service and ERS, for example, and could even be tied in with agricultural experiment stations throughout the country. Various functions could include the gathering and analysis of data on the manufacture, storage, transport, and distribution of farm inputs, as well as on the assembly, transportation, storage, processing, manufacture, and distribution of resulting food products. Attention could also focus on present farming statistics.

What things should be monitored? These include some of what we look at now, but also what is being described by our systems analysts and requested by the structure and control researchers in ERS and across the country. Examples are firm numbers and sizes, cost and profit data by product line, temporal, spatial, and production linkages within and between firms, contract and other marketing arrangements, prices for inputs and products.

We have no "blueprint" to guide our efforts because we are not sure what we are looking for. We talk vaguely about performance "dimensions" and performance "norms," but with the possible exception of efficiency, we are not certain if any aspect of distributive performance is important enough to cause us to refurbish our theoretical and quantitative kit of tools.

Future ERS Research

A survey of the research and policy data *needs* of other executive research units and researchers at State universities and business and consulting organizations should be undertaken by ERS. Then a "think tank" of agency, university, and business research *administrators* should formulate an organizational structure that permits these data to be monitored, summarized, and made regularly available.

I sympathize with Boxley in his concern about having an ordered set of societal goals that will permit us to select the "right" objectives for analysis. I doubt if we ever will, if we depend on others to provide it.

How about law? The law is there. Anyone can read it and understand it as well as an attorney. Most attorneys are involved with interpreting the law or writing it for a legislator who has a cause to promote. Nothing keeps the economist from proposing legislation based on his analysis. But economists' tools are terribly incomplete for addressing many important current issues.

Review of: STRUCTURE, CONTROL AND USE OF AGRICULTURAL RESOURCES

by
Greg C. Gustafson*

In the context of the ERS Forward Look activity, I had thought the purpose of these two companion papers was to identify emerging issues in structure and control and explore their implications for research in ERS. My expectations were not completely fulfilled. Boxley focused narrowly upon process and goals. Reimund and Martin reviewed old territory. Neither paper laid out a specific program of research for the 1980's.

After some reflection, I reread the papers looking for insight. At first, I was unsure how to react to the differences in scope and perspective of these papers. Then I realized the obvious—that by confronting us with these differences, the authors have shed considerable light on the basic issues.

An appropriate setting for discussing these differences is in terms of research needed. A simple classification scheme might have three categories: research to identify the determinants of structure-control, research to determine the impacts of alternative states of structure-control, and research to design and evaluate policy options that affect the structure, control, and use of rural resources. Each of these categories is deserving of attention by ERS and is at least alluded to by the authors.

Research on the determinants of structure and control was underemphasized in these papers. Reimund and Martin discuss some obvious factors causing change in structure-control, but overlook more subtle influences, for example, Federal tax policy. Provisions allowing commingling of income, cash basis accounting, accelerated depreciation, investment tax credit, and differential treatment of capital gains become the most important factor attracting urban capital to farm production. As Raup has stated, the extent of the influence of Federal tax policy on incentives and its potential consequences is an area ripe for research.¹ In fact, the general subject of conflicting and unintended consequences of public policy might be a useful focus of inquiry for research on the structure, control, and use of rural resources.

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¹Summary comments of Philip Raup at the Resource Organization and Control Program Review, Washington, D.C., April 15, 1976.

The authors have more to say about research of the second kind—determination of the tradeoffs between alternative states of structure-control. Both papers imply that such research is important, but offer contrasting views on whether efficiency or distribution should be studied more intensively. Reimund and Martin are largely efficiency oriented.

Boxley, on the other hand, presents a persuasive argument for primary emphasis on distribution issues and tradeoffs. He observes that “the essence of economic and social concerns for structure and control would seem to be distributive.” His breakdown of distribution into three subgoals of access, security, and equity is an important contribution.

I find Boxley’s argument more appealing, particularly because distribution impacts have been ignored in the past. Nevertheless, I suspect we must have both, though research on efficiency should not come at the expense of research on distribution.

Some specific points are not addressed in either paper. Among the unasked questions are:

How is the quality of life in rural America affected by structure-control in the production subsector? Does concentration affect the level and quality of local public services, the stability of employment, the vitality and diversity of nonmetropolitan communities? In the absence of policies to inhibit concentration, will rural America become 10,000 company towns devoid of the elements essential to the character of rural communities (a town newspaper, local Grange, 4-H clubs, the County Fair)?

What relationship (if any) does the incidence of monoculture have to structure-control?

What are the implications of the post-1972 farm income situation for structure-control in the production subsector?

Research on policy options has received too little attention in ERS. We have not been responsive to the needs of policymakers for analyses of changes in farm estate tax legislation, restrictions on bigness in agriculture (the proposed Farm Antitrust Act, State restrictions on ownership of farmland by nonfamily corporations), more rigorous enforcement of the 160-acre law in the arid West, and rural land use control techniques. Is it time to reorder our priorities? Can we do a thorough job of research on policy options and remain nonpolitical?

Review of: STRUCTURE, CONTROL AND USE OF RESOURCES

by
B. W. Marion*

Although their organization and imprecise foci were the source of some frustration, I found much of interest in these two papers. I was initially bothered by Boxley's reluctance to forecast the future because "the only significant future is now;...the problems and opportunities of the future are being created by decisions of today." However, I find it a useful insight and a refreshing contrast to the technological determinism frequently evident in the writing of economists. Boxley's institutional perspective should remind us that decisions concerning the emphasis of today's technological research may determine the future scale requirements of such technology. This is helpful, yet it need not prevent us from saying something about the future. For example, the trends toward increased farm size, specialization, geographic concentration, and capital requirements are propelled by forces so strong that there appears to be little question that they will continue.

Boxley's meaning and uses of the terms "structure," "control," and "process" are somewhat fuzzy. I interpret his use of structure as going beyond the structure of markets to include vertical and multistage aspects of structures. I find it useful to define the structure of a subsector as the functions that are performed, the stages in the vertical system, the proprietary and authority structure, and the institutions and arrangements that are an integral part of the subsector. Control can then be defined as control over *decisions*—particularly critical decisions—which largely depends upon the structure of authority in the subsector (2).

I generally agree with Boxley's comments concerning the goals of society for the structure and control of the agricultural sector. As long as food prices avoid the mercurial journey of the recent past and show only modest increases, I suspect Congress and the public will see structure and control issues largely as distribution rather than efficiency issues. Certainly one of the important research issues is the relationship between various structure-control configurations and the distribution goals of access, security, and equity.

Boxley suggests the need to consider new and modified institu-

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tional arrangements, including those which bring bolder changes. I would second this point and suggest it is time for a careful reexamination of all existing institutional arrangements. Mechanisms for price discovery, market news, inspection systems, grades and standards, market orders, and other institutions may be the source of "market failures" with detrimental effects on subsector structure and performance. It is time to determine whether the effects of these "old time religions" are consistent with their litany.

In the second paper, Reimund and Martin concentrate particularly on structural changes, their causes and consequences. The changes identified are consistent with the available evidence and conventional wisdom. Little is said about present structural arrangements. This is unfortunate: the indicated trends toward increased concentration in farm input industries and food marketing industries would be of less concern if many of these industries were not already rather highly concentrated.

The structural changes expected in the farm input and food marketing industries warrant more thorough treatment. One might conclude from the Reimund-Martin paper that the nationalization of markets has set loose compelling economic forces that dictate the survival of only very large food manufacturing and distribution firms and lead to increased concentration. Although small firms are rapidly declining in number, the economic imperatives are not that restrictive. In several food manufacturing industries, four- and eight-firm concentration ratios declined from 1958 to 1972, (for example, canned fruits and vegetables, fluid milk, meatpacking, vegetable oil mills, cane sugar refining, shortening and cooking oils). Industries with high levels of product differentiation have experienced rather sharp increases in four- and eight-firm concentration; producer goods industries, on the other hand, have generally declined in concentration (4).

Most of us are imbued with a large dose of determinism. We tend to assume that there are compelling economic reasons for the structural characteristics of an industry or subsector. Research is needed that examines the economies of size of food manufacturing and distribution *firms* and that defines the minimum efficient firm size when all functions are considered. This will not be easy but warrants a high priority.

Reimund and Martin implicitly follow a structure-conduct-performance model in developing their paper. But they avoid explicitly acknowledging the industrial organization paradigm and deprive themselves of a rich body of literature concerning industry structure-performance relationships.

The authors are concerned with *subsector* structure-control-performance relationships (3). I would agree that there is no ade-

quate blueprint of these interrelationships, particularly in a dynamic setting. However, I believe we must use the theoretical framework that has been partially verified empirically, and at the same time attempting to develop a new and more appropriate framework. Analysis can still proceed by using the industrial organization model in a vertically related multiple-industry setting.

The limited focus and lack of factual evidence detracts from each of these papers. Readers are expected to accept much on faith or conventional wisdom. Since conventional wisdom is often proven wrong by empirical evidence, one of ERS' research priorities might be to develop the descriptive data needed to support or refute the points in these papers. I sense that this is a general need which goes beyond these papers.

The restricted focus and implicit assumption that markets are effective instruments for price determination and resource allocation may raise some eyebrows. Economists have long assumed that buyers and sellers are sufficiently informed to represent their interests in the marketplace. Given the complexity of the marketplace, there is a real question whether either consumers or farmers have adequate information to be effective market participants.

When the influence of advertising is taken into account, the notion of consumer sovereignty must be reconsidered. If consumers can be manipulated by advertising, as Galbraith contends, then consumer sovereignty is a charade for producer sovereignty.

The growth and economic-social-political power of conglomerate corporations in the food and fiber economy warrants more concern, in my view, than is present in these papers. These organizations hardly fit our conventional single product-single market economic models. Enormous in size and usually multinational in scope, these organizations have considerable ability to control their environments. We are only beginning to understand their conduct and performance effects.

These are sensitive issues which are more convenient to ignore than to address. However, they are also central to our economic system. At minimum they warrant a conscious choice.

Lastly, a comment about ERS' previous research focus: ERS has generally avoided studies that develop or attempt to evaluate performance. Industry and subsector structural studies conducted by ERS have tended to focus instead on describing structural characteristics and their changes over time. While this information can be useful, it is also neutered. So what is the natural response? Perhaps this posture is necessary for ERS to do research in the *public interest*. The rationale is not readily apparent, however.

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Abstract of: A FORWARD LOOK AT CASH RECEIPTS ESTIMATES IN ERS

by
Edgar L. Lewis and Clinton F. Wells*

This paper covers the history, present use, and future needs of cash receipts estimates at the national and State level.

Subjects such as clientele use, statistical reliability, preliminary estimation problems, emerging statistical problems, prompt review, updated automation, and relationship to other statistical series need the attention of all who are responsible for the development, use, and interpretation of farm cash receipts.

One of the most important and publicly visible jobs performed by the Economic Research Service together with the Statistical Reporting Service has been to supply the United States with estimates of national and State income received from farming. Estimates of cash receipts are developed for the individual commodity reported at the State level and summed forward to obtain the State and national totals. The Economic Research Service has the responsibility for assembling this wealth of statistical information and has the sole responsibility for the State and national estimates.

Over the years cash receipts estimates have been used by an ever-expanding audience. By far, the greater use of these data has been at State levels. State totals of cash receipts are now being used as control totals for the development of standard metropolitan area and county level estimates by the Survey of Current Business and Statistical Reporting Service field offices. But while the use of cash receipts estimates is expanding, the data base has been deteriorating at an alarming rate, especially in the last few years. The emphasis in the Statistical Reporting Service and Census of Agriculture has been to obtain reliable national levels for major commodities at the expense of individual State estimates.

Further reliability associated with cash receipts estimates will depend on the following actions being properly implemented in the future:

- redetermination of the present and future use of cash receipts estimates by the clientele especially at the individual State levels;
- revaluation of present and future statistical reliability, priority determinations, timing and availability problems;

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- additional data needs for preliminary estimates of cash receipts using up-to-date and highly sophisticated estimating systems already developed for forecasting work at the national level;
- advanced anticipation of emerging estimating problems such as contract pricing confidentiality, marketing distributions of minor crops, and farm definitional problems;
- establishment of prompt review procedures of revised State estimates of cash receipts in May prior to release of national totals to Commerce;
- redesigning in-house computer processing and release schedules to allow for efficient, accurate and timely compilation, summary, and analytical review of cash receipts estimates; and
- reassessment, with respect to retention or deletion, of the cash receipts statistical series with other farm income series or with proposed statistical series needed for national accounting and the like.

Abstract of: PROPERTY AND THE FUTURE OF AGRICULTURE¹

by
Gene Wunderlich*

This paper speculates about the future status of real property, the future condition of agriculture, and the relationship between them.

Property is a system through which owners communicate to others their interests in property objects. Essentially, property is an information system. The increasing complexity of the real property system is an inevitable consequence of more parcels of land, more separable rights, and more holders of rights. This means that the bundle of rights is divided into many parts and the parts are held by many people.

As the distribution of property interests becomes more widespread, and as information systems become more specialized (high initial costs, low unit costs) new forms of concentration of property may arise. Particular types of interests may become the focus of information specialists who control access to information sources. To some extent the present limits on access to multiple listing in real estate is a step in that direction. As the information system becomes organized and regulated, access to the system may be restricted and its value expressed as franchise; for example, a seat on the New York Stock Exchange.

Thus the concentration of economic or political power associated with the ownership of large amounts of land could be submerged by control of information about land. What the stock market has done for capital, the land information market will do for land.

Biological sciences will be the most important influence on the future direction of what we now call agriculture, but the property system will affect the distribution of benefits and costs, and may have some effect on the direction and pace of change.

At least two technological advancements—energy management and genetic engineering—may greatly enhance the potential for food and fiber production and also affect the organization of agriculture.

The effectiveness with which scientific effort is encouraged and used will depend to a great extent on organization. The

¹This paper is published in full in *Amer. Jour. Agr. Econ.* 58:946-952, Dec. 1976.

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organizational change from today's agriculture probably will be toward two general forms: food and fiber factories, concentrated physically and financially to serve national and global transportation facilities; and natural farms based on occupational (today's subsistence, part-time and retirement farms), recreational (today's hobby farms but in greater number), and cultural (tomorrow's art form) objectives. The two organizational forms will coexist and to some extent will support one another.

Much of the future of property and agriculture would appear to depend on effective information management. Both biological and organizational processes, almost by necessity, will become more complex. In research, management, and legislation, information requirements will increase. Issues of privacy, independence, freedom, responsibility, interdependency, control, and equity will surface in many ways in many places. Better information, obtained faster and less expensively, will be needed to resolve these issues. The property system will be no exception.

Chapter 6— QUALITY OF LIFE

FORENOTE

Our ancestors had a high regard for quality of life. That is why the founding fathers used such words as welfare, life, liberty, and the pursuit of happiness.

The two main papers in this chapter briefly review past and present quality of life research and look to the future. Stuby's paper is on directions for major issues. He considers quality of life relevant to ERS in three contexts—development, environment, and technology. He believes that the usual institutional output data, although helpful, are incomplete and need to be supplemented by monitoring the real-life changes experienced by people as they see them. Data on such subjective experience can be converted into quantitative indicators and can be used to compensate for the problems of today's institutional measures.

Doeksen, Bird, and Green look through their crystal ball to identify emerging issues related to quality of life in nonmetro America. They focus on community services, health, housing, and land use. They note the recent reversal in population shifts between urban and nonmetro areas and the impact on numerous quality of life problems, including energy.

Reviews

Three reviewers react to these papers. Gum says both papers provide insight and guidance for the role of ERS in quality of life research. Most of his comments are confined to Stuby's paper, with which he strongly agrees. He would emphasize the importance of the point that the meaning of people's values can be separated from the objective measurements of quality of life.

Youmans thinks the two papers are well written and merely wishes to supplement with some observations to provide insight.

He points out that, in the past, poverty in the United States was mainly among immigrants who outgrew it in this land of opportunity. Contemporary poverty appears to be more permanent and is made up of the many rejected groups displaced by modern technology. It presents a greater challenge and is also a more varied heterogeneous condition that will require many special studies.

Headley praises the "two thoughtful papers that deal with problems associated with quality of life in nonmetropolitan America...Both seem to break with older, more narrow definitions, which equated quality with quantity." He agrees that there is room for more research to ascertain the quality of life as perceived by the people living it.

Contributed Papers

Two quite different contributed papers add color to this chapter. The first written by David Brown concentrates on passenger transportation in rural areas; the second, by Jeanette Fitzwilliams, on the rural health-care shortage problem.

Brown calls our attention to the changing significance of public transportation in the nonmetro areas and the implications this has for the amenities of life and work. This issue has become more pressing with recent trends in population. An unprecedented reversal in population shifts toward rural and small-town areas comes just when public transportation has almost disappeared from such places.

In her paper, Jeannette Fitzwilliams sets out an orderly research plan on a selected quality of life issue: the rural health-care shortage. She presents a strong case supporting overall planning for a complete research program, "boxing" the separate parts, and timing them in advance of need. She ends by saying: "I have already been told that this proposal is too idealistic... While I set a high goal, I expect progress to be made in small steps."

NEW DIRECTIONS FOR QUALITY OF LIFE RESEARCH

by
Richard G. Stuby*

Research is always conditioned by two chief problems: first, the problem of knowing what is most important to discover and, second, the problem of knowing how to go about discovering it. All sciences, even the most exact sciences, are limited by their techniques, and especially by their technologies, far more than they are by their phenomena.

*Carl C. Taylor,
"Next Steps in Rural
Social Research,"
Journal of Social Forces,
March 1925*

INTRODUCTION

The quality of life for rural people has long been of interest in the U.S. Department of Agriculture. It has run as a major theme through publications of ERS and its predecessor agencies since 1919. This rich tradition includes: research on farm-operator level of living, farm incomes, and rural poverty; the institutional concerns for rural health care, housing, education and community services; and the more recent concerns for energy and the environment. The focus was on rural people as farmers at a time when "farm" and "rural" were essentially synonymous. It shifted to include rural nonfarm people as the occupational structure in rural areas has been altered by the "agindustrial revolution" and the urbanization of America.

Research on quality of life issues has changed character as social needs, the level of academic knowledge, and research capabilities and administrative policies have changed; but, it has been pervasive in one form or another within ERS. In addition, it continues to receive attention by agricultural leaders in non-government roles.

Despite this tradition of research, however, no one has been successful in coordinating and unifying quality of life research to yield a comfortable accumulation of knowledge under the bibliographic heading of "quality of life." While it is pointless to argue

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who is to blame for this state of affairs, there is a need to carefully evaluate directions and priorities for quality of life research in the late 1970's and project them to the next decade. For our society has moved from a feeling of wellbeing based on the economic growth and affluence of the 1960's, to a feeling of anxiety over the possibility that the very quality of human existence can rapidly deteriorate. This paper will examine what the author believes to be the major issues for quality of life research at this time. It will suggest some directions and propose some priorities within the limitations that thoughtful readers will readily recognize.

“What is quality of life?” We need not attempt a universal definition for there may be no consensus on any definition proposed. Rather, we should view the concept of quality of life from several perspectives. The intent is to tackle the first problem mentioned by Carl C. Taylor in the prologue to this paper; that is, “knowing what is most important to discover.” Then we can look at several policy and research contexts relevant to quality of life and begin to address Taylor's second problem of “knowing how to go about discovering it.”

ON “KNOWING WHAT IS MOST IMPORTANT TO DISCOVER”

Let us briefly compare what economics, sociology, and psychology say about quality of life and then show how they cut across the current social research and policy issues as development, environmental concerns, and technology assessment.

Economics tends to view quality of life as the product of economic growth and full employment which leads to an income sufficient for buying the goods and services that condition the life quality for any given individual or group.

Sociology has two distinct viewpoints on quality of life. One view is that quality of life is a product of the proper interfacing of social institutions as they act on individuals. The major focus is on the functioning of the social system. In contrast, the other view focuses on the functioning and coping of individuals within given social systems. Here, quality of life is viewed as a product of both the social system and individual adjustments to it, but the major focus is on the coping mechanisms at the micro-social level.

Psychology simplifies these viewpoints a step further by emphasizing the adjustment of individual personality to various stimuli in the human environment without being overly concerned about how the stimuli are organized in either sociological or economic terms. Quality of life is viewed as adjustment to a host of

stimuli including those of major concern to both economists and sociologists.

These several viewpoints are highly abstracted for comparative purposes. All are directed to a human condition loosely termed quality of life, but none of them treat it comprehensively.

Research and Policy Contexts

One could jump to the well-worn conclusion that we need interdisciplinary research on quality of life issues; that an appropriate mix of economists, sociologists, and psychologists would produce the best research. Such a conclusion has been reached repeatedly but ensuing attempts at interdisciplinary research have not had notable success.

Perhaps a different strategy is in order. An examination of quality of life issues against three pertinent research and policy contexts—development, the environment, and technological assessment—may lead to some conclusions about such a strategy.

Whether development be modified by the adjectives “economic,” “rural,” “community,” or “area,” it refers to the processes of orderly change and restructuring of human systems to meet human needs. Quality of life then, is a major, and perhaps *the* major goal of development activities, and thus, the ultimate dependent variable in development research. All basic social sciences bear on the processes of development and on such multidisciplinary and applied fields as planning and management. Thus, development represents a nexus of interdisciplinary efforts, all based on the underlying assumption that quality of life is a function of development ($QL=f(D)$).

A second research and policy context relating to quality of life issues involves environmental concerns. Many different versions of environmental-ecological issues come under the idea that quality of life is a function of the environment ($QL=f(E)$). Environment is written here with a large E just as development is written with a large D, because there are numerous versions of the concept of environment. These include the physical, social, and esthetic aspects which are viewed as occurring in interrelated systems.

Paradoxically, problems of the environment often collide with those of development. What is good for development may be bad for the environment.

This paradox is further confounded by the third research and policy context technology assessment. There can be little argument against a general statement that quality of life is a function of technology ($QL=f(T)$), for the development of technology has been in the mainstream of human history and is the foundation of modern society. But since technology interacts with both the developmental and environmental contexts, increased tech-

nological development may or may not mean increased economic or social development.

In fact, a major stimulus for technology assessment has been the degenerative effects, both realized and potential, of technological developments on environmental quality and hence on the quality of human life.

Quality of Life As A Dependent Variable

A logical step would be to pull the above assumptions together into a general model that would express quality of life as a function of development, environment and technology ($QL=f(D, E, T)$) and begin to analyze the complex interrelationships and interactions on the right side of the equation. This may be a necessary and ultimately crucial task. But it is one that must await further methodological research with respect to the left side of the equation. Further refinements in measurement, indicator construction, and data development are needed here first. Without appropriate dependent variables, there can be no valid empirical determination of relationships or theoretical closure of the independent variables that are the substance of numerous current research efforts. The problems with research on quality of life issues are not necessarily matters of proper interdisciplinary mix. Quality of life research does not suffer from the lack of attention by the academic and the bureaucratic worlds. Rather, it suffers from a misplaced attention on the independent variables or causes and a lack of agreement on what kinds of indicators should be used to measure effects. If quality of life is the most important dependent variable in development, environment, or technology research, there must be valid, precise, and useful operational measures of life quality that can be used across a broad range of research projects; whether conducted by economists, sociologists, psychologists, political scientists, or any combination of these.

Indicators of the Dependent Variable

Focusing then on quality of life as a dependent variable, social scientists must devise indicators of life quality. Yet attempts to address the quality of life issue quickly become frustrated not only by lack of conceptual agreement among social scientists, but also because there seems to be no convenient empirical common denominator for quality of life. A person's wealth can be measured in dollars or his lifetime in years but there is no common unit to measure a person's quality of life. One person's idea of a high quality life, with high levels of satisfaction and well-being, may not coincide with another's ideal.

Thus the immediate issue is not the conceptual: What is quality of life? But rather the philosophical: Who shall judge quality of life and by what criteria should it be judged? Without some agree-

ment on the philosophical base from which to start, the conceptual issue can never be resolved.

Two distinct types of dependent quality of life variables may be discerned in actual social science practice and both relate to the philosophical issue just described. The first type involves the outcomes—at the institutional level—of the collective decisionmaking in both the public and private sectors of society. The other involves the impact of these institutional outcomes on individuals in society.

Institutional level variables. We are more familiar with institutional output variables. They are measures of institutional performance and are reported as basic governmental and other institutional statistics or data series. The outputs are sensed in terms of jobs, housing, education, health services, community facilities, credit, consumer goods, clean air and water, energy supplies, public safety, and so on. The data from which the outcome indicators are developed are largely enumerative in character and can be aggregated to local, State, regional and national totals.

In some discussions on quality of life many of these institutional outputs are viewed as necessary conditions for achieving quality of life. Without argument over the semantics of “necessary,” it can be said that without at least a considerable number of the institutional goods and services, an individual’s life would not have much quality. And so, on the assumption that some given level of institutional outputs will in turn produce individual quality of life, social scientists often take a conceptual shortcut by using institutional outputs as indicators of life quality while ignoring the actual impacts of institutional outputs on individuals.

However, such shortcuts may lead to a short circuit in the feedback mechanism from the institutional structures to the public and private decisionmaking centers such as Government agencies, business and industry, professional, trade and community associations, unions, and other special interest groups.

When institutional outputs are used as indicators, the response to perceived deficiencies in quality of life is quite predictable. A numerical lack of some institutional output is corrected by producing more of it. For example, if it is noted that some communities lack health delivery systems, efforts are made to increase the number of health service units such as clinics or hospitals or the number of health practitioners. Or if it is noted that some people live in overcrowded or otherwise unsatisfactory housing, efforts are made to build more housing units. If quality of life is measured by some numerical quantity, the quickest response to the quality problem is to increase the quantity of institutional output.

There is a certain inescapable logic here, but three serious

problems ensue. First, many of the institutional output variables are highly aggregated and insufficient attention is paid to their distributional effects.

Second, there is inadequate means for judging what level of institutional output is good, bad, adequate, or sufficient. To the extent that normative judgments are made, they are often made without empirical data.

Finally, there is no mechanism to define the appropriate mix among various institutional outputs for achieving life quality. What levels of which institutional output are necessary for quality of life at some specified level? What substitutions or tradeoffs can be made? What is the value of one unit of one output to one unit of another output? Without some measure of quality of life that is independent from the measures of institutional outputs themselves, the equations inherent in the above questions are unsolvable. Institutional output variables do not measure the quality of life actually lived. Rather, they are germane only to their own institutional context and thus, while necessary, they are terribly insufficient indicators of life quality.

Individual level variables. The second set of dependent variables used as quality of life indicators comes from the subjective estimates given by an individual in regard to his own life quality. It is possible to convert these subjective interpretations into objective quantitative indicators of institutional outputs actually received. Several recent volumes demonstrate that there are ways to do this (1,2,3).

Indicators derived from subjective estimates have profound implications for many kinds of social science research. These indicators can compensate for the distributional, the appropriate mix, and the normative problems of institutional output indicators.

Institutional performance measures may accurately assess the aggregate amount of an output available to people, but they may not measure the extent to which the institutional output is actually received or how this product is evaluated by various individuals. Subjective estimates of quality of life permit assessment of both the distribution of the institutional output and its impact on people's lives.

Closely related to the distributional problem is the problem of appropriate combination of institutional outputs which affect quality of life. Most indicators of institutional performance are not involved with this issue for they are concerned mainly with their own affairs and not with the relationships between institutions. Subjective estimates of life quality, on the other hand, can be used to examine the interinstitutional relationships and assess their balance.

This capability can also be used to judge the substitutability of

one component for another; in other words, to define equity in tradeoff situations. Judgments of equity from an institutional viewpoint must be interpreted cautiously because of the opportunity for self-serving appraisals. Individuals, however, can legitimately speak to the point of equity in tradeoff situations. Let us examine residential preferences as a case in point. Subjective estimates of life quality about desirable community size and amenities reveal tradeoff preferences across many institutional dimensions such as income, housing quality, health services, and educational systems. Whether or not the income foregone by living in a small town is balanced by the esthetics of the environment can be determined only from the evaluations of individuals who have actually experienced the tradeoff or who have accumulated enough information to vicariously experience it. Aggregate indicators, based on such evaluations, can reveal the nature, strength, and homogeneity of these preferences. In turn then, the desirability of various policy options about residential patterns may be inferred from these indicators.

The most important use of the subjective estimates of life quality however, is as a normative feedback mechanism from the individual, who receives institutional outputs, to the institutional output system itself. A major concern within the social indicators movement has been the issue of how to determine what is normative in terms of the measures of system performance. In other words, at what point on the scale of an institutional output indicator is the variable basically "good" as opposed to basically "bad?" At what level of the variable should a person or family become eligible for a given program?

Scientists often shy away from normative judgments or exhibit great anxiety in making them. Yet much research done by social scientists for government policymakers is either implicitly or explicitly evaluative, and any evaluative exercise must have some independent, normative standard by which the empirical reality is judged. The question is: What will be used as the normative standard in quality of life research and who will set it? In current practice, normative standards are sometimes the reserved prerogative of the policymaker. At other times the normative standards are agreed on by panels of scientists or other experts. Often however, there is no inductive logic available to assign a normative standard. It is then that inductive inferences drawn from the perceptions, satisfactions, and experiences of the individual become valuable. They can provide the basis for a sound, rational, and scientific determination of normative standards for public policy.

This is not to suggest that the opinions and insights of policymakers, scientists, or other experts should be ignored, but only that normative distinctions drawn from the perceptions and

experiences of individuals also be explicitly considered in policy formation. What is good housing? What is clean air? What is an adequate income? What are sufficient employment opportunities in a community? Subjective estimates by individuals can help answer these questions.

The issue of normative indicators reveals a confusion in the interpretation of the two terms "objective" and "subjective" as they refer to social indicator usage and social science data. The estimates made by an individual are indeed subjective, but the data compiled from these estimates may be interpreted and analyzed as objective, rational, "hard" data. It is a great irony that subjective data can be used to make scientifically objective inferences while the so-called objective data often must be given a highly subjective normative interpretation.

In conclusion, it can be seen that both institutional output data and individuals' subjective estimate data are required to deal with quality of life concerns. Obviously, current institutional measures should not be abandoned for they reflect necessary inputs to an individual's quality of life. However, we must recognize that these measures do not present a complete or clean picture for quality of life research. Thus, it is asserted here that experiential data based on the attitudes, opinions, perceptions, satisfactions, and judgments of different individuals are a necessary complement to the enumerative data more commonly used to indicate quality of life. These experiential data add the weight of normative judgments from the population. They directly address the issue of the distribution and impact of institutional outputs and they provide insight into the appropriate mix of institutional outputs and the substitutability among these outputs.

ON "KNOWING HOW TO GO ABOUT DISCOVERING..."

The second problem articulated by Carl Taylor in the prologue to this paper is "knowing how to go about discovering" those facts that are important. If ERS is to deal with the important concept called quality of life, it must deal with subjective estimates of life quality as a necessary set of dependent variables. And so the issue becomes: How do we develop scientifically objective indicators of life quality from subjective data?

Taylor's observation that every science is limited more by its techniques and its technologies than by its phenomena is relevant to this problem. There has been some skepticism as to the scientific efficacy of attitude and opinion research. However, this skepticism can be negated to a large extent by recent advances in

the techniques by which data dealing with subjective estimates of life quality are collected and analyzed.

Most of these data are collected by social surveys. In the past, survey research was often constrained because survey data were of low quality, incomplete, or relied on low order measurement. In recent years however, two important trends have been converging to meet this problem. First, analytical techniques have been developed to effectively utilize the nominal and ordinal data inherent in social survey research. These techniques include multivariate nominal scaling, multiple classification analysis, discriminant function analysis, and multivariable contingency analysis, all of which have been developed in conjunction with computer technology.

Second, there has been the increased use of communication and computer technology in data collection. This performs two interrelated tasks. It permits the collection of more detailed data, which permits the use of more sophisticated, higher order measurement techniques and it gives the researcher more options in his research designs. This new technology provides for flexibility, speed, and efficiency, whereas past survey research generally left much to be desired in these areas. A recent ERS survey has used one version of these survey techniques. A brief description of the general process may illustrate its capabilities.

A sample of 2,400 adults was interviewed via long distance telephone (WATS) lines in late May to early June, 1976. A complicated interview schedule was stored in a computer memory. Interview questions were displayed in proper sequence on CRT (television screen) devices. The interviewer read the question from the CRT and immediately keyed responses back into the computer. This procedure allowed for complex edit checks, intermediate data tabulations, and a clean data tape as soon as the interviewing was completed. The laborious and error-prone editing of hard copy questionnaires, coding, keypunching, and data verification were bypassed. The total time expended, from the start of interviewing to the completion of a clean data tape, was about 4 weeks.

The use of telephones limits surveys to households with phones, but this does not present a serious problem since about 94 percent of the U.S. population can be reached by telephone. In fact, this problem is more than offset by the sampling flexibility and control that can be achieved. Random digit dialing can insure representativeness in the sample. Simple screening of respondents can quickly isolate samples from relatively rare populations (for example, recent urban to rural migrants) or isolate purposive samples of various kinds. Sampling rates can be varied to enhance sampling efficiency while assuring adequate statistical

reliability. Furthermore, since the execution of the sample design is under the direct and continuous control of the researcher, problems with interviewers subverting the sample design are virtually eliminated.

Interviewer performance can be monitored and corrective action taken if necessary. By linking the telephone interview to the computer, some of the load is taken off the interviewers, thus allowing them to concentrate on the questioning rather than on the mechanical manipulations of the interview schedule. Since the computer keeps track of the question sequence, complex conditional sequences of questions may be used which add or delete questions depending on previous responses. This allows for in-depth probing and detailed measurement techniques.

If it is true, as Taylor said, that "All sciences, even the most exact sciences, are limited by their techniques, and especially by their technologies, far more than by their phenomena," then many of the limitations to the effective development of quality of life indicators have been removed. The study of quality of life phenomena is no longer severely constrained by its techniques, but instead presents opportunities for meaningful policy research.

IMPLICATIONS FOR ERS

Having come this far with the polemics on quality of life research, permit the author one last rhetorical question. "What should be the future role of ERS in quality of life research?"

Without attempting to catalog all of the ERS research activities relevant to quality of life, certain kinds of research are worthy of mention. In recent years, we have seen interest in environmental studies, technology assessment, energy research, migration turnaround, State and local government activities, and a host of research areas under the aegis of rural development. These last include studies of income, manpower, housing, health and education, community services and facilities, regional analysis, and industrial location. Some of these activities represent single program areas while a number crosscut several program areas and others are only part of a program area. However, each of them seems to be reasonably well institutionalized in the current ERS. Most important, however, is the fact that these research activities, which relate to development, environment or technology, also relate to quality of life.

As a response to the general need for social indicator data the Economic Development Division (EDD) has initiated a long-term project designed to provide indicators relevant to rural development research in fields such as energy, health, and housing.

Similarly, the Natural Resource Economics Division (NRED) has indicator-research programs dealing with environmental quality that attempt to relate the social and psychological aspects of environmental quality to environmental programs. Both the development indicator and environmental quality indicator research efforts are important first steps toward ideal quality of life indicator research and together they provide a sound basis from which to proceed.

This basis is further enhanced by several unique attributes and capabilities of the ERS structure that would enable it to produce excellent research results:

- A long and venerable tradition of research that could be described by no better term than quality of life research. For what other reason do we research the production and distribution of food and fiber except that these are essential to our life quality?
- A geographic, rather than an institutional, orientation which allows for multivariable, comprehensive studies of geographically distributed social and economic phenomena, particularly those related to the nonmetropolitan areas. On the other hand, for example, the Department of Labor and the Department of Health, Education, and Welfare are concerned with the vertical integration within their institutional domains, rather than the horizontal integration of several institutions at community, county, State, and regional levels.
- A tradition and a capability for measuring and predicting trends has been instrumental in developing viable data systems and analytical systems related to agricultural production and marketing. These same abilities must be viewed as valuable resources in quality of life indicator development.

These attributes put ERS in a unique position for becoming a leading Federal agency for developing life quality indicators, devising systems to monitor these indicators, and producing timely and accurate information on quality of life, particularly for the nonmetropolitan areas.

The greatest obstacle that ERS may encounter in conducting the above tasks is a common one: lack of data. Data acquisition and evaluation become the first tasks if we are to seriously embark on further quality of life research.

In evaluating current ERS data resources, one is impressed with the sheer quantity. In EDD alone, the data files contain over 61,000 variables for each of over 3,000 county units in the United States. In the face of this it would seem almost ludicrous to suggest that we need more data. Indeed, one can detect a strong sentiment within ERS that too often we emphasize data as an end in itself.

Whatever the merits of this sentiment however, the argument in this paper is not to abandon these valuable data or redundantly add to them. It is rather to develop other kinds of data which can act as the catalysts to better analysis, stronger inference, and more interpretable reporting. If a sociologist may lean on microeconomic theory, the marginal utility of data based on subjective estimates of quality of life is sufficiently high to warrant investment in their systematic acquisition.

The second group of tasks to be faced is the development, construction, and testing of quality of life indicators based on, or relating to, the complete spectrum of data from the aggregate level to the individual level. However, these tasks cannot be separated from those of data collection. There is a necessary articulation and integration of the data collection and analysis tasks that must be respected if we are to do meaningful quality of life indicator research.

The conclusions and the position of this author are obvious. ERS should expand its efforts to develop indicators of life quality that are germane to a variety of research-policy contexts in the agency. This ultimately will require the acquisition of new data along with the commitment of additional resources to the research task. Although it is beyond the scope of this paper to address the organizational issues raised by these conclusions, it is assumed here that several alternatives do exist. These alternatives should be delineated and carefully considered in future ERS research planning. If we are to continue to use the term "quality of life," we must learn to use it quantitatively, precisely, and analytically. This not only befits the image of a research agency, but it also benefits the communication between social science and public policy.

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QUALITY OF LIFE RESEARCH IN NONMETROPOLITAN AMERICA: A CRYSTAL BALL VIEW

by
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This paper attempts to look forward and reflect on the quality of life research issues we see emerging in nonmetro areas over the next decade. We realize there are no firm conclusions about many of these matters and will raise more questions than we will answer.

Our approach is first to broadly define quality of life; second to review past and expected conditions in nonmetropolitan areas; and third to discuss emerging research issues.

QUALITY OF LIFE

The term "quality of life" is used daily but is nebulous. Haller describes quality of life as the satisfaction of the wants and needs, hopes and aspirations of people (12):

- Parents want their children to survive and grow up to be healthy.
- They want them to have access to adequate medical services, pure air and water, waste disposal systems, nutritious food, and recreational facilities.
- People want education. They want the knowledge and understanding necessary to be able to relate to their surroundings and to take actions that will be beneficial to them and their children.
- People want the opportunity to influence group decisions affecting their lives.
- People want work that will enable them to support themselves and to contribute to the well being of others.
- People want a social system that will equitably distribute the task of providing goods and services and the remuneration for doing the work, while allowing special rewards for those who make especially valuable contributions.

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These, according to Haller, are the elements of the "good life." People, in striving for the good life, are migrating toward non-metropolitan America (2). A growth pattern of this type is unprecedented in the modern history of the United States and has implications for future research issues.

CHANGING NONMETROPOLITAN SOCIETY

Tremendous gains in technology have changed our rural economy from one that was solely agricultural to one that is diversified. Indications are that the long period of migration from farms is slowing. For example, from 1960 to 1970, the annual rate of migration from farming was 5.6 percent; from 1970 to 1974 it was 1.2 percent.

The impact of nonmetropolitan areas has been influenced, too. Until the late 1960's, the migrational drift was toward metropolitan areas. Since then, it has turned around. From 1970 to 1973 nonmetropolitan areas had a growth rate of 4.2 percent compared to 2.9 percent for metropolitan areas (2). The growth rate for new jobs follows a similar pattern. These shifts are largely explained by the problems that occurred in large cities during the late 1960's. Firms and people have found smaller cities and towns more attractive.

In addition to changes in sheer numbers, the composition of the population is changing. The national birth rate stood at 15 per 1,000 population in 1973, the lowest in U.S. history. One consequence is that the median age is rising and will continue to rise if the present birth rate holds. Each year the number of persons 65 and older increases. In 1974, 22 million people were 65 years and older and by the year 2000, 29 million are expected to fall in that age group.

More American women are now entering the labor force since they are very young when their last child is born. In 1950, 33 percent of the females 16 years of age and over were in the labor force. By 1960, this figure had increased to 38 percent and by 1973 to 45 percent. In 1970, both wife and husband were working in 37 percent of white households and in 48 percent of black households.

In summary, research issues in quality of life in rural areas emerge as the nonmetropolitan population grows, the number of children per family decrease, the number of elderly people increase, and more wives join the labor market.

QUALITY OF LIFE RESEARCH ISSUES

The population growth in nonmetropolitan areas is said to have been caused by the decentralization of manufacturing, increased settlement of retired people, the expansion of State colleges, more recreational activity, and a birth rate higher than that for urban areas (2). For continued nonmetropolitan growth, ample employment opportunities must be available. The issue of providing jobs in nonmetropolitan areas was considered important enough by the organizers of this report to warrant special attention (25). In this paper we focus attention on community services, health, housing, and land use.

The development of facilities in these four areas requires much lead time and often large capital outlays. Research for projecting community needs for these services in nonmetropolitan areas is needed. This involves much more than population projections.

Community Services

In the early 1970's, research on improving community services in sparsely populated areas was stressed in many regional conferences (6,14,22). Programs in rural development were expanded and professionals were hired by universities and research agencies.

A vast amount of research has been completed as evidenced by some recent bibliographies (19,24). However, much remains to be done (20,26). Space does not permit discussion of all previous studies but we will present our views on where additional emphasis is needed.

Local community research issues. Local citizen groups and policymakers are continually faced with problems of how to improve community services in rural areas. Local policymakers, such as town councilmen, mayors, and county commissioners, must deal with many specific problems; all compete for limited funds.

The number and range of alternative organizations is probably greater than most researchers or local decisionmakers realize. For each alternative organization considered, cost, quality, and quantity data must be derived. New ways and methods need to be used to measure output and quality. Some costs are not borne by the organization, many services are not single transactions but a series of transactions, and other services are offered at different locations. These characteristics make it difficult to measure output and quality.

Hirsh discusses the structure of the production function for public services where output is a function of quality factors, input factors, service conditions, and state of technology (13). With

such cost functions and locational models, we can evaluate alternative organizational structures as to costs, quantity, and quality of output. The equity problem of the distribution of benefits and burdens from a given service must be evaluated for each alternative.

A research agency should derive regional community service budgets that are flexible enough to allow adaptation. The research results can then be used by extension economists who are working with decisionmakers in many different communities in deriving the costs, returns, and quality of alternatives applicable to a particular community.

State and national research issues. Some who request community service research results are public officials and administrators charged with operating public programs. Public officials need research results that measure equity and cost for various levels of service. Administrators need information on how to conduct programs efficiently.

Some programs such as revenue sharing and rural development allocate funds for community services. These programs need to be evaluated as to equity and efficiency in solving community service problems. Community service gaps must be identified so that efforts can be directed toward the most pressing problems.

Financing community services. The New York City crisis made everyone aware of financing problems facing urban centers. The evidence presented before the Joint Economic Committee on January 30, 1975, indicated that many States and cities will face severe financial difficulties in the next 5 years. Even though large cities were the primary topic of discussion, nonmetropolitan communities are in the same boat. Inflation has greatly increased their costs. Rural governments have been asked to take over additional community services. Research is needed which deals with how to finance various activities so as to enhance services and reduce costs.

White and Musser (28), in studying the issue of financing State and local services in a cyclical economy, conclude that more research is needed on ways to stabilize the finances of State and local governments.

Health

The need to make health-care services more available and accessible to the 56 million nonmetropolitan Americans is well documented. Illuminating examples include reports by Doherty (8), Matthews (15), and Davis (7). They agree that the problem of rurality, economic poverty, and health is a circular one. Even if health-care services and facilities, controlled for quality, were evenly dispersed, nonmetropolitan Americans with chronically low incomes and relative isolation would experience serious diffi-

culty in participating in a complex medical system where access is based mainly on the ability to pay. But spatial inequalities, with two exceptions, exist chronically as indicated in the following tabulation:

	Per 100,000 population	
	<i>Metro</i>	<i>Nonmetro</i>
Non-Federal physicians, office-based practice: (1970)	104	60
General practice	23	30
Special practice	81	30
Registered nurses (1966)	332	223
Dentists (1967)	62	35
Hospital beds (1970)	719	977

Source: (15).

The list suggests a poor distribution of health resources. This, along with rapid price inflation, helps account for the growing national concern with health care.

Various methods could be used to discern and rank rural health issues that need research attention. The means used here are expressions of need voiced in 1975 by 42 State directors of health systems agencies. In their judgment, the broad issues are evaluations of major innovative programs designed to increase the supply of health care services and facilities in medically underserved areas, consumer health education, cost containment measures, and areawide planning and transportation analyses, especially for primary and secondary health care services and facilities. Consumer health education and cost containment measures are research issues facing metropolitan America as well as nonmetropolitan America.

Evaluation of major innovative programs. Many recent innovations, short of such major reforms as national health insurance, are being used to increase health services in rural areas. Most innovations fall in two broad categories: financial incentives, and hardware. All of these programs need socioeconomic evaluations.

An example of the 127 clinics in the first category is the Lee County Cooperative Clinic in Marianna, Arkansas, funded by Section 314-e of the Comprehensive Health Planning Act of 1966 (P.L. 89-749). Department of Health, Education, and Welfare (HEW) funding of this clinic began in 1972. In Marianna, a broad range of health services are provided to local people at no charge if they have low incomes.

Other examples in the financial incentives category include nutrition programs for the elderly, physician group practice, mobile units, satellite clinics, health maintenance organizations, and physician assistants. Each needs to be analyzed as to feasibility and benefit-cost ratios. Which delivery system works satisfactorily and under what conditions?

Improvements in radiology and communications are examples of hardware adjustments or adaptations to maintain and improve health. Computerized Axial Tomography (CAT), which costs approximately \$400,000, allows detection of a cancer within the body in ordinary tissues while the cancer is very small and otherwise almost undetectable. Although the initial cost is high, it substitutes to a large extent for several more painful and intrusive procedures, such as cerebral arteriography. Which hospitals should buy a CAT scanner? Parks (21) discusses many of the studies which consider modern telemetry. Examples include monitoring communication equipment used on the Papago Indian Reservation (17) and equipment used in Alaska (9). All such innovations need to be tested for cost effectiveness as well as the quality of service.

Consumer health education. This issue concentrates on the assertions that pandemics and epidemics due to infectious agents have been largely eliminated; and unhealthy, sedentary, apathetic life styles have emerged as the chief villains causing needless illness and early death. Part of the evidence is that the principal causes of death in the United States are now heart disease, cancer, stroke, and accidents. Thus it is argued that special educational efforts and supportive programs would be more effective in improving health than incremental improvements in medicine. Somers documents studies supporting the case for more emphasis on health education (23). Research is needed to determine effective ways to assist young people to develop more rewarding life styles, and to offer adults more adjustment alternatives in their prevailing life styles should they desire to use them. Green has reviewed many studies and concludes "the payoff is more than proportionate to the effort and costs" (10). In another paper, Green discusses research methods to evaluate health education programs and concludes the job is difficult but possible (11).

Cost containment measures. During fiscal 1975, price increases for health services were much greater than others in the overall economy—10.3 percent for medical care services, 7.7 percent for other services, and 7.0 percent overall (16). The increase in hospital service charges was the largest at 13.0 percent. It is commonly alleged that the situation is one of crisis, especially for the 56 million nonmetro Americans who tend to have lower incomes and less health insurance protection. Research is needed

to discern and evaluate a broad range of cost containment tactics including some which are indirect. An example of the latter is the set of nutrition programs for the rural elderly. Such low-cost programs may prevent more expensive hospitalization or premature institutionalization of the elderly.

Areawide planning and transportation. The present rural health-care delivery system is characterized by fragmentation of existing services and facilities. One cause for the fragmentation has been the past heavy reliance on categorical programs, such as the Hill-Burton Act for hospital construction, which has resulted in overinvestment in small rural hospitals. The recently enacted (1975) National Health Planning and Resources Development Act (P.L. 93-641) creates a network of health planning and resource development agencies at the substate and State levels. A significant share of the allotments under this program must be expended in medically underserved rural areas. Thus, the institutional climate is right for researchers to consider integrated sets of health services and facilities located in more cost effective patterns.

Housing

Adequate housing is needed to improve quality of life. Congress expressed this in the 1949 Housing Act, which contained the national goal of a decent home and suitable living environment for every American family. Our country has come a long way toward meeting that goal. Based on the definition of substandard housing as that which lacks complete plumbing or is dilapidated, 60 percent of occupied housing in nonmetropolitan areas was substandard in 1950. Bird estimates that in 1975 the percent had decreased to 10 percent in nonmetropolitan and 3 percent in metropolitan areas (4).

But today a whole new set of housing problems is arising from the changing social and economic conditions. Households are getting smaller. The average number of persons per household dropped from 3.14 in 1970 to 2.89 in 1976. More marital separations are occurring. Single-person households are becoming common. The number of single-person households rose 38 percent from 1970 to 1976 to a total of nearly 15 million households. More aged are living alone. In 1976, there were 6 million households occupied by a single person 65 years of age or over, compared with 2.5 million in 1970. During this same time frame, the housing stock per unit has been getting larger. More single- and two-person households are occupying three- and four-bedroom homes. Housing costs per person are rising rapidly in the United States because of the reduction in household size.

Shelter costs are increasing more rapidly than household incomes. Since 1970, housing prices have increased about twice as

fast as household incomes. Heating costs have increased even more rapidly. Increasing energy costs are impacting directly and indirectly on housing. Directly, they are increasing the cost of operating a home. Indirectly, they will affect the location of housing. Rising transportation costs may make much of our housing stock obsolete because of location. New housing patterns may be necessary to reduce transportation costs. Research is needed to help households determine the most desirable location of housing.

Reducing shelter energy requirements, especially for petroleum fuels, has become an important housing goal. Various sources of energy such as the sun, the wind, and the ground, are being considered. Research and programs to foster the development and use of these energy sources are underway. But many energy conservation procedures are being recommended to the public without adequate tests to prove their practicality.

Adequate mortgage credit is basic to home construction and improvement. Studies have shown that rural families have not obtained as favorable terms as have their urban counterparts. Research is needed to determine how this situation could be alleviated.

Adequate housing for the single person presents a special problem for rural areas. Most single persons lack sufficient capital to buy a home and are thus forced to rent. But rental options are few.

In addition to research which attempts to find ways of improving credit, lowering operating costs, and providing new modes of housing, research is needed to develop programs that will improve the quality of life in various types of neighborhoods. The housing problem for one household cannot be resolved without simultaneously resolving the housing problems of its neighbors. Improving the adequacy of community facilities and social organizations may play an important role in improving the adequacy of a given housing unit. Housing programs need to be evaluated in terms of the impact they are having on improving the quality of the neighborhood.

Land Use Issues

Continued concern over land use is expressed by many. Local residents are concerned about retaining control. National policymakers want to protect productive farmland. For instance, in September 1976, the President's Council on Environmental Quality (1) issued instructions to all Federal agencies to make sure their projects do not destroy highly productive farmland. As non-metropolitan America grows, more issues will surface on urban sprawl, extension of public utilities, and conversion of open land to uses other than agriculture and recreation.

The need for research on land use is not anything new (18,27). Some of the needs about land use are technical and do not involve economic research. For instance, the Soil Conservation Service provides excellent information on soil types and classes. The Extension Service has an outstanding educational program on land use. Researchable areas include protection of productive farmland, costs of a dispersed pattern of settlement, and natural resource development.

Protection of productive farmland. As nonmetropolitan areas grow, the encroachment of urban areas, roads, industry, and airports on farmland causes concern. Near urban centers the market system places higher values on land for urban and commercial uses than for farm uses. Research is needed to determine whether there are social values associated with preserving agricultural and open-space lands that are not reflected in the market price system. This involves projections of future demands on land for agricultural and nonagricultural purposes for alternative futures. Different assumptions for size of population, dispersion of population, consumption patterns, resource development, and exports would determine alternative futures.

Any change in land use will cause income redistribution. Knowledge about the distribution of impacts is needed if compensation schemes are established (5).

Costs of dispersed patterns for settlement. Population data clearly indicate a very dispersed pattern of location of residences and industrial plants. But the costs of a dispersed pattern of settlement may be greater than generally realized. Per unit public service costs are larger for scattered populations. Transportation costs are higher and imply total reliance on private autos. Economic research to provide estimates of costs in relation to various settlement patterns is needed.

Natural resource development issues. The development or depletion of natural resources is affecting many regions of the United States. For instance, the coal development of the Northern Great Plains will dramatically change the demographic conditions and quality of life in that region in a very short time span. Many issues suddenly arise. Does the delivered cost of energy to urban areas cover all the economic and social costs? What about land reclamation? What is the distribution of benefits and costs of mining? How are the communities to plan for sudden growth? Our research project in ERS on the development of coal in the Northern Great Plains is a very timely one that should be useful to local, State and national decisionmakers.

An example of depletion of a natural resource is the declining water supply of the Ogallala formation, which underlies a large portion of the Great Plains. Many research issues arise as to how

a region can adjust as its economic base declines. As other natural resources such as oil and gas decline, other regions of the United States will face drastic economic adjustments. Research is needed to project both direct and indirect changes and to find ways to promote orderly adjustments.

CONCLUSION

Many other issues will surface that will be germane to the quality of life in rural America, but space does not permit us to cover the entire arena. Some issues will relate to environmental quality, pollution abatement, and providing recreation opportunities. The key to a research agency like ours is to continue to be in contact with decisionmakers at all governmental levels. We must continually ask these questions about uses of our research: "Who are the decisionmakers who most need data? What do they need; and in what contexts?" (3).

If we are to maintain and improve the relevancy of our research, several steps must be taken. First, we need the opinions of those who are affected by programs. If we are to measure the impact of programs on the quality of life of rural people, we need their interpretation and evaluation.

A second step involves increasing our interaction with policymakers. Policymakers range from town councilmen to the President. We need their assistance in defining the problem, specifying the objectives, and reviewing the results. If the policymakers cannot use our results, we need to reevaluate our efforts.

A third step is to interact with those who provide the services that affect quality of life. For example, to have a real insight into rural health the problems, the health researcher must be in contact with providers of these services as well as the users.

The last step is to continue our efforts to make our research interdisciplinary. Problems have arisen during previous attempts to apply interdisciplinary research. Since quality of life research crosses many disciplines, these problems must be overcome.

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Review of: QUALITY OF LIFE PAPERS

by
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One term used to describe the total of the goods produced by an economy is gross national product; a second is quality of life. Yet using both to mean the same thing usually brings the response: "Wait a minute. Gross national product and quality of life are very different concepts."

This apparent contradiction raises such questions as: Why not use quality of life as the basis for allocation of scarce resources? Why should economists not include it in their analyses?

Research is always conditioned by two chief problems: First, the problem of knowing what is most important to discover and, second, the problem of knowing how to go about discovering it. All sciences, even the most exact sciences, are limited by their techniques, and especially by their technologies, far more than they are by their phenomena.¹

The paper by Doeksen, Bird, and Green addresses the question: What is important to discover? Their "crystal ball" presents a shopping list of quality of life components: Community services, health, education, transportation, housing, land use, and so on. It sets the stage for defining the scope of what Stuby terms the quantities of institutional outputs involved in quality of life research.

Stuby's paper on "New Directions for Quality of Life Research" approaches the subject from a more general viewpoint, and discusses Taylor's "what," "how," and "why" aspects as well. Stuby specifically addresses quality rather than quantity. Therefore, my further remarks concern his paper.

What?

"What is quality? Is it nothing but poor quantification? Is it what you say when you cannot state precisely what you mean" (4, pp. 401-403)? Is it simply an attribute of life?—for example, "The worker's life frequently has the quality of being boring; seediness is the outstanding quality of the bum's life" (2, p. 53). Do all attributes of life have quality? This seems to be what Stuby has in mind in his mini-revue of economics, sociology, and psychology.

The author continues by saying, "Quality of life...is the goal." How can this be? Should a description of a condition of life be a

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¹Carl C. Taylor, 1925, as quoted by Stuby in "New Directions for Quality of Life Research."

goal? It shouldn't. Quality of life really refers to the *good* quality of life. Everyone knows this. Why can't we put it down on paper?

Why indeed? In part, it is because the social sciences are seemingly unable to develop any immunity to fashionable jargon and to the tendency to make things sound as complicated as possible. Another reason seems to be at work here, however. By talking about quality, we are able to steer away from the word goodness—a word we assume to be hopelessly slippery, a word pointing to, “values” and “value judgments.” The word “quality” somehow makes the question sound more scientific. It is well known that social science is charmed by the evident competence of natural science and seeks to attain its precision, though it may thereby be seeking more precision than its subject matter permits (4, p. 54).

As social scientists, we should be concerned with what is *good*. How can we advise policymakers if we cannot measure the *goodness* of alternatives? Stuby proposes a function: $QL=f(D, E, T)$. This implies that quality of life is a function of development, environment, and technology and government. But it does not go far enough. Where do people fit in? It is their perceptions of these elements and their values (what is good; what is bad) that gives this function meaning.

Let us reformulate the quality of life relationship as follows: $PR=f(D, E, T)$ and $QL=f(V, PR)$, where PR is people's perception of reality and V is their values. What have we gained? Two functions make it clear that quality of life has both positive (D, E, T) and normative (V) components (1,3, p. 6).

Quality of life is a value-laden function of reality. It can be used to measure whether one action or state of affairs is better than another. But quality of life is not simply the measures of D, E and T. As Stuby states, we cannot simply assume that institutional outputs are measures of quality of life. People's values must be considered.

How?

How does one define what is good? How can this definition be related to the institutional outputs (D, E, T) so as to measure quality of life? From an objective viewpoint one cannot define what is good. Value is a subjective concept. However, one can objectively identify and measure what people's values are.

The methodology is available and in use. Stuby briefly reviews the appropriate survey and analytical techniques. People's values toward residential preference, predator control, water quality, and many other subjects have been measured.

One point implied in the paper needs to be emphasized. Mea-

asuring people's values can be separated from measuring quality of life or changes in quality of life. Why emphasize this? As technology advances, the changes in the reality component of quality of life (D, E, T) become more complex.

Changes in reality will affect the average person. But he will not be able to visualize the impact on air quality of a 10 parts per million increase in Nuzit Sulfide (NuzS)² until it happens. He cannot tell prior to the event how it will affect him. However, perception of NuzS is about the same for everyone in a population and can be estimated by observations on a few people exposed to it. Once it is known how many people perceive NuzS, (through eye irritations, for example), an irritation scale can be developed and related to the obnoxious substance. Then people who do not even know what NuzS is can express their values for absence of eye irritation. This separation of the reality and the value components makes it possible to develop measures of changes in quality of life. This avoids, in part, the problem described in *The New Yorker*:³

These are hard times for the layman. He is no longer thought competent to work out his own opinions on many matters, even many that touch him intimately. His very survival has become the property of committees and the subject of learned argument...He has little to say...being largely ignorant of the information on which plans for him are based.

Why?

The answer is obvious. If we wish to improve the quality of life, we need practical and reliable measures of what we are trying to improve. The simple assumption that quality of life will be improved if we have a larger gross national product is no longer realistic or adequate for policymaking.

EPILOGUE

Both the "Crystal Ball" paper and the "New Directions" paper provide guidance and insight into the ERS role in quality of life research. I hope my polemic provides further support for the

²Nuzit Sulfide is a fictional name for a new chemical.

³Comment in *The New Yorker* as quoted in Moynihan (4, p. 408).

future of such research in ERS. If ERS is to provide useful information to policymakers, it must deal objectively and scientifically with quality of life issues.

Phaedrus went a different path from the idea of individual, personal Quality decisions. I think it was a wrong one, but perhaps if I were in his circumstances I would go his way too. He felt that the solution started with a new philosophy, or he saw it as even broader than that—a new spiritual rationality—in which the ugliness and the loneliness and the spiritual blankness of dualistic technological reason would become illogical. Reason was no longer to be “value free”. Reason was to be subordinate, logically, to Quality, and he was sure he would find the cause of its not being so back among the ancient Greeks, whose mythos had endowed our culture with the tendency *to do what is “reasonable” even when it isn’t any good*. That was the root of the whole thing. Right there. I said a long time ago that he was in pursuit of the ghost of reason. This is what I meant. Reason and Quality had become separated and in conflict with each other and Quality had been forced under and reason made supreme somewhere back then (5, pp. 352-353).

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Review of: QUALITY OF LIFE PAPERS

by
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These two thoughtful papers deal with problems associated with the quality of life in nonmetropolitan America, a question unbearably broad and complex. Both authors believe in attacking the problem directly. Both seem to break with older, more narrow economic definitions of quality of life, which equated quantity with quality.

The most important question raised by Stuby is the tangle about normative versus positive, objective versus subjective, and scientific versus unscientific. There seems to be room for much research on how quality of life is perceived by the people living it. This represents a challenge in the collection of information explaining how people perceive life and its quality.

The USDA is in a good position to develop information on perception of the quality of life. That people's observations are objective or subjective is not as important as that these people are evaluating where they are in life relative to where they would like to be. It is more important that the information be positive as compared to normative, than that it be objective, compared to subjective.

Stuby asks: "Who is to judge the quality of life?" The people are to judge. The first major research question is to ascertain the results of the judging. Certainly, managers of social institutions are not to be trusted, for they have a vested interest; more hospitals are the answer to quality of life problems as seen by hospital managers. The second tough research question is how to deal with the distributional problems referred to by Stuby. Certainly, this must be studied from various aspects. But the important consideration, my values tell me, is that the data consist of the best judgments of people about their own satisfaction with quality of life and what affects it. Probably no other area of work is more vulnerable to the imposition of a set of preferences held by only a few members of the establishment.

Quality of life is presented as a many-dimensional thing. Not brought out so clearly is that several of these dimensions are interdependent. That is, the level of life depends upon the operation of an institution or law that makes it possible to fund pub-

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lic transportation. The externalities, so pervasive in any collective action of this type, can cause individuals, who are fully aware of the quality of life shortfall in the community, to oppose public funding with the resultant negative effect on quality of life. The question of the appropriate mix of publicly and privately supplied goods, along with developing methods of achieving that mix, is not stressed in the papers, but is at the very heart of the problem and needs attention.

Issues addressed by Doeksen, Bird, and Green are more the "nuts and bolts" of the research task, compared with those addressed by Stuby. They have done a good job of laying out a set of relevant research problems dealing with community services, health services, housing, and land use.

Doeksen suggests a strategy for improving relevancy by recommending interaction with policymakers, with providers of services, and more importantly, with the people where they happen to be. All of these interactions are desirable with regard to most people's value positions, but one wonders if it is possible for a Federal research agency to get intimately involved with town councilmen, for example. I would like more detail on how this can be done.

Both papers imply that quality of life is principally involved with levels of services. What about the feeling of certainty for the provision of whatever levels of services are available? What about differentiating between potential levels of services and the degree of access which might be limited by income distribution or location. Do such broad national policies as incomes policy, tax reform, and welfare need to be addressed along with the provision of services that enhance quality of life? I believe they do.

Finally, in times when there is so much public noise about running out of resources, it is appropriate that the social science arm of the USDA point to questions of the quality of life in non-metropolitan America. One might even speculate that the quality of life in future generations is more related to the quality of life in those generations that precede them than to how many barrels of oil each generation burns.

Review of: QUALITY OF LIFE PAPERS

by
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A review of any research paper can attack the author's theses, and suggest a new synthesis of issues; or it can attempt to add some observations to clarify, and perhaps provide deeper insight into the topic under discussion. This review follows the second course. It is no easy task. The two papers on the quality of life, one by Stuby, and the other by Doeksen, Bird, and Green, are well written.

Stuby proposes some new directions for quality of life research. He argues that current research by ERS has emphasized three independent variables (development, environment, and technology) and that changes in the quality of life have been assessed from institutional outputs. Stuby suggests that ERS can make more effective use of subjective estimates of the quality of life. He believes experiential data can be extremely useful, if they are used in an objective and scientific manner.

Doeksen, Bird, and Green choose a "crystal ball view" of quality of life research which deals with nonmetropolitan people over the next decade. Their crystal ball view includes defining quality of life, reviewing past and expected conditions in nonmetropolitan areas, and identifying emerging research issues. To these authors the term "quality of life" includes such elements of the "good life" as health, education, influence, work, and remunerative rewards.

As nonmetropolitan areas grow there is an increase in the number of children, in the number of elderly, and in the number of working wives. The emerging quality of life research subjects are community services, health, housing, and land use. The authors add that effective research on quality of life requires feedback from those affected, interaction with policymakers and providers of services, and interdisciplinary research.

It is axiomatic that the concept of the quality of life constitutes a continuum. At one end are the more fortunate people who enjoy a high level of living and a high quality of life. At the other end are the less fortunate who live marginal, hard pressed, vulnerable lives. It is not enough to say these people possess a low quality of life. Thousands of them in the United States, metropolitan and nonmetropolitan, live in constant jeopardy, with no regular

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or adequate income, substandard homes, compromised water, improper sanitation, untreated diseases, and general conditions of life that too often abruptly end the lives of infants, children, young people, and mature adults.

A low quality of life and widespread poverty has existed since the appearance of man on this planet. But contemporary poverty in the United States differs from that of the past.

The older poverty in the United States was experienced mainly by immigrants to this country who came to a new land and found themselves unskilled or semiskilled in a rapidly expanding economy. These persons viewed their poverty as temporary and eagerly looked forward to the time when they and their children would climb the economic ladder to achieve the abundant life they had been promised.

Contemporary poverty, in contrast, appears to be made up of the internal aliens of an affluent society. Much of this poverty is the result of automation where workers are displaced by technological change. It is also the consequence of rejected minority groups, of many old people, of people forced to leave their farms, of deserted women left alone to raise their children, and of large numbers of young people unable to find jobs in a highly technical society.

Large numbers of today's poor regard their poverty as a permanent way of life with little hope for themselves or their children to achieve a better life. This mental outlook of despair offers a special challenge to any agency undertaking research on the quality of life in the United States.

It would be fallacious, and counterproductive to viable research, to assume that the populations studied are homogeneous. At any point on a continuum are found a wide diversity of subcultures and social groupings. In nonmetropolitan and rural areas of the United States these include black Americans, Spanish Americans, American Indians, subsistence farmers, cowboys, plantation owners and workers, coal miners, dairy farmers, merchants, factory workers, and a variety of persons who migrate to small towns and rural areas to achieve a better life.

All of these social groupings, with their human frailties and weaknesses, provide rich opportunities for study. Practitioners and policymakers need additional information to initiate successful ameliorative programs. They need data that reach beneath the social and economic conditions to reveal the underlying subjective values, beliefs, attitudes, hopes and fears of this population. Many have painfully discovered that it is the subjective aspects of human behavior that are most resistant to innovations. Knowledge of these subjective elements can provide useful data on the psychological health of the populations studied and can provide

clues to practitioners about the willingness of prospective clients to participate in development programs.

Stuby points out in his paper that an improved quality of life has been a major goal of "developmental" research in ERS. Implementation of the Rural Development Act involved strategies for rural and nonmetropolitan communities to attract industrial enterprises. It was assumed that such enterprises would improve the quality of life. But many communities have painfully discovered that the expected benefits from industrialization have not been achieved. Some groups in the communities have benefited while others have been harmed.

Doeksen, Bird, and Green suggest that ERS research become more interdisciplinary. I would prefer "multidisciplinary." The broad range of critical problems confronting nonmetropolitan areas in the Nation requires the expertise of many research disciplines. Efforts to develop multidisciplinary research in ERS will require vigorous and imaginative leadership on the part of top management.

Recruiting patterns in ERS need to be examined carefully. It is a common practice for managers to recruit new personnel shaped in their own image; it is necessary to enlist professionals trained in a broad range of disciplines.

The speed of social and economic change in the United States and its differential impact suggests an important research contribution to be made by ERS. Assessment of the impact of social change upon groups and communities requires careful continuous longitudinal studies. ERS is a relatively stable research organization with a long past and the prospect of a long future.

It would be strategic for ERS to initiate longitudinal studies at various sites throughout the nation. Periodic assessments at each location could provide public and private agencies with useful data on emerging trends in the quality of life. Reliable and continuous information on demographic and migratory patterns; on incomes, employment, housing, taxation, transportation, and industrialization; on physical and mental health and nutritional levels; on public safety, crime, social welfare, recreational and leisure time facilities; and on family and community life would add immeasurably to the possibility of achieving a better life for residents of nonmetropolitan areas.

PASSENGER TRANSPORTATION IN NONMETROPOLITAN AMERICA

by
David L. Brown*

*The community area is carved out
of the regional territory by man's
facilities for movement.*
Amos Hawley (7)

INTRODUCTION

What is the structure of passenger transportation in non-metropolitan America? How do people get around? What effect does transportation have on the quality of their lives and on the vitality of their communities? This paper demonstrates the importance of these issues, suggests strategies for researching them, and indicates how such analyses would contribute to ERS research.

The analysis of passenger transportation in nonmetropolitan communities has two distinct but interrelated focuses. Passenger transportation affects the location of economic and social activities: it shapes the roles communities play in the territorial division of labor and relatedly, in the accessibility to goods, services, and opportunities. Past research has focused on the accessibility issue while neglecting community structure (11). But the issues are interrelated and should be considered together.

TRANSPORTATION AND SETTLEMENT STRUCTURE

The role of transportation routes and transportation technology in determining the settlement structure of an area has long been recognized. As early as 1915, C. J. Galpin pointed out that the bounds of an agricultural community could be measured by observing the transportation patterns of farm families with respect to the various trade centers (5). In 1933, Walter Christaller systematized these notions and developed three hierarchies of urban location (3).

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The relationship between changes in transportation and in settlement structure has been addressed by Hawley (7). He pointed out that advances in transportation have extended the range of the human community.

Transportation has influenced the centralization of population and activities in American society. One outcome is that nonmetropolitan communities are no longer protected by distance from competition with larger places. Many residents of rural areas avail themselves of the goods, services, and opportunities of the city. Increased mobility has also improved the efficiency of the nonmetropolitan community. Another outcome has been the greater need for the residents of nonmetropolitan areas to travel long distances to metropolitan communities to seek employment and to procure goods and services. Paradoxically, centralization has occurred simultaneously with the reduction of various modes of passenger transportation. Thus, nonmetro persons have more need to travel, but fewer transportation options.

Today, most passenger transportation in nonmetropolitan America is by private automobile (11). Intercity bus service provides the most common alternative to the private auto, but stopping points are inaccessible to large numbers of nonmetro residents, and the frequency of service is not sufficient to connect well with either places of work or providers of goods and services. Rail service, once a major mode of intercity transit in nonmetropolitan America, has all but disappeared, and water, air, and taxi services are not commonly available.¹

Greater nonmetro dependence on the private auto is suggested by data on the proportion of households owning at least one car. Currently, 84.5 percent of nonmetropolitan households own one or more autos, compared with 77 percent of their metropolitan counterparts (11). Moreover, data from the 1970 Census indicate that 80 to 90 percent of rural residents who work away from home depend on automobiles and fewer than 1 percent use public transportation. In contrast, 80 percent of urban workers depend on automobiles, and 12 percent use public transportation (10).

The lack of alternatives to the private automobile is a substantial hardship for many residents of nonmetropolitan communities. Some because of low income, mental or physical disability, or age, cannot drive an automobile. Further, it is estimated that as many as 20 million rural persons lack access to transportation because the family car is used for commuting to work by the principal wage earner. This often means that they are completely deprived of mobility, and hence denied ready access to many of

¹Rail transportation in nonmetropolitan areas has declined substantially since AMTRAK assumed control of intercity rail-passenger transit service.

the essentials of life. Transportation difficulties cause many elderly rural persons to ignore early warning signs of medical problems, and frequently they cannot buy food items because they are not able to get to the store. In fact, transportation was identified as the number one problem of elderly rural persons by the 1971 White House Conference on Aging (4).²

Passenger transportation requires attention in any program of research that focuses on the economic and social structure of non-metropolitan America.

ISSUES FOR ANALYSIS AND THEIR POTENTIAL CONTRIBUTION TO DEVELOPMENT RESEARCH

What are some of the specific issues that a program of passenger transportation research might entail? How would information on these issues contribute to the program of research in ERS? Development research is now carried on in eight broadly related program areas by the Economic Development Division (EDD). Together they aim to provide a comprehensive description and analysis of the social and economic structure of non-metropolitan America. However, no aspect of passenger transportation is currently being analyzed by EDD.³ This is a serious shortcoming since transportation is a factor in almost every aspect of social and economic life.

Table 1 cross classifies substantive issues of passenger transportation by EDD program area. The issues are grouped into three categories: community development, labor force and labor markets, and social welfare.

Community Development

The United States has entered a period of greatly reduced growth in its major metropolitan areas and one of largely unprecedented demographic revival in most of its rural and small town areas. Moreover, recent research by Beale and Fuguitt demonstrates the pervasive nature of this trend (1).

What are the transportation implications of the reversal of relative growth rates between metropolitan and nonmetropolitan areas? This question can be addressed in two ways: from the per-

²An excellent bibliography of recent work on passenger transportation in rural areas is presented in Appendix B of the Department of Transportation Report (11).

³However, a limited effort was undertaken by the National Economic Analysis Division (8).

Table 1—Potential contribution of transportation analysis to development research in a program area

Issue	Human resources					Community facilities			
	Health and education	Income	Manpower	Population	Housing	Industrial location	Regional studies	State and local government	
COMMUNITY DEVELOPMENT									
Revitalization of nonmetro areas	x	x	x	x	x	x	x	x	x
Intercommunity relationships	x		x	x		x	x	x	x
Demand or need for transportation services	x	x	x	x				x	x
Formulation of development policy								x	x
LABOR FORCE AND LABOR MARKETS									
Structure of job commuting			x	x	x	x	x		
Labor markets and structure			x	x		x	x		
Entry or withdrawal from labor force		x	x						
Manpower services	x	x	x						x
SOCIAL WELFARE									
Access to services	x	x			x				
Community participation	x								x

spective of the determinants of population growth, and from that of the implications of population growth.

More specifically, have improvements in transportation facilitated job commuting to nearby metropolitan and non-metropolitan workplaces? Does the increased efficiency of transportation permit easier access to goods, services, and amenities than has heretofore been possible in nonmetropolitan areas? A more subtle issue relates to attitudes about communities. Does improved transportation make nonmetropolitan areas seem less isolated and thus more attractive to people?⁴

The renewed growth of nonmetropolitan areas has been rapid and largely unanticipated. Consequently, communities need to plan carefully to adjust to changes. Population change affects both size and composition and must be considered in planning for economic activities and for community, health, and social services. This is true for the planning of transportation services as well.

Transportation is the link that ties persons to activities. Changes in transportation routes and technology open new possibilities for the organization of activities in space. *We need to determine whether improved transportation has increased the potential for intercommunity cooperation in economic development projects and programs.* A panoply of questions is suggested by this issue: What organizational arrangements are possible? What forms of cooperation are necessary? Who are the sponsoring agencies? How do they interface with local government? What are the legal issues? What fiscal capacity is necessary to provide minimum service levels in various types of areas?

Finally, the general area of public policy should be considered. *We need to determine how transportation policy can be integrated with other rural development policies.*

The transportation issues implied by the process of community development contribute to the work of all program areas in EDD (Table 1). For example, knowledge of the demand or need for transportation services created by renewed population growth is relevant to the analysis of health and education, income, manpower, population, and State and local government.

Labor Force and Labor Markets

Rural industries draw their labor from remarkably wide geographic areas. Given the opportunity to work in a plant, rural residents have shown a strong tendency to maintain their established homes and commute great distances to work (6). Data from the

⁴While easier transportation may be a factor in the renewed vitality of non-metropolitan areas it might also lead to the purchase of goods and services at other locations, thus leading to the decline of some communities.

1970 Census show that almost a fourth of the rural labor force crossed county lines to reach work as compared with only about 18 percent of their urban counterparts. *It is surprising how little we know about the structure of commuting in nonmetropolitan areas or between nonmetropolitan and metropolitan areas.*

Data are available to describe some of the basic dimensions of intercounty commuting. The fourth count summary tape of the 1970 Census includes a tabulation of place of work for every county, and place of 20,000 population in the United States. By using these data one could describe streams of intercounty commuting, make metro-nonmetro comparisons, and describe differences between various types of nonmetropolitan areas in the journey to work.

However, these data do not permit an answer to other questions of basic concern such as: What distances are involved? What costs are incurred? What are the fuel requirements of such travel? Information on some of these issues is available (see Appendix A). Other issues of interest include the effects of long distance commuting on the function of small towns: Have some taken on a primarily residential function, serving as "bedroom communities" for larger employment centers? Does the increased range and frequency of long distance commuting permit nonmetropolitan labor markets to achieve greater levels of scale? Do they become "federated work places" as Thompson has suggested (9)?

Finally, *the structure and costs of commuting may affect the rate of participation in the labor force.* At what point does the cost of the journey to work become so high that individuals withdraw from the labor force? Does the relationship between cost of transportation and labor force participation vary between different types of communities, or persons? *At what point does transportation cost inhibit participation in manpower services such as job training and retraining programs?*

Table 1 shows that the journey to work, while primarily the interest of the manpower studies program area, concerns other program areas as well. Commuting affects the viability of communities, and therefore their chances for population growth or decline, their level of income and wealth, and their supply of housing.

Social Welfare

Access to essential services is important to social welfare and to quality of life. Research has shown that travel time affects the utilization of services. For example, Bosanac showed that medical care utilization declined directly with increasing distance from the providers of medical services (2). Thus the role of transportation should be considered in planning the delivery of health, welfare,

educational, nutritional, social, and recreational services. Access varies greatly under different levels of transportation technology and with different modes of organization.

Accordingly, *it is important to determine what alternative systems are possible to increase accessibility to services in non-metropolitan areas.* Participation in community affairs also declines with distance. Thus, the impact of transportation on public participation in community organizations, local government, and civic activities is also an appropriate subject for research.

Data and Methods

The analysis of passenger transportation requires consideration of numerous methodological and conceptual problems. We do not have a specific measure of either demand or need for transportation in nonmetropolitan areas. Nor do we have a systematic procedure for categorizing transportation services that includes such factors as frequency, mode, trip type, origin, destination, length, and target population; and we have not determined the appropriate units of observation for such work. Moreover, a catalog of data needs and resources for passenger transportation research should be compiled. A brief statement on data is presented in Appendix A.

Nearly everyone agrees that an adequate understanding of population and employment growth requires consideration of the role that commuting plays in providing rural workers access to employment opportunities, but few appreciate the importance of transportation analysis for other aspects of development research. As demonstrated in table 1, information on passenger transportation is relevant to each area of research, whether it be regional analysis, health and education, or income studies. Moreover, it should be pointed out that transportation binds together the various aspects of a community: residence with workplace, place of production with place of consumption, and the locations of decisionmaking with the sites where decisions are carried out. Thus, it is not an exaggeration to suggest that information on passenger transportation is a requirement for a truly comprehensive program of research on the nonmetropolitan community, its social and economic structure, and its place in the economy and society of the Nation as a whole.

APPENDIX A

Selected Data Sources for Passenger Transportation Analysis

1. 1970 Census of Population:
 - a. Fourth Count Summary Tape: For any county, city of 20,000, central business district, or remainder of county, this file gives the number of resident labor force who work in each of 20 places of employment. A distribution of the labor force by means of transportation is also available. This file could be used to describe the structure of intercounty job commuting.
 - b. Public Use Sample: Contains a place of work item (re-coded to standard metropolitan statistical areas and State), and a means of transportation to work item; these could be used to describe the characteristics of intercounty job commuters.
2. Nationwide Personal Transportation Survey: Collected in 1969-70 by Census for Department of Transportation; includes information on numerous transportation issues such as mode and frequency of travel, trip types, and seasonality of travel.
3. Consumer Buying Expenditures Survey: Contains information on household ownership of automobiles and light trucks; published in Current Population Reports, Series P-65, Nos. 40 and 44. Survey is no longer taken.
4. Annual Housing Survey: Large national sample of 76,000 households collected in late fall by Census for the Department of Housing and Urban Development (HUD); contains data on purchase and ownership of automobiles, parking facilities, and journey to work (time, distance, mode, travel arrangements). 1975 Special Supplement to Annual Housing Survey: Sponsored by Department of Transportation, this supplement will contain a large amount of detailed data on journey to work, characteristics of commuters, and satisfaction with travel arrangements.
5. Bureau of Labor Statistics Budget Studies: Contains data on expenditures for transportation.
6. Five Thousand American Families—Patterns of Economic Progress: A National probability sample conducted by the Survey Research Center of the University of Michigan; contains data on modes of travel to work by city size. These data are publicly available.
7. Bureau of Economic Analysis, U.S. Department of Commerce: Social Security—Internal Revenue Service Records Match, under contract from HUD, the Bureau of Economic

Analysis has matched Social Security Administration records (filed by place of work) with Internal Revenue Service records (filed by place of residence). This allows one to measure intercounty commuting by age, sex, race, earnings, and industry.

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THE RURAL HEALTH SHORTAGE AREA PROBLEM: A RESEARCH PLAN FOR A MAJOR ISSUE

by
Jeannette Fitzwilliams*

The Federal Register for February 25, 1975, published a list of 673 Medical Critical Health Manpower Shortage Areas (CHMSA's). Nearly all were rural. These areas affect about 20 percent of the counties of the United States: Some 500 whole counties and parts of almost 200 others. Pick up any study discussing rural conditions and you are almost sure to find poor health care and poor health status mentioned as high priority items. Congress and the executive branch are attacking these problems through many different programs.

Although health is primarily the responsibility of the Department of Health, Education, and Welfare, there are many uniquely rural conditions that constrain the improvement of health care delivery and health status in rural areas. Under the Rural Development Act of 1972, the Secretary of Agriculture is directed to provide leadership and coordination within the executive branch and establish goals for the quality of community services and facilities for rural development (*18: Sec. 603(b)*).

Rural health shortage is not a new problem, nor are attempts to solve it new. It may have more prominence now because good health is coming to be looked on as a right, not just something to be obtained only if you can afford it. It will become more prominent as people realize that we now have the technical expertise to obtain a very high level of health care and health status.

Because of differences in geographic barriers and population density, delivery of health care will always be less accessible and more costly in rural areas. But the rural-urban gap for the continuity and quality of health care, and for the level of health status can be narrowed. However, if there is no change in our approach to the problem, that is not likely to happen.

If we can go to the moon, why can't we solve the rural health problem? The answer lies in the difference in the way the two problems are approached. In the case of the moon, the issue was clearly stated: How do we land a man on the moon and get him

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back safely? Having defined the problem, the experts made a list of all the things they had to find out and do in order to get there. Each necessary project—research, testing, training, and production—was listed as one of a series of “boxes” in such a way that the relation of one box to another—both conceptually and temporally—was made evident. The business and research worlds were then invited to fill these boxes. Each knew what he was to do and why. As the work proceeded and the results came in, decisions were made, the plan was revised and further contracts let. Finally, the results of all these boxes—the research, simulation, testing, training, and manufacturing—were synthesized in one project that put men on the moon and brought them back.

What happens with rural health? First, there are dozens of problems, but no plans. It is as though the moon project has simultaneously been trying to go to the moon, Venus, the center of the earth, the bottom of the ocean, and China. The names on the boxes would be similar but the conditions to be met would be different so that the results could not be synthesized.

Second, the individual researcher tends to concentrate on the box that appeals to him without giving much attention to the long range reasons why this information is sought. As a result, without some clearinghouse for coordinating results, the information obtained may not get into the hands of the next researcher who needs it.

The converse of this problem is caused by the exigencies of grantsmanship. The technically sophisticated proposal that promises much prevails over the simple fact-finding proposal every time. However, when the winner comes to carry out his project, he often finds neither the data nor the methodology available, and the project produces neither the simple results that were needed nor the more important results that were promised.

To solve complicated problems, data, tools, and theoretical concepts must be available. This will not occur unless somewhere there is a long term commitment to an issue plus a realization of what is involved.

The purpose of this paper is to point out the need for a new approach to the planning and management of policy-oriented research. I have chosen the rural health shortage issue for illustration because I think that issue is worthy of a long-term commitment by ERS. But the basic points are equally applicable to research into other social issues. If we are to solve social problems, both delivery operations and research must be coordinated and research must use the planning and managerial techniques that are not so very different from those required of good business managers.

A COORDINATED APPROACH TO RESEARCHING A MAJOR ISSUE

The Major Steps

The solution of a major social issue is immensely complicated. It cannot be solved by one research project or by one discipline. The expertise of a great many disciplines must be brought to bear. Data (often requiring years of lead time) must be collected, and methodology and concepts developed and tested. Separate projects need time to start up, mature, and be evaluated. The mere size of the problem is likely to repel researchers who want personal recognition for their accomplishments. No one agency is willing to commit sufficient resources to do the whole job.

All these factors must be reconciled and accommodated. I believe the approach I suggest can do this. In fact, many of the boxes are currently being filled and the mechanism to coordinate and manage them is already in place.

The major steps of the suggested approach are these:

1. A group of experts lays out the main features of the master research plan consisting of a series of projects or boxes.
2. The plan is approved and researchers and operational projects are invited to fill the boxes.
3. Findings are continuously reviewed and disseminated and recommendations made.
4. The plan is continuously updated and researchers and operational projects are invited to fill the next set of boxes.

A Digression

Now, I want to digress to discuss more fully what I mean by "boxes," because these boxes are the heart of what I am proposing. The attached diagram (fig. 1) of one small segment of the whole plan will illustrate what I mean.

Each box defines a specific project. Each project can stand alone and will produce a report and often a tape containing needed data or a computer program. Their position on the page, starting at the bottom, shows crudely their time frame and the arrows show how they interconnect. Thus, A and B have to be done before C.

A could be a survey study on attitudes or use patterns while B could be an analysis of census and transportation data to determine geographic accessibility and socioeconomic characteristics of the shortage areas (CHMSA's). C tests their interrelationships and reactions. Meanwhile, someone else is doing project D, which develops and tests the methodology or program to be used in project E. E will use inputs from C, data prepared by another set

One Small Segment of Array of Boxes (Projects)

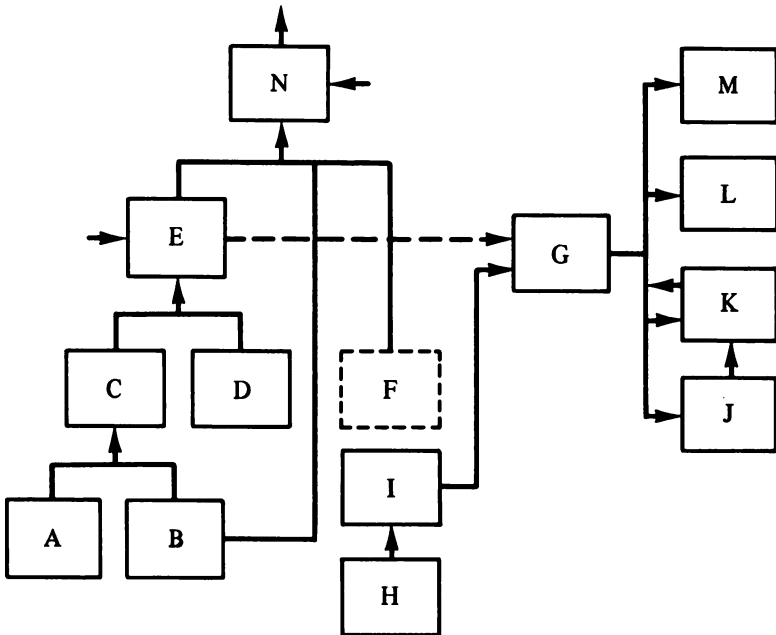


Figure 1

of projects, and information from the American Hospital Association.

G is a demonstration clinic—one of the types of solutions being studied. H represents a set of studies done in many different places, collecting and evaluating information on records kept by similar institutions. Project I puts all the information from H together and recommends the type of records needed later to evaluate G. The arrow shows G receives these recommendations. Later, it uses the findings of project E to improve some of its management procedures.

Projects J, K, L, and M are studying and evaluating what G is doing and K, too, has a feedback effect on G. Project F is in a box of dotted lines to show that it stands more or less alone (for example, a legal study) so it does not matter when it is done, so long as it is done before N.

Finally, the whole lot become inputs, directly or indirectly, into project N. N cannot be well researched unless the prior steps have been carried out. N, in turn, becomes the input for other studies.

Major Components of the Master Plan

There are five major components of the Master Plan. Each is represented in figure 2 by an oblong with an identifying letter. They are:

How and With What Success has the Problem of Critical Health Manpower Shortage Areas Been Solved?
Elements of Master Research Plan

A. Definition of the Problem	B. Types of Solutions								
<p>Questions to be Answered:</p> <ul style="list-style-type: none"> In how many areas: <ul style="list-style-type: none"> Is the problem being solved: Completely? Adequately given constraints? Solution is failing--Why? Nothing has happened--Why? What are major requirements for success: In each area? For each solution? What further action needs to be taken to increase potential for success: At Federal level? At State level? At local level? <p>By-products: Results of "Boxes":</p> <ul style="list-style-type: none"> Predictive coefficients. New methodologies. Greater understanding of relationships. 	<p>Resident Doctors:</p> <ul style="list-style-type: none"> Solo Group <p>Physician Extenders:</p> <ul style="list-style-type: none"> Solo Doctor's office Clinics <p>Preceptorships</p> <p>Clinics:</p> <ul style="list-style-type: none"> Resident or rotating Free standing or satellite 								
<p>D. Research Processes to be Pursued Simultaneously or Sequentially</p> <p>Stage VII ● 12/80: Repeat Stages IV, V, and VI but with greater refinement.</p> <p>Stage VI ● Repeat of Stages II and III as relating to Status of 1979 but at a more sophisticated level, including testing of theories based on findings of Stages II, III, and V.</p> <p>Stage V ● Rating (evaluation) of Success of each example of Type of Solution. ● Analysis of Success by Type and across Type as it related to each Branch of Knowledge. ● Analysis of Success of Types of Solution across Branches of Knowledge. ● Evaluation of gaps in research and update of Research Plan.</p> <p>Stage IV ● Status 12/78: Synthesis of change in Facts based on Monitoring.</p>	<p>E.</p> <table border="0"> <tr> <td></td> <td style="text-align: center;">M O N I T O R I N G</td> </tr> <tr> <td style="text-align: center;">1981</td> <td></td> </tr> <tr> <td style="text-align: center;">1980</td> <td></td> </tr> <tr> <td style="text-align: center;">1979</td> <td></td> </tr> </table>		M O N I T O R I N G	1981		1980		1979	
	M O N I T O R I N G								
1981									
1980									
1979									

<p>Stage III</p> <ul style="list-style-type: none"> ● Analyzes across Branches of Knowledge to a limited degree. ● Application and testing of new methodology. ● Synthesis and dissemination of all studies bearing on problem to date-policy recommendations. ● Evaluation of gaps in research and revision of Research Plan. <p>Stage II</p> <ul style="list-style-type: none"> ● Analysis within Branches of Knowledge. Synthesis and dissemination-policy recommendations. <p>Stage I</p> <ul style="list-style-type: none"> ● Development of methodology and software needed for next stage. Continue data collection. ● Obtain and disseminate Facts: descriptive with minimum analysis but enough synthesis to make information operationally useful. Start data collection. Define basic information to be obtained by all. ● Rough out Research Plan: Define Problem and Success. Create system of "boxes". 	<p style="text-align: right;">1978</p> <p style="text-align: right;">1977</p> <p style="text-align: right;">1976</p> <p style="text-align: right;">C H A N G E</p>
<p style="text-align: center;">C. Branches of Knowledge That Must Enter the Research Process</p> <p>Human and Area Characteristics:</p> <ul style="list-style-type: none"> ● Geographic accessibility ● People: age, sex, income, education, cars, etc. ● Area: size, land area, growth, nonhealth resources <p>Health Resources:</p> <ul style="list-style-type: none"> ● Within area: facilities, manpower, linkage systems ● Adjacent: facilities, manpower, linkage systems <p>Environmental Aspects:</p> <ul style="list-style-type: none"> ● Unsanitary housing ● Industrial and air pollution ● Substandard water systems ● Work hazards <p>Financial and Management Aspects:</p> <ul style="list-style-type: none"> ● Payments systems ● Funding and capitalization ● Ability to be self-sustaining ● Cooperative use arrangements among facilities ● Records and data banks <p>Technological Aspects:</p> <ul style="list-style-type: none"> ● Computers and their use ● Telemetry ● Communications systems ● Helicopters, etc. <p>Medical Support Aspects:</p> <ul style="list-style-type: none"> ● Pharmacies ● Laboratories, X-rays, etc. <p>Medical Aspects:</p> <ul style="list-style-type: none"> ● Problems presented ● Referral patterns ● Utilization patterns ● Outcomes ● Health status ● Problems not presented <p>Legal Aspects:</p> <ul style="list-style-type: none"> ● Legal responsibility ● Licensure <p>Political Aspects:</p> <ul style="list-style-type: none"> ● Local accountability ● A95, 1122, HSP, AIP, Certificate of Need ● Federal-State-HSA-Local inter-relationships <p>Organizations and Attitudes:</p> <ul style="list-style-type: none"> ● Health institutions and roles ● Role of staff, board, public ● Community support ● Attitudes of consumers ● Attitudes of health professionals <p>Educational Aspects:</p> <ul style="list-style-type: none"> ● Professionals: Preparatory Continuing ● Consumer: Personal health ● Both: Resource utilization <p>Auxiliary Service Aspects:</p> <ul style="list-style-type: none"> ● Transportation ● Health and homemaker aides ● Social services and counseling ● Rehabilitation 	

Figure 2

- A. Defines the problem: The questions to be answered, the criteria for evaluating success, the types of results to be expected;
- B. Indicates the types of alternative solutions (operational projects) to be monitored and studied;
- C. Suggests the scope of the knowledge that must enter the research process in the shape of boxes;
- D. Indicates the major research processes that must be pursued simultaneously or sequentially, the type and timing of the boxes, and the updating of the plan;
- E. Recognizes the importance of the changes that occur over time; these, too, will be translated into boxes.

Figure 2 is a conceptualization of the full master plan both at one point in time and over time. It is only illustrative but shows the depth and scope of the jobs to be done and their inter-relationships. The initial plan will cover all aspects but some will be dealt with in more detail than others. Thus element A, and Stages I and II of D, and the major components of E for 2 years ahead will be spelled out in some detail for certain branches of knowledge and the rest will be merely roughed out enough to give a sense of direction. Not the same planners will define every box. A core group with a wide knowledge of the subject will rough out the major sets of boxes. These sets will be disaggregated into individual boxes with the aid of those possessing more specialized knowledge. Like the requirement in the National Health Planning and Resources Development Act of 1974, there will be a master plan and an annual implementation plan. The latter will be revised each year; the former as often as conditions warrant. As time passes, these plans will be expected to take on greater depth, scope, and specificity.

Following are a few comments on each of the elements:

A. *The problem.* The first responsibility of the group proposing an issue for selection as a major research commitment is to describe the problem and set bounds to it. The task of the group drafting the master plan is to define the problem even more clearly by spelling out the questions to be answered by this research at the end of each succeeding time period. As time passes, both questions and definitions may be refined, but their major thrust should not change.

B. *Types of solutions.* The issue illustrated focuses on the solution to the health shortage problem. The organizational arrangements listed in B are some of the major alternatives now being used to solve the problem. Other solutions may be developed. In addition, other organizations need to be defined and studied. These are components of the health delivery system and are often essential to its success. They are closely related to the branches of knowledge and will need to be spelled out in C. For instance,

community organizations would be specified under "political aspects" in figure 2.

C. *Branches of knowledge that must enter the research process.* This is a partial listing; every subtopic will probably result in several boxes at each stage. I have refrained from labeling these branches of knowledge "disciplines" because many different disciplines may want to take a crack at analyzing the same facet of the problem, while the answer may lie in combining expertise. In fact, as the process reaches stage III—analyses across branches of knowledge—a real team effort with a genuine exchange of ideas will be required. None of us is entirely an economic man. The economic solution may be perfect but the full solution to the shortage problem will founder if political, legal, geographic, and public relations aspects are not considered.

D. *Research processes.* C shows the scope of the topics that must be studied, and D illustrates the *types of projects* and the *timing* of the boxes that constitute the master plan. Should the shortage issue be accepted as a major commitment and a master plan roughed out, it would be found that some of the boxes in stages I, II, and III have already been filled.

However, the greatest immediate need lies in stage I (data collection and fact-finding descriptions of the events) and stage II (simple analyses and construction of indices). Thus the initial plan would be fairly specific for stages I, II, and III and much more general with regards to stages V, VI, and so on. However, *these later stages must be covered for two reasons. First, there is a time lag in obtaining data. Second, some of the most important boxes in stages I and II involve the actions needed to procure and process the data and methodologies required for stages V, VI, and so on.*

E. *Monitoring changes.* These kinds of activities will show up in boxes but they have been treated as a separate element because they have to do with changes over time. They would involve such things as changes in the laws affecting types of solutions, new locations for National Health Service Corps, or Rural Health Initiative projects, actions of the Robert Wood Johnson Foundation, entries of new kinds of solutions, and changes in the designation of shortage areas. Certain changes would be summarized on a yearly basis; others as they occur.

Organizational Aspects of Managing a Major Research Plan

The organizational aspects may be divided into two parts: Getting the plan started and keeping it running.

The first step is to get one or more organizations to initiate the planning and then to invite participants to fill the boxes. Financial provisions must be made to cover the travel costs and

time expended by those selected to prepare the initial plan. A further sum would be supplied to generate interest among potential participants.

The second step involves an advisory committee (and perhaps subcommittees) to oversee and update the plan and develop methods for communication between participants, for selecting or generating participants, and for funding.

Participation would be voluntary and the advisory committees would be drawn from major participants. The first difference between this suggestion and the usual participation scheme is that the main content of the boxes would be specified by plan managers rather than by those applying for funding.

The second difference is that main funding would not come from the plan manager. Instead, participants would look to their usual sources. Participation in the plan would come from two incentives. First, the plan managers, by accepting the applicant as a participant, would be indicating to the funding source that the project is worth doing (thereby making funds more accessible). Second, participation in the plan (contract to fill a specified box) would entitle the participant to access (at a reduced charge) to findings, tapes, technical assistance, and the dissemination of various types of information generated by the project.¹

What Is In Place Now?

Of course, the whole master research plan as just sketched out will never come into being but it is a good idea to have in mind the goal we should strive for. Then, there is some chance we can approach that goal.

Much of what I am talking about is already in place and could easily be adapted to provide the organizing and managing structure, the synthesizing and disseminating process, and the data generating base.

The experience of the last 10 years spent trying to solve health problems has made both Congress and those operationally responsible for solving them keenly aware of the need for a new approach to data, technical assistance, and research. As a result, the National Health Planning and Resources Development Act spelled out in considerable detail the responsibility of all with respect to data collection and analysis, technical assistance, and research. It provided for a National Health Planning Information Center (NHPIC) (*19: Sec. 1533(c)*) and for regional centers for health planning (*19: Sec. 1534(a)*) to furnish technical assistance and conduct research studies of health planning and resource

¹Individual and organizational recognition would be greatly enhanced because current methods of publication would be continued but the dissemination would be greater.

development. Since solving the health shortage problem is one of the issues to be addressed in the health service and annual implementation plans, shortage-area research could be a responsibility of these centers.

Today, much policy-oriented research is being done by the staffs of planning agencies and their technical assistants (sometimes university departments but often private consulting firms). Formerly, the results of these studies did not enter the literature stream. Now, they are all being acquisitioned and processed through NHPIC. Information about them is disseminated by NTIS through its Weekly Government Abstract on Health Planning (13).

In addition, these centers and many other organizations are synthesizing information focusing on various issues (13). Many are going beyond reviews of literature that report the highlights of the research and theory being developed. Some literature reviews are beginning to classify hypotheses into groups and then rate the research as being strongly supportive, weakly supportive, or contradictory (8). Thus, some of the "D-type" boxes I talk about are already beginning to appear, and in a form relevant to this major issue.

A whole new approach is being developed with regard to data. The National Center for Health Statistics has been established to improve health data. For the individual researcher the little survey is out; he should use what is already available both because it is better and cheaper (23). To ensure this is so, a Cooperative Health Statistics System, providing a "once only" method of collection, is being developed to coordinate Federal, State and local data-collecting activities (16,23). Pilot cooperative systems are already in place and ready to be copied by other States or research consortia (4,5,23).

To make such a cooperative system work, a great deal of thought has to be given to what data need to be collected and why. Issues have to be defined and priorities set so concepts and their statistical approximations can be determined and agreement reached concerning the organization of these raw data for use (2,24,25). Many conferences already have been held for this purpose and much progress has been made (14,15). But this is not going to be of much use if every research unit continues to ignore these efforts.

The Health Services Administration (responsible for CHMSA's) is commissioning still other boxes. It is putting great emphasis on the coordination of operational projects, evaluation of such projects and the basic research needed for their design and improvement (7).

Part of what I am talking about is a shift in the organization

and management of research but part also calls for some shift from discipline-oriented research to policy-oriented research. I define the former as research where the focus is on a theory or finding primarily of interest to the discipline and the latter as research where the focus is on a theory or finding pertinent to policy decisions. Some of the leaders in research are beginning to realize that part of the lack of relevance in research and the gap between expectation and performance is due to the fact that policy research is being conducted as though it were disciplinary research. These men are beginning to recognize the differences and to develop policy-oriented research methodology (2,6,9,10,12,17,20, 21,22,24,25). Part of that difference is the need to focus not just on the question asked for a specific project but on the relevance of the answer to the solution of the major issue. Thus the interconnection of the various boxes is important and must always be in the forefront of the researcher's mind. Knowledge for its own sake is not enough.

WHAT WOULD BE THE ERS ROLE IN SUCH A MAJOR RESEARCH PLAN?

Let us assume that ERS does accept the rural health shortage problem as a major research commitment. Let us assume further that it will be one of many research groups that tackle this problem—at first independently, but later in a coordinated fashion. What role should ERS play?

Criteria for Decision

I believe the role of ERS should complement—not duplicate—the work of others. As a research arm of the Secretary of Agriculture, it should be consistent with its responsibilities regarding rural problems. It should reflect the specialized responsibilities of USDA agencies such as the Extension Service, Rural Development Service, Farmers Home Administration, and Food and Nutrition Service, which have missions related to health and environmental problems. It should capitalize on its ability to cut across State and local lines as well as across program areas thereby obtaining a picture of developing trends in various parts of the country. It should also capitalize on its special relationship with the agricultural colleges, both with regard to field staff and cooperative research projects. *It should reinforce and build on other work being done in ERS and particularly in the Economic Development Division (EDD).* Finally, for the first few years I think it should concentrate on those activities that are most needed even though they are descriptive rather than analytically sophisticated.

Some of the Priorities as Seen by HEW and Me

I discussed this plan with some people from HEW concerned with these CHMSA's and with rural health problems. They set the highest priority, particularly in the short run, on research projects that would: (1) identify geographic areas where resources (dollars, food, training) should be applied; (2) disseminate analytical information concerning what is going on and what resources (Rural Health Initiative projects in HEW, Consumer Health Education in Extension, Women-Infants-Children projects in Food and Nutrition Service, Robert Woods Johnson projects, and so forth), are available and where people are getting health care; and (3) show the impact of health-related characteristics and projects on the community and vice versa.²

From my own knowledge I know there is a crying need for the first two items on this list. It is easy to get generalized statements but difficult to get hard facts. Studies do not collect or do not retrieve and publish data at the rural level. Each Government agency knows only what is happening under its own funding authorization. Many times the Washington office does not have the information because operational management is at the regional or State level.

In any case the operating agencies do not have the time to abstract the analytically important information even though they possess it. This is true of both HEW and USDA operations. We, as a research agency, can cut across lines and dig out the information needed. This information is needed by administrators in locating projects, by communities in designing projects, by researchers in planning projects, and by USDA in evaluating rural health problems.

ERS in Relation to the Secretary of Agriculture and the Department in General

Sometimes the Secretary of Agriculture gets a request for his opinion on a health-related matter. More often, particularly in regard to regulations, the invitation to comment is by way of the Federal Register. Sometimes, regulations or bills present problems for rural communities and should be brought to the Secretary's attention. Whether the request comes from the top or the bottom, ERS should be able to provide the background information needed to make a policy decision. That, I believe, is one of our primary responsibilities. To accomplish this our research has to be on a national basis. However, rural people and communities

²When Tufts Medical School sent a team to improve health in rural Mississippi it found its first two tasks were to get food for the people and to dig privies.

are far from homogeneous with regard to health-related characteristics. Therefore, while national in scope, our research should focus on patterns that identify trends and problems occurring in various areas of the country.

ERS in Relation to Agricultural Colleges and ERS Field Staff

Certain types of research can best be handled at the local level. Furthermore, most agricultural colleges can only spend their funds for geographically limited research. Yet, for purposes of making major administrative and policy decisions an overall grasp of these topics is needed by HEW and USDA. By synthesizing the individual studies carried out locally we could provide the national picture.

The Mechanics

Assuming a tentative commitment is made by top management, the health program group takes the lead in drawing up tentative plans (see fig. 2) for both the master plan and the role they will play. They must confer with others inside and outside EDD, ERS, USDA, and HEW to make sure that their plans are compatible with the work of others and *capable of fulfillment*. *In so doing, it is important to include all ranks: those at the bottom know about issues and data while middle and top management know about budget and department constraints and priorities.* This process will take several months but should be started early and geared to deadlines which permit review in connection with the budget. It would be an ongoing process repeated each year in a modified fashion.

Simultaneously and sequentially, members of the program group would also proceed to fill those boxes scheduled for immediate completion, take any actions needed to acquire and prepare data for the next set of boxes, *make contacts and alliances with other agencies to ensure the development of data needed for research planned for the future*, and make the contacts necessary to ensure coordination with other projects that will contribute input to future projects.

Morale and Personnel Development

By including everyone in the planning an esprit de corps will be developed. Morale will further improve because with proper planning the researcher will not be asked to do a job with inadequate data and tools; he will be able to deliver what is promised. Participation in planning will ensure he knows what is going on (which makes for better work) and from the first he will be learning what goes into good research management.

Since the boxes are interrelated and become more sophisticated he will have a sense of growing with each project, not only in

knowledge of his subject, but in command over analytical tools. His chances for professional recognition and opportunities for promotion will be enhanced both by the wide dissemination given to his output and by the fact that those who evaluate him will have a better knowledge of his capabilities.

Staff and Equipment

Staff and equipment both take time and money to acquire. They may remain in ERS for a long time. Without a plan it is easy to be saddled with the wrong skills and tools for the jobs eventually done.

Applications for Funding

Sometimes ERS is asked to undertake projects; sometimes it contracts for work—often at short notice. A plan showing feasibility and priority is needed to provide criteria for accepting or rejecting an offer or making a counteroffer.

SUMMARY

Following are the main points I have tried to get across in this paper. They are addressed to ERS because that is the focus of this paper, but I believe they could be addressed to a large part of the research community equally well:

- We need a *new approach* to the management of policy-oriented research. This paper attempts to spell out some of the elements of that new approach and the reasons why such an approach is necessary. *Projects must build on each other in a coordinated and rational manner.*
- We need to pay greater attention to *acquiring the data and tools* needed to do the job of which we are capable. But before we can acquire the data and tools we must know what our long-term commitments are. Because of the time lag, *we must lift our planning sights* from their current 1- to 2-year level to a 5- to 10-year level.
- We need *increased communication* both within ERS and the divisions and with our colleagues outside USDA. Where policy issues are involved, this communication should involve both researchers and those with operational responsibilities.
- Personnel at all levels should be involved: Each has a different expertise to offer.
- Much of the structure, methodology, and expertise needed for this new approach is available and is being used by others. It should be used by ERS. It could be adapted to meet the requirements of the suggested approach.

The health shortage areas issue is worth a major ERS commitment and the foregoing suggests what is involved.

I have already been told this proposal is too idealistic; that the incentive for change is lacking. While I set a high goal, I expect progress to be made in small steps. Progress only comes as the result of ceaseless prodding by little people. Without idealism we would not have National parks and forests. Without a dream and the resolve of many little people we would still be living with Jim Crow. Without a demand for greater relevance in Washington, Jimmy Carter would not be President.

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Chapter 7— ECONOMIC OPPORTUNITY

FORENOTE

The problem of the people left behind in the march of progress, often through no fault of their own, belongs to all of us. Rural poverty has probably received less attention than urban poverty. It is more out of sight and out of mind.

Stinson and Cook present a strong case for ERS to lead the way by being prepared with definitions, data, and delineation of policy issues. They discuss the energy crisis and rural development, environmental restrictions on agriculture and industry, and demographic trends in nonmetropolitan areas. They call for the use of forecasting models to estimate the probable effects of proposed policies.

Three reviewers present contrasting reactions. Barkley finds little to disagree with and writes a paper of his own. He sees too little attention to the future in the Stinson-Cook paper, and senses a need for more analysis of stock and flow resources and the opportunities they offer in rural areas. Barkley asks why no one has explored the reasons for the current reverse population movement from cities back to the country. What has caused these people to move? Will the movement continue?

Coltrane generally agrees with Stinson and Cook but finds their assumptions about rural areas too restrictive. We need to examine our analytical models, but we should not wait for general agreement before moving into studies of specific areas to develop information about economic opportunities.

Lynn Daft gives the authors high marks for their choice of topics and treatment. But he faults them for the absence of policy justification for recommended analysis. This needs to be devel-

oped more explicitly to aid the policymaking process and to get the attention of policymakers. Daft also has misgivings about the narrowness of the scope and mentions two of many possibilities that might have been explored. These are the implications of a changing transportation network and continued changes in agriculture beyond the present energy and export questions.

In the contributed papers, Ogg, Bird, and Gadsby discuss three different subjects. Ogg examines research needs for nonpoint pollution. Alan Bird identifies rural areas and rural people as significant contributors to national development and explores their role in the present and future contexts. Gadsby reviews past research on impacts of development, and anticipates greater future commitment of ERS to this field.

ECONOMIC OPPORTUNITY IN RURAL AMERICA

by

Thomas F. Stinson and Neil R. Cook*

The People Left Behind, the report of the President's Advisory Commission on Rural Poverty, was released 10 years ago. It focused national attention on the rural poverty problem, called for immediate action, and made more than 150 recommendations for change.

Unfortunately, little happened. Poverty programs were among the casualties of the Vietnam War and attention shifted elsewhere. Rural development was relegated to a small corner of the Nation's consciousness, overshadowed by the economic situation, the environment, the energy crisis, and Watergate. In the past 9 years, economic opportunity in rural America has gone from an issue of national concern to one of peripheral interest.

The problem has not gone away, however, and neglected issues can move into the public spotlight quickly. A minor issue can become a major policy issue overnight if the President, a cabinet member, or an influential member of Congress suddenly takes serious interest. This potential demand for research and information means that ERS should maintain a strong presence in the rural development field.

ERS must be prepared to supply on short notice the data and general information about rural development needed by policymakers. To maintain this capacity for response the agency must identify and research a large number of issues, many of which may not be considered important by policymakers. In addition, the agency must maintain the ability to provide the detailed program analysis that only a group with an extensive background in rural development can provide.

Unfortunately ERS is losing this ability. Major parameters influencing the rural economy have changed but our analysis has not been updated. We have fallen into the habit of repeating the same old arguments for rural growth, failing to note that these justifications were developed before energy was in short supply, before environmental restrictions imposed limits, and before the Nation realized that it was going to have to exist in a period of less rapid economic growth.

All of us need to reevaluate the analytical frameworks and

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models we use. We need to thoroughly reexamine the impact that rural development would have on the Nation's welfare under today's conditions.

Because ERS plays such a large role in rural-development research, it must lead this effort. If it fails to do this, sufficient resources and emphasis will not be given the topic. Without this effort we risk doing much irrelevant research in the coming decade. Worse, we may perpetuate programs whose results are the opposite of those desired, and our analysis of the effects of proposed programs may be totally wrong.

The major part of this paper is a discussion of research issues in three areas where major changes have occurred: energy, the environment, and rural in-migration. Although each topic has a potential impact on economic opportunity in rural America, our concern goes beyond finding the answers to the specific questions posed in this paper. We hope to encourage the research and related work required to reevaluate and, if necessary, redefine the role rural areas should play in the Nation's future growth. The paper concludes by noting two important policy issues likely to arise in the short run and by calling for increased investment in simulation models for short-run policy analysis.

We recognize that rural development is an ill-defined concept with meanings ranging from national economic efficiency to rural welfare. But even if one chooses a particular meaning the specific ways for achieving it are highly controversial. It is the work of economists to help balance opposing policy extremes. Thus we attempt to cover some important issues under several concepts of rural development.

This is a slight change in focus from that implied by the assigned title. However, it seems premature to analyze attempts to improve employment opportunities, to provide public service amenities, and to maintain rural communities without first having better information about how alternative levels and configurations of rural development affect the Nation's welfare.

THE ENERGY CRISIS AND RURAL DEVELOPMENT

The energy crisis, with the resulting increase in fuel prices, appears to have the most potential for changing the role of rural America. Since 1967, gasoline prices have more than doubled, transportation costs have increased dramatically, and heating fuels have become more costly and—in the case of natural gas—supplies have run short. Earlier analyses of the relative costs and benefits of urban and rural settlement may not be valid now.

ERS needs to determine the effect of the changed energy situation on the optimum distribution of economic activity and population.

Four separate topics need careful analysis. The first is the general issue of the impact of increased energy costs on the location of new industry. The next two topics concern the effect of the energy crisis on two sectors important to rural areas, agriculture and energy production. The fourth topic is a discussion of potential research on the effects of energy price increases on the location of households.

Industrial Location and Energy

If nonmetropolitan areas are to grow, the most likely stimulus will be increased industrial employment. Even though the service sector is expected to provide the greatest number of new jobs for the nation, this will not be true in rural areas. Nonmetropolitan areas lack the population to support the extensive service sector that exists in urban centers.

In a restrained or limited growth economy, however, competition for new industrial development will be keen. If existing market forces create strong economic incentives for firms to locate in either metropolitan areas or rural areas, much of what can be realistically expected as a role for the nonmetropolitan areas will already be determined.

What is needed is a complete and detailed study of the impact of market forces, especially the new transportation and fuel costs, on the location of industry. How important are fuel and transportation costs to various industries? Which industries are particularly affected? We need to know whether the energy crisis has produced any new incentives to locate in either the rural or the urban areas, and if so, the relative magnitude of these incentives. A second, related question asks what the effect of increased energy costs on the geographic distribution of industry is? No one can predict the exact outcome, but carefully conducted studies can provide indications of the economic forces and of the costs of government intervention to counteract them.

Agricultural Employment and Energy

Agriculture plays a large role in the rural economy. Any changes in its structure will have a significant effect on the area. Here three rather broadly defined research issues emerge. They are: effect of increased energy prices on production methods, the effect of increased fuel prices on the kinds of crops grown and their location, and the effects of increased transportation costs on the processing and distribution.

First, consider farm production methods. We know that when the price of a factor increases less of that factor and more of a

substitute will be used. What we need to know is how much human power, or labor, will be substituted for mechanical power. Shortrun changes will be slight, but in the next 10 years adjustments might be necessary.

Special attention should be paid to the impact of the higher energy costs on the scale of the farming operation. It may be that slightly smaller, more labor-intensive, farming operations will be favored. The implications for rural welfare of even a small increase or decrease in the number of agriculturally related jobs are great, and the possibility of a significant change in the availability of farm employment due to shifts in production technology can have a large impact on economic opportunities in rural areas.

Since any change in either the location of food and fiber production or the mix of products will have some impact on the number of agriculturally related jobs in an area, studies analyzing the impact of energy price changes will provide important information needed for planning the role of nonmetropolitan America.

We need to determine the impact of increased transportation costs and energy costs on the processing and distribution industries. Will increased freight rates and rail line abandonment reduce local economic activity enough to limit employment opportunities? Will increased transportation costs produce a shift from fresh to processed vegetables and fruits and more seasonal labor? And, how about effects on river transportation? Will economic activity shift from communities located on rail lines to those on water routes?

Research is needed on all aspects of the impact of higher energy prices on agriculturally related employment. Without additional research, major structural changes such as those that accompanied the mechanization of cotton, may catch us unprepared to deal with their effects. Even if the studies indicate that no substantial impact will occur, as in the study of the flue-cured tobacco industry, the information obtained will be useful in defining a role for rural America.

Energy Production and Rural America

Energy production and conversion will have a major role in the future of nonmetropolitan areas. Most of the existing domestic supply of fossil fuels is in the more sparsely populated areas. Environmental pressures are likely to force new energy conversion plants into these areas as well. ERS needs to help evaluate some of the tradeoffs between increased energy production and other forms of activity in the region.

Another issue of importance concerns the determination of which type of energy production is appropriate for rural areas. In the case of Northern Great Plains coal, for example, there is the problem of deciding whether mining for outshipment only or for

on-site conversion to electric power is in the Nation's best interest. Of equal importance is whether that decision conflicts with the best interests of the region.

ERS needs to give particular emphasis to research in this area to make clear the costs and benefits of all the options available. Again, because of the relatively small employment base in these areas, any expansion or changes in energy employment will have a major impact on the total number of jobs available in rural areas.

ENERGY AND THE LOCATION OF THE HOUSEHOLD

Finally, the effect of increased prices on the spatial distribution of households needs to be analyzed. Since commuting distances of more than 30 miles one way are still accepted, families have a great deal of freedom in choosing a location for their home.

We lack solid information about the strength of financial incentives to migrate to or from small towns. What has happened to commuting costs? Have they increased to the point where long distance commuting is no longer in the individual's or the Nation's interest? Have costs increased to the point where significant economic incentives have been created to migrate to growth centers? If there are now strong economic incentives to migrate, the life of many small communities is on the line.

What we have are two major questions: What is the impact of the increase in energy costs on the distribution of population between the central city, the suburbs, and the rural area? And, within the nonmetropolitan area, what is the optimum distribution of population?

Both issues are important. For decades society has had a suburban orientation. The combination of relatively low commuting costs, single-family housing, and the package of amenities offered by the suburbs has proved to be a strong force drawing people from both the urban and the rural areas. But this may be changing. Increased commuting costs may have reduced the attraction of the suburbs—especially the second- and third-ring suburbs—to the point where population might begin to move back closer to the city. What we need to know, in more traditional economic terms, is the cross elasticity between fuel prices and the demand for suburban living. Whatever the outcome, it will have enormous policy implications for the allocation of resources within USDA. Since the types of programs and research each outcome would require are vastly different—and in fact, contradictory—obtaining information on the effects of fuel prices on suburbanization is a high priority research topic.

When we concentrate on the optimal location of the population in nonmetropolitan areas, similar questions emerge. At present our rural development policy is devoted to maintaining the viability of all rural communities. It has been argued that the existing investment in infrastructure in these areas and the residents' social ties to the community make it in the national interest for the small towns to continue to exist. Now that costs have increased the question must be reexamined. Again the policy implications are great: a shift from a policy of maintaining all rural communities to one of investing in those areas where the market forces for growth are the strongest would necessitate major changes in the way rural development funds are allocated.

ENVIRONMENTAL RESTRICTIONS AND RURAL DEVELOPMENT

Increased public concern with the quality of the environment may limit the development of rural areas. Environmental restrictions were virtually unheard of 10 years ago and the public had little control over where firms located or how they disposed of their wastes. Today, detailed environmental impact statements are required on nearly all proposals before any action is allowed. In addition, any vocal, well-organized minority can force lengthy delays or even block construction of a project that may be in the best interests of both the local community and the Nation. Environmental regulations may prove to be a major factor limiting rural economic growth in the coming decade.

Planning has become increasingly complex, and more and more conflicts are occurring between environmentalists and developers. The new standards set forth by the U.S. Water Resources Council indicate that environmental quality and economic development are to be considered equally important in water resources planning, but that regional development through water resource development is not a legitimate objective. In practice, however, environmental planning still receives less weight than economic development.

It is also difficult to organize environmental information into concrete planning models. Rural development is not very precise or well understood and environmental development is even less so. This results in many decisions being made by either administrative law or the courts. The decisionmaking process is time consuming, costly, and frustrating to technicians, businessmen, and politicians.

Because environmental considerations will play a major role in all physical development decisions for some time, ERS needs to

carefully analyze the possible tradeoffs between maintenance of the environment and economic efficiency. Planners and policymakers, especially at the State level where the decisions are normally made, need this information, but they lack both the time and the research capability to conduct the necessary studies.

Three broad research topics involve the effects of environmental restrictions on the rural economy. The first concerns possible impacts on the agricultural industry. The second topic deals with the effect that enforcement of stricter regulations may have on nonagricultural industries and on the individual communities. The third concerns research on estimating values for nonmarket goods.

Environmental Restrictions and Agriculture

Environmental regulation will have two major effects on agriculture. First, the use of agricultural chemicals will be restricted to some unknown extent. Second, restrictions on land use will be applied, perhaps with a reduction in net returns.

Agricultural chemicals have been in use for several decades. As minimum tillage to reduce soil erosion becomes more prevalent, water quality may be changed by the increased chemical runoff. Little is known about the tradeoffs between a reduction in sedimentation and turbidity and the chemical contamination of soils, stream courses, and water bodies. A reduction in farm income with its own consequences could result. In the short run, a lack of knowledge of the regulations to be imposed could contribute to a great deal of uncertainty on the part of agricultural producers, processors, and suppliers.

If environmental restrictions limit the uses of land, the rural economy may also suffer. A large amount of the total investment in rural America is in agricultural land and the facilities necessary to make it productive. Restrictions could cause major capital losses for farmers. ERS must be prepared to assess the effects of restrictions on land use on the rural economy.

In the short run, programs advocating land resource conservation could limit rural economic opportunity. Our basic hypothesis is that longrun planning, which implies greater emphasis on soil conservation, will not increase during the next decade. However, if improvement of water quality standards proceeds as scheduled, soil conservation could become a major affair in the next decade. Uniform application of soil erosion standards would impinge differently on various regions of the country and best land management practices to achieve water quality improvement have not been clearly defined. In addition, the effectiveness of various methods of implementing these practices—education, technical assistance, land use regulation—has yet to be determined.

To meet the USDA mission of controlling erosion while encouraging rural development, ERS should develop the capacity to analyze regional and interregional shifts in production associated with alternative kinds, levels, and location of water quality control schemes. We need multiobjective planning models which would integrate with efficiency in production, and equity. The methodology should be sophisticated enough to capture the major interrelationships, yet simple enough to be understood by laymen. The study should be done by an ERS-led multidisciplinary team including economists, sociologists, and physical and political scientists.

Environmental Restrictions and Industrial Development

Some rural industrial plants were constructed with little regard for environmental protection, and adjustments to new environmental regulations are difficult. The costs may eventually be passed on to consumers, but rural areas may suffer a loss of income during the adjustment period. Frictional unemployment of both human and physical resources also could reduce income in rural areas.

Location of new industries could end up being decided as much on the basis of minimal environmental insult—perhaps being weighted by population pressures—as on economic efficiency.

Dispersion of dirtier industries into sparsely populated areas may distribute pollution problems more evenly and contribute to rural incomes, but at the expense of the amenities of rural living. Even now, some rural communities are trying to restrict industrial development to the small, clean firm.

The reluctance to accept the dirty industry raises an important research issue. How much of this reluctance reflects an accurate assessment of the local costs and benefits? Careful analysis may show that, for the local community as a whole, the benefits exceed their associated costs. Then education programs, and possibly income transfers between gainers and losers, may aid in making development more acceptable.

We also need to consider the possibility that local net benefits may differ from national net benefits. And what happens if the underdeveloped areas decide they have enough? Do we then encourage the industry to move to the Bahamas or Uganda and import the finished products? Should there be some form of Federal impact aid to compensate the locality for benefits others receive from the industry? Or do we need to return to a modern version of the company town—such as the proposed energy parks in Pennsylvania—where at least in theory it may be possible to capture more of the external benefits and pass them on to the

workers and those living in the immediate vicinity. Since the "big, dirty" industries provide a significant portion of the semiskilled employment in any region, the way they are handled in the future is likely to have significant effects on the type of rural development that occurs.

Small towns face many of the same problems in coping with the environmental quality standards. However, they lack the option of closing down and moving elsewhere. Many communities will be faced with a prohibitive expense requirement that they expand or upgrade their sewage disposal facilities. The question of whether it is in the Nation's best interest to invest large sums of money for sewer systems in small rural towns is worthy of study.

Environmental Restrictions and Nonmarket Goods

The urban population is demanding services for which there are no established markets. Outdoor recreation, the visual quality of the landscape, and open space are examples. Since many of these demands are not priced, sociologists will be needed to help determine how much of these benefits the public wants at various implicit prices. Congress ultimately decides, but it ought to be an informed decision.

Research on the development of new mechanisms to transfer resource rights efficiently and equitably is important. In some instances the services have been transferred through the sale of a portion of the land rights. In others, resource rights have been leased. There are also instances where resource owners have sold services directly, as with recreation. But the taking of traditional rights often occurs through public regulation, or more subtle changes in engineering or project standards. Government decisions that give windfall gains or losses in the name of environmental progress should be carefully studied and limited.

DEMOGRAPHIC TRENDS AND RURAL DEVELOPMENT

During the 1960's the major demographic forces affecting non-metropolitan areas were assumed to be population decline and rural out-migration. Planning for the future needs of the non-metropolitan community emphasized the possibility of a decline in population. Only in studies of the rural-urban fringe and the growth centers was the possibility of growth problems considered. For the rest it was assumed that the best that could be hoped for was a stable population with a gradual redistribution of the population within the area.

Now this has changed. Nonmetropolitan population declined nearly 3 million during the 1960-70 period, but from 1970 to 1973 rural net in-migration amounted to over 1.1 million. All sizes of communities shared in this growth. Many rural areas have suddenly become more attractive to the public and the reasons for this growth need to be analyzed and included in any assessment of economic opportunity in rural America.

Four factors have influenced this population growth: an increase in the number of industries locating in rural areas; an increase in the number of retirees; the continued desire of American families to live in a suburban setting; and an apparent preference on the part of both industry and people to relocate in the West and the South, away from the population centers of the East and the North Central States.

The issues surrounding industrial location have been covered in the discussion of energy and the environment. Research issues associated with each of the other three factors will now be examined.

Retirees and the Rural Population

The most important demographic force during the next decade is likely to be the large increase in the retired segment of the population. The Nation's retired population will probably rise to over 28 million by 1990, an increase of 40 percent from the 1970 levels. This group can have an enormous impact on the nonmetropolitan areas. Compared to retirees of earlier generations they are more mobile and more financially secure. Should they choose to locate in rural areas they will have a definite impact on the communities chosen, and may themselves stimulate economic growth.

The concepts of basic income and basic employment are familiar. Policymakers know that when a new manufacturer moves into a community one can expect increases in income and jobs greater than the increase which the plant is directly responsible for. What is often overlooked, however, is that transfer payments in the form of social security and pensions act the same as basic income, and create additional economic activity although not necessarily of the same type or magnitude.

If a significant number of retirees choose to locate in rural areas, they will have a major influence on those local economies. More research is needed, however, to learn what the retirees' propensity to locate in the nonmetropolitan areas will be. We also need to know what factors will influence their location decisions, and how the retirees will affect the local economy.

Studies of employment multipliers associated with transfer payments, and other effects of increased retirement population are also essential. Retirees could prove to be a major source of new basic income for rural communities and could provide a stimulus

for new service jobs. But along with these benefits will come changes in the economic structure of the area. Community leaders need to be prepared for those changes.

Suburbanization and the Rural Population

The second major demographic factor which will affect non-metropolitan areas is the strong American desire to live a suburban lifestyle. One cannot help but be impressed by the fervor with which people in survey after survey express their desire to live in lower density surroundings, and by their success in attaining this goal.

The generation now forming households and making residential location decisions, for the most part, grew up in the suburbs of the metropolitan areas. They place a high priority on retaining this style of life, but often find that it is beyond their means. Housing prices are just too high. So many move further away, choosing to continue that style of living and family life with a longer commuting distance or limited employment opportunities rather than choosing the package of amenities, lifestyle, and employment opportunity offered by the urban area. The recent improvements in the quality of services offered in the nonmetro areas have accentuated this trend, making the nonmetro areas even more attractive.

ERS needs to pay careful attention to this trend. The forces for suburbanization are creating an interaction between urban and rural areas that is continually redefining the role of non-metropolitan areas. How important is the job location in determining the place of residence? What are the national tradeoffs between suburban growth and continued growth of the agricultural sector? What about the tradeoffs between suburban growth and continued national growth? The long-term effects of present policies with regard to planning, zoning, and development on the rural-urban fringe deserve more detailed analysis.

Interregional Migration and Rural Population

The final demographic factor that needs to be considered in defining a role for rural America is the trend for both workers and industry to migrate to the South and West. Some attribute this movement to the lure of the warmer climate.

We need better information on what influences migration, and on the relative costs and benefits of interregional migration. Any appraisal of rural economic opportunities without a thorough examination of the migration issue would be incomplete.

We also need to be aware that the migration from the more industrialized North to the more rural South is going to create a new set of problems. Questions about the effects of growth on small towns will become more urgent while those concerning the

impact of decline on small farming communities will receive lower priority. We will have to break away from some of our stereotypes of rural development.

CONCLUSION

In this paper we have identified three broad topics for future research emphasis. The effects of the changing energy situation, stricter environmental regulations, and rural in-migration are reshaping the structure of the rural economy and the role that rural America plays in the national economy. Each of these factors needs analysis before planning can be done to minimize the adverse effects such change may have.

Given more space, we would have included several other issues. Two long-term matters are particularly important. The first involves implications for rural economic opportunity of increased American food production for the world market. The second concerns the failure of traditional economic development programs to improve the welfare of the rural poor. Economic opportunities in rural America have not been equal, and research is still needed on methods of directing the benefits from national programs designed to increase economic opportunity to those ethnic groups and geographic areas with the greatest need.

ERS also needs to be prepared to analyze two current policy issues: Welfare reform, and a national employment policy that utilizes the public sector as an employer of last resort. Both of these programs have enormous implications for rural areas, and when enacted they could easily be the largest single force determining changes in rural America during the next decade.

Finally, both authors feel a need to call for the development of additional forecasting models for use in rural development work. Although models are discussed only in the environmental section of this paper, development of models capable of estimating the effects of proposed policies on rural population and income also requires consideration. Models similar to the TRIM simulator of the Urban Institute, which simulates the effect of changes in taxes or transfer payments on the incomes of individuals, could be developed to focus on rural rather than urban areas. Such models would greatly increase our capacity for short-term analysis.

Review of: **ECONOMIC OPPORTUNITY IN RURAL AMERICA**

by
Paul W. Barkley*

Comments on a paper can take several forms. In one, the discussant simply agrees and says, "This is a good paper." In a second, he agrees but expands on some points that the authors did not elaborate. A third is disagreement that leads to vituperative reaction. Professional feuds may develop that are often damaging to all parties. A fourth style is a simple statement by the discussant that he finds little to work with in the original paper, so he writes one of his own.

I find myself in the last category. There are some good points in the Stinson-Cook paper, each of which will be mentioned. However, little of the material is truly future-oriented. The paper provides no guide to what ERS should do other than to prepare for the inevitable, and the inevitable is defined in an ambiguous way. Stinson and Cook couch everything in terms that say "maybe something might arise." This is hardly justification for ERS to continue its rural economic development activity nor does it give much clue to how that activity should be organized in the future.

Stinson and Cook correctly note that interest in community development and rural industrialization has waned in the past decade. After the activist 1960's attention focused on the difficulties felt by the national economy. The human misery in rural areas is just as great as ever and if the Federal Government has responsibility for alleviating this misery, ERS should become more involved in studies of rural economic development.

The problems of rural economic development can be regarded in different terms. The action agency views the issue as one of felt needs, while the researcher sees it as a deviation from optimum. The authors of the paper choose not to use either of these schemes but to take three fashionable economic problems and bend rural development to fit their molds. It is true that energy issues, environmental considerations, and population shifts will affect rural areas; but these are like scores of other events that have brought change in the past two centuries. The difficult task is understanding how and when rural areas create economic incentives and disincentives and how people react to them. Those

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working in rural development have seemed to ignore these aspects in their efforts to improve sewage systems, deliver improved health care, and maintain antiquated public transportation systems.

Stock and Flow Resources in Rural Areas

Despite ambiguity in definitions of stocks and flows, these terms provide a useful starting place for an inquiry. A stock resource is an inventory waiting to be used. Petroleum, minerals, and forests near their climax stage are stocks. A flow resource does not wait for use, but passes by. It is used or it is not used. In nature the stock resource is not usually renewable; the flow resource is continually renewed—sometimes in a daily cycle (sunlight), sometimes annually (the growing season). Rural development economists, many of whom were originally trained in natural resource economics, would do well to recall this distinction.

Rural America is filled with both stock and flow resources. There are huge stocks of man-made capital ready to be utilized. The rural areas have vacant storefronts, unused sidewalks, underutilized water systems, and increasingly, underutilized school systems. Some of these collections of resources have resulted from selective depopulation. Others have developed because of indivisibilities in capital goods. These unused stocks pose two problems for economists. One relates to efficiency, and the other deals with distribution.

A once prospering town fallen into economic decay has unutilized or underutilized stock resources. Since the stock of capital fixed in the town is immobile, opportunity costs drop to near zero and disequilibrium arises between unused stock in the rural area and used stock in some urban locale. This disequilibrium represents an economic opportunity in three parts. Part one concerns finding the disequilibrium. Part two deals with measuring its extent, and the third part with inducing factor owners to redistribute economic activity to take advantage of the opportunity.

A rural area in the Northern Plains may have large volumes of man-made stock resources in the form of unused social overhead capital. Since social overhead capital is designed to enhance the productivity of private capital, the ability of the Northern Plains to increase rewards to capital invested in factories, machines, and other forms of private capital may be high. These potential rewards may be obscured by a visible structure of freight rules, a perceived locational disadvantage, and an idea that no significant labor force resides in the area. These apparent disadvantages should be regarded as hypotheses for research rather than as fixed obstacles.

A capable research group could design analysis to ascertain the

nature and magnitude of the man-made stock resource disequilibrium that exists between New Jersey and Wyoming, for example. The group should look into the economic advantages of the rural area and its ability to use existing stocks. It should also examine the disadvantages that must be suffered in relocating productive activities in rural areas.

Studies of the differential productivity of various factors would be more useful than the usual studies on factors affecting plant location which have been sponsored by ERS and by the experiment stations for many years. It is of less interest to know why plants locate where they do than to know how much advantage can be taken of underutilized, fixed-in-place, man-made capital.

Stock resources in rural areas are probably responsible for the grossest forms of disequilibria between the rural and the urban economies, but the flow resources—mainly people—bear the burden of lowered incomes and lost opportunities. This is because the stocks depend upon the flows or are tied to the flows because people hesitate to take risks when knowledge is scarce. A century ago the problems were less severe because stocks were not yet accumulated. Risks on the frontier were high, but those who left the East to homestead did not leave much behind. Today, staying in place may offer limited prospects for the residents of Appalachia or Northern Idaho but even these certain prospects look better than perceived risks involved in moving to Chicago or Dallas.

As the flow resources become increasingly static, the rewards to them diminish. Movable capital leaves the area, natural stocks run down, and productivity of labor drops. The President's Commission on Rural Poverty did a splendid job of describing poverty in rural areas, but failed to link the causes of poverty to opportunity and to the various forms of capital that can give rise to opportunity. Consequently, this task remains a field for research.

Income Distribution

Income distribution is connected with both the ownership of stock resources and the ability to produce useful flows of factor inputs or products. The most obvious income problem is that of the indigent, the elderly, and the low-skilled unemployed. These people have few economic opportunities other than income transfer programs. To date, national income transfers have bypassed the rural poor because of the high costs of certifying and servicing poverty-stricken rural residents.

Stinson and Cook correctly note that the future of many rural areas depends upon social security checks, unemployment checks, and disability checks. These transfers should be considered as much a part of the economic base as forest, topsoil, and exploitable minerals. The difficulty lies with program adminis-

tration in rural areas. Public transfer programs are expensive and often suspect in rural areas where recipients, however deserving, are visible to peer groups and subject to their pressure.

The ironic twist in income distribution comes in the relationship between stocks and flows. The owners of private social overhead capital and private economic overhead capital may enjoy a handsome current income from this ownership. As time passes and as community decline sets in, the current incomes from such capital may remain high for some time. This leads to false expectations about the future and unwarranted investments in additional fixed capital are often made.

In many rural areas, the causes of maintained current incomes and of reduced future earnings are just beginning to be understood. This problem is particularly severe in the retail trade sector and, if Stinson and Cook are correct in their assertion that population will be moving to the rural areas, the retail trade sector must come under closer scrutiny.

Most researchers on retail trade have estimated the size and shape of service areas, conducted economic base studies, and made superficial counts of what services are available and what are not. This is not sufficient. The retail sector will be seriously affected by changes in energy supplies, environmental legislation, and population distribution. Stinson and Cook hint at this but never develop it as a topic deserving the attention of say industrialization. This is a serious omission. Scores of people and agencies are asking questions about retail trade in rural America, which is essentially virgin territory for rural economics research. Stinson and Cook should not have overlooked this in a commentary on the future.

Back to Stinson and Cook

Although the temptation to continue my own paper is hard to quash, I now turn to some specific comments on Stinson and Cook.

The authors of the paper seem to be describing what is already upon us rather than looking at the future. Their views of present problems are, moreover, somewhat disappointing.

They talk of restructuring agriculture to use less energy. This may happen, but long range planning in this Nation continues to emphasize substituting capital goods for labor in production. Even if temporary interruptions should occur in this trend, the centralization of control of agricultural production is likely to continue, with fewer people becoming involved in the direct production of farm products. If labor use is intensified, it is more likely to occur in agricultural processing and this may imply more rural employment opportunities. The direction for research is clear. Where on the road from farm to market, will labor first

substitute for fuel-using capital? Will it be close to farm production, market outlets, the fuel source, or the labor supply? The answer is unknown, but as long as the energy crisis exists, we need to come to grips with the problem.

Rising energy prices are causing U.S. citizens to rethink the problem of where households should be situated. We do not know whether aggregate energy costs for the economy would increase or decrease if population were arranged more evenly across the Nation. Moreover, it cannot be assumed that energy is the appropriate variable to use in designing the optimal distribution. Determining the proper criterion and the role of energy in the optimizing function is one of the questions. An answer will involve a second series of problems: What is the energy cost and the total capital cost of rearranging people into the lowest energy cost mode of dispersion? The costs of relocating roads, utility lines, and even trivial public services may be much greater than the savings in annual flows of energy—another irony related to stocks and flows. Stinson and Cook should not have missed this point; for in missing it, they indicate a failure to look beyond the immediate crisis.

In demography, the authors pick up the current theme that says the century of movement to the cities is over and that people are now moving back to the country. This may be true. In many areas, one is hard pressed to find vacant houses, and town populations have increased.

But the final evidence is not yet in. Where did these people come from and why did they decide to settle where they did? Beale, Fuguitt, Zuiches, and Dillman have each speculated about these things, but they have missed on the simple questions: Why would they repeat the move? Would 30 percent of the population prefer rural America if it knew that 30 percent of its present neighbors would be there, too? I know of no one who has successfully joined the issue. This issue again brings attention to the retail trade sector and turns us back to the ironies of the relationships between stocks and flows.

The most interesting point in the Stinson-Cook paper is made about the role of rural America in the national economy. At the outset, the authors suggest that few people care about the future of rural areas—that it is a dead political issue. Later, they suggest that rural America has a definite role to play in shaping the entire economy. The two are not necessarily inconsistent. Rural areas are responsive to what happens in the urban sectors. But it is unlikely that a policy for rural development would have a noticeable impact on the urban areas. It is unlikely that this urban dominance will be changed. Rural development research is for the rural area; not for the Nation.

ERS and Community Economic Development Research

More than a decade has passed since I was employed by ERS. At that time, I was continually impressed not only by the work done in response to Congressional inquiry but also by the work done because no one else would do it. In this latter capacity, ERS became involved in asking questions that no one else dared ask and in inquiring about impacts that seemed superficial. Although times are different and the tempo of change has quickened, I do not think it irresponsible to ask ERS to continue to do research on questions of rural economic opportunity. These questions need not be—and should not be—the simplest ones related to energy, the environment, or to population shifts across the Nation.

ERS's unique advantage is its capacity to work at the national level, to marshal data sources not usually available to other researchers, and to be in close to the Nation's policymaking mechanism.

Even though public interest in rural economic opportunity has been dwindling, the problem persists. To ward off the possibility of the problem becoming unmanageable, ERS must increase its competence in this area. It must uncover problems and solve them in their first-, second-, and third-round effects.

This kind of future is not understood or even approached in any meaningful way by the two authors. Rather, it comes from a careful examination of what we know, of what we suspect, and of what we do not know. Research in rural economic development calls for broad programs led by the most innovative minds in the field.

Review of: ECONOMIC OPPORTUNITY IN RURAL AMERICA

by
Robert Coltrane*

Stinson and Cook begin with two important observations for the ERS researcher. First, policies on rural development evolve out of the political process, and second, the researcher's major responsibility is to supply, often on short notice, information needed by policymakers.

Their second observation, defining the responsibility of researchers in public policy formation, is especially relevant. It has two major implications for researchers planning a forward-looking research program for ERS.

First, the researcher should anticipate information needed in terms of the policymaker's conception of problems and solutions. This means that researchers must understand the policymaker's point of view.

Second, the research program should provide for thorough analysis of existing and developing problem situations, and take account of causal factors and corrective actions, not readily apparent from casual observations. The policymaker may not see the need for such information because he is unaware of particular relationships. Thus, special efforts must be made to transmit research results to the right individuals and groups.

This is an appropriate perspective for discussing the research needed on problems associated with economic opportunities in rural areas. Therefore, I am surprised to find that the authors occasionally stray from this perspective. Moreover, I am especially concerned about some parts of their approach to rural development research.

Stinson and Cook state that major parameters influencing the economies in rural areas, and presumably the range of opportunities for individuals, have changed in recent years. They further assert that ERS needs a major research effort to estimate the impacts of these changes on rural communities. Without this effort, they contend, ERS will find it difficult to fulfill its role of a provider of information to policymakers.

I see little reason to argue with these observations or with most of the specific issues the authors discuss. But I do see room for questioning their expressed purpose for doing the research. First, they state that rural development research results should be used

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to define or redefine the *proper* role for rural America. It is unclear as to whether researchers alone should determine the role, or whether inputs from policymaking groups and citizen groups should be sought. In any event, these statements seem to conflict with the division of responsibility between researcher and policymaker implied in the first part of the paper. Second, the authors conclude that it is premature to develop information for policy and programs without first knowing the proper role for rural America.

What exactly do they mean when they say that the role for rural America must be defined before research pertaining directly to economic opportunities has any relevance? Do they mean that researchers should have a notion of what conditions should be like in rural areas to serve as a guide for formulating researchable hypotheses? If so, I agree with them. Or, do they mean that rural areas should have a unique mix of economic activity and a population distribution to perform this function that ERS should determine? The need for ERS to determine the optimum distribution of economic activity and population in nonmetro areas, given higher energy prices, is a point of emphasis throughout the paper. However, if this is necessary, it would be essential that the optimum distribution in metro areas be ascertained because of inter-area linkages.

If this concept of optimization is to be employed, it would seem necessary to have a general equilibrium theory of national economic development and growth, including locational or spatial functions. Otherwise, one could not construct a meaningful objective function for nonmetro areas.

The optimum distribution requirement creates a difficult set of theoretical problems for the researcher to solve. Present growth and development theories do not include the features necessary to determine the optimum distribution of population in nonmetro areas.¹ Still, one must ask whether a general equilibrium model for regional or rural development would be valid and useful even if formulated. Myrdal says such a model could not explain changes in the economy:

The notion of stable equilibrium is normally a false analogy to choose when constructing a theory to explain changes in a social system. What is wrong with

¹Development planning models are available for determining optimal regional-sectoral distributions for reaching employment or income targets. These models may be useful in simulating growth sequences, but they do not provide information on the dynamics of economic growth or the development of human resources, which influence economic opportunities. See Richardson, Harry W., *Regional Growth Theory*, John Wiley & Sons, New York, 1973; and Ginzberg, Eli, *The Human Economy*, McGraw Hill, New York, 1976.

the stable equilibrium assumption as applied to social reality is the very idea that a social process follows a direction—though it might move toward it in a circuitous way—toward a position which in some sense or other can be described as a state of equilibrium between forces.²

The changes that have occurred in metro and nonmetro areas in recent years are solid evidence that neither the economy nor the population distribution tends to reach a stable equilibrium. For example, following the end of World War II, the number of people living in rural areas declined as large numbers of people moved to the urban areas. Recently, the migration trend appears to have reversed. During 1970-73, nonmetro areas gained population at a faster rate than metro areas.³ In addition, nonfarm wage and salary employment increased faster during 1970-76 in nonmetro areas than in metro areas. The larger growth rate in nonmetro areas meant that these areas had a larger share of total U.S. nonfarm wage and salary employment in 1976 (25.7 percent) than in 1970 (24.3 percent).⁴

As researchers in the field of rural development, we need to identify the forces influencing changes in the economy and incorporate them into our research and into our dialogue with policymakers and others interested in rural development. We need to concentrate especially on the conflicting forces.

Four of the more important conflicting forces underlying rural development efforts are efficient use of resources, equity among individuals for access to productive resources and consumption items, economic growth, and environmental quality. Stinson and Cook discuss the conflict between economic growth and environmental quality, as well as some broad research issues concerning tradeoffs between the two forces. The efficient use of resources seems to occupy most of their discussion about a role for rural America, and the need for an optimum distribution of economic activity and population. However, the authors failed to give equity forces much consideration in their framework. Once equity of opportunity is considered, the concept of an optimum distribution of population to maximize or minimize some national aggregate assumes a different meaning than when only efficiency criteria are used.

This discussion has centered on some basic problems in Sti-

²Myrdal, Gunnar, *Economic Theory and Under-Developed Regions*, Harper & Row, New York, 1971, p. 13.

³Beale, Calvin L., *The Revival of Population Growth in Nonmetropolitan America*, U.S. Dept. Agr., ERS-605, 1975.

⁴These data adapted from State Employment Security agencies' estimates. They are based on changes from March 1970 to March 1976.

nson's and Cook's approach to rural development research. Their approach implies strongly that rural areas are little more than productive units in the national economy and that people are inert participants. The assumptions of this approach are too restrictive for analyzing locational decisions of firms, employment relationships, manpower development processes, and residential preference decisions.

I fully agree that we need to examine our analytical models and frameworks of analysis. There is a lot of room for improvement. However, I do not think that we should wait until we have general agreement on the role rural areas should play in the Nation's growth before we study specific problem areas for the purpose of developing information about economic opportunities. After all, it seems more constructive to speak about ways of broadening options for people than to determine their optimum distribution.

Review of: ECONOMIC OPPORTUNITY IN RURAL AMERICA

by
Lynn M. Daft*

Most of the Stinson-Cook paper is devoted to describing and justifying the need for ERS research on three topics: the effect of higher energy prices on industrial and household location, agricultural employment, and the production of energy in rural areas; the effect of environmental restrictions on agriculture, rural industry, and the demand for nonmarket goods; and the effect of retirees, suburbanization, and interregional migration on rural demographic trends.

On the whole, I would give the authors high marks, both for their choice of topics and for their treatment of them. Few would argue that the forces identified in this paper will not play a significant role in shaping the economic and social character of rural areas in the coming decade.

However, two aspects of the paper give me some trouble. One is the absence of policy justification for the recommended analysis. The paper contains numerous statements about the need to better understand various relationships and effects. But "why we need to understand" isn't made clear. This is not to say good reasons could not be offered. Indeed, some are intuitively obvious. But intellectual curiosity is not enough, particularly for an analytic unit serving the public policymaking process. Answers to many of the questions raised in the paper would be highly useful. They would be even more useful if they were identified and placed in a policy context.

This raises an old and vexing problem. What should be the role of economic development research in USDA? To what extent should the research agenda be influenced by the informational needs of the policymakers and administrators of the USDA development programs? Historically, they have had little influence over research. In fact, one might argue that agencies outside USDA (for example, the Office of Economic Opportunity, The Appalachian Regional Commission, and the Economic Development Administration) have exercised more influence through the use of contracts than have those within the Department. The absence of any extensive development-program responsibility in USDA is partially responsible for this.

In the last few years, however, Department responsibility in the development field has increased significantly. The President's fis-

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cal 1977 budget requested \$314 million in outlays and over \$6.4 billion in loans for industrialization, community facilities, housing, electrification, and telephone programs. In light of these amounts, there would seem to be merit in rethinking the inter-agency relationships. And, if a stronger linkage with USDA program administrators and policymakers is desired, they should be included in the deliberations over fashioning a future research agenda.

The other misgiving I had about the paper was the narrowness of its scope. As the authors acknowledge, there are a number of other issues that might have been added to the list had they taken a more general approach. They mention two: the implications for rural areas that increased U.S. food exports might have, and the income distribution effects of economic development programs. Others range from the developmental implications of a changing transportation network to the community effects of continued economic change in the agricultural sector. The latter issue extends beyond the effects of higher energy prices or expanded exports alone. Though I hold no brief for these particular topics, I see advantage in considering a broader range of research options. Perhaps the Stinson-Cook paper will feed into a process wherein that will be possible.

Tying an extensive research program to higher energy prices and environmental regulations carries an element of risk. Both issues are based on the effects of governmental decisions. In the case of higher energy prices, most of the key decisions are made by foreign (OPEC) governments, and are subject to change that is sometimes quick and drastic. This does not negate the importance of evaluating effects of such decisions, but it suggests caution in allocating research resources dealing with associated questions.

There is another more fundamental set of policy questions that must not be ignored in fashioning a research agenda for the future. The most basic concerns the role the Federal Government should play in furthering regional economic development. Another question is: What role should USDA have in administering programs relating to regional economic development? These may be unanswerable questions. At least the answers must be expected to change as circumstances change. These are difficult questions for a research organization to deal with because of their political ramifications. Still, if meaningful debate of public policy involving economic development occurs, they will be near the cutting edge. There has been little serious debate of the subject in recent years. Perhaps more input from ERS would improve the caliber of such debate in the future. I can think of very few organizations within or outside of Washington that are as well equipped as ERS to handle this basic issue.

RURAL DEVELOPMENT— A ZERO-SUM GAME?

by
Alan R. Bird*

Wage-price inflation and high unemployment persist in the 1970's, despite continuing monetary and fiscal measures. Can rural development help alleviate this situation? What are the pros and cons of alternative public measures? This paper outlines these questions and explores their implications.

NATIONAL ECONOMIC CONDITIONS IN THE 1970's

The 1970's rival the 1930's as a climactic economic period. In the early 1970's, the United States and other developed countries first felt the joint effects of high wage-price inflation and high chronic unemployment rates. These conditions persist although the United States has been less severely affected than most other economies (8,17).

Several unusual circumstances accompanied these economic setbacks. Examples include the oil embargo and the energy crisis; bad crop years in key food-producing countries; increased international trade, including state trading practices by major communist countries; and controversies associated with efforts to improve the environment.

Such unique, pervasive, and multiple aberrations, though momentous, are nonetheless explainable under Keynesian theory. In time, according to this viewpoint, increased real gross national product (GNP) and reduced unemployment would follow from application of monetary and fiscal policies.

However, use of supplementary measures can also be consistent with Keynesian theory. Such measures could significantly reduce the hardship for those most affected by inflation and unemployment and expand economic opportunities for many.

Even with containment of inflation and reduction in unemployment, millions of U.S. residents would still be below the official poverty level-of-living line. As a leader of the free world, the United States has an opportunity and an obligation to use her economic strength as a means of positively exercising that leadership (23).

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THE ROLE OF RURAL DEVELOPMENT

What are the contributions of rural people to national development? What more could they do? From the beginning, rural people have provided both the food and fiber for domestic consumption and the goods to trade for needed imports. Their continuing increases in productivity have released resources so that other industries and activities have been able to form and give rise to the many great metropolitan areas.

The same 1970's that first revealed intense wage-price inflation plus high unemployment also revealed major changes in rural areas. Although some of these changes are evolutionary, like farm enlargement and consolidation, some are discontinuities or other major shifts in resource use and living patterns. Parallel turnarounds in the composition of international trade and in international relations also involve rural development and rural products. After two centuries, what do these major rural turnarounds mean for national development? Are the recent positive effects of rural development being neutralized by perverse interactions with other sectors of the economy and with international markets, so that the net effect on real GNP is zero or less? Is rural development now a zero-sum game so that no net national benefits accrue? Is accelerating rural development more critical to national development than ever before?

REDUCED FLEXIBILITY OF MONETARY AND FISCAL MEASURES

Although novel measures may be devised, the discretion open to public decisionmakers in monetary and fiscal programs appears more limited than it formerly was. The level of government expenditures is already quite high. Some of the reasons are:

- A large proportion of the civilian budget is deemed "uncontrollable" since it fulfills open-ended social commitments of prior legislation;
- The Federal labor force—as a proportion of the total civilian labor force—has declined considerably in recent years;
- Some programs that previously involved direct increases in Federal expenditures now involve more private sector inputs through guaranteed or insured loan programs;
- A number of programs, such as storage and disposal of surplus food, have reduced or zero Federal expenditures;
- Continuation of high unemployment rates is likely to evoke public funding of emergency employment programs;
- The largest recent increases in government expenditures

have been State and local expenditures for education and welfare;

- Finally, meeting the competitive needs of a volunteer army in a nuclear age is costly, especially with continuing inflation.

At the same time, continuing wage-price inflation forces more income earners and property owners into higher tax brackets, thus reducing the scope for increases in public revenues.

Increasing or decreasing the money supply and affecting interest rates up or down pose unusually complicated problems throughout the national and world economies. Thus, it is not surprising that economists like Milton Friedman and Arthur Burns favor a relatively stable rate of expansion in the money supply more or less in step with the rate of increase in real GNP (5).

These factors all place a premium on considering other economic measures to stimulate national economic growth.

MONITORING THE CONTRIBUTION OF RURAL DEVELOPMENT TO NATIONAL DEVELOPMENT

Little theory exists to provide guidance on other measures to stimulate national economic growth through rural development. Fragments of theory and other comments are available (10). A systematic monitoring of likely major factors and interactions seems called for. Some of this monitoring could involve comprehensive systems such as Leontief's well-known models (14). Yet it seems urgent to supplement these with other analyses and observations.

This paper suggests a specific annual report on rural development to be produced by ERS staff in cooperation with State universities and private research institutions. Members of the staff might serve on a rotating basis. An initial trial draft might be developed by ERS staff alone.

The report would address the general subject of the economic and social contribution of rural development to national development. It would focus on identifying, screening, and evaluating priority interactions between rural development and national development and would surface both policy issues and research and staff activities in a national context.

The report would be professional and serve as resource material for the development and modification of legislative and program proposals and actions, for the Secretary of Agriculture's Annual Report on Rural Goals, for the President's Economic

Report and the Manpower Report, and for other ongoing reports, such as ERS' own Situation and Outlook Reports.

The first draft of this report would focus on those actual and potential contributions of rural development which help to combat and overcome wage-price inflation and high unemployment while ensuring every citizen a socially acceptable minimum level of living. It would follow the ramifications of changes in economic and social activities in rural areas through the remainder of the national economy. International trade and feedback effects would also be examined so that problems could be specified and solutions suggested.

Supplementary activity might be to produce a periodical comparable to *Agricultural Economics Research* and addressed to the same general purpose.

A PRELIMINARY SKETCH FOR AN ANNUAL REPORT

The following discussion sketches out three major possible rural contributions to containing inflation and accelerating economic growth and employment. These contributions include: supplying relatively low-priced or abundant food and fiber; supplying relatively low-cost, varied, and novel lifestyles; and supplying relatively low-priced or abundant energy.

Success in these activities would prompt rural areas also to demand increased quantities of goods and services produced elsewhere. This would further facilitate employment without undue inflation.

ABUNDANT FOOD AND FIBER

The early 1970's have seen an unprecedented turnaround in many aspects of rural living and production. In part, the question of how best to foster synergistic effects becomes one of capitalizing on changing trends.

Record quantities of U.S. food and fiber have come with relaxation of U.S. production controls, but some added constraints, such as environmental controls, have had a counterbalancing effect. These increased quantities of food and fiber have been sold, at record high prices because of unprecedented and sustained world demand. The U.S. ability to provide these foods, particularly grains, has enhanced both our general trade position and our relations with some food-deficit countries. The extent to

which this strong international demand for food will be sustained is controversial and an urgent topic for continuing research.

Prudence dictates both a consideration of the consequences of a lower future rate of gain in product prices and of increasing price variability. Moreover, transmission of the effects of extremely high food and fiber prices—overseas, within the national economy, and back within agriculture itself—has cost effects which redound to the disadvantage of the farmer as well as the overall economy.

Sustained increases in food and fiber prices are likely to cause further increases in the prices of most other goods and services, including prices of purchased farm inputs. These additional increases feed a further round of increased food prices, probably with some reduction in farmers' net income, and so contribute to inflation, even with high unemployment. Labor-union wage agreements tend to include allowances for cost-of-living increases. Food, housing, clothing, and furniture are major components of these living costs. Successive agreements should be analyzed for the "snowball" effect as large corporations pass on cost increases.

Some employee groups, such as Federal Government employees and retirees, although not unionized, receive wage and salary increases based on comparability formulas. Many State and local government employees are now unionized, so that an agreement on a new (higher) contract in one jurisdiction can easily induce a ratchet effect.

Wage adjustments that respond to increased food and fiber prices tend to fan further inflationary rounds.

Housing prices tend to be particularly responsive to wage and other price increases. On the supply side, both labor and material costs for construction increase. Zoning regulations and restrictions on sewer hookups limit supply. Changing demand conditions can accelerate the appreciation of housing, especially in suburban areas. About a fifth of all residents change houses each year. Included in these movers are significant numbers with salaries adjusted for living costs, some of whom are entitled to Veterans Administration (VA) and other preferential financing. With VA financing, little or no deposit is required and the seller commonly pays "points" to further facilitate the sale. And, of course, the interest payments are tax deductible.

Only a very few such sales are needed to inflate the value of all homes in a neighborhood. The common realty practice of using comparable recent sales and providing computerized data can accelerate the rate of price increase. The continued escalation in the price of housing itself strengthens the demand because of expected further inflation. Partly in response to this inflation of housing costs, mobile homes have recently represented a quarter

to a third of all new non-SMSA¹ housing completions (2). Relatively short-term, high-interest mortgages for mobile homes have further inflated housing costs. These inflated housing prices are built into cost-of-living indexes to fan a further round of wage increases.

A third significant factor causing intensification of labor costs is the tendency for reduced competition for senior jobs. This occurs because many large organizations, public and private, have perquisites, such as retirement, health, and vacation benefits, that discourage crossing organizational lines to seek a new job.

What more could be done to slow the increase in farm input costs? For example, limited oil exploration leases on the Continental Shelf are allocated by means of a lottery, as are some grazing and farming leases outside the United States.

In cases where neighboring farmers compete for local (limited) land, is some modified form of lottery feasible to contain cost escalation? Could the sellers of such land be forgiven capital gains tax provided the land were sold for farm enlargement or addition under some specified ceiling price? Since sellers are the main source of credit for farmland purchases, is there special scope for containing land prices through credit guidelines?

To what extent is the cost of farmland being contained by the practice of separating the farmhouse with a few acres for use by a farm or nonfarm worker? Could more public lands be leased to expanding farmers and ranchers at rates that would not inflate land costs? To what extent and at what net cost can the productivity of farmland be upgraded by use of urban waste products and other technological and institutional breakthroughs?

How could labor costs be contained or reduced? Some reduction since 1970 may have come through increased productivity as a result of an unprecedented decline in the median age of farmers. However, this may be more than offset by the trend toward extension of minimum-wage legislation and unionization to farms, especially since the number of farm wageworkers has stabilized (7). The longer-run answers to this question appear particularly critical. With decreased population in some key farming regions, maintaining an adequate supply of high-quality labor may depend increasingly on the clustering of population to facilitate a more varied social life and the economical provision of education, health, and other services. What is the scope for promoting such clustering through encouraging farmers and their employees to commute to the farm? What modifications of public programs would enhance the feasibility of this clustering?

¹Standard Metropolitan Statistical Areas (SMSA).

In what ways can other farm input costs be contained or reduced? The land-grant system, USDA, and others will, of course, continue to produce improved technologies, some of which will be cost saving. Competition for water can be expected to rise, particularly through the increased demands for electricity generation. Increased demand for water is likely to be greatest near present and expected major centers of population—generally at or near the coastlines, including the Great Lakes. One basis for a significant increase in water supply—a cost-effective desalination process—would tend further to concentrate expansion of food production and metro and nonmetro settlements at or near coastlines. What is the status of this technology?

Increased farm input costs (and indeed, other factor cost increases) are a response to increased product prices. Would it be more effective, therefore, to intervene directly to limit product price increases and so contain the extent of successive increases in input costs? To a limited extent, grain embargoes have had an equivalent effect; how successful were they? What are the implications for further price containment?

LOW-COST, VARIED, AND NOVEL LIFESTYLES

The 1970's have seen an unprecedented turnaround in population distribution (*1*). Population growth rates are increasing in virtually all nonmetro areas and in metro areas of less than 750,000. Population growth in larger metro areas has slowed or declined. Farm population has stabilized and is getting younger. Reversing past trends, population in U.S. nonmetro counties grew faster from April 1970 to July 1974 than in metro counties—5.6 percent compared to 3.4 percent.

Nonmetro counties adjacent to metro counties increased population by 6.2 percent from 1970 to 1974. Nonmetro, nonadjacent counties increased population by 4.9 percent. These latter previously had rates of out-migration higher than for the adjacent counties. There are three main components of this turnaround:

- Climaxing 1960 trends, some 360 retirement counties accounted for somewhat less than half the 1970-74 nonmetro in-migration and grew by 14.5 percent since 1970.
- Counties with large State colleges intensified trends of the 1960's with a 7.1 percent 1970-74 growth rate, but may be peaking out.
- A number of other counties reflect varied industry patterns and perhaps a flight from the cities. Manufacturing comprised 50 percent of all nonmetro employment growth in the 1960's, but only 3 percent of the employment growth from 1970 to 1976.

Counties with high dependence on farming still have net out-migration.

Intensifying the trend of the late 1960's, mobile homes have comprised about one-third of all non-SMSA housing completions since 1970. Nonmetro housing tends to be more dispersed, with more people opting for open-country residences (2).

Nonmetro areas then, can be said to be experiencing an increased variety of growth and settlement and a locational pattern of housing and nonfarm businesses that could be termed "exploded urbanization." The implications for significant (inflationary) increases in the per capita cost of community services is a major unanswered question.

An important subcomponent is the cost of alternative ways of providing community services to a dispersed farm population. Those farm families most remote from town also have the least opportunity for nonfarm income through wagework. Great Plains counties on the periphery of multicounty districts (and thus furthest from urban centers) consistently showed slower increase in family median income from 1950 to 1970 than their more urban neighbors.

LOW-PRICED OR ABUNDANT ENERGY

Energy costs and the costs of energy-intensive inputs are likely to rise more rapidly than prices in general. At the same time, it is difficult to conceive of commercial food production becoming much less energy-intensive. Rural areas still have a significant opportunity to increase the supply of energy, particularly electricity. Increasing the coal supply while facilitating multiple use of land and water is a possibility already under study (15).

Other energy issues offer scope for staff input through summary situation statements and task force activities, although the role of research is less well defined. Increasing the supply of power plants offers nonmetro areas promise of a major role in containing inflation. First, a large but debatable number of new power and expanded power plants will be needed in the next decades to meet the projected national electricity demand. With presently known technology, both coal-fired and nuclear plants will be needed. Most of these plants will be sited in those nonmetro areas situated near metro areas. Their construction and operation require a long lead time—up to 10 years—and that lead has been increasing. Primarily because of environmental hazards, community resistance to these plants has increased (12).

Is it possible for these communities to enjoy both safety and electricity? In other words, could the concentration of food and

fiber production around such plants provide a safety and health buffer that would facilitate community, State, and industry agreements on power plant sites, in addition to facilitating multiple use of water and waste products?

An alternative breakthrough that could reduce the demand for centrally-generated electric power and maintain environmental quality is in the conceptual stage. It comprises a device which harnesses solar energy, and is thought to be capable of servicing the electricity demand from about 30 residences or equivalent usage. Clustering of rural residences—including the possible relocation of residents of small farms into such communities—would offer promise of capitalizing on such a device.

NONMETRO DEMAND FOR GOODS AND SERVICES

Provided containment of inflation can be achieved through such measures as the three identified above, a strong and efficient nonmetro economy could provide a strong and expanding market for goods and services produced in domestic metro areas and in foreign countries. Accordingly, an increase in employment and the introduction of significantly new lifestyles would result. Depending on the extent to which the three prior rural contributions to national growth could be assessed, estimates of this latter contribution could be made with increasing rigor.

CONCLUSION

In 1967, Bishop (4) pointed to the urbanization of rural America as a significant emerging trend that would inextricably link farming and other rural activities with urban activities. He pointed to the likely need for agricultural economists to refocus and to take into account more macro problems and dimensions other than economics. Again in 1976, he stated that to be viewed meaningfully, rural development must be seen as a necessary element in national development (3). This theme also circulated through the 1976 annual meetings of the American Agricultural Economic Association and the Northeastern Agricultural Economics Council (10,11,20). Bishop further stated that, until a national development policy is formulated that can be translated into specific goals, we are likely to continue to treat the problems of social and economic organization as secondary to the problems of organization for the production of goods.

This paper has tried to extend these ideas. It has identified rural areas and rural development as significant historical contributors to national development and has explored their role in combating chronic wage-price inflation and high unemployment rates. The concept of rural development is somewhat broader than that used by Bishop. It embraces both the provision by non-metropolitan areas of better and more varied places to live and work and the efficient provision of goods and services, notably food, fiber, and energy. As with any definition of rural, this one is arbitrary. In particular, it may be noted that metropolitan areas are also significant food and fiber producers and the loci of varied lifestyles.

This exploration is preliminary and is not one that is best pursued alone. If pursued, the resulting reports may comprise part of a continuing staff activity to support coordinated decisionmaking at Federal, State, and local levels.

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RESEARCH NEEDS FOR NONPOINT POLLUTION

by
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Public leaders have voiced a variety of pollution concerns, well amplified in the news media, and legislators have responded with strong budgetary and legal commitments to deal with water pollution problems, including those from nonpoint sources. The importance of water pollution is accentuated by Section 208 of the Federal Water Pollution Control Act Amendments of 1972, with its requirements for State identification of nonpoint sources and for corrective measures.¹

There is a need to determine where and how ERS can make a contribution. Resource allocations will undoubtedly be based on the potential for focusing national economic research on certain key issues. These will be to protect producers and consumers of farm products from unnecessary burdens, while assuring optimum control levels for pollution from all sources.

Early identification of the working relationships of economists, engineers, and natural scientists is desirable if optimum nonpoint pollution controls are to be effective. Success will also depend on the prospects for organizing the diverse regional mix of nonpoint research needs to fit into local and national policy frameworks. This paper focuses on these two issues.

Dimensions of the Problem

Croplands, a fifth of the surface area of the contiguous United States, are the major geographic origin of nonpoint pollution. Runoff from these lands contains sediment, pesticides, herbicides, fertilizer nutrients, and animal wastes (containing similar nutrients plus organic material). Each type of pollution varies with the mix of crop and other land uses, location, precipitation, cropping patterns, temperature, conservation practices, and many other factors. The physical diversity of farmlands makes it difficult to trace pollutants to their origins.

Potential controls complicate matters by altering land uses if they change cost relationships. Even when the environmental, cost, and locational impacts of potential policies can be anti-

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¹Section 305 of this legislation is also relevant since it calls for estimates by States of environmental impact and economic costs and benefits associated with attainment of its objectives.

pated, economic benefits are difficult to quantify, even though very real. All of these problems vary greatly between regions.

Immediate Need for Economic Input

It is too early to know just what measures States will propose for controlling local nonpoint problems, but most controls are certain to affect costs and location of production. Consequently, nonpoint pollution from sediment, nutrient runoff, and pesticides can be meaningfully considered only in connection with detailed land use information.

Natural scientists and engineers are not well equipped for creating regional land-use data systems, nor are they able to anticipate shifts in the cost and location of production as resource owners respond to new State laws. This implies a strong need for collaboration with agricultural economists who have mathematical programming skills. Economists should be involved early in the research effort. Already modeling efforts by engineers might have been based upon land use data suitable for regional or river basin application if their interest in small area accuracy had been supplemented with soils and land use data systems of the mathematical programmer.

Timely agency emphasis on nonpoint pollution will enhance the chances for early coordination. Despite communication problems, there are good examples of multidisciplinary modeling success. Soil loss components of ERS mathematical programming models are relevant since these models include interactions between a number of physical and economic relationships.²

Nutrient models could be developed from a similar data base.³ Linear programming models for river basins across the country could be adapted to include relevant pollution components but only if it would be possible to obtain the needed links between economic planners and physical scientists.

State authorities need information from such models. If pollution from a particular cropping practice or land use is not quantified on the basis of very specific physical properties, pollution controls may involve considerable waste. These controls may be applied to lands where they are not needed as well as where they are. Identifying optimal controls for detailed soil, slope, location, and land use combinations is the basic research problem for anticipating effects of specific nonpoint pollution controls.

²Several ERS projects are underway at Ames, Iowa. See (2) and (3).

³Estimates of phosphorus losses have been made by using the sediment models and employing certain assumptions about enrichment ratios (5). However, the authors caution that biologically available phosphorus may actually come from quite different sources than sediment.

Identification of Control Alternatives

Economists must sometimes wait for natural scientists to define the environmental damage relationships before pollution control costs and benefits can be determined. For instance, in some North Carolina estuaries, it is not clear yet whether nitrogen or phosphorus is the limiting factor for algae blooms, one of the State's main pollution concerns. Since these two nutrients come from different sources⁴, economic research is hampered by not knowing what constitutes the most desirable control objective.

The Need for A National Perspective

A given quantity of sediment deposited in a waterway will cause differing environmental and economic costs depending on demands for water uses. These demands include recreational uses for fish and aquatic life, the number of water supply reservoirs, and similar variables specific to the area.

As local agencies look for acceptable means for implementation of Section 208 requirements, there will be some temptation to adopt models from other parts of the country. The tendency to allocate Section 208 planning funds among States without considering the differing magnitude of their environmental problems increases the danger that some States may invent restrictions that have a low marginal return.

Undertaking longrun research programs to solve pollution problems requires systematic study of the economic costs and benefits of pollution control. Even highly sophisticated programs for controlling pollutants can be tremendous wastes of resources if they are applied without proper consideration of program cost and benefits.⁵

Selection of inappropriate objectives for pollution control may even make other pollution problems worse. For example, reduced tillage practices that discourage sediment loss may sometimes increase pollution from pesticides and nutrients (5). In most areas there is not yet a sound basis for saying where no-till is inappropriate. This again emphasizes the importance of research and communication concerning specific local and regional goal selection.

⁴Porter, and others, find that nitrogen is dissipated as a gas from low, wet soils, while biologically available phosphorus is most inclined to enter the water system from "drained organic soils" where phosphorus has little opportunity to react with minerals (5).

⁵Bruce Ackerman, and others, described one example where hundreds of millions of dollars were allocated to control biological oxygen demand on a stretch of the Delaware River where this was the least of the area's environmental problems (1).

Defining Regional Information Needs

Early identification of insignificant nonpoint problems could save considerable planning resources at the State level.⁶ Broad regional descriptions of potential nonpoint sources might indicate to State planners areas which should receive emphasis, thus avoiding imposition of costly State controls having relatively low marginal return.⁷

More detailed data on water-quality cost and benefit relationships will be useful in the future to allow a more sophisticated definition of environmental quality goals. Much research remains to be done to develop damage functions for nonpoint pollutants. The detrimental effects of nonpoint pollutants on water supplies and on environmental recreation need particular attention. The quantitative identification of regional pollution control benefits is a relatively long-term research objective which is designed for use by policymakers in Washington.

The immediate need on the part of the States is for the broad comparisons that will indicate locations across the country where each type of pollution is most damaging, and thus, where further detailed research and planning effort is, or is not, required.⁸ In other areas, benefits of controls may prove to be unattainable at any reasonable cost. Although it is finally up to the individual States to define their own goals, they are guided by national legislation, and need to see their problems in relation to other parts of the country.

SUMMARY

Physical data on the basic sources of pollution and knowledge of costs to those affected by nonpoint pollution are both essential to determine the costs of control. Some regional pollution cost information is available and waiting for a systematic national program evaluating information needs. These broad regional needs should be defined without delay.

Meanwhile, many regional pollution problems are sufficiently well defined and are waiting for development of models concerned with specific control alternatives. Valuable time and

⁶Many States are operating at very elementary levels in designing Section 208 programs. For instance, Massachusetts planners have discussed basing dairy waste controls on a study of one farm.

⁷Ackerman notes that planners "may be understandably reluctant to conclude that the scientific fact gathering effort—however commendable an enterprise that may be—has not gathered information about the issues most relevant to economic analysis" (1). Thus, early technical decisions often unduly influence policy.

⁸The fifteen regions of the "National Land Use Regions" might be useful in this context (6).

research money will be lost if economists expect natural scientists to define pollution control relationships without guidance on how policy alternatives will impact on farm production, land use, and the mix of cropping patterns. There is a need for early assessment of regional nonpoint research priorities and for immediate involvement of agricultural economists in modeling efforts.

Longer-term nonpoint research goals include measurement of demands for water of varying quality. This will surely be required as policymakers seek to improve upon national water quality legislation to take account of regional differences in economic benefits from sediment or nutrient reduction.

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Abstract of: ECONOMIC IMPACTS AND NATURAL RESOURCE DEVELOPMENT

by
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This paper responds to one of the pressing issues facing the Economic Research Service, the development of studies to define and measure the effects of impacts associated with natural resource development.

The scope of research on the measurement of natural resource impacts is covered in a discussion of studies and evaluation results from Resource Conservation and Development Program (RC&D) projects. Much of the analysis has dealt with case studies which were formulated specifically to answer localized questions. These studies, however, were sufficiently representative that results could be generalized to other areas of the country.

The paper also notes impacts specifically derived from the context of operational features of the RC&D program itself. The most important aspect in this instance is an enumeration of results and lessons derived from evaluations over the past 10 years.

The paper concludes with a discussion of the kinds and nature of research needed for the future in light of a renewed national emphasis on increased economic activity necessary to create new income and employment and ERS responsibility for rural development studies.

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Chapter 8—

CLIENTS AND BENEFICIARIES

FORENOTE

This chapter includes a main assigned paper, four reviews, and three contributed papers. The main paper by Sayre and Stovall, distinguishing between clients and beneficiaries, examines the ERS Management Information System and finds that it pays insufficient attention to clientele. Clients change over time, and it is essential that research keep up with these changes. The authors survey researchers and find that the perception of primary client has shifted from private to public clients. But they discover a severe lag in adjusting communication to the new clientele.

The reviewers agree that the authors have contributed to understanding the problem. They raise several pertinent questions about the definitions of clients and beneficiaries. One reviewer suggests that good research starts with the specification of objectives and argues that the authors give too little attention to the relationship between objectives and clientele.

The contributed paper by Blankenship examines the ERS function of outlook. He discusses the degree to which he feels items such as price forecasts should be made available (to the public). He advocates as much openness as possible providing the analyses are sound.

Roney's contributed paper examines the whole set of relationships between researchers and information specialists. Roney interviewed a cross section of economists and information officers in ERS and reports their reactions. There is a general consensus that information officers should be more involved in research planning but opinions differ as to the extent of that

involvement. All agree on the need for improvement in audience identification, writing skills, and feedback.

Gum and Arthur propose a computerized system for making information on policy issues more readily accessible. They cite the recent predator control information system as a prototype.

ERS IN SEARCH FOR ITS CLIENTELE

by

James R. Sayre and John G. Stovall*

Social scientists of ERS have clients just as do doctors, lawyers, and insurance agents. But unlike other professionals, social scientists rarely meet their clients face to face and may not always be sure who they are.

USDA's former chief economist Don Paarlberg has noted that:

Energy, environment, and rural development have all been put in the agenda by groups other than those representing agricultural interests. As a result, our job of planning research is much more difficult. It is not clear who our clients are today but we must identify them (7).

As this implies, the client should in some way be closely associated with the formation of the research product. If this is not done, ERS may misjudge research priorities and fail to meet public and private needs for economic intelligence.

Clientele problems manifest themselves daily. Researchers are frustrated by the many demands for information that they are not able to fill. Information officers react to day-to-day crises. Both conditions are symptomatic of an ill-defined set of clients.

The ERS Management Information System (MIS) was developed "to facilitate the process of establishing priorities and implementing, managing, and evaluating the ERS program" (11, p. i). This basic management tool should deal with such a basic concern as clients. It does not.

We believe that:

- ERS has not defined its clientele very well.
- ERS should have a clear-cut system for the identification of clients.
- The composition and priorities of ERS clientele groups change.
- The ERS communications system should clearly define its clientele and design its products so as to maximize their utility to its clients.

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- In large measure, the future well-being and survival of ERS will depend on its ability to perceive clients and serve them equitably.

How will we identify the right client groups and measure their importance?

Shall we ask the Secretary of Agriculture? Of course. In fact, he is an important client himself. But he cannot be expected to answer the question fully. Indeed, he would expect any alert agency to tell him who it is serving and why.

Shall we depend upon our own leaders to spell out our clientele for us? Not even they have all the answers.

Congress? We'd better not face the appropriation committees admitting we do not know for whom we are in business (*12, p. 811*).¹

We are well advised by many groups but the final determination of who our clients are lies with us. Continual probing and questioning, in the manner of Drucker's "effective executive," is the key:

If a man wants to be an executive, that is, if he wants to be considered responsible for his contribution, he has to concern himself with the usability of his "product," that is, his knowledge.

Effective executives know this. For they are almost imperceptibly led by their upward orientation into finding out what the other fellow needs, what the other fellow sees, and what the other fellow understands. Effective executives find themselves asking other people in the organization, their superiors, their subordinates, but, above all, their colleagues in other areas: "What contribution from me do you require to make your contribution to the organization? When do you need this, and how do you need it, and in what form?"
(5)

Yet, from all the bases of consideration—political power, legislative mandate, common sense, public interest, moral beliefs—how do we sort out our concept of clientele?

¹Of course, Congress has something worthwhile to say on this point. Budget documents refer to users and beneficiaries. The report accompanying the appropriations bill for ERS says... "The Service develops and carries out a program of economic research designed to benefit farmers and the general public." Representatives of ERS are frequently quizzed on this topic in hearings on the appropriation bill.

CONCEPTS OF CLIENTELE

This paper will not attempt a grocery list of people or groups who should be considered clients. Clients vary by research program area, and gradually change as national issues evolve. To impose a static list on a dynamic situation would be neither wise nor possible.

Instead, we need to appreciate the importance of the task and to institute a systematic procedure for identification. Four years ago, ERS was advised that:

Management must be cognizant of the importance of instilling a "clientele consciousness" and appreciation of changing clientele values and goals throughout ERS to maintain a progressive, responsive agency (10, p. 14).

One concept is to say that anyone who finds our research useful is a client. But unless we assign priorities, this is to assume that our mission is to serve anyone and everyone who asks. This is not tenable for an organization of limited staff.

Motes, former Economic Development Division Director, spelled out three broad classes of clients:

- Those who have the power to tell us what to do: ERS Administration, Secretary's Office, Office of Management and Budget, Congressional staff, Congress, and so forth;
- Those who have development-related problems, and whose problems we can solve; and
- Other researchers—those whose numbers and analyses we use, and who use our numbers and analyses (6 p. 10).

Motes went on to say:

...we must recognize that every product cannot be a final product, directly helpful to an important outside group. And, we must invest in the research overhead to allow those products that are final products to be powerful and useful (6, p. 11).

One problem with Motes' concept arises between clients and what we might call beneficiaries. Are those in his second class really clients, or are they beneficiaries? Most MIS statements confuse us by using the terms clients and beneficiaries interchangeably. The MIS guide, for example, says that a preliminary project statement should indicate "who will use the results," and that the detailed project statement should "identify who will be benefited." Do these phrases mean the same thing? Do they both refer to clients?

For ERS, we think the following distinctions are useful:

Clients: First handlers or users of our research information;

those at whom we should directly aim our information.

Beneficiaries: All those who gain in some indirect way from our research. Here, beneficiaries differ from clients in not being the first intended users of our information. But they either benefit from change generated by our clients or they benefit indirectly in some other way.

These two categories are not mutually exclusive: individuals and groups may belong to both or either at various times. These definitions are employed only to guide our discussion of clientele and their needs.

If these definitions are legitimate, it is clear that the MIS guide is confusing: "Who will use the results" apparently refers to clients while "who will be benefited" refers to beneficiaries. Beneficiaries are important and we must recognize their needs, but it is clients for whom we are producing. As we plan research and its end products, clients, not beneficiaries, must receive prime consideration. They are the ones who will determine whether our product meets their needs. Clients are the link with the final beneficiaries.

Clients in the Past

In the early 1900's, USDA economic researchers primarily served farmers, providing only limited service to policymakers. At that time there was almost no extension service, little or no agribusiness, and only a few farm organizations. The farmer was nearly the sole object of attention.

A 1909 USDA bulletin by two farm management specialists noted that:

The United States Department of Agriculture is in almost daily receipt of letters to the following effect: The writer owns a farm. The farm is not paying. Can the Department suggest a kind of farming that will pay (8)?

Many profound changes have occurred in the almost 70 years since this bulletin was issued. Agribusiness has grown phenomenally; public policymakers have proliferated in both legislative and executive branches of Government. All need wide economic intelligence.

Many new sources of information have developed for the farmer. Research needs of farmers have also changed, as their businesses have become more complex. Custom-made analyses are being supplied from places other than the Department. For example, a new agricultural marketing advisory service in Des Moines utilizes member newsletters and direct telephone lines to provide up-to-the-minute advice to farmers. More than 16,000 people sub-

scribe to this \$300-a-year service. As ERS Information Director Ben Blankenship recently said:

You can imagine the amount of sophisticated analysis this service will demand from the news sources. That means that, if we are on the ball, we should be able to pass along to the service some useful information on occasion. It also means that, in our efforts to reach farmers directly with our intelligence, we have a formidable competitor which can get to them much more quickly than we can (3).

Another major change has been in the issues. For ERS, farm-gate questions have long since given way to issues of regional and national import: rural development, national capacity to produce food and fiber, consumerism, assistance to developing nations, environmental quality, and energy. Where the former research focus was on farm performance, the more recent one is on total agricultural performance and the well-being of rural America.

Clients Today

Analysis designed for public decisionmaking dominates the ERS research program today. ERS has a direct line to clients such as the Council of Economic Advisers, the Secretary of Agriculture, and the Congress. Its publications reach but a small number of farmers; most go to groups or individuals making decisions affecting huge numbers of people and large geographic areas. We still count the farmer and the consumer as beneficiaries, but less and less do we count them as our direct-line clients.

Often, ERS information is repackaged by clients and distributed to farmers and consumers. Ben Blankenship explained this when questioned by Congressman Frank E. Evans during the 1976 House agricultural appropriations hearings:

Mr. Evans. Can you tell us about how many farmers plant wheat, or grow corn and use these (ERS outlook and situation) publications?

Mr. Blankenship. About a third of the mailing list of each of the publications. These are give-away publications and a mailing list might total only 5,000 to 8,000. Essentially, we are wholesaling the reports mostly to wire services, other press people and the extension types who pick up our reports regularly. We do use some computer services and leased wires to get information to the Extension Service and ASCS county offices (12, p. 810).

It has not always been easy for ERS researchers to adjust to the new demands. According to a 1972 ERS advisory committee:

In fulfilling this mission ERS has a dual role: to serve not only the executive and legislative branches of government but also private individuals and firms comprising the food and fiber sector. Although there is much complementarity, there is also potential competitiveness between the roles. It is important that neither role seriously overshadow the other (*10 p. 6*).

The traditional methods of designing, packaging, and delivering analyses for public decisionmaking have not been adequate. Briefings and dramatic oral presentations are sometimes more effective than technical manuscripts.²

Many decisionmakers are unfamiliar with both the technical aspects of agriculture and the economic jargon. The 1972 advisory committee pointed out a severe case of noncommunication between these decisionmakers and ERS researchers:

ERS economists often are unfamiliar with the operational aspects of programs and the variables and constraints involved in the decisions that program managers and policy officials must make...Researchers in general have difficulty responding on short notice and are hesitant to make judgments without considerable empirical evidence. This high degree of professionalism is often not appreciated by Department officials who want to know the time of day and not how the watch operates, and who must make decisions no matter how imperfect the information may be (*10, p. 57*).

A closer focus on exactly who we are serving is vital. How capable our system is of achieving that closer focus depends, in part, on the way we identify clientele.

ERS CLIENTELE IDENTIFICATION TODAY

The ERS Management Information System is an administrative tool to aid in research planning, monitoring, communication, and evaluation. It aims to keep ERS doing what it is supposed to do for the people it is supposed to serve. Put more bureaucratically, MIS is designed to:

...enable all employees of ERS to see how their specific efforts contribute to the overall mission and objectives of ERS and provide greater assurance that resources are allocated to the areas of highest priority as deter-

²There are, however, at least two examples—The Weekly Memo and the Quarterly Memorandum—which demonstrate an effective ERS method for communicating economic intelligence to high-level public decisionmakers.

mined by the combined wisdom of the ERS staff, the universities, and those that the program is intended to benefit (11).

Unfortunately, this purpose statement contains the word “benefit,” but fails to specify whether the recipients of this service are beneficiaries, clients, or both.

All this planning, monitoring, communicating, and evaluating might be expected to focus on the clientele. What is the use of a research program unless someone uses the results? Yet a review of MIS instructions and the actual MIS statements produced show a remarkable lack of such focus.

MIS is divided into three basic parts—MIS-1, MIS-2, and MIS-3 (11):

- *MIS-1* describes each program area. Required is “a brief statement of why the objectives listed should be accomplished and who would benefit.”
- *MIS-2* is a detailed statement of each project in a program area. The writer is asked to “identify who will be benefited and how...” He is also instructed to “provide a detailed plan outlining the techniques to be used in dissemination of results to intended clientele groups...”
- *MIS-3*, the annual plan of work, documents the real nuts and bolts of the project outlined in MIS-2, and lists anticipated reports and publications. No instructions about clientele or beneficiaries appear.

To summarize, MIS-1 wants to know who will benefit. MIS-2 also wants to know who will benefit, and how results will reach clientele groups. Finally, MIS-3 is not concerned about clients at all, even though it discusses specific products of research. Fuzzy instructions produce fuzzy products. So it is with the MIS statements we reviewed³ We found ERS’ record for client identification far from satisfactory. One example is: An MIS-1 statement which intones:

These issues are of broad concern to policymakers, to participants in the food and fiber sector who are directly affected by developments, to the general public who have concern about our economic and political processes, and to individuals as consumers.

To figure out who should get the report from this program would be difficult. Yet, this vague reference was much more specific about clientele than most MIS statements. Of the MIS-2 statements on this program area only one mentioned clientele: “other researchers.” That conflicts with the statement in the MIS-

³We conducted an informal survey of all ERS MIS statements as of May 1976.

1, yet it is specific and probably legitimate. Of the seven MIS-3 statements in that program area, not one mentioned clientele.

Another program area made a clean sweep from MIS-1 to MIS-3 with no mention of clientele. This statement contained details on publishing; but, audience was no part of those plans.

A third MIS example outlined a strong statement on clientele by naming groups within industry, government, and universities that could use the information. But the MIS-3 statements contained no reference to clientele.

As table 1 illustrates, there is little indication that ERS clientele is systematically identified under this system. Few MIS-3 statements give any attention to clients, and only about a third of the MIS-1 statements are fairly specific on this matter.

A vague reference to clientele may be worse than no mention, because such references often identify beneficiaries rather than direct clients. If we are designing the research product for clients, vague references to beneficiaries may even be counterproductive since any product planning based on them will be off the mark. One MIS-1 statement notes that "Findings of such research are needed by farmers as a guide to production and marketing decisions." Yet farm-level publications are rare in ERS today.

Another problem in the MIS system is the surprising trend toward less clientele specificity as we go from the MIS-1 to the MIS-3 statement. One would think that as the research program moved closer to publication, there would be more references to clientele. After all, we eventually must deal with such mundane subjects as mailing lists. Yet just the opposite is true. The degree of specificity *declines between MIS-1 and MIS-2, and then drops off sharply, declining to near zero, at the MIS-3 stage* (fig. 1).

The absence of MIS-3 client statements is not surprising since none are requested in the instructions. Why were statements on clients not required to accompany the lists of anticipated reports in the MIS-3 annual plans of work? The titles are there; the completion dates are listed; but the audience is ignored.

Some division instructions are more specific about clientele. For example, the Natural Resource Economics Division directions for preparing the "detailed project statement" call for discussion of:

Dissemination of results—a detailed plan (developed in cooperation with the ERS Division of Information) outlining the techniques to be used in communicating results to the intended clientele groups (4).

Despite this urging, little clientele identification actually results; moreover, researchers and information officers rarely work together at this stage in planning dissemination.

Table 1—Extent of clientele identification via the ERS Management Information System (MIS), by Division

Division and MIS stage	No clientele identified	Vague reference to clientele	Clientele fairly well identified
	<i>Percent</i>		
CED:			
MIS-1 ¹	30	30	40
MIS-2 ²	55	27	18
MIS-3 ³	98	2	0
NEAD:			
MIS-1	20	50	30
MIS-2	43	36	21
MIS-3	98	0	2
FDCC:			
MIS-1	0	64	36
MIS-2	20	43	37
MIS-3	94	0	6
NRED:			
MIS-1	0	33	67
MIS-2	30	35	35
MIS-3	100	0	0
EDD:			
MIS-1	55	45	0
MIS-2	29	53	18
MIS-3	93	7	0
Total ERS:			
MIS-1	22	45	33
MIS-2	38	37	25
MIS-3	97	1	2

¹The MIS-1 statement describes the entire program area. ²The MIS-2 statement is a detailed description of each project. ³The MIS-3 statement is the annual plan of work for each project.

Source: Informal survey of all MIS statements maintained in ERS Administrator's Office, May 1976.

CED = Commodity Economics Division
 NEAD = National Economic Analysis Division
 FDCC = Foreign Demand and Competition Division
 NRED = Natural Resource Economics Division
 EDD = Economic Development Division

**Percent of Management Information System (MIS)
Statements Identifying Clientele, May 1976**

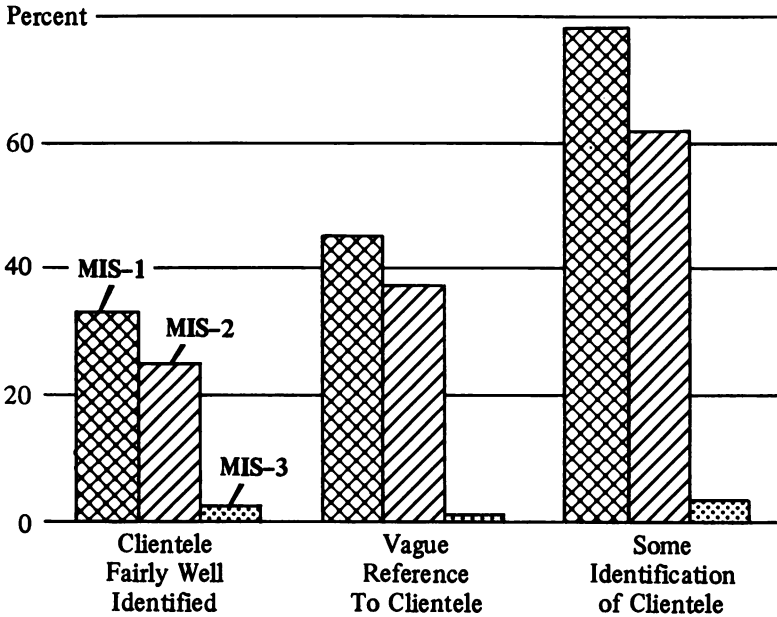


Figure 1

ERS PROGRAM MANAGERS' VIEWPOINTS

To gain a better appreciation of how ERS research managers view clients and beneficiaries, we sought opinions via a questionnaire. Program leaders, division directors, and division staff were asked to rate various clients now and for 1985 by distributing 100 points among stated categories. They were asked to rate in terms of how much each client's needs are weighed in designing research. They were also asked to rate the importance of various beneficiary groups. Finally, we inquired whether they thought ERS gave clientele adequate, some but not enough, or very little attention.

Oral comments and other feedback indicated difficulty in attaching rating numbers to client categories. This confirms our hypothesis that there is no clear notion of who ERS clients are. However, some researchers believe such concern with clientele may be unwarranted. For example, Peter Emerson (National Economics Analysis Division) noted in his response that "A good researcher (especially an applied economist) always has a client in

mind. This will be reflected in a well-defined hypothesis. The real question is: "What are the important social issues and which are researchable?" "

At any rate, individual ratings of various clients and beneficiaries varied widely, although division averages were more consistent.

Responses confirmed the idea that public decisionmakers are becoming our prime clientele. Public agencies got a rating of 56 (out of 100) compared to 28 for private decisionmakers in terms of the attention they command in the ERS research-planning process (table 2). This perception of public decisionmakers as the dominant client group contrasts sharply with the old view that the main thing is to serve farmers directly. Farmers and landowners received only a 7 rating. This calls for close scrutiny of our information dissemination designs (research reports, TV, and so on) to determine whether they really meet the needs of public decisionmakers.

The program managers gave clients within USDA a healthy rating of 29 (table 2). Again, we wonder how our current dissemination program stacks up. Mel Cotner noted that "much of our work in ERS recognizes the client relationship—but often the research is not applicable or in usable form."

Differences in the public decisionmaker vs. private decisionmaker ratings were striking between general research areas. The three Food and Fiber Economics divisions—Commodity Economics Division (CED), NEAD, and FDCD—gave more attention to private decisionmakers and less to public decisionmakers than did the agency as a whole (table 2), while NRED and Economics Development Division (EDD) program managers gave high ratings to public decisionmakers (66 percent for EDD and 72 percent for NRED). Various factors are responsible for this; for example, much of the research in NRED is funded by the Soil Conservation Service, a public client.

Private decisionmakers ranked better as beneficiaries than as clients in the ERS research-planning process. As beneficiaries, they scored 47 of the 100 points, but as clients, they received only 28 (tables 2 and 3). Farmers and landowners rated 7 as clients; they advanced to 12 as beneficiaries. Consumers doubled their client score of 6 when considered as beneficiaries. Another comparison shows that private decisionmakers rate much higher as beneficiaries than do public decisionmakers—47 vs. 38 (table 3). Consumers and farmers are clearly considered to be the ultimate beneficiaries of government decisionmaking.

Other researchers in the agricultural economics profession are perceived as a significant, though not major, clientele (table 2). Indeed, part of ERS' obligation is to serve the needs of colleagues

Table 2.—Percentage rating to ERS research planning of various client groups, all respondents, 1976¹

Client group	CED ²			NEAD ³			FDCD ⁴			EDD ⁵			NRED ⁶			ERS ⁷					
	P.L. ⁸	Dir. ⁹	All ¹⁰	P.L.	Dir.	All	P.L.	Dir.	All	P.L.	Dir.	All	P.L.	Dir.	All	P.L.	Dir.	All			
	<i>Percent</i>																				
Public:	58	38	50	49	49	50	47	57	50	66	66	51	66	9	9	9	8	9	14	12	13
Congress	11	8	10	12	18	14	9	13	10	17	9	9	17	9	15	16	15	8	8	8	8
USDA agencies	13	9	12	18	10	16	18	15	17	16	11	11	16	23	23	23	23	23	17	12	12
Sec. Office (USDA)	25	12	19	9	12	10	10	22	13	9	6	6	9	9	9	9	8	9	14	12	13
Other Federal agencies	7	5	6	6	8	6	7	7	7	9	9	9	9	9	9	9	16	15	8	8	8
State and local agencies	1	1	1	3	1	3	1	0	1	12	8	8	12	11	19	19	19	14	5	4	5
Other	1	3	2	1	0	1	2	0	2	3	8	8	3	1	0	1	0	1	1	2	2
Private	29	32	30	38	36	37	36	27	35	9	15	15	11	18	15	17	29	28	28	28	28
Farmers and landowners	8	8	8	11	10	10	6	8	7	1	1	1	1	6	5	6	8	6	8	7	7

Agribusiness	9	10	9	12	10	12	10	12	13	7	12	0	1	1	4	4	4	9	7	9
Consumers	5	4	5	10	10	10	4	2	3	6	4	5	2	1	2	1	2	6	6	6
Farm and commodity groups	6	7	6	5	6	5	9	10	10	2	0	1	5	2	4	5	6	5	5	
Other	1	3	2	0	0	0	4	0	3	0	9	3	1	3	1	1	2	1	2	1
News media	3	5	4	3	5	3	5	6	5	2	3	2	1	3	2	3	2	3	5	3
Other researchers in the agricultural profession	10	15	12	10	5	9	11	10	10	10	19	30	19	6	8	6	10	12	11	11
No client consideration	0	10	4	0	5	1	1	0	0	2	1	2	4	2	3	1	5	2	2	2
Total	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100

¹ Division Directors, their staff, and program leaders (59 respondents). ² Commodity Economics Division. ³ National Economic Analysis Division. ⁴ Foreign Demand and Competition Division. ⁵ Economic Development Division. ⁶ Natural Resource Economics Division. ⁷ Division averages weighted by the number of Specialist Man-Years (SMY's). ⁸ Program leader. ⁹ Directors and their immediate staff. ¹⁰ Program leaders plus Directors and staff.

Table 3—Percentage rating of relative importance of various beneficiaries, all respondents, 1976

Beneficiary	Program leaders	Directors and staff	All
		<i>Percent</i>	
Public:	38	40	38
Congress	12	8	9
USDA agencies	6	12	10
Secretary's Office	10	6	7
Other Federal agencies	6	8	7
State and local government	4	3	3
Other	0	3	2
Private:	45	46	47
Farmers and landowners	12	11	12
Agribusiness	11	13	13
Consumers	12	11	12
Farm and commodity groups	6	8	7
Other	4	3	3
News media	4	5	5
Other researchers and the agricultural economics profession	13	9	10
Total	100	100	100

in the agricultural economics research community, as Motes points out in his three classes of clients.

One difference between program leaders and division-level staff is in how much attention ERS gives to clients in its planning process. About 60 percent of the program leaders, but 85 percent of the division-level staff, feel that not enough attention is given to clients (table 4).

The program managers see no dramatic shifts in their perception of clientele importance by 1985 (table 5). There is a slight drop in the importance level of public decisionmakers; the rating of private decisionmakers advanced from 28 to 35 (tables 2 and 5). Apparently farmers and landowners, as well as consumers, will be receiving more attention in the future while agribusiness may be receiving less.

A result which one author of this paper found discouraging was the low rating given to the news media (table 2). Clearly, ERS public information officers need to point out how the news

Table 4—Percentage of respondents expressing degree of ERS attention to clientele in the research planning process, all ERS

Degree of attention	Program leaders	Directors and staff	All
	<i>Percent</i>		
Very little	0.0	5.0	2.0
Some, but not enough	60.0	80.0	66.0
Adequate	32.5	15.0	27.0
No response	7.5	0.0	5.0
Total	100.0	100.0	¹ 100.0

¹ 59 respondents.

Table 5—Percentage ratings of relative importance to ERS research planning of various client groups, all respondents¹ 1985 projection

Client group	CED	NEAD	FDCD	EDD	NRED	ERS ²
	<i>Percent</i>					
Public:	49	46	46	64	67	52
Congress	13	16	11	16	9	14
USDA agencies	9	10	14	13	18	12
Secretary's Office (USDA)	19	10	13	9	9	13
Other Federal agencies	5	6	6	14	12	7
State and local agencies	2	3	1	10	18	5
Other	1	1	1	2	1	1
Private:	36	45	36	16	22	35
Farmers and landowners	11	16	6	2	10	11
Agribusiness	8	8	12	2	3	7
Consumers	12	16	6	6	4	11
Farm and commodity groups	5	4	10	0	4	5
Other	0	1	2	6	1	1
News media	5	3	6	2	3	4
Other researchers and agricultural economics profession	10	5	12	18	8	9
No client consideration	0	1	0	0	0	0
Total	100	100	100	100	100	100

¹ Division Directors and staffs plus program leaders. ² Division averages weighted by number of Scientist Years.

media can reach important clientele. Material prepared specially for them would get greater pickup and would stand a better chance of reaching other clients.

IMPLICATIONS AND RECOMMENDATIONS

We should not conclude from our survey that program managers in ERS have a firm fix on their clientele. The variance in their responses suggests that more dialogue on clientele is needed. John Lee's (CED) response indicated that ERS' notion of clientele is not all that clear: "The shift over time in our program to dealing with larger national issues and policy issues versus the old micro-orientation certainly is an example of thought given to clientele. On the other hand there is lack of clarity about clientele of our situation and outlook work."

Clientele identification is often only implicit in research planning. Topics, methods, funds, man-years, and expected output are explicitly covered; the audience is implied or ignored. Possible dangers in this include issues being misread, research relevancy being misweighed, and bias substituting for feedback from clients.

Systematic and explicit consideration of clientele is needed. We find it useful to distinguish between direct clients and ultimate beneficiaries. Instructions for completing MIS statements should be revised to reflect these needs.

Even where useful identification of clientele does occur in MIS, the ERS follow-through is faulty. Some good MIS clientele statements are available: FDCD's Statistics Program clientele statement in MIS is exhaustive and well focused. This situation raises several questions: Should such an MIS reach the editor? Should it go to the distribution officer in charge of mailing lists? Are proper channels of communication and product forms used to serve the identified clients? Many delivery systems are available as alternatives to our traditional research report-press release-magazine modes. These include microfiche, computer information services, and others that may be more cost-effective in reaching our audience.

To link the research results, the audience, and the most effective medium, *MIS statements on clientele need to be communicated systematically to ERS information officers* charged with the dissemination of information. One possible method of doing this would be to involve an information officer in the MIS-writing exercise.

To bolster the MIS clientele input, *ERS should mount a campaign to improve its program of getting information to its most important target clientele.* The campaign would seek methods to pinpoint ERS clients, tailor the ERS product to their needs, and adopt information vehicles to reach them with the most impact at the least cost.

ERS should form a committee of division publication officers, including Division of Information representatives, to carry out

these objectives. The committee would coordinate the many activities which could be carried out within and outside ERS. It might:

- Make special contacts with ERS program leaders and researchers to discuss their clientele and information needs. Collect names for mailing lists.
- Construct feedback systems for current ERS media such as television, *Farm Index*, press releases, and research manuscript mailing lists. Set up pilot clipping service, return-card device, and other check systems.
- Evaluate ERS publishing experience with the National Technical Information Service.
- Explore computer-based information systems, especially the Extension Service's use of outlook and situation report summaries via computer.
- Evaluate alternatives to the type of narrative now presented in Agricultural Outlook. Are we sure that the style of writing used is the most appropriate for Ag Outlook's primary clients—mainly Congress and the Secretary's staff, and the economic establishment in Washington?
- Conduct training seminars for ERS researchers in audience identification and effective merchandising of information.
- Evaluate effectiveness of the information program now conducted by the Information Division. This should be done by someone from outside the agency.



The problem of clientele is ever changing; it can never be settled permanently.

We must be receptive to signals from the administration, from the profession, from our contacts, and from professional communicators. We must operate within a systematic framework, such as the Management Information System. We must develop close working relationships between research managers, researchers, and information officers to ensure that we are reaching the most important clientele with the most relevant information at minimum cost. Above all, we must heed the advice of that 1972 Advisory Committee by raising the level of "clientele consciousness" throughout ERS.

We offer no simple solution or mathematical formula to settle the ERS clientele-identity problem. The process is just as complex as the discovery of new knowledge in economics. It requires a keen sense of legal, moral, ethical, and pragmatic considerations. How well we perform this intricate job may be just as important to ERS' future viability and survival as the quality of the economic information we generate.

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Review of: ERS IN SEARCH FOR ITS CLIENTELE

by
David L. Firor*

Sayre and Stovall have devoted a lengthy paper to exploring such questions as: Does ERS know who it's working for? Does ERS need to know? Then the authors offer some suggestions on how to find out.

After much involvement with semantics, the answers become clear. In many cases, ERS does not know who it is working for, but it believes that it needs to know.

Surveys of those in ERS indicate that in their opinion the most important clients of ERS today are the legislative and executive branches of the Federal Government, followed by private decisionmakers. Farmers and land owners receive a much lower rating than either the public or private decisionmakers. The authors contrast their findings with the traditional view that the mission of ERS was to serve farmers directly.

However, they completely fail to give any consideration to the significance of this statement. Discussion on this point might be of great value. After all, ERS is a part of the U.S. Department of Agriculture, generally accepted (despite the food stamp program) to be an agency devoted to improving the income and life style of the American farmer.

A thoughtful examination of the position in which ERS now finds itself—serving mainly public decisionmakers rather than farmers—might lead to the conclusion that the agency has long since gotten off the track on which it was intended to travel.

Sayre and Stovall quote the ERS information director as having referred to a private advisory service as a "formidable competitor." This might well induce another question: Why does a Government agency feel it necessary to compete with such a service if that service is doing the job?

In discussing those who cause research to be instigated, referred to by the authors as "clients," it may be unfair to suggest that one category has been left out. However, a long association with different research organizations leads to the conclusion that research is frequently instigated by the researchers themselves and that if pushed for designation of the "beneficiaries," they may be

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named merely as a means of continuing a pet project. This possibility might well be considered by ERS as they embark on their Forward Look.

The authors make a number of recommendations, including: improved clientele identification, the communication of clientele identification systematically to ERS information officers, a campaign to improve dissemination of information to important clientele, and a suggested list of activities to be carried out by a committee of division publication officers.

It is difficult to fault any of the suggestions of the authors. However, on a pessimistic note, it may be suggested that in both public and private agencies, new programs with high goals frequently bounce off the backs of those who are supposed to be changed and improved by them.

Review of: ERS IN SEARCH FOR ITS CLIENTELE

by
Ben C. French*

To provide an analytical framework for examining the points developed by Sayre and Stovall, I find it helpful to think of ERS as an *inquiring system* and to employ Churchman's definition of such a system.¹ Very briefly, for something to be conceived as an inquiring system it must be goal seeking, have a measure of performance, have a client or clients whose interests are served by the system, have components which are goal seeking and coproduce the measure of system performance, have an environment which also coproduces the measure of performance, involve decisionmakers who can produce changes in the measures of system performance, and have a designer who conceptualizes the nature of the system and whose intention is to change the system to maximize its value to the client.

Without going into all aspects of the system itself, it appears that Sayre and Stovall are playing the role of designers. As such, they are concerned with finding better means of identifying clients, with evaluating the performance of system managers in this regard, and with changing the system to enable it to better serve the clients' needs.

The authors begin their main discussion by examining the concept of clientele. In this they stress the distinction between true clients and beneficiaries and suggest that "as we plan research and its end products, clients instead of beneficiaries must receive prime consideration for they are the ones who will see and use our product." Since the term "beneficiaries" does not appear in Churchman's definition of an inquiring system, the distinction seems very proper. However, Sayre and Stovall may have the proverbial cart before the horse when it comes to research planning. In the system's framework, beneficiaries relate to the goals of the system. It seems to me that good research planning starts with a specification of goals; that is, whom do we wish to benefit and in what way? In some cases clients and beneficiaries may be identical. More generally, we need to choose or identify clients whose interests are consistent with the goals established for the inquiring system. I would argue that the authors have given insuf-

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¹Churchman, C. West, *The Design of Inquiring Systems: Basic Concepts of Systems and Organization*, Basic Books, Inc., New York, 1971.

ficient attention to the relationship between objectives and clientele.

Sayre and Stovall go on to note that the clientele of ERS has changed and diversified over the past 70 years—shifting from early focus on serving farmers directly to current emphasis on serving public decisionmakers. The authors suggest that the ERS Management Information System (MIS) has not functioned well as a means of identifying clients. This is attributed in part to fuzzy MIS instructions which lead to fuzzy products. Sayre and Stovall are concerned by the results of their survey of ERS research managers which suggest considerable variation in the perceptions of the importance of various classes of clients among levels of research managers. They conclude that ERS needs to do a better job in identifying and defining its clients.

Although client identification is clearly an important concern, and it is possible that ERS has not defined its clients very well, I find it difficult to accept fully the notion that an established public agency of long standing would not know who its clients are. Or, stated another way, it seems anomalous that the legislative and administrative bodies which created the agency in the first place would have, in effect, left to the employees of the agency the task of determining why and for whom it exists.

The authors argue that the Secretary of Agriculture and the agency leaders do not know fully who the clients are. But surely Congress and the various administrations which have periodically reorganized ERS and its predecessors have kept in mind some objectives and goals, and an associated set of clients whom they have wished to see served. Client definition would thus involve interpretation of the (changing) thinking of the above groups.

It seems to me that the research managers of ERS may have much better perceptions of who their clients are than suggested by Sayre and Stovall. The variation in these perceptions may be attributed to the diversity of programs and clients of the organization.

If I am correct, then, the real problem facing ERS is this one: first, to specify how the various classes of clients relate to the basic goals and objectives of the organization, thus determining the level of service to be provided to each; second, to determine the kinds of economic information that may be needed by, or be helpful to the clients; and third, to find ways to generate the information and communicate it so that it will be most useful to the users. The paper could be improved by a more detailed and specific exploration of the first and second problem areas above.

Although the authors present a thoughtful and stimulating discussion of the issues relating to client identification, the assigned topic seems too narrowly confined for the broadness of their

view. It is difficult to examine one component of an inquiring system in this way without considering its relation to the other parts. Thus, a problem perceived as being due to incorrect client identification may in fact be due to producing the wrong product for the clients' needs, improper or incomplete specification of goals and objectives, or poor packaging of the product or communication of research results. To develop a proper perspective of the role of clients it would seem desirable to take more of a total system view.

Review of: ERS IN SEARCH FOR ITS CLIENTELE

by
H. Milton Patton*

James Sayre and John Stovall provide a refreshing analysis of issues relating to the identification of clientele and beneficiaries of ERS services. The writing is clear and the problems of programming are set forth with candor.

The distinction between clients and beneficiaries is useful. So too is the notion that their identification is not a static process: it is also probably true that the individual farmer-as-client definition no longer follows the traditional mold. Staff views on this issue indicate the sophistication of the contemporary researcher.

Were other professions, bureaucracies, and research organizations as straightforward in stating their problems, the world would be a better place.

My main criticism is that the paper does not go far enough in developing potential classifications of clients and beneficiaries, matched with potential program services. It is not enough to analyze the current MIS procedure. A broader range of alternative future directions should be defined.

One approach might be to make a general analysis of information in the policymaking process. Since the paper has previously defined policymakers as the primary users of information, it would be desirable to identify not only information needs, but information flows. The pluralistic nature of decisionmaking in this field requires a much broader information system, serving the public, the nontraditional agricultural professional groups, the emerging public interest groups and related organizations, and the recent generation of publicly-oriented citizen organizations.

This notion might also be traced through the nature of policy issues. Just as there is a broad diffusion of individuals in decisionmaking, there is a new level of interrelationship required of policy analysis. For example, questions relating to growth policy are no longer considered strictly within national economic policy, but also relate to natural resource use and international relations.

This may be extended a step further into the new awareness of the intergovernmental relations process which recognizes the interdependence of levels of governments and agencies in implementing any particular policy or program.

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Consequently, the paper should further analyze the following three notions as related to information flow:

- The broad range of individuals and organizations who influence policy beyond the traditional definition of “policy official;”
- The broad range of national policy issues which suggest the need for agricultural data and information; and
- The several levels of Government and their varied functional needs.

Two specific suggestions for techniques that would inform the selection of ERS priorities and approaches might be the following:

- Do not rely upon traditional publication systems. Experiment with other techniques. An example might be to make first contact with potential users through an “opportunity” card system broadly based and easily returned for those interested in a product. This would provide continual feedback on who is interested and not interested in particular products. This has been used successfully elsewhere, is simple to do, and informs both the potential client and beneficiary as well as ERS about the utility of the product.
- Do not search for “formal” structures representing “symbolic” users to develop program ideas and priorities. Rather, develop *ad hoc* seminars of “clusters” of users to continually identify emerging issues and needed information.

While ERS has a rather formal cohort relationship with land grant institutions, it should seek to expand its relationship with other disciplines. For example, geographers, planners, political scientists, and many in other nonagricultural disciplines need agricultural data and analysis. They, too, feed the stream of policy action and can make effective use of ERS information in policymaking.

The authors are to be commended for their work. ERS is to be commended for its effort. We hope this is the beginning of an informing process.

Review of: ERS IN SEARCH FOR ITS CLIENTELE

by
James G. Vertrees*

The authors address an important issue. I gather that the objective was to emphasize the importance of identifying clientele and the need for a procedure for doing so. In my judgment that objective is subordinate to other questions. For example, how should ERS attach priorities to various clients?

The equating of ERS to doctors, lawyers, or insurance agents, in terms of having clients, is not too useful. For one thing, other professionals receive payment from several sources. ERS is paid nearly in full each year by only one client: Congress. This implies that ERS research should have a policy orientation.

Though important, clientele identification does not rank equally with the quality of economic information in importance to the viability and survival of ERS.

After suggesting that the Secretary of Agriculture, the Director of Agricultural Economics, and Congress are unwilling or unable to fully identify ERS clientele, the authors conclude that clientele identification is largely the responsibility of ERS. If such identification is at the level of the individual researcher, I generally agree.

Though resource constraints prevent an agency from serving in a like manner every client identified by every researcher, client identification by researchers is a key initial step. Obviously this places an important responsibility on individual researchers to lay out relevant researchable issues and the associated clientele. Beyond this point there is a need to attach priorities so as to remain within resource constraints. For researchers to be effective in this process they need to be aware of the environment within which a research problem exists. An important part of that environment is interest groups. Sometimes the environment includes only a researcher's peers, while at other times there are many readily identifiable groups. The researcher must know that environment well; to do so requires communication in the most effective sense of the word.

The authors devote much of their paper to the need to tailor the communication of research results to identified clients. Effective communication is a key and it is important to link researchers with information officers. However, in many instances the

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users of economic information receive it early and in a form much different from what ultimately is made public, if it ever is. If researchers clearly identify clientele, this alone will make for more effective communication. The impression was given that information officers can package any piece of economic analysis to neatly fit the needs of clients. If that is a correct impression, it is bothersome; in my judgment it is too simple a view, placing emphasis on package rather than content.

SHOULD WE STAND OUT OR BLEND IN?

by
Ben Blankenship*

"Now here's Channel 8's John Parks with the weather and farming forecasts."

"Thanks, Fred. We've gotten through 1980 in pretty good shape so far and the Weather Bureau says that next month should be warmer than usual, with a 75 percent chance of it being at least as warm as a year ago."

"And here's good news for corn growers, from the Agriculture Department. Harvest prices next month may average a whopping \$5.00 a bushel nationally according to the Outlook and Situation Board—which gives that forecast a rating of six *most likelies* to only three *probably lowers*. The forecast is nearly a dime above what the economists were predicting a month ago."

Is this the direction the reporting of our analysis is heading? If that makes you uncomfortable, you are not alone. ERS is continually placed in an uncomfortable position by its dual role of providing intelligence internally for administration and congressional policymakers and externally for the taxpaying public.

A candid appraisal for the Secretary, for example, must be toned down for public use because outsiders may not understand that the projections are tentative or are highly qualified by assumptions.

As a result we frequently seem to waffle in public. We deal in "ranges" when we project crop supplies. We issue a farm income forecast almost furtively, and muddy it by publicizing both "total net" and "realized net." There is frequent vacillation between fiscal and calendar year data on the same subject matter. And contrast our policies of issuing steer price forecasts for two quarters ahead and offering wheat price forecasts spasmodically, if at all. If you were an outsider, wouldn't these kinds of things raise thoughts of political mischief?

ERS does not consistently waffle, which also leads to confusion. For example, we issue detailed cost estimates for corn by

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geographic subregions, but fog up national harvesttime price estimates. We do the same for soybeans, while simultaneously projecting specific lower levels of palm oil imports, which are big factors now in soybean markets.

"I've been in HUD, IRS, Treasury, OMB, the White House, and Defense," says Bill Greener, recently the Pentagon's Public Affairs Chief, "and everywhere it seems too many government people spend time arguing over the question 'how can we say this,' when they should just be putting out the facts, telling the truth."

Let us admit that on occasion we take firm stands. The world food situation analysis, the calling of the turn in the cattle cycle, and the pinpointing of the back-to-rural-America trend are examples.

No matter how we rationalize though, it is no secret that we do have a credibility problem. We rank fairly low in the USDA pecking order. During the regional ERS conferences in 1975 there were frequent references to the lack of trust in Washington staff studies, by our peers both on field staff and in the universities. And we get included in the blanket condemnation of Washington Big Government.

In our dual advisory and public roles, we may never attain full confidence. More important anyway is the perception of our roles by our clientele. Ironically, our effort to go more public with more information may make it appear that we are covering up some remaining areas.

On the other hand, some groups might perceive us to be better than we really are. For example, our situation reports are in pretty good repute. But what, after all, is a situation report's contribution to decisionmaking if it keeps the bottom-line consequences—the prices—in the author's desk drawer, and simply resurfaces the supply-use forecasts released weeks earlier in the Agricultural Supply and Demand Estimates report? The result: not only is our price forecast withheld from the public, but even discussion of future market developments is generally precluded, for the good reason that mentioning them would appear to be endorsing them, with no judgment of our own in print to play them off against.

More important than perception of our information, however, is the product itself. We must first have confidence ourselves in the research that backstops the study or forecast. It may be useless and misleading to issue a point estimate if we cannot back it up well. If our research base does not give us the confidence to be forthcoming in public with the numbers that are demanded in private, we should stop supplying the numbers at all, establish the research system that will enable us to furnish them confidently,

and then begin furnishing the numbers freely to all. If no system could fulfill such demands, we should get busy lowering expectations of what we can deliver.

Even if we were successful in obtaining a satisfactory system, a strong feeling would remain in ERS that the public would not understand the tentativeness of these projections, but would seize any number that we publish as gospel. This is elitist thinking. It assumes that markets react mostly to our own analyses and it presupposes that an Administrator or Congressman handles the information more perceptively than the farmer, the futures trader, the agribusinessman, the consumer, or even our fellow economists elsewhere.

If we agree that the above are legitimate clients, we have little choice but to deal them all in on our intelligence. If we decide instead to pick and choose among them, we open ourselves to charges of political opportunism.

Each spring, our Administrator tells the House Agricultural Appropriations Subcommittee, at a hearing open to the public, what prices we are predicting for the major commodities. But it is a long time after that before you'll see any further reference to such specific predictions in ERS publications.

Congressman Whitten said to ERS Administrator Quentin West in 1975 subcommittee hearings:

The farmer does not want to stake all his capital, land, and machinery built up over a generation or so betting on what just the market will say. He wants all the information he can get. That is why it is so important that we get a solid and concise statement from you zeroing in on your best estimate as to what the price of soybeans, wheat, and corn will be this fall. Is that unreasonable? Hedge it around if you must because the qualifying statements give farmers the opportunity to take a look at them as they begin to develop and see what direction this thing is drifting.

Congressman Andrews made this comment at the same hearings:

Now, nowhere else in this Government of ours do we have the combined energies and talents for any forecasts that we do in your shop and we would like to have you come up with one price.

Congressman Burlison, in 1976 hearings, said:

Dr. West, the price forecast you gave us last year for soybeans, wheat, and corn for crop year 1975 turned out to be pretty good, just a little bit low. What is the price forecast for 1976 for these major commodities?

As objective economists acutely aware of the weaknesses in our data, and as bureaucrats in a conservative department, we are prone to err on the side of caution. Should we deny some people intelligence that we consider less than foolproof but that they would consider useful and would have trouble obtaining elsewhere from a qualified source?

Traditionally we have held aloof from public needs. We know that with economic turbulence those needs have been escalating rapidly. Yet, we have been issuing only the information that can be solidly backed up by the whole research establishment. There is also the legitimate concern that such increasing demands from the outside have not been matched by increasing resources on the inside.

Most of us worry lest we say publicly more than we know. A few of us assert that we know more than we are willing to say publicly. Again, things get tangled when we appear willing to say certain things to some clients but not to others.

The dilemma of being candid with all of our clients or picking and choosing among them will become more pressing as time goes on. Note the complications that arise with the freedom of information statutes, the increasingly sophisticated managers in farming and agribusiness, and our increasing ability to crank out numbers quickly for an increasingly complex food and fiber situation worldwide.

How do we cope with the dilemma in the future? Should we retrace the staff economists' route and have the politicians speak for us and shield us? This would mean lowering our public profile and relying more on others to disseminate the information we produce. In such a blending-in effort we would benefit by being a harder target to hit in any bureaucratic reshuffling. But the good in our analyses might be severely filtered.

Or should we proceed further along the route we seem to have chosen haltingly in the past few years and attempt to reach all our clients more effectively, by standing out above the crowd and being more informative and candid?

Outlook is only one of several ERS functions that could have been chosen for this paper. I have focused on it because I am familiar with it and because it stands up to close scrutiny. It is an important program and is conducted competently. It has the opportunity to become outstanding. But ERS outlook will not be outstanding until we get straight on price forecasting and the audiences for that effort. The longer we let these matters slide, the greater will be our risk of becoming known for working hard and well, but on the wrong things.

In any event, let us not become like some agencies. As Peter Drucker says: organizations which are run on good intentions too

often end up being run not for the value added to the taxpayers but for the convenience of their employees and officials.



To translate good intentions into action, I recommend that the ERS Administrator set up a “Sunshine Board”—to review ERS practices on public release of data and analyses, to draft a new long-range policy aimed at more openly and consistently fulfilling public and administrative needs, and to disband following its report to the Administrator.

ERS INFORMATION DISSEMINATION: INSIDE PERSPECTIVES

by
John C. Roney*

INTRODUCTION

Are there problems with ERS information dissemination? Interviews with 24 ERS managers, researchers, and information officers, show frustration with a process that often seems slow, ineffective, and lacking in feedback.

"I spent two years researching this study," moans one economist, "and three years getting it through clearance and editing processes. Now it's five years old, it's out of date, and nobody will want to read it." Nonetheless, the study was published.

A former deputy administrator admits he recently had trouble reading a published ERS report. "Anyone who hasn't gotten a Ph.D. in economics in the past 15 years couldn't have handled it. It should have been mimeographed for such a small audience."

All those interviewed agreed that feedback is a vital part of an information dissemination process; none believe they are receiving enough. One economist says, "It's like dropping a stone into a well and listening for the splash. Sometimes you wait a long time ...and...wonder if it didn't splash, or if you just didn't hear it."

These cases may represent extremes but they are symptomatic of a perception shared by many: there are problems with ERS information dissemination and they need to be addressed.

BEFORE RESEARCH— THE PLANNING STAGE

Identifying Audiences and Their Needs

"We can't conduct research and then let the information sit," says Mel Cotner. Although ERS is basically a research organization, there is agreement that one of its major functions is dissemination of its findings. But there is a wide range of views on the composition of our audience and the means that should be used to reach it.

When asked for whom ERS performs its research, those inter-

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viewed emphasized Government administrators, the Congress, and other professional economists. Many also referred to a less direct audience: the general public.

Alan Bird recognizes an initial audience of policymakers but views the general public as "our ultimate beneficiaries."

Several persons echoed Bird's commitment to a wider audience. Deborah Smith sees a "moral responsibility for ERS to communicate its findings to the general public." Cotner adds: "If John Q. Public is paying for our research, he should have access to that information to help him in his decisionmaking."

This wider audience, however, is often ignored in the planning of ERS research. Bird notes "an unwillingness on the part of ERS researchers to attack national windmills." But efforts in that direction should not be quixotic.

Many of those interviewed acknowledge that ERS is under increasing pressure to relate to a wider, changing audience. Lyle Schertz points to "our traditional concern for equity" with regard to farm income and nonfarm income. "We have two courses to choose from. We can just concentrate on commercial agriculture, or we can recognize that commercial agriculture has achieved some equity, and embrace other audiences—food stamp people, consumers, environmentalists, small farmers—those people with little resources."

Others agree that ERS should expand its audience, but for less idealistic reasons. They see ERS relating to consumers, as a response to their growing power. J. B. Penn suggests that as "the number of farmers in the U.S. is dwindling," and "consumer groups are growing in size and strength," ERS should do more than just add a consumer angle to its research reports; it should "research consumer needs."

Despite the need for reaching the general public and expanding to more interest groups, ERS researchers are not as audience oriented as they should be. Smith says: "It's amazing to see the number of cases where researchers write without any sense of whom they're writing to."

A shortsightedness about audience identification seems common. Cotner feels that some researchers regard a narrow, primary audience as their final one and "fail to remember their ultimate client." Roger Strohbehn says: "Researchers recognize one main audience but it stops there too often." Director of Information Ben Blankenship maintains that "the last thing a researcher thinks of is whom this work should be directed to."

Gene Wunderlich presents a view that may be shared by other ERS economists. He defends the tendency of researchers to think first of professional or scholarly considerations. Wunderlich says that though "no researcher would consciously work on an unim-

portant or irrelevant question," he "doesn't start with a question of audience. He responds to a problem."

Information officer Angela Wray, on the other hand, suggests that "we, as a government organization, should ask ourselves whether we can afford the luxury of putting resources into publishing material that is not utilitarian." She recommends that ERS question whether the research that it publishes "meets a measurable need or serves a pragmatic purpose. Does it make a contribution to public policy or provide some edification for the general public and policymakers?"

Whether the research is oriented toward the short term or long term, its usefulness must be considered during the planning stages and must be linked with specific audiences and their needs. While most agreed that the consciousness of ERS researchers toward their audiences needs to be improved, there was a diversity of opinion on how to achieve this.

Who Should Be Involved in Planning ERS Research?

Alan Bird advocates more interaction within and between the research groups with seminars or "skull sessions" to exchange ideas and "dialogue on emerging issues." Jim Sayre suggests training seminars for research groups which would focus specifically on the topics of audience identification and merchandising of information.

In varying degrees, however, most suggestions for enhancing researchers' consciousness of their audience in the ERS information dissemination process involved an expanded role of the Division of Information (DI) in the planning stage.

Tom Hady is one of the few who was skeptical of early DI involvement. "What information does the Information Division have that researchers don't have?" he asked. Jim Pearson stated: "I don't see any unique expertise that the Information Division could input to the process. Can the Information Division suggest any more than an expert economist can?"

Smith concedes that "the researchers probably know better than I which specific audiences are most appropriate for their research," but adds that "the general public should not be overlooked." She would like early DI involvement in a "cooperative effort."

Lynn Rader endorses DI involvement in research planning, but has reservations. He finds value in an "awareness of popular possibilities" for a piece of research, but worries about the Division's "becoming involved too soon, before the results are in. When the results begin to take shape, then we can think about the types of reports they might generate."

Several others were less reserved about the value of added DI

involvement. Strohbehn suggests going “beyond an editing service” and recommends discussion of placing the information specialist in “a co-author role.” He believes that the information specialist can help in the execution of the research “to see that the researcher stays on track, keeps away from tangential questions, and sees the problem from the audience’s perspective.”

Involvement in the Management Information System (MIS) Process

Most of the suggestions for enhancing audience consciousness have been attitudinal—centered around discussion of audience awareness. One suggestion that the interviewees were asked to comment on was structural—the possibility of direct Information Division involvement in the Management Information System (MIS).

In their paper “ERS in Search for its Clientele,”¹ Sayre and Stovall describe MIS as a tool ERS uses “to aid in research planning, monitoring, communication, and evaluation.” MIS is divided into three separate stages. The MIS-1 statement gives an overview of a program area, the objective of the program, and the reason for achieving those objectives. The MIS-2 statement describes each separate project in the program area, and the MIS-3 is an annual plan of work, describing progress on each project and anticipated publications.

Sayre and Stovall examined all MIS statements on file and found only vague, general references to audiences at the MIS-1 level. Those become even less specific in subsequent MIS statements, as the research nears the publication stage. The lack of specific attention to the audience prompted the two to suggest that the instructions be revised to require “systematic and explicit consideration of clientele.” They further recommend that an information officer be involved in the writing of MIS statements to help “link the research results, the audience, and the most effective medium.”

Most of the persons interviewed indicated they would favor some form of DI involvement in the MIS process, though the degree of involvement varies.

Rader, for example, would endorse such input at the MIS-3 stage, when some results have already been gathered. “Early establishment of a rapport between the researcher and the information person will enhance the position for better involvement at the later stages.” Because DI does not have enough staff to consult on every report, Rader suggests some selection: “Input on only a third of the projects would be very helpful.”

¹Earlier in this chapter.

Penn would prefer involvement much sooner. He finds the lack of audience mention in MIS "symptomatic of our problems" and would like DI input as early as possible, to help researchers become "more oriented toward output and audiences."

Cotner endorses both early and ongoing DI involvement. He believes this would help keep the pressure on in the accountability portion of MIS statements for specific mention of audiences and publication titles. "The information officer knows publication outlets, can help the researcher identify his clients, knows what information approaches would be appropriate, can influence how the research is done, and has an educational responsibility to teach the researcher to write."

Schertz shares the view that a contribution at the MIS level would improve the writing of subsequent reports. But rather than attempting to assist in all MIS statements, Schertz suggests as a more practical alternative that information specialists take one or two MIS statements and, with the researchers, rewrite them to show how well a statement can be done.

Another recommendation that would not put much strain on resources might be to require Information clearance on MIS statements. Ken Farrell suggests that "just raising the question of Division of Information signoff of MIS statements would develop a consciousness of audience by the researchers."

The few who opposed official Information involvement in MIS statements tended to object more to the MIS process itself than they did to DI intrusion. One objector grants the "need for interaction between the editors and the researchers," but feels MIS is "too formalized" for that interaction.

DURING RESEARCH—THE WRITING STAGE

Is ERS Tailoring Its Research to Specific Audiences?

All agree that ERS should be presenting its information in a way that is understandable to each interested audience but few believe this has consistently been done: "We are not well targeted to particular audiences," says Farrell. "We seem to write more for ourselves and other researchers than we should."

His complaint calls attention to a problem mentioned by nearly all persons interviewed: that even when researchers are aware of the audience, they may not have the inclination, or the ability, to tailor the presentation to the specific needs of that audience.

A researcher's attitude about whose responsibility it is to market the research is a factor. Blankenship theorizes that ERS researchers are "for the most part nurtured in an academic atmosphere and imbued with a desire to add to academic knowledge.

They seem to think it's up to other people—the administration, the Information Division, the news media—to go and figure out how their work is applicable.”

Pearson also sees a failure by some researchers to recognize their role in the dissemination process. “If part of a technical study has relevance to the man on the street, it is the responsibility of the researcher to see that a separate version of the study is put out” through a joint effort with Information.

One economist admits that after he finishes a report he is generally tired of it, ready to move on, and does not want to be concerned with secondary audiences. It is an attitude that Farrell calls “lazy and inexcusable,” but one that is probably shared by many ERS researchers.

In the event that a researcher is interested in extending his work to a wider audience, the next hurdle is that of adjusting the writing style. No one interviewed is pleased with the quality of writing of ERS economists, but opinions vary as to how bad the writing is and why so little is being done about it.

“The quality of writing here is atrocious,” comments one researcher. “Most of our economists are incapable of writing for laymen.” Joe Willett contends that “economists *can* say things to ordinary people, but tend to use technical jargon to show the profession they're with it.”

Whatever the cause, there has been little effort to rectify the problem. One economist says he senses “no message from the organization that top-quality writing is among our major priorities.” He predicts that “unless the top administration of ERS gets intimately involved in the writing problem, nothing will be done.”

Speaking from an administrator's point of view, Farrell acknowledges that “some researchers can't write,” but adds “they could write well if they tried.” He would support the reinstatement of ERS training courses in writing, attributing the present lack of such courses to “indifference.” Better writing by researchers will speed up the editorial process and free editors' time for earlier involvement in the information process.

AFTER RESEARCH—THE MERCHANDISING STAGE

The Editing Process

Ideally, before a manuscript arrives on an editor's desk, he or she has already discussed with the researcher the objectives of the report and its intended audience; has talked with the researcher about adjusting the organization and writing to suit the audience;

and has done a “pre-edit review”—a glance through an early draft to see if the researcher is on the right track.

Though this is the process envisioned by many of those interviewed, the manuscript that appears on an editor’s desk is likely to be one that he or she has never heard of.

One economist related an incident that illustrates the frequent lack of communication. He complained that a highly technical marketing report he had written for a small, specialized audience was tied up in the editing process while the editor laboriously translated the report into language that a layman could understand. The economist could not imagine why any layman would be interested in the report and also could not explain why this was never communicated to the editor, who apparently did not ask. The whole publication process was held up for an unnecessary translation. Even when there is no earlier communication between author and editor there at least must be a close interaction during the editing and merchandising of the report.

To Publish or Not to Publish?

That is a question that is not asked often enough in ERS, according to several interviewees. They contend that, although the agency gives ample consideration to *how* a report should be published, it lacks criteria for deciding *whether* it should be published at all. Judith Armstrong recalls a manuscript that was not very worthwhile but was published anyway mainly because the author had recently died “and it seemed like the least they could do.” She questions an apparently prevalent attitude that, since the publication costs are small relative to aggregate research costs, “we may as well publish it.”

Armstrong says that the questions that should be asked before a manuscript is published for wide distribution include: “Is it timely? Is it relevant to a specific issue or need? Is it applicable to a wide area or a substantial number of people? Can it be readily understood? Does it refute a popular belief?”

Pearson thinks the criteria are useful earlier in the process. He suggests that they be applied not for the question of “do we publish or not?” but rather for the question of “should the research ever have been done in the first place?” He admits though, that in addition to the relatively low cost of publishing a research report, other factors that contribute to the tendency to “go ahead and publish it” are author pride and the pressure of “publish or perish”—an attitude Pearson would like to change to “produce or perish.”

Willett points to the need for a careful set of selective criteria: “Rather than concentrating on what is important, we try to get everything out. If you’re going to make an impact, you have to be selective.”

The Packaging of a Publication

Several persons suggest that to achieve impact, ERS must devote more attention to the physical appearance of its publications.

Jim Kasal complains that even the publications ERS prepares for its more general audiences “look so drab and formidable, so eggheaded, that they wouldn’t interest anybody. We worry about spending an extra \$100,” he contends, “after spending \$100,000 on the research.”

According to Linley Juers, ERS should be more concerned with the packaging of its general reports and less concerned with the technical bulletins. “We should play up, in terms of flamboyance, the articles of general interest,” he suggests, “and “de-glossify” the very technical, esoteric studies for small audiences.” Penn recommends that ERS enhance its publications with color and more graphics. He contends that color and good graphics “improve readability, and get the attention of the people we’re supposed to reach.”

ERS has improved the appearance of its publications in recent years, but budget constraints still keep it from coming close in attractiveness to many private publications.

Considering Outlets

The outlet for the distribution of ERS findings is another part of the dissemination process that should be given more careful consideration.

The interviewees were asked to comment on the effectiveness of some of the current ERS distribution outlets and to suggest possible new methods.

Mailing lists. Distribution officer Donnell Royster says that many authors and editors give little thought to whom a publication will be sent. “It doesn’t make sense,” he says, “to print a publication and not worry about distribution.”

One economist admits that “when the distribution office calls me up and asks if I want a publication sent to, say, mailing code 4718, I don’t have a clue to what that means.” To find out more about a mailing list than is in the title, it is necessary to request a printout of all names on the list, wait two to three days, and then pay for the printout.

Sayre refers to the existing USDA mailing lists that ERS uses as “antiquated” and Royster allows that the lists are “old, obsolete, and haven’t been changed in years.” He says he has suggested updating the lists by sending letters every two to five years, to check on interest and duplication, but has been told it would cost too much, “even though it might save money in the long run.”

Special interest mailing lists. The traditional mailing lists are loosely built along the lines of the general manuscript series, with little organization by special interest categories. Several efforts are now underway to reconstruct the lists according to particular areas of interest. Such a system would make the scattershot method of trying to cover all potential clients in a subject area with several large, general mailings unnecessary, and would give the researcher a better feel for his audience. Though change-over costs may be substantial, the system would be less expensive and more efficient as smaller targeted mailings would result.

Farm Index magazine. The *Index* is judged to be helpful in reaching a general audience. One critic, however, suggests that the *Index* may be going overboard in its attempt to popularize ERS material. "It's too simplistic, too flashy" Willett remarks. "It doesn't reflect the economists enough."

Agricultural Outlook magazine. The *Outlook* received some criticism for the opposite extreme. One economist says "any busy person would not take the time to read it," and suggests the magazine adopt "a more direct, punchier style, like the Kiplinger reports," with information officers as coauthors of the articles.

Sayre and Stovall, in their paper, suggest that though the *Outlook* may be acceptable to its primary audience—Congress, USDA administration, and Washington's economic establishment—a livelier approach might serve that audience even better.

An intermediate publication. Some expressed concern about the amount of ERS information that never leaves the agency but that could have been useful to some outside audiences. George Rogers refers to material too substantial for a brief study but not worthy of a full-blown report. He suggests an informal publication, aimed mostly at the profession, that would include those intermediate-sized reports, an overview of works in progress, and, perhaps, "the bits of information lying around the agency that people would accumulate if they had the outlet."

National Technical Information Service (NTIS). NTIS can be viewed as a combination of two of the preceding suggested outlets—computerized, special-interest mailing and an intermediate publication vehicle. Agencies can send their manuscripts to NTIS, which then sends either microfiche or paper copies to any of its special-interest categories of paying customers. NTIS also stores the report for subsequent requests.

The advantages of NTIS are its specialized distribution, its archive service, and its potential as a cost-saver. "Compared with the cost of publishing a manuscript, distributing it ourselves, and storing it here, NTIS represents a substantial savings," says ERS contact for NTIS, Don Dickson. He adds, though, that "com-

pared with aggregate research costs the savings are not nearly as significant.”

NTIS has potential for highly technical reports that have too narrow an audience to warrant full publishing. It is also being seen as a low-cost alternative for a manuscript of dubious quality, which could imply that a report accessed to NTIS was not good enough to rate publishing. For this reason, and because it is still not very well known, acceptance of NTIS has been slow. Dickson believes, though, that given time, “the prognosis for NTIS is good.”

Television news spots. Regular features on topics of ERS research aired on local news programs across the country were generally praised by the reviewers. Penn calls the features “a real quality product that brings more of our work to meet the current, day-to-day news needs of the people.”

Publication-request flyers. A partial solution to the problem of outdated mailing lists would be sending one-page flyers that summarize a new report and include a publication-request form, rather than sending the actual publication. Smith, who has begun to prepare such a program, sees it cutting costs and providing some instant feedback.

Increased utilization of the Extension Service (ES). Several urged that ERS work more closely with ES, capitalizing on what Farrell terms their “direct responsibility to reach a wide audience.”

Sayre says ERS is not entirely bypassing Extension. “The point is, we do funnel a lot of information through ES, but it’s not a coordinated effort. It’s a hit-and-miss job.” Sayre maintains that as part of a more coordinated effort, ES “should come to us, and see what we’ve got to serve its audience.”

ES Information Division Director Ovid Bay would “like to keep going” in the direction of increased cooperation with ERS, but warns that “we would quickly get into budget questions.” Cotner echoes his concern because of Congressional preference for a strong State orientation for the Extension Service.

FEEDBACK

Why is ERS Feedback Inadequate?

All the people interviewed acknowledge the value of feedback as a measure of the effectiveness of the ERS information process. Two program leaders with close ties to narrowly defined primary audiences were the only ones who think their feedback is adequate, but even they feel their secondary audience feedback is not sufficient.

Some frustration is apparent. "I often wonder whether we ever reach anyone," says Armstrong. "And if we do, is it useful?" Wunderlich says he "feels like a lighthouse, sending beams of light out and not knowing where they reach."

Schertz suggests one reason ERS does not receive enough feedback might be the ineffectiveness of the product itself. "Maybe it wasn't written well, maybe it was not publicized in the right way, maybe the topic wasn't relevant or timely. We have to case the market well."

But even those problems could have generated some negative feedback. The fault probably is in the ERS feedback mechanism.

How Can ERS Improve Its Feedback?

All the interviewers acknowledged the importance of feedback. But when asked why ERS lacks feedback and how it could be improved, the usual responses were: "I don't know" or "I haven't thought about it."

Asked why ERS has not developed a feedback mechanism, Farrell replied: "We've been too busy. It's an oversight...one forgets the potential value of feedback." Farrell, and others, seem to realize the irony of working too hard to ever stop and see whether the work has been effective.

Pressed for ideas on how to improve ERS' flow of feedback, the suggestions made were generally expensive. Proposals such as surveys, questionnaires, phone calls, personal visits, and outside reviews are all intriguing, but costly.

The most obvious way to begin improving ERS feedback is to monitor distribution. Royster's statement that "Many people in ERS don't appreciate the importance of their distribution system" holds for gathering feedback as well as for the initial dissemination. Economists, even at managerial levels, have little grasp of the information available through closer contact with the distribution office. One manager, for example, was not aware that he could check the number of requests for a given publication by calling the distribution office and asking how many copies remained in stock—he did not know that such information was available.

The distribution office has always kept a record of the identity of any bulk-order requests and recently attempted to record every individual request, but found it lacked the personnel for such detailed recordkeeping.

One approach to enhancing feedback is underway on a trial basis. DI has instituted a clipping service—a fairly inexpensive process of monitoring the national press for stories based on ERS research.

One method that should be considered is Armstrong's suggestion that ERS take advantage of the yearly Agricultural Out-

look Conference to seminar with some of the users of its information.

Until the Government modifies its paradoxical policy of discouraging reader surveys as too costly, ERS needs to be innovative in its approaches for feedback gathering. The least expensive but most basic initiative ERS can take is to develop a consciousness for the importance of feedback in evaluating the effectiveness of the agency's programs.

CONCLUSIONS

In recent years, the Division of Information has made significant gains in merchandising ERS information, in identifying clientele, and in focusing on given audiences. But progress with the overall system of information dissemination still needs to be made. This paper has defined areas where the need for improvement is greatest—audience identification, the tailoring of information to the needs of those audiences, and the development of an effective feedback mechanism.

The paper has also suggested methods for realizing improvement. In terms of resource availabilities, several of those recommendations emerge as the most feasible. One suggestion for enhancing audience recognition in the research process is to submit MIS statements for Information review. This would insure greater audience consciousness on the part of ERS planners without tying up Information personnel in the MIS-writing exercise.

The quality of writing of ERS researchers must improve if the agency expects its research findings to reach audiences efficiently and effectively. If ERS management cannot find the resources for on-the-job writing courses, it should encourage participation in evening courses. In the longer run, ERS should make writing ability a major criterion in its hiring process.

The best immediate suggestions for enhancing feedback are monitoring distribution, and substituting flyers for actual reports on some mailing lists.

The author noted several ironies in talking with a broad sampling of ERS employees. The most striking was the number of economists who recognized a problem but were waiting for management directives, and the number of managers who recognized the same problem but thought it due to researchers' indifference.

Mutual recognition of the problem is a good sign but the lack of awareness of the common recognition indicates something more basic: the need for better communication within the agency.

Structural changes to improve the system of information dissemination will take time and resources. Meanwhile, ERS should

take more basic steps for attitudinal change. By increasing interaction and exchange of ideas between all parts of the agency—between management and researchers, researchers and information officers, and between the researchers themselves—ERS will lay the groundwork for further improvement.

APPENDIX

The author would like to thank all the persons interviewed for the generous contribution of their time and thoughts. The interviewees were:

Office of the Administrator: Kenneth R. Farrell, Deputy Administrator; Lyle O. Schertz, Deputy Administrator; Linley E. Juers, Senior Economist, Colorado State University.

National Economic Analysis Division: James L. Pearson, Acting Associate Director.

Commodity Economics Division: Lynn Rader, Assistant Director; J. B. Penn, Leader, Agricultural Policy Analysis; George B. Rogers, Leader, Poultry.

Foreign Demand and Competition Division: Joseph W. Willett, Director; Lynn A. Austin, Economist.

National Resource Economics Division: Melvin L. Cotner, Director; Roger W. Strohbehn, Deputy Director for Resource Studies; Gene Wunderlich, Senior Economist; James Kasal, Economist, Colorado State University.

Economic Development Division: Thomas F. Hady, Deputy Director; Alan R. Bird, Senior Economist.

Foreign Development Division: William A. Faught, Director; Dana G. Dalrymple, Economist.

Information Division: Benjamin R. Blankenship, Director; James R. Sayre, Leader, Resource and Development; Donnell Royster, Distribution Officer; Judith A. Armstrong, Donald W. Dickson, Deborah T. Smith, Angela Wray, Information Officers.

Also:

Extension Service, Information Division: Ovid U. Bay, Director.

Abstract of: INFORMATION FOR POLICY: A NEW APPROACH

by

Russell L. Gum and Louise M. Arthur

As policy issues have become increasingly complex, provision for prompt and efficient access to information has become a critical component of ERS decisionmaking. Difficulties with present data sources often impede decision processes.

The authors propose a computerized system that can offer specific, comprehensive, yet succinct and flexible information on economic, social, and environmental impacts of a decision. Data from simulations and a variety of nonstatistical sources can be incorporated to permit consideration of all aspects of an issue within a reasonable time frame.

As new data become available the system can be readily updated. The recently developed predator control information system is cited as prototype.

Chapter 9— THE ROLE OF ERS

FORENOTE

Who never to himself hath said: "this is my own, my proper role?" This chapter goes to the heart of any forward look because it considers the place of ERS in the minds of those who make up the agency and of those who receive its services.

Crosswhite and Moore, in separate papers, present related views with different emphases. They both express the need for rigor and objectivity; both perceive the conflict between long-term research and service activities.

Crosswhite sees the basic role of ERS as one of providing economic intelligence. Since the issue-client matrix is becoming more complex and resources are limited, priorities will be more difficult to establish. But a broad-based long-term program must be continued.

Moore says that quality of research must be maintained for ERS to stay credible. We must choose and be willing to say "no" to those requests that are beyond our resources to handle.

Five reviewers present a rich array of comments. They range from the didactic and pointed remarks of Hiemstra to the far-reaching observations of D. Gale Johnson. Hiemstra thinks ERS "would be well advised to stop trying to convince itself," that it is an independent research agency. Johnson calls attention to the need to pursue analysis of the tie between world trade and domestic agriculture and to accept more responsibility for research on consumer problems.

Hildreth underlines the growth of adversary positions in recent years between Congress and the executive branch, and between consumers and farmers (for example, the wheat embargo). ERS

should do a better job of anticipating such issues before they reach the adversary stage.

Blaich thinks ERS researchers have been unduly concerned about the effect of involvement in analysis of national programs and policies.

David Allee endorses Crosswhite's and Moore's positions and then goes beyond them in a thought-provoking paper. He says: "A different point of view should enrich the intellectual stew, not burn the pot." He thinks that even though standards for rigor and objectivity are applied, economics still deals with value-loaded attitudes and economists are not neutral. They must work closely with client groups to explain themselves.

Contributed papers by Back, Fuglestad, and Roop tackle three other themes.

Back takes for granted, as did Adam Smith, "that the interests of producers ought to be attended only so far as they coincide with those of consumers" and stresses public sovereignty as the basis for research orientation.

Fuglestad makes accountability to "public and private decisionmakers concerned with the use of resources in agriculture and rural America" the touchstone for dealing with emerging issues.

Roop compares reward systems for research and other activities in the universities and ERS and suggests modification that may help provide a better balance for research.

Finally, four more contributed papers (represented by abstracts) enfilade the problem from a number of directions. Crom presents a plan to facilitate matching jobs with researchers' abilities. Dickason suggests a methodology for studying international economic phenomena. Ericksen points to the need for better description and understanding of the interdependence of farmers, consumers, and economists. Williams philosophizes about the need for analysis of land ownership and management systems and their relation to land use change.

ERS ROLES, FUNCTIONS, AND SERVICES

by
William M. Crosswhite*

New programs in environmental economics, rural development, and international aspects of food demand and supply have added to the number of groups using ERS research information. Can we better identify emerging issues? Are there other ways to deal more effectively with economic information needs? Who are the clients that will shape our future research agenda?

In the next 10 years, ERS will be forced to choose among many new issues because resources are unlikely to permit study of all or even most of them. It will be difficult to maintain a reasonable balance between research and staff activities required for a broader clientele. Pressure will be exerted on ERS to expand its research program and to lead in interagency research, staff functions, and service activities.

COMPLETING THE ERS RESEARCH AGENDA

The questions most often asked in research planning are: "What are the issues?" and "Who are the clients?" A major objective of the Forward Look and most other ERS activities is to identify the emerging issues and the clients of the coming decade. Sayre and Stovall, in their Forward Look paper on "ERS in Search for Its Clientele," say:

Another major change has been in the issues. For ERS, farmgate questions have long since given way to issues of regional and national import—rural development, national capacity to produce food and fiber, consumerism, assistance to developing nations, environmental quality, and energy. Where our former research focus was on farm performance, the more recent one is on total agricultural performance and the wellbeing of rural America.

The ERS research agenda is determined by looking outward to identify economic problems in the food and fiber sector, land and water resources use, rural areas, and international food demand and supply. Numerous changes have been made in the ERS

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research agenda over the past 10 years. An Economic Development Division was created in 1965 to study problems of rural areas. Environmental studies were consolidated into a principal study area in the Natural Resource Economics Division in 1973. An ERS Energy Board was established in 1974 to study problems of energy use in agriculture and energy development in rural areas.

Not all economic issues get on the ERS research agenda. First, the Office of the Secretary and agencies of the Department directly influence our research priorities. Research related to the Department's mission, including studies specified in legislation and special Departmental requests by Congress, receives top priority. Second, because clients differ depending on the issues and the times, their influence will vary widely. It is the growing complexity of the issue-client matrix that complicates the process of balancing research and staff activities. ERS has not kept pace with changes in issues and clients, nor has the USDA-land grant university system. A committee should be set up to carry out two major tasks. The first would be to conduct a study of our clients, to assess their information needs, and formulate an ERS information system.

The second task would be to design activities and feedback mechanisms to identify high-priority research needs. The study possibilities range from issue-oriented workshops and conferences to followup research on economic information needs. Program Leaders can exert more leadership in completing the research agenda. Each program area should include analyses that look for future problems and evaluate alternatives for dealing with them.

Control over the research agenda has apparently passed from the agricultural and rural groups to a new set of clients. New issues and new clients have pushed out the research boundaries. New groups and new program agencies for consumer, environmental, and other concerns have been able to get the new issues on the research agenda by using public pressure on Congress to provide the necessary public funds.

THE WORK OF ERS

The work of ERS is part of the Federal-State agricultural research system. The system is made up of six agencies in USDA, 55 State agricultural experiment stations, 15 schools of forestry, 16 land grant colleges of 1890, and Tuskegee Institute. These organizations conduct about 95 percent of all publicly supported agricultural research.

The work of ERS has been perceived fairly consistently over

time as noted in the following series of statements compiled by Baker and Rasmussen.¹

The real work of the new Bureau of Agricultural Economics is to put the farmer and the dealer in farm products in possession of the facts they need in order to act wisely in all these problems of production and marketing, and to provide such service and supervision as will tend to establish efficiency and fair play in the marketing of farm products. (Henry C. Taylor, 1922).

I feel that the Bureau of Agricultural Economics and its companion bureaus, the Bureau of Census, and the Bureau of Labor Statistics are the agencies which would be responsible for seeing that the administrative officials, the Congress, and the people are reasonably well informed across the entire economic field. (O. V. Wells, 1946).

...assists the Director in the development of short- and long-range economic research and statistical work required by the Secretary of Agriculture, undertakes analytical studies of current and proposed agricultural programs, and represents the Director in the economic and statistical review of program actions. (Nathan M. Koffsky, 1961).

Our basic and continuing task is to provide the economic intelligence...that is necessary for understanding the significance and meaning of changes taking place on farms, in related processing and marketing industries, and in rural communities, and to provide evaluations of the consequences of alternative courses of action in solving agricultural problems. In addition to this basic core of economic research we are being called upon increasingly by the public, the Congress, and other agencies of the Federal Government for economic information related to very specific questions or to the solution of specific problems. (Louis Upchurch, 1970).

BAE ventured outside the research and service role in the 1940's with an emphasis on planning and discovered the unfortunate consequences of being political. BAE was abolished on October 13, 1953 and its functions divided between two agencies—the Agricultural Marketing Service and the Agricultural Research Service.

¹Baker, Gladys and Wayne D. Rasmussen, "Economic Research in the Department of Agriculture: A Historical Perspective," *Agricultural Economics Research*, July-Oct. 1975.

The plans were protested by a hastily organized committee of agricultural economists that included the Bureau's first chief, Henry C. Taylor; Howard R. Tolley, then with the Ford Foundation; and Raymond J. Penn of the University of Wisconsin. This committee offered a compromise plan after it became apparent that the Secretary would accept no sweeping departures from his plan no matter how strong the objections and that the top men in the BAE had already accepted it. But the committee compromise was rejected, and after the reorganization had taken effect, the Committee's views and the views of other economists appeared in an article entitled "The Fragmentation of the BAE," (*Journal of Farm Economics*, Feb. 1954). The economists' argument contained several points:

- The need existed for a strong program of fundamental, longer run research—as distinguished from operations and program research pointed at immediate improvement.
- It was important that the research be carried on in a unit removed from action, service, and regulatory work to preserve its objectivity and freedom from pressures.
- Farm management research should remain within agricultural economics.
- A type of organization like the BAE would give agricultural economics a high standing and it would attract people of first-rate ability.

THE ERS RESEARCH ROLE

The special characteristic of ERS, highlighted in the views of past leaders of BAE-ERS, is its objectivity and analytical rigor, and its special advisory role to the Office of the Secretary. It should not adopt policy positions or serve as an advocate for a particular course of action or policy. ERS research and communication processes do not decide or implement policy, but facilitate the access of both policymakers and the interested public to economic information.

Since economic problems change rapidly, they are rarely solved. Thus, it is not a single solution that ERS should seek but rather a better understanding of the problem and an array of alternative solutions. The major contribution of research is often in the approach taken or the perspective developed by the researcher and in the inspiration he brings to the problem. It is

the researcher's role to abstract or generalize the significant aspects of related problems and develop principles and techniques for problem analysis and problem solving.

ERS researchers need the mind-set of a university professor in conducting their research, but this may diminish access to decisionmakers. Research results may not support the policy positions taken by the Administration. Communication channels may be closed either by the researcher who resents having his output tailored to the needs of the agency or by the decisionmaker who does not feel his requests for economic information are being met.

Don Paarlberg, former Director of Agricultural Economics, described the role of the research economist in his remarks at the 1976 ERS Management Conference.

ERS is not:

- Merely supporters of the Secretary's ideas;
- A group of scholars talking to one another;
- Teachers;
- Profit oriented;
- A professional institution with a God-given right to grow;
or
- Captives of the agribusiness establishment

ERS is:

- A public-supported institution with a charge in the food and fiber area and rural sectors with responsibility to the general public;
- A research agency that should constantly test the waters to enlarge its boundaries—but when the tests shows there is strong opposition, it must pull back if it wants to survive;
- An agency that should maintain a balance in resource commitment between the vehicle (methodology) and the payload it delivers;
- An agency that should maintain objectivity as an essential element. Being objective has its downside when it does not support fully the current policy. But in the long run our real strength rests with our objectivity.

The problems associated with the role of a researcher in an operating Department must be recognized. Special efforts are required to keep research relevant, objective, and analytically rigorous. Access to decisionmakers must be established and nurtured by the researcher and the agency through continuing efforts to know and understand the information needs of users. These have a significant influence on the timing of research efforts. Timely and relevant research in a period of few changes can effectively be carried out through long-term projects. Remaining timely and relevant in a period of rapid change may require more short-term research and staff support.

STAFF VERSUS LONG-TERM RESEARCH

The growing complexity of the issue-client matrix may require the allocation of more of the time of researchers for staff research. However, effective staff research requires an adequate base of long-term research.

The responsibility for allocating staff time between staff and long-term research falls on the program leader. This makes the leader part researcher and part research manager and long-term research may be adversely affected.

What are the management options? A first option is to improve the handling of staff work within ERS. These responsibilities could be shifted to a staff group at the division or agency level. The group could identify important issues and provide feedback to research programs. Since some members of ERS have both major staff interests and research capabilities, a staff group could more effectively use their talents.

A second option is to establish an economic staff group in the Office of the Director of Agricultural Economics. Previous Directors have had staff groups that were effective in providing feedback to researchers and in packaging research results for use by decisionmakers.

The long-term research role of the field staff has been eroding under the current organization partly because of the placement of field staff in narrowly-defined program areas and partly because greater demands have been made on them for short-term staff research.

These concerns have been surfaced on previous occasions, but they should be reexamined. It is logical to look to the field staff for carrying out long-term research, but the field staff also needs to identify ways to make long-term research more relevant and accessible to users.

A special role of long-term ERS research is to study the interplay of changing technology, markets, and social structures and determine the consequences of these changes for agriculture and society. ERS must maintain interest in the discovery of facts and new theories. We must remain committed to developing the methodology for studying new and emerging problems.

EMERGING ROLES

The need for improved communications and coordination has provided ERS with an opportunity for three new roles. These are:

- Leadership in identifying emerging issues and initiating interagency and interdisciplinary research,

- Development of new sources of data and data services for colleges and other user groups, and
- A larger role in dissemination of economic intelligence to users.

ERS has already begun to provide research leadership within the Department in the areas of international issues, pesticide impact studies, food program evaluation, credit programs affecting rural areas, and technology assessment. An important aspect of this leadership is a capability to identify significant problems, and in cooperation with other disciplines develop comprehensive problem-oriented research. Interagency research must be increasingly concerned with national and regional issues, carried out in terms of the biological, physical, economic, and cultural aspects of the problems.

Progress has been made in developing new data sources. Appropriated funds have been provided to collect, in cooperation with SRS, primary data on food and fiber production and land and water resources. A Data Services Center has been established within ERS to coordinate data collection and distribution to public and private users.

Economic information is sought by a growing number of clients. ERS should examine the needs for improved information dissemination. This should be done cooperatively with the Extension Service, Cooperative State Research Service, and land grant universities. There is a particular need for a unified and coordinated research effort on research information dissemination within the USDA-land grant university system.

OVERVIEW AND SUMMARY

Concern with issues, clients, and roles requires an outward look, but there must also be an inward look at staff resources of the agency.

The 1973 reorganization provided for additional management and staff input by establishing the position of program leader. Other changes can be identified with specific management objectives. Most have contributed to mobility of ideas, funds and people, as well as to greater management control over research.

The basic ERS research, staff, and service roles remain relevant and appropriate. The need to be objective and to conduct rigorous analyses is a key element in all of our research and service functions. There are a number of implications for ERS in the discussion outlined in this paper:

- The issue-client matrix is becoming more complex, but this does not change our basic role of providing economic intel-

ligence. Because our resources are limited it may not be possible to service all new issues and clients. Research priorities will become more important.

- The management of research in ERS is becoming more complex and ERS is losing some control over its research agenda.
- New leadership roles are emerging in data services, information dissemination, and interagency research.
- ERS should insure that its research information reaches appropriate user groups and decisionmakers.

Important aspects of the major ERS functions can be summarized as follows:

Research Function

- Research should exert some control over an expanding agenda.
- It should serve many and varied clients from government, industry, and the private sector.
- Research should be appropriate for the problem; that is, long-term, short-term, applied, methodological, or descriptive.
- Output should be appropriate to the needs of the client; outlets are numerous.
- Research should be objective and carried out with the appropriate level of analytical rigor.

Staff Function

- The staff should have limited control over an expanding agenda.
- It should realize only one major client—USDA—and a few other clients such as Congress.
- It should be short-term and applied.
- The staff should organize output to consist mostly of staff reports and consultation.
- It should be objective and rigorous.

Service Function

- Should have considerable control over an expanding agenda.
- A small number of clients should be served.
- Service should consist primarily of data services and information dissemination.
- Output should mostly consist of data.

ERS has a combined research-staff-service role to provide economic intelligence on regional and national problems. Economic information should be timely, relevant, and based on objective and analytically rigorous research. Research priorities, changing in response to the growing number of issues and clientele, will

require that an increasing proportion of resources be devoted to short-term research and staff efforts. However, if ERS is to provide effective staff functions, a large and broadly based long-term research program must be developed and maintained. This can only be done efficiently and effectively through an integrated cooperative program by the Federal-State agricultural research system.

ERS ROLES, FUNCTIONS, AND SERVICES

by
Charles V. Moore*

In 1961 Willard W. Cochrane, then USDA's Director of Agricultural Economics, said; "The role of economics in the Department of Agriculture is to make both basic and applied economic research a force for the betterment of all groups in our Nation and in the world."¹

Like other elements of the executive branch of the Federal Government, the U.S. Department of Agriculture must look to the legislative branch for financial support. Traditionally, political support has come from the production and processing stages of the food and fiber industry. However, consumers are affected by the policies and programs of the Department and also have a direct interest in our work. Finally, the agricultural economists of ERS have a peer group of equally trained professionals in the universities and industry. Standards of professional quality are set by this peer group.

WHOSE COIN DO WE SEEK?

Individual professionals in ERS will seek recognition and rewards from one or more of the above groups. Some will attach more importance to one group than another because of personal interest in a set of problems or methods of solving them. No two researchers will perceive the role of ERS exactly alike. However, in the aggregate, ERS is faced with the problem of maximizing a multiple goal that includes each of these clientele groups.² To maximize this aggregate function, weights must be attached to each of the groups. High relative weights for the executive and legislative branches imply a high proportion of staff work in the output mix. In the bureaucratic scheme of life, this might also imply higher growth rates in budget and personnel for ERS.

Conversely, high relative weights attached to professional recognition would change the output mix toward more long-term and methodological research.

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¹Cochrane, W. W., "The Role of Economics and Statistics in the USDA," *Agr. Econ. Res.*, July 1961, pp. 69-74.

²Although we are unable to quantify this problem, conceptually the maximization framework provides an excellent basis for viewing it.

An alternative viewpoint or model for the product-mix problem would be an all-encompassing framework that covers all bases. With this model, ERS would avoid assigning weights but would encounter the still more difficult problems of setting minimum satisfying limits and ordering preferences. In this framework, ERS would attempt to maximize the lowest ordered preference, say that of consumers, after satisfying other groups in the order of their priority.

INDEPENDENT RESEARCH

One dimension of the multidimensional objective function just discussed is the quality aspect of research. Regardless of whose coin we seek, the quality of the research output will be judged by all who use it; and it will be judged by different standards depending upon the clientele groups.

Members of the USDA administration and the legislative branch operate in a political environment under adversary proceedings foreign to the trained researcher. From their point of view, quality would be measured by the usefulness of the research for a predetermined goal. To a lesser extent, consumers and members of the food and agricultural industry apply the same measure. But the agricultural economics profession judges us by different standards—rigor, thoroughness, accuracy, and particularly lack of bias.

If ERS is to be an independent research agency a decade from now, how can these opposing and conflicting demands be resolved? Administrative and Congressional requests for research to be used in adversary proceedings must be met. If ERS is to maintain its credibility, we have a choice of two alternatives. The first is to request that the administration form a separate staff economist group unattached to ERS that would perform these functions. This alternative may be detrimental in terms of support during budget hearings. The second alternative requires a set of ground rules agreed to and supported by all parties to keep the quality standard inviolate. All sides of a question must be explored, all alternatives must be given consideration, and the chips should be allowed to fall where they may. One report tainted with political considerations is sufficient to sully our reputation for years to come.

In considering the independence and role of ERS, a subsidiary question must be asked. Is ERS the agricultural economics research group for USDA alone, or for all agencies of the Federal Government? It has been disturbing in recent years to observe a proliferation of small agricultural economics research groups in

other Federal departments. If there are economies of scale in research, ERS should be able to argue effectively that these functions should be housed here.

Quality, objectivity, and rigor begin in the way in which the research question is framed; they must be continued through the review of the final manuscript. If each of us insists on high standards, no administrator will feel uncomfortable standing behind us, regardless of how unpopular our conclusions may be.

WHO DEFINES THE RESEARCH PROBLEM?

ERS research has been classified into many two-part groups. Examples are staff—basic, service—long term, brush fire—methodological.

The hallmark of a good manager is the ability to anticipate problems in an intermediate and long-term planning horizon. To quote the general manager of a large (40,000 acre), diversified crop farm in California, "I've got other people to look for the rough spots in the road immediately ahead. My job is to look down the road for the major turns." Is this not also true of research management?

One of the more disruptive influences in our research is the crash project that comes down the chain of command, only to find there is no stock of research knowledge.

It is impossible to anticipate all the questions that will be asked. But the more questions we anticipate, the higher our credit rating will be. We must have asked the question of ourselves before it is asked of us. Failure to anticipate puts ERS in the position of allocating a higher percentage of resources into scrambling for answers in an information vacuum.

The tradeoff is one of assessing the benefits and costs of anticipatory versus reactive research. In my judgment, it is an inefficient use of scarce resources to have a high percentage of people engaged in reactive research. When ERS defines the problem in advance, we control the timing and allocation of resources and the output. If the problem is defined externally, ERS loses most of this control and costs increase accordingly. How can ERS avoid this "staff work trap?" Anticipating "turns in the road" is not only the responsibility of top management, but of everyone in ERS.

How does this relate to the role, functions, and services of ERS? It will be impossible to increase the proportion of anticipatory research by just sitting in the monastery at 500 12th St., S.W. ERS will need to increase its contacts with Congressional

Committees, other Federal departments, the food and fiber industry, and consumers.

An improved liaison could be accomplished with little modification of the existing structure of ERS. Consider, for example, Shaffer's suggestion for interagency task forces or State Department-like desks to maintain closer contact with the regulatory agencies, and improved monitoring of basic changes underway in the system.³

Another approach would be to broaden our information base by implementing part or all of Ben French's suggestion for each program leader to operate as an information center for the entire profession.⁴ French's idea of a research desk in each program area would also help.

The major adjustment in ERS, however, must be in attitude. We must become more aggressive in searching out emerging problems and policy questions. In field locations, this may entail more latitude since every program area is not represented at each field location.

CAN ERS SAY NO?

I have observed on several occasions ERS acceptance of research requests far beyond our scope of professional competence or means. While these requests are difficult to refuse, failure to deliver on promises can work only to our detriment. Many failures are caused by an inadequate data base of physical and biological information. After accepting an assignment, we are forced into either evading the question or doing a poor job of answering it.

ERS personnel involved in negotiations for extramural funded research or with Congress must keep in mind that the role of ERS is that of an *economic* research organization and not an interdisciplinary research group.

As additional regulatory agencies emerge and the complexity of the food and agriculture sector become better understood, ERS may be called upon more often for answers to policy questions based on research in other disciplines. This will require willingness to enter interdisciplinary task forces. A task force is a grouping of units or individuals with dissimilar capabilities capable of contributing to a common objective. Operational control is

³Shaffer, James D., "Changing Orientations in Marketing Research," *Amer. Jour. Agr. Econ.*, Dec. 1968, pp. 1437-1449.

⁴French, B. C., "On the Failures of Agricultural Economics and the Design of a Better Research Information System," Joint ERS-FCS Seminar, April 18, 1974, Washington, D.C.

distinct from administrative control. Administrative control can impede objectivity and candor both in the day-to-day operations and in the final reporting. In my experience, agricultural economists are in a better position to head an interdisciplinary task force than physical or biological scientists, because they are trained to weigh relative contributions.

One function of ERS is to provide leadership in conceptualizing problems and in organizing the resources and talents to accomplish the task at hand. It would be naive to assume this function can be developed overnight. A long educational process would be involved in gaining the confidence of physical scientists. The burden should be carried by those charged with the liaison function discussed earlier.

IS DATA-GATHERING RESEARCH?

Although one of the major functions of ERS is economic intelligence, the Statistical Reporting Service and the Bureau of the Census are the primary collectors of our data needs. Much of our data gathering in recent years has been mandated by Congress; for example, the marketing margin studies. The concern here is that the role of ERS as a data gatherer should not become an end in itself.

ERS sometimes appears to be expending such a high proportion of its resources in designing questionnaires, and in editing, tabulating, and summarizing interview schedules that little time is left for analysis. Time and again questionnaires are prepared with no testable hypothesis in mind or at best a very unsophisticated question. I would argue that ERS has abdicated that role in economic analysis which requires creativity and imagination in conceptualization and model building. We are in danger of losing our research identity unless funding and manpower are provided within the data-gathering contract for comprehensive analysis of the data.

So much for changes that I would like to see in the existing roles and functions of ERS. I turn now to what I consider the more significant question of the future role, function, and services of ERS.

WILL THERE BE A NATIONAL PLANNING AGENCY?

Two recent bills in Congress directly relate to national planning. The Humphrey-Javits bill titled "Balanced Growth and Eco-

conomic Planning Act," would create an Economic Planning Board. The other, the Humphrey-Hawkins bill "The Full Employment and Balanced Growth Act," would retain the President's Council of Economic Advisers (CEA) but greatly expand its scope and planning functions.

The passage of one of these bills or something like it in the next 10 years is highly probable. The United States is one of the few major countries in the world that does not have a formal planning agency.

The passage of a national planning act will have profound effects on USDA and on ERS in particular. Under the Humphrey-Hawkins bill, annual and long-term numerical goals would be set for employment, production, and purchasing power. All departments, agencies, and regulatory commissions would be required to submit to the CEA an annual report indicating their contribution to these goals and the tie-in with the other agencies.

It is not clear from the bill if the planning function would be centralized under an enlarged CEA and Office of Management and Budget (OMB) or would take the form of enlarged planning units within individual agencies. One could speculate that the Council would sponsor and develop a large input-output model of the economy. USDA might be responsible for developing a disaggregated input-output model of the food and agriculture sector or a sector planning model like the one developed by Michigan State University for certain underdeveloped countries.

ERS' current function as an economic intelligence unit could be overshadowed by the planning function. It would influence the kinds of data we collect and the type of research we undertake. A sector planning model would require massive data and research on the positive rather than the normative behavior of the major parts of the food and fiber sector. Research would include employment and income generating effects of Soil Conservation Service and Forest Service projects and programs. Additional research would be needed about the response of growers, processors, and consumers to policy changes.

Instead of relying on the comparative statics of the Census of Agriculture, we would need to collect information on the dynamics and interrelationships within agriculture.

Policy analysis would also take on a different form. Instead of analyzing a program from the viewpoint of forecasting its effects on farm income, the question would be turned around. With a given income and production goal, what program do we need to reach that goal? The ingenuity and creativity of our policy analysts will be taxed.

The work in foreign economic analysis concerning the impact of our policies on other countries and the impact of their policies

on U.S. agriculture would have to be greatly expanded. Any sector planning model would have to account for the globalization of U.S. agriculture.

With the full employment goal of the Humphrey-Hawkins bill, a heavy burden would fall on the economic development people in ERS. Employment and income generation and distribution aspects of all USDA programs and policies would come under closer scrutiny by OMB and the Council of Economic Advisers.

Environmental problems would become more important in national planning. The interdependencies between agriculture and other industrial sectors with respect to air, land, and water would need to be quantified. Partial analyses or impact studies now underway would be insufficient for planning needs.

The input industry's importance to food and agriculture would come more clearly into focus in the context of a sector planning model. Planners would be searching for bottlenecks and constraints to achieving national goals and we would need much more information on inventories, manufacturing capacities, and investment behavior in the input and service industries that supply agriculture.

This is a sufficient sketch of the possible changes which ERS may encounter under a national planning scheme. Indeed, the impacts will be profound. Of course, a separate planning unit may be organized within USDA with its own staff economists. Even so, heavy reliance would still be placed on ERS for data and research. Even if ERS is not assigned the planning function, the shift in the focus of our research which I have discussed here would be beneficial to ERS.

WILL THERE BE A DEPARTMENT OF CONSUMER AFFAIRS?

In 1975, the Senate passed Senate Bill 200, the Consumer Protection Act. The House passed an amended version of the same bill. President Carter has stated his support for creation of a Department of Consumer Affairs.

The creation of such a department within the next 10 years is probable. The effect on ERS will depend heavily on the powers granted to the new department by Congress. At least one State—California—now has a Department of Consumer Affairs. It was given the power to sue other State agencies as well as to initiate court actions against private parties and corporations.

The vast majority of consumer complaints received by the California Department of Consumer Affairs concern food. Most of the Department's research requests to the University also concern

food. If California's experience is a guide, ERS could expect an upsurge of research requests in the consumer area. These will run the gamut from questions of unfair trade practices in commodity markets, to water pricing in rural communities, to price impacts of world trade policies.

The body of economic theory on consumer behavior and protection has developed rapidly in recent years. It is conceptually rich and awaits empirical testing. In terms of anticipatory research, ERS is the logical Federal agency to start to determine the solutions to these questions and to develop a fund of knowledge to help answer inquiries and to defend USDA programs in court actions.

With the continuing decline in farm influence in Congress, it may be wise for ERS to cultivate a broader political base in a group to which we all belong—the consumers.

HOW DO WE GET THERE FROM HERE?

Economic information has value only if it changes the perception of the decisionmaker enough to change his decisions. To maximize information value over all clientele, ERS research managers must constantly monitor the road ahead and search for emerging problems or major "turns in the road." One suggestion is the formation of a "think tank." This implies employing outsiders with their different perspectives to come in on a short-term basis. I would argue that ERS has the capability of conducting this search with existing resources through an improved liaison function as discussed earlier.

Research managers have two options in their choice of pathways to arrive at the mix of roles, functions, and services projected in this paper for a decade from now. First, they can take a passive role by continuing on the present trajectory, and by making minor adjustments. This alternative will probably get ERS into an optimum configuration about 5 years late, with everyone scrambling to answer policy questions from an inadequate information base.

The second option would be to use a Bayesian analysis as our conceptual decision framework. This would mean prediction of the probabilities of major future events ("turns in the road"), defining alternative research mixes (actions or strategies), and then selecting the actions that maximize utility for all of our clientele in combination. As our perception of the probabilities changes, the model would be updated and new optimal actions determined. Even though this model is not yet fully quantifiable, the decision framework will be useful.

Funding of ERS to accommodate these turns in the road is, of course, uncertain. Under a generous funding scenario, there would be no problem of simply expanding the amount of resources available to ERS (I assume the supply of agricultural economists is elastic), and the agency would simply grow.

Under more limited funding, ERS research managers would be required to make some difficult decisions in ranking research and service priorities. For each new program area added, something would have to be dropped. Some current administrators might even have to return to doing research.

SUMMARY AND CONCLUSIONS

Major turns in the road lie ahead of ERS, not to mention some chuck holes, bumps, and heavy traffic.

To maintain our identity as a credible research organization, the quality of our research must be sacrosanct. We must be willing to say "no" to those who offer funds for research beyond our expertise. We should not become so enamored with collecting numbers that we forget analysis.

Finally, two major possibilities have appeared on the horizon: a National Planning Agency and a Department of Consumer Affairs. We can lay the groundwork now and be prepared to make a contribution when the time comes or we can wait and hope to muddle through. I prefer the former.

Review of: ERS ROLES, FUNCTIONS, AND SERVICES

by
R. J. Hildreth*

Moore and Crosswhite emphasize objectivity and quality of research. A major problem is that different clients of ERS have different perspectives on "objectivity." The range of interests is wide, from farmers to consumers in the food system, and through many levels of government. They have different reasons for wanting intelligence and often have conflicting interests and different criteria for objectivity.

The first major question raised by Moore is: "Whose coin do we seek?" His answer is that different individuals in ERS seek the coin of different groups. Arriving at an objective goal for ERS by summing up individual preferences is difficult, if not impossible. It might be worth noting that Arrow's theorem about ordering of goals by democratic means is titled "Impossibility Theorem."

One answer is to impose the ordering of goals from the Administrator's Office. However, since research is an enterprise requiring independent thought and action, such a process does not provide an easy solution. There are differences not only in perspectives of clients, but also in reactions to the perspectives by individual economists in ERS. ERS, like every large research unit, apparently muddles through by obtaining "sufficient consensus" in a sufficiently democratic way to continue about its business. The people who control funds have larger votes in arriving at the sufficient consensus, but not so much that independent thought and action does not occur.

The client-issues matrix is complex. As Moore points out, both the requests of Congress and the USDA administration must be met. The growth in the adversary positions between Congress and the Administration in the last decade is a significant element of the environment facing ERS. Other adversary positions have grown as the economy and society have become more interdependent. For example, the embargo of wheat sales to the USSR was viewed differently by farmers and consumers. USDA agencies, Congress, farmers, the firms in the food system, and consumers have become more concerned about food issues. Also, other Federal units—such as the State Department—church groups, and even international publics, have an increased interest

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in the U.S. food system as the size of the world food problem has grown.

The major point of both papers is the need for ERS to anticipate issues before they become part of the adversary proceedings. The ability to see the "major turns down the road" is a useful way to deal with client-issues matrix problems. When a major turn has been predicted and economic information developed before the turn occurs, the information is not viewed as being as partisan as when the battle has been joined by the adversaries. Such performance may even prevent useless battles.

The criterion for successful performance in anticipatory versus reactive style is the ability of ERS to anticipate issues important to clients. Performance in choosing issues probably should not be judged from the point of view of the economics profession. Rather the judgment of the economics profession is wanted on the rigor, accuracy, and objectivity of the analysis.

Neither of the papers presents a simple step-by-step method for anticipating major turns in the road. I do not know of such a method. Obviously clear and deep economic thought is required. But major turns often come about from political and social forces. An understanding of such forces will make for better anticipation.

Moore suggests two major turning points will occur if a National Planning Agency and a Department of Consumer Affairs come into being. I find his analysis of the changes in ERS research agenda with the existence of these agencies logical. But an important question is whether they will come into being.

There are a number of minor concerns I would like to discuss. A conflict appears to exist between Moore and Crosswhite on the matter of data collection. Moore asks: "Is data-gathering research?" Crosswhite sees some advantages for ERS in more collection of data. I tend to agree with both positions. Collecting data for its own sake without testable hypotheses to use it adds little to knowledge. But model building without data to verify the model is not research; it is only an exercise in logic. Moore's concern with acceptance of funds for research beyond the scope of professional competence appears valid. However, if a significant issue can be anticipated, that competence can be developed or hired.

The roles, functions, and services of ERS in a decade from now cannot be determined clearly and precisely in two papers, but the papers do turn attention to many of the major problems and opportunities. They are a good start.

Review of: ERS ROLES, FUNCTIONS, AND SERVICES

by
O. P. Blaich*

Moore and Crosswhite have shown unusual insight into the problems that ERS has faced in adjusting its past research programs and in speculating about the future. They have also identified a key element critical for planning a research program: usefulness to clients.

But while the authors have found the major elements for planning economic research, they have largely ignored them in speculating about the future role of ERS. They seem to assume that ERS will continue in its current planning mode, guided by professional objectives with allowance for Executive and Congressional needs, the demands of various interest groups, and the personal preferences of researchers. This is a highly-subjective approach to economic-research planning; it is short on client orientation and lacks the potential for maximizing utility and minimizing costs for the information ERS produces. It lacks the goal of efficiency, which economists tend to revere.

A review of ERS output over the years provides evidence that research planning may have lacked a client-utility orientation. How far this has been a factor in obtaining funding in the last 10 or 15 years is difficult to appraise. From 1968 to 1976, the Statistical Reporting Service (SRS), the Animal and Plant Health Inspection Service (APHIS), and the Extension Service (ES), for example, each had funding increases well over 200 percent. In the same period, ERS gained only 187 percent. Still this was more than the Agricultural Research Service (ARS) (179 percent) or the Cooperative State Research Service (CSRS) (166 percent).

A key factor in the future role of ERS is the extent to which the political system is becoming more sophisticated in its demands for program performance. A number of bills introduced in the Congress would require more frequent accountability of performance. In addition, there is much interest in the General Accounting Office (GAO), the Office of Management and Budget (OMB), and other executive agencies for increased program evaluation. There is also discussion of zero-base budgeting.

ERS has a wide range of clientele: farmers, agribusinessmen, consumers, the executive, the Congress, and trade organizations to name a few. An important question is the extent to which ERS

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can provide useful information for each of them. This needs to be examined carefully.

Ideally the process of deciding whether or not useful information can be provided requires a careful analysis of the decisions that each client has to make and a determination of the information for which there is the greatest need. The principles underlying this evaluation process are well expressed by Moore. He states that: "Economic information has value only if it changes the perception of the decisionmaker enough to change his decisions."

The application of the above theorem to research planning requires the identification of the client and a knowledge of the dimensions of his decision model. The complete model would include all of the relevant economic variables, the client's goal and other choice criteria, the resource adjustments that are the focus of the client's decision, and the way in which all of these variables are linked together. It would then be possible to determine the contribution that additional information could make to the value of the decision. ERS needs to raise its level of consciousness regarding this principle.

Application of the above principle to each individual decisionmaker for each decision is virtually impossible considering the enormous number of clients ERS purports to serve. It presents less of a problem if limited to those who can be dealt with on a one-to-one basis. This would be possible with decisionmakers in the executive and legislative branches and perhaps some other national-level groups. To reach clientele *groups*—including farmers, agribusinessmen, and consumers—it will be necessary to find shortcuts.

An acceptable way in which ERS has served its more remote clients is to provide generalized information that can be produced and distributed at low unit cost to large numbers. Such information is not specific to each individual's needs but it is still sufficient to be helpful. The supply-demand and price information needed for numerous legislative or administrative program decisions is an obvious example. It is usually published in the generalized form of averages, yet it can be used by farmers and other commodity-market participants. To make such data useful the decisionmaker needs to apply an extrapolation formula by which he transposes the national data to his specific decision model. In some cases these extrapolation formulas are quite simple; in others they are not.

Considering the foregoing limitations on the utility of information for the remote client, ERS needs to examine closely the cost of producing generalized information. Sometimes the value of the information might be less than its cost.

Opportunities for providing byproduct information to remote clients are numerous and varied. Economic decisions made within the jurisdiction of the USDA alone are related to about 250 different programs. In addition, there are numerous other national programs involving topics such as taxation, transportation, market regulation, rural development, and international trade.

The USDA programs cover a wide range of topics but current ERS research provides information directly for only a few of the program decisions of the Department. The most significant involvement has been with commodity supply-management decisions. ERS has also provided cost-benefit information for conservation projects and has made sporadic efforts in some other areas. For many of the USDA programs, however, direct involvement has seemingly been avoided—the most notable ones are international trade, rural development, and nutrition.

ERS managers and some researchers appear unduly concerned about the impact that involvement in national program and policy analysis may have on the agency's credibility. While there is some element of risk, analysts have participated for years in the commodity and conservation program decision process without serious repercussions.

Development of much of the information needed for making USDA program and policy decisions would involve little risk of controversy. The high-risk research is that which deals with the full-scale decision model including an analysis of alternative actions and their consequences in all relevant dimensions. However, all ERS research projects need not be so comprehensive. In many cases the research may be exploratory to determine which economic variables should be included in the decision model; in others it may involve developing more accurate measures of key variables or coefficients; in still others the research may involve projections or forecasts of the economic system; and in some it may involve an assessment of past program performance. In all cases, however, the researcher has to be acquainted with the full decision model.

An analysis of the economic information needs of remote clients requires a similar procedure to assure maximum effectiveness. However, it involves one additional step; that is, the optimum level of generalization that can be achieved for any particular subset of clients' decisions must be determined.

I believe the authors would agree with me that ERS needs to introduce as explicitly as possible the principles related to the value of information as an added variable in determining its role and functions. ERS must continue to respond to current political realities, but the political choices should be subject to the scrutiny of cost-effectiveness as long as the competition for funds is strong.

Review of: ERS ROLES, FUNCTIONS, AND SERVICES

by
David J. Allee*

Crosswhite and Moore have systematically reviewed some of the alternatives in the roles, functions, and services ERS should perform over the next decade. This paper goes beyond their arguments and does not, in the main, take issue with them. A different point of view should enrich the intellectual stew, not burn the pot.

The objective of this paper is to provide some food for thought about analysis that is more political than has been traditional among economists. Some significant value conflicts are involved.

Crosswhite and Moore repeatedly refer to objectivity and rigor, nonadvocacy and relevancy. These are seen as necessary requirements to weather the storms of a political system that stresses advocacy and interest representation. The implication is that standards for objectivity and rigor exist in the professional fraternity, and commonsense should guide. But economics is not neutral. Its application with rigor introduces many value-loaded attitudes. Remember all the issues we sweep under that rug marked "equity?" Economists' conclusions *will* favor some groups more than others. The mantle of science has not protected the nuclear physicist or the entomologist; it is even less likely to protect the economist.

These are hardly new ideas. The point is that economists are a particular interest group. As a group we have norms of behavior and procedures by which we defend ourselves. Those who follow the group's rules of objectivity and rigor are recognized as worthy of that protection which the group can offer.

Other considerations come to mind. Economists are adapting their approaches to a wider range of questions. Public-choice economists, using familiar reasoning, ask who should make decisions and how, rather than what they ideally should be. Other disciplines have worked well in tandem with economics. Perhaps ERS should consider a broader range of social science.

Some less traditional aspects of public issues and ways of exploring them could be more effective and at the same time protect the agency. Systematic identification of the actors and arenas for policy formation might draw us away from the image of the

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decisionmaker as a philosopher king. Indeed, if ERS is to address all sides of a question, it needs a better process to identify those sides.

The suggestion that ERS foresee national planning and consumer affairs as strategic for the next decade needs to be examined. These may be manifestations of a wider question, namely the effectiveness of government to implement policy. Skill in applying economic analysis to evaluating agency behavior in an interagency context may serve both purposes.

Finally, ERS has an opportunity to strengthen federalism in research and at the same time enhance the ability of the group to offer protection to its members. ERS should consider bringing those of like interests together to define what objectivity and rigor mean for them. Standards are not so universal and timeless that they can be taken for granted.

Going Beyond Normative Economics¹

ERS might consider more emphasis on the institutional analysis of intergovernmental arrangements for the management of resource systems. Improved conceptual tools to do so are at hand. Economists are comfortable in defining systems as input and output arrangements. Market failure notions (externalities, common property, public goods, limits to competition, maladjustments in technology changes, and so on) fit nicely in normative models from which flow prescriptions for correction. Attorneys, political scientists, and sociologists have skills in evaluating the structure and authority resources available to the participants in the programs who are trying to deal with these market failures.

However, for more effective research, it will be necessary to enrich the intellectual tools in this analytical mix. Some have had success in applying the approaches of the economist and the attorney in different ways with judicious borrowing from political scientists and sociologists.

The Political Economy of Water Pollution as an Example

Some thoughts on how to proceed in a particular policy area may help. Water pollution is an area with unique potential for USDA agencies. It may contain the seeds for more modification of rural property rights than any other area of current policy concern. What to do about pollutants in land runoff is the issue. Nutrients, pesticides, silt from rural areas, and silt and various

¹The discussion in the next two sections was inspired by a review visit to ERS to seminar with the group on "Resource Ownership and Control." The thoughts in the discussion were probably borrowed from the staff of that unit or from my fellow visitor, Phil Raup.

pollutants from urban areas appear to account for 50 to 80 percent of the objectionable constituents in many watersheds.

Economists have put considerable effort into pollution problems. The literature on the effluent charge is extensive. Virtually none of it is based upon experience because in spite of vigorous advocacy by economists the effluent charge remains unused. To my knowledge, no one has explained why.

Recently, effort has gone into evaluating the impact of cut-backs in fertilizer and pesticide use, taxes on these chemicals, and other approaches, which may be as likely of adoption as effluent charges. Over the years, economists have examined the costs and returns associated with soil-conservation practices. This means that there is some economic analysis on which to start an examination of institutional adjustments. Much of what has been done assumes a level of regulatory effectiveness that is not very realistic; it lacks an empirical base. Institutional analysis should help provide realism.

Regulatory processes can be looked upon as bargaining situations. Standards, technical information, compliance monitoring, information on impacts on water quality, information on costs and returns, cost sharing, public participation, and particularly relationships between units of government at different levels become elements in that bargaining and affect the outcome. Public-choice models may help analyze these elements.

USDA programs can give a base for this sort of study. The Soil Conservation Service provides technical assistance to local soil and water conservation districts and has some authority to cost-share and provide technical assistance in farm-runoff pollution. EPA-funded "208" planning programs administered through State pollution agencies are exploring alternatives in dealing with the nonpoint pollution problem, often in cooperation with other agencies. Indeed, the State role is large. The Agricultural Stabilization and Conservation Service (ASCS) has more potential for cost-sharing than it has developed. The Extension Services are beginning to extend the information others are developing.

Identifying the Relevant Questions

Economists define things in terms of their discipline. This means an issue will be fitted to the analytical skills available; questions for which conceptual tools are not available will be reformulated or ignored. This is part of the process of applying the norms of objectivity and rigor. The more this is done with a full knowledge of the viewpoints and concerns of the political participants for each issue, the more likely the result will be seen as balanced and objective by those outside the disciplinary group. The problem is how to get that knowledge.

Equally perplexing is how to project a posture that demon-

strates this kind of evenhanded approach. Since many see the researchers as clearly identified with particular interest groups, it is especially necessary to reinforce their intent to follow strict professional rules of behavior.

The following approach that seems successful has been tested in the development of educational programs for New York legislators.²

With thousands of bills introduced, it is impossible for the legislators to consider each problem in depth. Like most groups, the Legislature depends upon specialists. The committee structure is a part of this. Also particular issues attract the attention of particular legislators for various reasons, such as constituent interest, the background of the legislator, his training, friends, and so on. Often this is reflected in committee assignments. Often it is not. Most new issues do not fit neatly into old committee jurisdictions; and a new issue attracts new participants.

Legislators will defer to the specialists among their colleagues on an issue. Most issues are *not* objects of strict party discipline, although much of the communication in arriving at consent follows the party-oriented structure. The roles of conflict and accommodation must be recognized in this deference process. Spokesmen for a legitimate interest are expected to have a hearing. Accommodation of a legitimate interest is expected. Conflict is expensive; it uses up too much time and effort needed for other issues. Almost any legislator, and many other participants, can pose the threat of conflict and cause the issue to be delayed pending accommodation or a recognition that while the objector may not be satisfied, other key figures agree that the interest of the objector has been dealt with fairly.

One point to be drawn from this model of the legislative process is that any given issue may command the close attention of only a few legislators and their associated staffs. Their need for information is large but highly specific. These few specialists should be particularly responsive to a research effort that is clearly intended to give them a role in specifying the questions to be addressed and the time, place, and format for the research.

The first step is to find the legislative and interest-group specialists. Following that, their particular concerns in a given issue must be determined. Finally, research must be designed and conducted in accordance with those concerns.

Finding the specialists involves redefining the issue in their terms. What is included in the issue depends on who gets involved and vice versa. A tested social science technique starts with those

²My colleagues, Stewart Wright, Fred Winch, Harold Capener, Harlan Brusted, and Lyle Raymond worked on this testing.

in formal positions of responsibility: committee chairmen, members and their staff, plus a few agency and interest-group legislative representatives. Interviews with these people gradually yield a definition of the problem and reveal those persons whom they think would become involved in proposals for legislation. These people in turn identify others.

Several things will have been accomplished if the interviews are conducted by a person capable of bringing some expertise to the situation. First, the audience will have been recruited on a one-to-one basis. This is essential in achieving commitment. Second, the current level of sophistication in the discussion of the issues will be identified. Third, in addition to a list of questions that are being asked in the legislative process, the interviewer will have spotted questions that are not being asked, but should be. Finally, the knowledgeable interviewer will have provided an educational experience for those interviewed. Even if it is determined that no further research is warranted at this time, the effort builds bridges.

Social Scientists as a Source of Internal Reform³

Public programs, like organisms, must adapt to changes in their environment. This is desirable because it leads to more efficient use of that scarce resource—public decisionmaking capacity. Important is the ability to use new information: it suggests new ways of handling something that needs doing. In part, the work of ERS should speak to the interests of groups that are not now heard within USDA but that have the potential of providing support for new missions and new roles. The identification of sympathetic “Young Turks” inside the organization will help ensure quiet outside interests of being heard if they speak up.

Inside other USDA agencies, decisions are made in a complex environment of multiple-level review processes and many value sets. A system of formal and informal checks and balances involves private individuals and groups along with a host of other government agencies. Two closely linked objectives must be fulfilled. First, the decisions should reflect the preferences of those who are served and affected and who care enough to be repres-

³This portion owes an intellectual debt to Leonard Shabman (Virginia Polytechnic Institute) and Helen Ingram (University of Arizona). See especially Leonard Shabman, and others, *The Political Economy of a Corps of Engineers Project Report: The Delmarva Waterway*, A. E. Res. 72-9, Department of Agricultural Economics, Cornell University, Ithaca, N.Y., 1972. See also, Helen Ingram and Scott Uller, “Public Participation in Environmental Decision Making: Substance or Illusion?” *Natural Resources Journal*, 13-150 (1973), University of New Mexico School of Law, Albuquerque, N.M.

ented in the process. Second, choices should be made that will keep the organization viable and growing.

At least four kinds of knowledge are needed to make better choices in response to these objectives:

- Knowledge of preferences at the individual and group level and of the power used to translate them into effective demand.
- Knowledge of past decisions, and the agency's capacity to influence others.
- Knowledge of the rules of the game: expectations of behavior and other constraints on the use of power, particularly on how the allowable range of choice is changing.
- Knowledge on how to obtain information for problem solving: management of technical expertise in both a design-analysis sense and an organizational-action sense.

Most of the information needed pertains to the social sciences. Note that its importance and sensitivity are so great that it is rarely collected directly. Much of that information is taken for granted. It is covered by myths, policies, and ritualized procedures. Part of it is collected as a byproduct of more technical information. More is simply transmitted in face-to-face communication along with formal matters. The point is not that social scientists, through their skills, are more able to collect such data. It is that they will filter, process, and interpret information differently because their biases are different. The result is a view of the environment for choice making that is more complete and more likely to effectively meet the objectives of generating information for decisionmaking.

Social scientists are well advised to follow up on this opportunity by reading signs that others are less trained to see, and by advocating new responses that are consistent with new sources of support. In particular, making contracts and seeking cooperation with agencies that primarily use social science expertise would be most useful. These would include regional and local planners, economic development agencies, many parts of Housing and Urban Development (HUD), Commerce, and Health, Education and Welfare (HEW) including the Economic Development Administration.

Timing helps determine how important certain information will be. In the life of a project or program it is often difficult to tell just when a decision was made. Everyone's attitude suddenly shifts from a creative, flexible stance where new options are welcome, to one preferred set of actions, widely supported, with information being sought only to support these actions. The social scientist needs to find a role in that early part of the process. Writing reports that no one reads until after the basic deci-

sion has been made is not very satisfying. How should the social scientist attempt to achieve such acceptance? It has to be done in terms of providing what the agency and its clients need.

Social scientists as a minority in a world dominated by other disciplines have to examine how they are going to behave. One model is that of the militant minority member, stressing his differences and urging revolution. Another image is that of an Uncle Tom—so subservient as to not be taken seriously. Neither is useful. I'd suggest the answer is yet a third model—that of the Young Turk, loyal and committed to the organization; but also questioning the traditional and the established: supportive of reform, often vocal about the need for changes.

The Young Turk role is important from another point of view. It maintains credibility inside, but more important it increases the agency's receptivity to messages from the outside. Many messages are never sent because the sender is sure no one will listen.

Stimulating More Effective Federalism in Research

One advantage ERS has is its ability to link itself formally and informally with researchers in the Agricultural Experiment Stations and in other organizations. It does appear to lack some of the delivery systems available to the experiment stations which extend their results to users and provide feedback from them. Examining these university relationships might identify ways to provide leadership to this larger community.

For example, has there been a recent conference on legal-economic issues that brought researchers together with the extension specialists active in the same issues? Researchers rarely seem to be aggressive in seeking out the users of their outputs. It might be worth trying.

How well do we lend a federal perspective to the many regional research activities? ERS specialists at the several campuses provide some linkages. University faculty are not without Washington contacts. But perhaps the regional research process could be made more effective by focusing on the needs of program and policy reform that would hit several levels of government simultaneously.

How can we encourage university-based research projects to adopt designs and approaches that contribute more to national needs while still satisfying State objectives? ERS has placed some emphasis on the needs of small rural jurisdictions, for example. Experiment station researchers have done the same, but it's not clear that there is much communication between them.

Perhaps a place to start on many of these opportunities would be in stimulating an examination of research methodology in the area of legal-economic or institutional research. ERS researchers played a key role in past efforts. I suggest that they do so again.

Review of: ERS ROLES, FUNCTIONS, AND SERVICES

by
Stephen J. Hiemstra*

ERS is not an independent research agency and would be well advised to stop trying to convince itself that it is. It is the economic research arm of USDA with a responsibility for research on and evaluation of all aspects of agriculture—both foreign and domestic. Its clientele is as diverse as any served by the executive branch. It should leave “independent” research to independent research agencies and concentrate on the applied research and service on practical problems that it is paid to perform.

This view differs from the conventional one espoused by Moore and Crosswhite. Moore laments that other Departments sometimes find it useful to hire agricultural economists. I see no problem in this as long as they do their own job and do not duplicate a responsibility that belongs to USDA. In fact, ERS might well consider whether this means that it has not been performing up to expectations.

Crosswhite's concern that control over the research agenda is “being passed from agricultural and rural groups to a new set of clients” may be valid. USDA was intended to serve the common good, rather than a special-interest group. Chipped in stone on the west side of the South Building of the Department are these words, “Dedicated to the Service of Agriculture for the Public Welfare.”

This view does not detract from Moore's analytical framework of attempting to maximize a multiple-goal objective in allocating scarce research funds. But it does focus more on the pragmatic and less on the professorial.

Neither does it limit the importance of quality research. It directs attention to the usefulness of the end product. In contrast to Crosswhite, I would draw a distinction between the research typically done by university professors and that expected from ERS. ERS research should be more practical than most I have seen coming from universities. Research for the sake of research and advances in methodology should be left to the professors as a matter of policy, except that many advances are the byproducts of good research rather than the objective of it. “Think tanks” are a diversion from the role of the agency and best left to others.

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Moore appears to have the conventional disdain for brush-fire research. While we all sometimes groan from the sheer weight of it, it can be useful in guiding our long-range research. Its volume may indicate how well we have anticipated research problems. If there are too many wiggles in the road (Moore), perhaps we need to spend time straightening it rather than looking for the next bend. I certainly agree that more effort should be made in effecting liaison with the policymakers so that answers will be ready when the questions come.

Research can be viewed from the perspective of both a flow and a stock concept. A reservoir of in-depth analysis should be developed in all major policy and program areas facing the Department. The stock of knowledge should be broad enough to encompass most of the questions posed to ERS by its various publics. A flow of economic intelligence can be tailored to fit the particular policy question at hand. The flow and the stock functions should be separated on major issues because some researchers are better at one than the other. But they cannot be completely divorced, or the stock researchers will lose sight of their objectives.

There is a danger in expecting the individual ERS researcher to conceptualize the relevant problems. He may know the economic methodology and what he can do, but he may not fully comprehend the policy issues and the operational characteristics of the program he is trying to analyze. He should not be afraid to roll up his sleeves and digest program regulations, or to get out and view program operations first hand. ERS' tight travel budget may at times be penny wise and pound foolish. One of the strengths of ERS is its huge pool of trained economic analysts. It should use its size to advantage by tackling the big problems of food and agriculture, and leave the individual projects to the prima donnas at the universities. Crosswhite's quest for the "mind-set" of a university professor is a misplaced ideal.

Moore's expectation of the future role of ERS in a national planning activity may not materialize. Nevertheless, his points are well taken. Hopefully, planning would be assigned to the Secretary's Office but ERS would need to provide analytical support.

Crosswhite would set up another committee: to study clients' needs for economic information and to identify priorities. If there is anything ERS seems to have plenty of already, it is committees. I would argue that ERS already has a committee with the responsibility of assigning research priorities. The chairman is Administrator West.

Review of: ERS ROLES, FUNCTIONS, AND SERVICES

by
D. Gale Johnson*

Neither Moore nor Crosswhite mention the recent efforts of the Congress to increase its information and analysis base. Failure to consider such efforts could have serious consequences for ERS. Until recently, the Congress had inadequate procedures for obtaining reliable and unbiased information on the operations of current programs or the consequences of future programs. Major reliance upon hearings has great disadvantages. Hearings may be useful in determining whether a particular problem merits some remedial action but not in determining the consequences of that action.

Congress now seems to be creating special staffs to meet such needs. The Office of Technology Assessment is one. The Congressional Budget Office is a second. Revision of the mission of the General Accounting Office and additions to its resources is still another.

These developments are desirable, though one can hope for improvements in their effectiveness. Congress has had access to the research of the executive branch, but until now it has not had the capacity to interpret what it receives or to determine how far policy or legislative proposals by the Executive are consistent with what is known about problems to be solved.

If the Congress does establish a substantial capacity of this kind, what impact will it have on ERS roles and functions? In my view the effect will be small if ERS is maintained as an organization that is charged with achieving a high degree of objectivity in its research. In fact, one can imagine circumstances in which Congressional staffs of high quality could assist ERS on this score. It is not easy for a research organization that is a part of a political action agency to maintain objectivity. It is remarkable that the record of USDA is so outstanding, not only in agricultural economics, but in numerous scientific fields. On occasion a high price has been paid, but then, few good things are without cost.

The importance and difficulties of maintaining an independent and objective research organization in a major Government department lead me to question the view that a national planning

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agency would have desirable effects on ERS, if ERS were given a major and active role. If such a planning agency were established, ERS would not long survive as an unbiased and objective research institution, if it were the USDA agency with primary responsibility for setting objectives and goals for prices, income, and production.

The USDA has had major planning functions for more than four decades. I refer to the commodity programs which required the types of activities and decisions normally associated with national planning. Should ERS have had a role in establishing the price and income objectives of these programs, either in the beginning legislation or in the annual decisions that were required? The answer of history was in the negative and this is the only answer consistent with the survival of independent research in economics within USDA. Clearly ERS had important responsibilities with respect to the commodity programs. But if I understand the public (and published) record properly, the primary responsibility of ERS was either to answer "what if" questions or to provide the analysis and data to permit policymakers to answer such questions.

Policies always involve choices among alternative means. Even if goal-setting would not involve ERS in politics, the choice of means to achieve the goals almost certainly would.

There are two important points about the second part of the Moore paper. One concerns the need to more fully integrate economic analyses of world agriculture, world trade, and domestic agriculture. While this point was made in the context of the national planning concept, it is a valid and necessary integration in any case. In the past, domestic farm policies gave little consideration to the conflicts between our trade and farm policies. It is not possible for U.S. agriculture to return to providing food and fiber for only the domestic market. Our research should more fully reflect this fact of life.

The second point involves the potential impact of the consumer movement on USDA and ERS. Too much of what goes on in the consumer movement puts that movement into an adversary relationship with agriculture and the Federal agencies responsible for food and agriculture policy. This vocal and strident part of the consumer movement has almost no understanding of the functioning of our agricultural production and marketing system.

The recent opposition to the universal product code and the action in various States and municipalities to require price markings on individual food items indicates how little understanding there is of the functioning of our food-marketing system. Much of the opposition rested on two related points—the loss of some information to consumers and the assumption that the cost sav-

ings from not marking each item would only swell the profits of the retailers and not be reflected in retail prices. It is true that price information available to the consumer would be in a different form; the price would be on a tape rather than on the item. Also, some price errors probably would be made in the information given to the computer. But there are errors made with the current system too; failure to clarify this point seems to me to have been a failure of the food retailers.

Economists have failed in not providing clear and accurate explanations of the effects of cost reductions on consumer prices. The rather frequent complaint that retail prices do not adjust downward as rapidly as farm prices has strengthened the belief of many consumer advocates that competition is ineffective in food marketing.

ERS should accept more responsibility for researching problems that are of concern to consumers of farm products. Numerous issues and problems have not been adequately investigated and explained: grading, the effects of changing grading standards, the effect on consumer costs of adding water to cured meats, effects of trade restrictions on consumers, and the impact of convenience foods on marketing costs are some such issues.

I will close on an obvious point. It is extremely important that ERS be maintained as an objective research organization as independent as possible from changing policy concerns. This does not mean that ERS should be unaffected by issues of concern to Congress, the executive branch, farmers, and consumers. But as economists, we all have the responsibility, whether in ERS or in a university, to carry out our research in as objective a manner as possible; for the best protection of the independence of ERS lies in such high-quality objective research.

ALTERNATIVE FUTURES FOR CONSUMER SOVEREIGNTY: IMPLICATIONS FOR ERS AND USDA

by
W. B. Back*

There are two purposes of this paper. The first is to describe briefly those elements of economics and philosophy that relate to consumer sovereignty and have significantly influenced agricultural economics research. The second is to propose some new research directions that are consistent with public needs for economic intelligence. Consumer sovereignty is a selected theme because it is a central point in the philosophical controversies within economics, and a useful concept for identifying future economic policy and research issues.

A brief history of consumer sovereignty sets the stage. Then the current situation in agricultural economics research is presented as a base. Finally, a discussion of the future of ERS in agricultural economics research explores directions.

HISTORICAL PERSPECTIVE— CONSUMER SOVEREIGNTY

Tucked away near the end of Chapter VIII, Book IV, of Adam Smith's *Wealth of Nations* is the germ of the conception of a competitive economic system powered by consumer interests (9):

Consumption is the sole end and purpose of all production, and the interest of the producer ought to be attended to, and only so far as it may be necessary for promoting that of the consumer. The maxim is so perfectly self-evident, that it would be absurd to attempt to prove it.

Historians say Smith borrowed this idea from the physiocrats. It is imbedded in the economic literature since Smith, but is seldom questioned.

Recent statements on the meaning of consumer sovereignty are contained in books by John Maurice Clark (2), and Ludwig Von Mises (11). Some excerpts follow:

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In our conception of a tenable system of private enterprise, it is crucial that the customer should be in position...to exert effective discipline over the producers... otherwise, government would feel constrained to undertake discipline over these matters (2, p. 9).

The direction of all economic affairs...is a task of the entrepreneurs...A superficial observer would believe they are supreme. But they are not. They are bound to obey unconditionally the captain's orders. The captain is the consumer (11, p. 270).

Both supporters and critics of the concept of consumer sovereignty abound. Major supporters include Friedrich Hayek (5), Murray Rothbard (7), Milton Friedman (3), and Ludwig Von Mises (11). Except for Von Mises, these particular supporters blame big government for any imperfections in the competitive economic system. Von Mises' position is:

There is in the operation of the market economy only one instance in which the proprietary class is not completely subject to the supremacy of the consumers. Monopoly prices are an infringement of the sway of the consumers (11, p. 272).

Rejection of the view that monopoly is an important force affecting competition and consumer sovereignty is based primarily on the position that, together with freedom of entry, substitution among productive resources or among products in consumption is sufficient to prevent any one producer in the economy from gaining a significant amount of market power. Milton Friedman (leader of the Chicago school of thought) is a major proponent of that view. It is in direct conflict with the entire intellectual foundation for the Harvard school of thought, including such notable contributions as those of Joan Robinson (10), E. H. Chamberlin (1), and Joseph Schumpeter (8). Support for government intervention in dealing with shortcomings of the private economic system came from a number of sources, but a major contributor was John Maynard Keynes (6).

The writings of John Kenneth Galbraith, especially *The New Industrial State*, embrace the views of all critics of a competitive economic order under indirect control of consumers (4). His position constitutes an extreme and is the direct antithesis of Milton Friedman's position, particularly in its portrayal of American corporations as monopolists and its support of more government intervention.

The tendency toward a polarization in economic philosophy has been augmented by a parallel polarization in political philosophy. At times, political and economic aspects of the debate have

been distinguishable only by the level of sophistication of the language used.

CURRENT SITUATION—FACTS, PHILOSOPHY, AND RESEARCH

Issues in economic philosophy have sometimes obscured our vision of economic and social change. We are well into a post-industrial society. With rising educational levels and affluence, demands for social, cultural, and physical services increase relative to those for industrial goods. An increasing proportion of consumer outlay goes for education, health, recreation, cultural activities, living facilities and space, and costs of local, State and national government functions. Increasingly, consumers relate to public and private institutions other than the marketplace to achieve their desires.

In the marketplace, consumers have limited power to signal to producers the kind of new product or production technology, number and size of producing establishments, location of industrial plants, management of wastes, or degree of employment that they desire. Consumer purchases reflect current preferences with respect to qualities and prices of available products and services. The available supplies are partly determined by past purchases. Producers do attempt to determine latent as well as previously expressed consumer demands.

For practical purposes, consumers of food and fiber products are synonymous with members of the public. The public is interested in acceptable standards in environmental quality, in health and safety, in full employment, in equitable distribution of income, in capacity to efficiently expand food and fiber production when needed, and in progress, as well as in the supplies and prices of food and fiber. Tradeoffs are necessary between food and fiber and other public objectives, as well as between public objectives within the food and fiber system. Some of the tradeoffs occur in the marketplace. However, as indicated earlier, the marketplace is inadequate to make many necessary public choices. We now have independent institutional structures, primarily within government, for making these choices. In general, the decisions made within government are not conceived as tradeoffs, but rather in terms of standards to be achieved. Too often these decisions are influenced more by public emotion than by knowledge. There may be no practical alternative to government as an institutional structure for public decisionmaking. But there can be improvement.

Agricultural economists have been drawn into the conservative-

liberal controversy on questions of public interest. We may have been exposed in graduate study to a biased menu in economic thought. Our concepts of problems of significant public interest reflect our own philosophical orientations. We frequently work on questions that are important to top officials but not necessarily to the public. We exhibit a tendency to "do our own thing," if permitted, and to gravitate toward the research and service work that is most consistent with our individual philosophies. Economic research usually is objective within the context of the questions asked, but the choice of those questions has seldom been the outcome of an objective thought process.

Our research is fragmented among the various subjects of public interest, in addition to being strongly influenced by producer interests and our economic philosophy. We do studies on industry structure and market power to reflect concerns about preservation of traditional family farming. We study the impacts of government regulations on production to demonstrate an unfavorable impact upon farmer costs. We seldom relate consequences to public interests. In short, it seems to me that too much agricultural economics research is a restudy of yesterday's problems to explain the past rather than to illuminate the future.

SOME FUTURE DIRECTIONS FOR RESEARCH

Assumptions and Premises

Purposes of research. I take for granted, as did Adam Smith, that the interests of the producers (farmers, processors, and distributors) ought to be attended to only in so far as they coincide with those of the consumers. However, I believe there is need for a broader concept of consumer sovereignty—one closer to "public sovereignty" or "public interest"—for use in identifying future economic research issues. I take for granted that the ultimate purposes of our research should be the same as that of production: to promote the interests of the consuming public.

Research orientation. Concerns about the utility of agricultural economics research are of long standing, as attested by the frequency of papers on this subject over the past four decades. One could infer, from the course the research has taken, that none of this has made much difference.

Although the ultimate purpose of applied research is to contribute to improvement in public choices, intermediate purposes could be to improve producer decisions, when this is consistent with the public interest. The public has limited means of communicating to research workers what its decision problems are, and

what information it needs. Signals from the public about issues are distorted by values of the particular spokesman. Public officials do a significant amount of interpreting or inferring of public interest, but this seldom reflects broad public viewpoints. Signals from public officials or members of the public are more likely to reflect producer than consumer interests. What is the public responsibility of agricultural economic research workers?

The situation described could be due partly to a high degree of uncertainty about the future and partly to the short political horizons of many public officials. Most public decisions are made without much understanding of future costs and consequences. Thus far, research has been of meager help. Yet research workers should pave the way for more rational and intelligent public choices. To be more relevant, some tilting of research orientation toward the future will be necessary. My position is that the proper orientation of ERS research should depend upon what futures analysis reveals to be the significant coming public issues for food, fiber, and rural people. Although a major part of research would be devoted to building a knowledge and data base, research should not end until policy (futures) analysis has illuminated the decision options and their consequences.

Futures analysis. Futures analysis is a newly emerging discipline. Frequently used synonyms are policy science and longrun policy analysis. Technology assessment is a component of such analysis. Futures analysis is necessarily rational rather than empirical. It can develop but not test hypotheses. It can yield plausible and logical sequences of actions (decisions), events, and consequences. It can be the basic analytical input into research planning that connects relevant aspects of the past with the future issues and choices.

Consumer or public sovereignty. As indicated earlier, the usual meaning of consumer sovereignty is too narrow to reflect the public interest in consequences of decisions of farm producers. I prefer the term public sovereignty to reflect these broader interests. Public sovereignty would prevail if all producer and government decisions contributed to maximum achievement of public (consumer) interest. This concept has limited operational utility, but is useful as a contrast with two other concepts: producer sovereignty and government sovereignty.

Producer sovereignty would prevail when producer interests form the criteria for all production and government decisions, regardless of the interests of the public. Usually, we associate producer sovereignty with monopoly, where producers have nearly exclusive power to price the products they market. Galbraith also includes influence of producers upon the values and preferences of consumers in these powers (4).

Government sovereignty would prevail if minimum producer or consumer (public) interest were considered in government decisions. It is assumed in this paper that government as a whole attempts to be responsive to public interests, but how government responds will depend on the degree of public sovereignty achieved, and on the knowledge and data base for public decisions.

Plausible Futures of Public Sovereignty

One may visualize a number of possible futures of public sovereignty, from a minimum corresponding to the maximum plausible producer sovereignty, to a maximum achievable degree of competitiveness and of public influence over producers. Some descriptions of these limits follow:

Minimum public sovereignty. Producer sovereignty could increase significantly in the food and fiber system. Production could be controlled by strongly organized and administered producer associations, or by relationships dominated by major corporations. Within 20 to 30 years, the family farm could fail because capital requirements came to exceed a family's capability to acquire and manage. In that case, financial institutions such as holding companies could be formed to control the assets of farm families or family corporations. Also, some of the financing of farms and farming could be by major agribusiness corporations. Of course, the timing and extent of such structural changes is a subject of much debate.

Consistent with such a trend would be an increase in the power of producers within the system to determine the kinds, qualities, time distribution, and prices of products marketed. This would also be associated with a decreasing degree of public power in the marketplace. The increase in producer power could be expected to generate and sustain activity by special public interest groups, such as environmentalists, conservationists, and consumer advocates. We could expect continued efforts within government to reverse the trends, to restore the family farm, to limit the powers of food corporation, and so on. However, there could also be increased alliances between units of government and producer groups, with less government restraint on producers.

The biological and physical properties of farm products would prevent producers from attaining as much power as Galbraith says American corporations already have (4). The preceding limits control the amount of change that producers could bring about and administer. Also, production is partly dependent upon climate and other physical environmental conditions not within the power of man to control. Nevertheless, there could be large increases in producer powers within the food and fiber system before reaching such limits.

Maximum Public Sovereignty. The current trends toward fewer and larger farms could be accompanied by declining producer sovereignty in two ways. First, through increased and better organized public interest-group activity, especially in influencing management of wastes, meeting health and safety standards, and so forth; and second, through increased regulation by government in response to the pressures from the public interest groups. This might lead to a new Federal agency for consumer affairs and the consolidation of the administration of all consumer-oriented legislation.

Implications to USDA

USDA's original and continuing mission stresses assistance to producers. Generally, it is assumed that most Department assistance to producers is consistent with the public interest. But increasingly, there are questions about this in view of the disproportionate service to large-scale producers, the increasing dangers of pesticide use, the high public cost of farm programs and the increase in pollution caused by such concentrated production as in feedlots. The second scenario—an increase in public sovereignty—does have some significant implications for USDA. The increase in regulations upon food and fiber system producers administered by other Federal departments and agencies, such as the Environmental Protection Agency (EPA), would retain and intensify a defensive posture of USDA. Also, a new Department of Consumer Affairs could diminish the justification for a Department of Agriculture and substantially weaken the Department's political posture.

Implications to ERS

The present research orientation of ERS is more consistent with the first than with the second described future of public sovereignty. Thus, effective pressures to change would be minimal if producers retained a maximum degree of sovereignty. However, current trends suggest that the public may be gaining influence and, if so, ERS will feel increasing pressure to make its research more responsive to public needs. I believe ERS should begin moving in that direction anyway, thereby contributing to more consumer (public) sovereignty.

I foresee from the foregoing discussion the following major problems in administration of future economic research:

- Selection of those "long-term" public issues upon which to base research;
- Gaining support of the public and public officials for research on the selected issues; and
- Gaining cooperation of research workers in achieving the needed reorientations.

Obstacles associated with the first problem are inadequacy of existing futures analyses to illuminate the long-term priorities for research, while an impediment concerning the second problem is the tradition of orienting policy research to the short-term horizons of political leaders. There is also the traditional high priority given to interests of producers, especially farmers. Resistance of research workers to change will reflect their "antipolicy" and "antifutures" attitudes. Policy analysis is not considered to be research by many researchers, especially if it is long-term futures analysis. Nevertheless, a major reorientation of economic research could be a possibility should consumer sovereignty emerge as described in scenario two. It would be difficult to achieve should the first scenario prevail.

The candidate "long-term" research issues for orienting economic research would include environmental and social impacts of new technology, long-term environmental, economic, and social consequences of various farm programs and policies, and prospective long-term demands for food and fiber products. All of this, and more, would comprise a research package that appropriately could be described as futures oriented.

This paper merely scratches the surface of a subset of a large domain of issues in the orientation of ERS research. A certain amount of futures analysis is prerequisite to a full determination of how ERS' research should be changed. Futures analysis is proposed as extension of traditional research activities to illuminate decisions, options, and consequences.

Looking backward, it is apparent that ERS and the agricultural economics profession have not prepared the public in advance for many major issues. The rural poverty problem emerged and persisted for decades before research was undertaken. The sudden change in world markets for U.S. food and feed grains in the early 1970's was not foreseen by ERS, nor was the magnitude of the related increase in U.S. food prices. The rise of "consumerism" in the 1970's was neither anticipated nor thought important by ERS. We continue to consider public concern about pesticides more an annoyance than an issue warranting major research. Can ERS exercise more leadership in anticipation of major public issues and in timely preparation of intelligence for use in public decisionmaking? If ERS cannot, its continued existence could come into question.

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ERS ACCOUNTABILITY IN THE FACE OF EMERGING FOOD RESOURCE ISSUES

by
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A decade ago major issues in agricultural economics included welfare aspects of commodity programs, overproduction, market structure, and the economics of flood control. In the classroom, air and water were cited as examples of free goods. Since then we have witnessed a vast change in economic issues and social priorities. It is certain that the next ten years will show similar changes.

The mission of ERS is "to develop and disseminate economic information for use by public and private decisionmakers concerned with the allocation and use of resources in agriculture and rural America" (13). These clients will hold ERS accountable for their investment in its analytical and informational capability. Should ERS fare poorly, the decisionmakers will go elsewhere with their needs and their support. An important factor in its accountability is the way in which ERS deals with new problem areas. To be faithful to its mission, accountable to its clients, and relevant to its role in economic affairs, ERS must be able to perceive and analyze emerging issues rapidly and well.

This is the setting for the "Forward Look" exercise; ERS is seeking guidelines for optimal agency conduct in the years ahead. Forecasting coming events can result in high payoffs. However, there is a substantial risk of failure, a risk that is difficult to explain to anxious clients. Forecasting cannot be completely relied upon if ERS is to be of maximum usefulness to its clients. How then will the agency respond to emerging issues in the coming decade?

The purpose of this paper is to present some views on the role ERS plays in the hierarchy of economic intelligence affairs, the mechanics of accountability, and a suggestion for greater flexibility in coping with emerging issues.

ACCOUNTABILITY AND THE CONGRESS

Congress provides most of ERS' resources, either directly or through the budgets of other agencies. Congress is society's sur-

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rogate; a lens through which constituents' social needs are focused. Fifty years ago the Bureau of Agricultural Economics (BAE) emphasized "production and marketing assistance to farmers" (12, p. 34). Since then the needs of farmers and other client groups have changed significantly (9).

ERS will be held strictly accountable by Congress for its ability to deal with emerging issues; vivid examples are the recent Russian grain sales, fuel shortages, and grain-barge shortages. Such issues require rapid and thorough evaluation as they surface and timely delivery of relevant information to decisionmakers. Congress sometimes prods ERS a little. For example, the Senate Appropriations Committee recommended an addition to the 1977 ERS budget for "an in-depth study of foreign investments in American agriculture" (14, p. 32).

It is unlikely that the rules of the game in ERS-Congressional relations will be changed. This could, however, become an emerging issue. Annual budget hearings appear to be an inefficient method for transmitting the desires of Congress. It may be that the reorganization of Congressional committees will make a difference. ERS may have to examine its relationship with Congress in a new light.

ACCOUNTABILITY AND USDA

More than anyone else, ERS provides economic intelligence to USDA planners. Effective decisionmaking requires the finest objective analysis available. Objectivity is the key. If the results of an analysis cannot be accepted, ERS should not make that analysis. Otherwise, ERS cannot expect long-term support from its clients. "Successive Administrators of the Economic Research Service have a right, nay an obligation, to announce the outlook for agriculture as it is, irrespective of the political wishes of the Secretary" (4, p. 996). This is absolutely necessary if ERS is to maintain its credentials for economic research and information. We can hope that these are more enlightened times than the days when an unpublished administrative report could bring the wrath of the Secretary down upon the BAE (1).

ACCOUNTABILITY AND AGRICULTURAL ECONOMICS

ERS is accountable to the agricultural economics profession, if only because of sheer size. ERS depends on the land grant universities as a source of trained staff, while the universities count on ERS to hire any number of newly minted Ph.D.'s, whose training

represents a sizeable part of university livelihood. Periodic ERS hiring freezes create considerable concern among graduate students and their professors.

Despite this dependence on ERS, academic economists retain a certain aloofness. Land-grant research staff considers itself the 'first team' in the profession while economists in business, extension, or government positions make up the taxi squad. A past president of the American Agricultural Economics Association says that "universities gratefully rely on USDA for data and otherwise almost disregard it" (2, p. 1106). One reason is a failure to understand how the basic purpose of ERS differs from university objectives. A significant part of university research is directed toward basic research. The purpose of ERS, as stated earlier, is to develop economic information as an aid to decisionmaking and not to seek truth for its own sake.¹ ERS inadequately explains this philosophical difference to prospective recruits and others in the academic world.

Related to these issues is the disdain many academicians feel toward the quality of ERS work, thinking that analyses are conducted in abbreviated time frames through ignorance of basic scientific research procedures. This is, of course, absurd. The client groups that are being served—especially the Secretary and Congress—are sometimes impatient. Necessary decisions are made whether the economic intelligence is available or not. ERS performs a significant function by providing most urgent part of the needed analysis immediately.

Economists past the age of 50 are fond of comparing—usually unfavorably—ERS with BAE. "Why should not ERS aspire to becoming the bright beacon of economic knowledge that BAE once was" (3, p. 10)? This is a recurring theme. What was it about BAE that evokes such response? Given the difference in the times, administrative structure, and missions, the two agencies are not entirely comparable. One fact about BAE, however, is that the most noted agricultural economists of the time flocked to its standard. These men were unlike the top agricultural economists of today. They were generalists. Men like Henry C. Taylor, John D. Black, Howard C. Tolley, and M. L. Wilson could write comfortably in such diverse areas as production, marketing, land economics, and policy. When opportunity took them to Washington they were greeted by an administrative structure receptive to their ideas. They were the generators of agricultural policy, putting their ideas into policy prescription and action programs.² Theirs

¹It is hoped, however, that truth is not too distantly removed from ERS endeavors.

²For a time (1938-1946) BAE was the official planning arm of the Department.

“was an age of great expansion and enthusiasm in agricultural economics” (5). The proliferation of both agricultural economists and specialties now makes it more difficult for the so-called top agricultural economists to exert such wide influence.

When the euphoria of the New Deal passed away and BAE was restricted in its activities, the glamour attached to federal service wore thin and the brightest lights of the discipline turned to other endeavors. One result was the tremendous postwar development of research methods and tools which has carried to the present.

A related postwar development is the pervasive feeling that agricultural economics has “arrived” as a science worthy of removal from secular affairs (2,6).³ The professional neophyte, having absorbed a measure of bias and prejudice from his professors, feels that he can make his greatest professional contribution in an academic setting.

ERS is not BAE nor should it be. But ERS is accountable to the agricultural economics profession just as it is to its other clients. ERS is greatly depended upon for data inputs for agricultural economics research. The agency is obligated to prepare and publish these data with the utmost care and integrity. It is also obligated to provide a suitable environment for those in ERS to conduct reliable, objective research. An effective management team must simultaneously deal with client groups, research issues, and researchers to generate an optimal level of ERS activity.

ERS must take the initiative in opening and maintaining effective lines of communication. If academic economists are going to spend a significant portion of their careers training ERS personnel, then they have a need and a right to know to what purpose those troops are being used. Present lines of communication are inadequate. For instance, academicians continue to believe that ERS economists do not publish much of their work in professional journals because of its inferior quality. “Graduate faculties in many universities look down their nose at in-house publications” (2, p. 1105).

One suggestion for improving communication lines between ERS and the academic world involves the field staff. It could keep ERS management informed of experiment station studies and other university research that complements, supplements, or competes with ERS activity. Similarly, the field staff could provide university personnel with current information on ERS research.

³This feeling persists despite the fact that agricultural economists are denied membership in the prestigious National Academy of Sciences.

INSTITUTIONALIZED FLEXIBILITY

Institutionalized flexibility? The term itself is anomalous. Institutions have traditionally borne an image of ponderous, dilatory decision processes. But ERS, to be effective in its mission, should be alerted to act on any emerging food problems as soon as it comes up. Four years after lengthy lines at the gas station, ERS efforts at energy research are fragmented among the divisions without unity. This is because of the nature of ERS' structure. Work on new issues cannot be undertaken without additional resources or altered priorities among existing resources. ERS lacks adequate flexibility.

This situation pervades the entire research establishment. Academic scholars also must contend with institutional impediments to timely investigation of new issues. Johnson and Schertz, for example, recognize the problem and call for remedial action (7,8). But what action? The time-honored method of reorganization, like J. I. Case's steam tractor, is a marvelously powerful but inefficient, mechanism. The reorganization of ERS in 1973 no doubt was followed by many man-months of wheel spinning before programs returned to a state of significant creativity.

What about an alternative? One worthy of discussion is an "Emerging Issues Commando Team." A team of ERS' brightest, most energetic professionals could be drawn from the several divisions to perform initial spadework and perhaps preliminary analyses on emerging issues. The concept is not new:

Those who organized the BAE believed the *primary* organization should be on scientific lines, with the conviction that to be able to draw well-trained men from groups carrying on fundamental research, and for building up temporary teams to wrestle with specific problems would prove more effective than trying to build the primary organization around the flow of shifting problems (10, p. 13).

In 1972 an advisory committee to the Administrator suggested that a small staff be assigned to "identify emerging problems deserving research attention" (11, p. 57).

Perhaps it is an idea whose time has come. When an emerging issue is pinpointed, the team could identify the problem, compile compendia of topical literature and data sources, and develop analytical strategies for ERS management.⁴ The last would contain suggested plans for funding, staffing, and ERS participation.

⁴Perhaps this could be done in conjunction with a similar team from ARS if the problem has biological or physical aspects.

If freed from other duties, the team should be able to give ERS management background for decisionmaking in short order.

The formation of such a team presents difficulties. Regular duties would have to be such that members could be spared for the periods needed. If the team is to be made of the "best and brightest" it is likely that program leaders would be loathe to lose their services. One possibility is that team membership could be semipermanent with duties assigned on a rotation basis.

Another problem is disciplinary composition. Perhaps a more workable concept would involve several "miniteams," each working on emerging issues in their own specialty: marketing, management, resource planning, production, and so forth.

There are difficulties, but if ERS is to be useful and influential in the decade ahead, it must respond to its clients yet be faithful to its mission. ERS must develop means to cope quickly with emerging issues that face the agricultural and rural economy.

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THE MIX OF RESEARCH AND ALTERNATIVE ACTIVITIES IN ERS AND THE UNIVERSITIES: IMPLICATIONS FOR THE FUTURE

by
Joseph M. Roop*

I have been with ERS just long enough to recognize a concern shared with the universities for the "mix" of research and alternative nonresearch activities. Alternative activities are the visible signs by which outsiders judge both organizations. For ERS, these activities are situation and outlook, policy evaluation, impact analysis, and other economic intelligence services; for universities they are mainly teaching, extension, and community service. Research, on the other hand, fulfills a less visible public purpose (the production of knowledge), and provides the reservoir from which a continuous stream of future alternative activities can be drawn. Both functions are vital to the survival of any research organization.

The reward structure internal to the organization, the forces of influence that may be brought to bear from the outside, and internal management practices all affect this mix. In ERS all three of these are subject to some degree of management control. If ERS is to maintain and increase its relevance over the next decade, the effect of management decisions on this mix needs to be examined and taken into account in the formulation of policies that bear on both the internal organization of ERS and how ERS interacts with its clients.

To develop the argument in its proper sequence, I first elaborate on the mix of research and alternative activities, in terms of their distinguishing characteristics, and then develop a parallel between the university and ERS. I next describe how the university protects the balance between the two by its reward system and its ability to insulate research from redirection from outside. I then contrast these attributes with those in the existing ERS system. The attributes in ERS that influence the mix are the same ones which will be affected by future management decisions. In the final part of this paper I examine the consequences of some management decisions on the mix of long-term research and alternative activities.

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Alternative activities are legitimate activities of professionals that displace research. They direct nonprofessional activity away from research too. These alternative activities use, but do not use up, knowledge. For example, providing a short-term forecast of the size of the corn crop prior to harvest requires knowledge about weather, supply response to prices, planted acreage, input use, expected harvested acreage, and so forth. But making the forecast does not reduce the size of the stock of knowledge. On the contrary, the accuracy of that forecast may instead stimulate further research.

RESEARCH VERSUS ALTERNATIVE ACTIVITIES

The distinction between research and alternative activities is similar to the one H. G. Johnson draws between basic and applied research.¹ To paraphrase his words: Research is concerned with adding to the stock of knowledge, while alternative activities are involved with turning the stock of knowledge to practical use. Where the division between these two lies is arbitrary; but some of the attributes of the extremities are important to this paper.

At one extreme is basic research. It is characterized as a diligent search for the unknown. It aims at the discovery and interpretation of facts, revision of accepted theories or laws in the light of new facts, and the development of new theories or laws. Even if it should fail, it is an activity that adds to the stock of knowledge.

This stock of knowledge is fundamental to production in all its manifold aspects. Yet the measurement of this stock is elusive. Counting the pages of technical manuals, the number of textbooks, or the books in the Library of Congress cannot measure, even roughly, the magnitude or quality of that stock of knowledge. Research is the process that produces new knowledge, a flow concept analogous to investment of capital.

Alternative activities are legitimate activities of professionals that displace research. They direct nonprofessional activity away from research too. These alternative activities use, but do not use up, knowledge. For example, providing a short-term forecast of the size of the corn crop prior to harvest requires knowledge about weather, supply response to prices, planted acreage, input

¹Johnson, H. G., "Federal Support of Basic Research: Some Economic Issues." In *Basic Research and National Goals*, report to the Committee on Science and Astronautics, by the National Academy of Sciences, Washington, D.C., March 1965, pp. 127-141.

use, expected harvested acreage, and so forth. But making the forecast does not reduce the size of the stock of knowledge. On the contrary, the accuracy of that forecast may instead stimulate further research.

Although the two extremes may be conceptually separated, they are similar. In a sense, they are both merely intermediate products at different stages of production. They are also similar in that the profit-motivated sector of the economy will not produce a socially acceptable level of either.²

Research builds knowledge, alternative activity puts it to use, and in the process provides evidence that further knowledge need be obtained or that the current level of knowledge is adequate. But the interdependence and ambiguity involved in distinguishing between the two should not lead us to minimize the differences. *Research creates knowledge, alternative activities put it to use.*

Those that value these alternative activities are the clients of ERS: businesses, universities, Congress, and the executive branch are examples. Moreover, our response to these different clients changes as the pressure they bring to bear changes. Consider the changes in responses to clients during the recent period of volatile price changes in agricultural commodities. During this period, the responses moved dramatically from a predominantly situation-and-outlook end product to policy analysis, impact statements, and the like. Simultaneously, our clientele demands shifted from universities and businesses to Congress, the Office of the Secretary, and other executive branch clients.

This shift in alternative activities provides the signals to public decisionmakers that an organization is responsive and is spending public funds appropriately. Neither universities nor ERS can provide much factual evidence about the consequences of research changes, since they are difficult to measure. Evidence that public monies are being spent on a different array of research projects is no longer adequate because the emphasis in accountability of public funds has shifted from the way money is spent to the results obtained.³ One cannot provide persuasive factual evidence that the stock of knowledge has been enlarged. Thus public decisionmakers must rely on evidence provided by the users of that knowledge. Alternative activities, not research, provide the evidence that the organization is a responsible repository of the public trust.

Redirection is also affected by the internal control system of management. At each level in the hierarchy, the goal of satisfying

² Nelson, Richard R., "The Simple Economics of Basic Scientific Research," *Jour. Pol. Econ.*, June 1959, pp. 297-306.

³Schick, Allen, *Budget Innovation in the States*, Brookings Institution, 1971.

pressing client demands is translated into subgoals or objectives. The manager's function is to achieve these objectives within specified time periods. The process is critically dependent upon two mechanisms: a metering *device* that allows judgments about the worth of an activity in relation to a goal, and a *system of rewards*, reinforcing activity that contributes to the goal.

But consider the dilemma posed by an internal control system that is highly effective in responding to client demands. Alternative activities supply the only evidence that ERS is responding. Yet the more that is done, the less research is accomplished, the less we build up the stock of knowledge, and the less able ERS is to provide effective economic intelligence. ERS and the universities solve this dilemma in similar ways. But there are differences.

The universities resolve this dilemma (as does ERS to a lesser extent) by using different reward system tracks and associating different metering devices with each. For the research track, the control system distributes rewards largely on the basis of the number and quality of a scientist's publications, since this is the only easily measurable indication that knowledge has been produced. But such reliance insulates the scientist from internal redirection because the judgments on his output are exterior to the organization. The discipline itself, the journals, and the professional peers to whom the scientist's work is submitted for evaluation are not responsive to the particular internal control system. In other words, the device used to meter the output of the researcher is outside the sphere of influence of the control system.

This reliance upon external metering both prevents the shifting of research entirely into alternative activities and protects the integrity of the research conducted. These effects are somewhat tempered by the opportunism of the individual scientist and the sources of funds.

The array of rewards in the university research track are considerable. Promotion and salary are but two of the more obvious. The perquisites of lightened teaching loads, larger offices, more research support, and attendance at professional meetings are distributed partly on the basis of feedback from the researcher's publication record. In addition, the monetary rewards to the researcher have no necessary relationship to those paid to individuals who choose an alternative track. For example, a university researcher may sometimes command a salary higher than his dean.

The metering devices used to judge the productivity of other track activities are more subject to internal control. The extension track is judged to some extent by publication, but concern is less with professional journals and more with popular publications. Teaching is metered by student popularity and the quality of stu-

dent produced. The administration track is almost entirely metered by the internal control system.

ERS has developed something similar to the alternative tracks used by universities. For those who move into a research track, an effort is made to distribute rewards on the basis of publication record and to insulate the individual from response to client needs. Similarly, those that enter different tracks—policy analysis, situation and outlook, or management—are judged by other sets of criteria than those used to judge excellence in research.

But there are two institutional arrangements in ERS that mitigate against effective insulation. The first of these, and the one least subject to internal management control, is the Civil Service System. The second is personnel management at the project and program area levels.

The application of Civil Service rules and regulations within ERS has a tendency to shift people away from research in two different ways. First, there appears to be a promotion ceiling above which an individual cannot go solely on the basis of research performance. Few get beyond GS-13 without assuming managerial responsibilities. Also, the individuals most likely to be selected for advancement are those who assume the most visible roles. One is almost always more visible to those exercising managerial responsibility if he is engaged in alternative activities rather than laboring in the silence of his office doing research.

Second, the use of research expertise in a staff capacity acts to shift efforts away from research. When the agency must respond to a highly visible or important client, management calls on the individuals with the greatest expertise on the subject to serve in a staff role to draft an appropriate response. Accepting this, however, implies that all other activities will have to be discontinued. While this is wise, and practically unavoidable, it is also unfortunate. It is wise because it provides the most technically competent answer of which the agency is capable, and unavoidable because line responsibilities mean that management must draw on research expertise. But, it is unfortunate because of the way the process gets routinized and prevents the professional staff from accomplishing research. I have no complaint about the use of research personnel in a staff role—every professional expects a certain amount of that sort of work. What I consider to be of crucial importance is the extent of this use and the degree to which the professional has a choice.

ERS is more responsive to client needs than are the universities. Is this as it should be? Can management have much effect upon the mix? What management policies could alter the mix over the foreseeable future? I now turn to these forward looking questions.

MANAGEMENT ALTERNATIVES AND THE "MIX"

So far this paper suggests that I disapprove of the current mix. Thus at this point, the reader probably expects a vehement argument for more research. I hate to disappoint, but I must. To the question: "Is this as it should be?" I can only respond, "I do not know!"

I do not know how strong the clientele demands are that establish the mix, nor do I know the politics involved in pleasing these clients. I don't know the extent to which ERS should play a role in maintaining the knowledge base, nor the will of management in assuming that role. My intellectual predisposition is to argue in favor of more research and less economic intelligence, but I recognize the paucity of evidence to support that position. So I address the remainder of my remarks to how management can affect the mix. Having revealed my position, I need not apologize for formulating management strategies as if the intent were to shift the mix toward the research end.

If more research is the goal, management strategies to achieve that goal can focus on three different, but preferably simultaneous approaches. Management can alter the internal control system, it can change the institutional arrangements under which research is conducted to make it more attractive, or management can change the reward structure. But a word of caution is in order: In management as in ecology, you do not change just one thing.

There are several changes in the internal control system that could promote more research. At the root of all of them is the control system itself. Research will be strengthened if the environment is more conducive to research. To promote that environment, management should allow the researcher some choice in the extent to which he engages in staff assignments, encourage a program of development for those interested in research, and encourage lower level managers to allow these choices. To provide the appropriate research guidance, program and project leaders need to consider an individual's talents and interests as well as his training and skills. But first of all, project and program leaders need more time themselves.

Project and program leaders need time to do more research and to provide guidance to staff. I propose that program leaders at least be given administrative assistants to handle administrative paperwork. Another institutional change might be to provide ERS with a more stimulating research environment. For example, the establishment of a visiting scholar's program would bring in some of the best minds in the Nation to work with ERS research-

ers. This would stimulate the professional staff to greater research output.

Research can also be promoted by shifting the reward structure to more clearly define a research track. Suggestions for revising this reward structure include: greater recognition and publicity, improved perquisites, increased staff, and better equipment. But some significant changes are constrained by Civil Service requirements. Sabbaticals could be institutionalized—possibly in conjunction with a visiting scholar's program—to reward effective research and improve the skills of the research staff. Selected field assignments might be used as rewards in the same way, since transfers out of Washington typically mean an increase in real income.

In conclusion, let me reiterate and summarize. I don't really know what the proper mix between research and alternative activities is for ERS, but I am convinced that a number of current management practices influence it. Once the choice is made about the appropriate mix, a number of strategies are available. My personal choice is for more research, so I've articulated the strategies as if that were the goal. Whatever the choice, and whichever strategies are adopted, the combination of research and alternative activities will have a profound impact on both the relevance of ERS and its interaction with its clientele over time.

Abstract of: ON THE OPTIMAL DEPLOYMENT OF THE ERS STAFF

by
Richard Crom*

In general ERS has followed an *ad hoc* staffing pattern. Staffing under a more uniform policy should enhance research efficiency, improve productivity, and provide a base for an individual's career ladder. Economic criteria can be employed to develop norms for staff deployment.

Criteria for optimal staff deployment. A research staff on national issues can best operate in close geographical proximity, the key element being the ease and frequency of communication.

Jobs need to be matched to people's abilities. Both jobs and employees can be classified according to depth of analysis, quantitative facilities, and ability to communicate.

Many economists have remained in one specialized area. To a degree we need this building of competency, but a point of job staleness may be reached, often in an employee's midcareer. Each employee's productivity should be evaluated at least every five years. If productivity is unsatisfactory, a change of assignment would be mandatory.

Our current situation. Data on location and length of time in the same job were collected for 112 Commodity Economics Division economists. Almost 70 percent have been at the same location more than 5 years; half have been there more than 10 years. Over 60 percent have been on the same job more than 5 years and about 30 percent have held the same job longer than 10 years.

A detailed plan is presented for periodic examination of productivity and rearrangement.

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Abstract of: A POSSIBLE DIRECTION FOR ERS RESEARCH

by
Clifford Dickason*

Many economists have tried to emulate the rigor of the natural sciences by looking for a body of universal economic laws and rejecting qualitative variables not objectively measurable.

Attempts to retain such rigor have caused many economists' research to lack validity and to have limited relevance.

A methodology for studying institutional economic phenomena, developed by Professor George Katona, and others, is appropriate for ERS economists to widen vastly the relevance and scope of their research.

This methodology includes respondent sample surveys; subjective observations, both quantitative and qualitative, placed along a continuum of intensity by the observer; and objective observations of the respondents' surrounding circumstances.

For example, the Amish farmers of Pennsylvania produce in a labor-intensive manner. They grow more tobacco than their soil-group acreages warrant. If we interviewed a sample of these farmers about why their decisions diverge from "the optimum," their responses would contain clues about how individual producer goals and decisions are influenced by manmade institutions. More important, their responses would serve as a means for economic researchers to describe and quantify how the institutions affect individual decisions. Many regional and national institutions influence farmers' choices.

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Abstract of: FARMERS, CONSUMERS, AND ECONOMISTS— A FORWARD LOOK

by
Milton Ericksen*

Consumers in the United States enjoy a high standard of living partly because of the productivity and efficiency of U.S. agriculture. It is desirable that consumers better understand the specialized and interdependent agricultural system.

A phenomenal transition has occurred in U.S. agriculture. Once virtually self-sufficient, the farmer now depends on others for nearly everything except his own labor. It is possible that the individual farmer may eventually give way to the large corporate farm. But it is also possible that he will be able to maintain his role as an individual businessman. This will depend on emerging technical possibilities and many other factors.

For the future, the consumer must be concerned that the agricultural-food system continues to work efficiently at all levels. The alternative could be rising relative food costs or even hardship.

When a system becomes as interdependent as the U.S. food and fiber system has, a breakdown anywhere may affect the whole system. Its functioning is not mechanical nor under the control of any one group. The common denominator is the price system. The economist's job is to seek out relevant information, check how well the system is functioning, and determine the meaning of trends.

ERS occupies a unique position in that consumers, farmers, agribusiness firms, and government policymakers are all served by ERS economists. This puts a great deal of responsibility on the ERS economist but at the same time provides the opportunity for leadership.

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Abstract of: EROSION OF SOIL OR FREEDOM?

by
Jerry Williams*

Guidelines and directives for resource planning are becoming more explicit in their demands for public involvement. With this emphasis, acceptability appears to have become the overriding determinant in the alternative selection process. Agencies involved in planning assistance studies are being called upon to not only analyze economic and environmental problems but to contribute toward developing acceptable solutions.

What solutions should ERS advocate to problems which call for land use change; for example, soil erosion versus the right to use private land without restrictions. Historically, ERS has not been an action agency. It has dealt with the efficiency and effectiveness aspects of alternatives. But has the time come to get more involved? ERS could make a contribution to the acceptability of land use change through changes in emphasis of present analysis. Several areas such as land ownership and management systems need to be examined more closely, especially as they relate to the makeup of typical farms for given areas.

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