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Social Science Agricultural Agenda Project

Proceedings

of

Phase I Workshop

Spring Hill Conference Center

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June 9-11, 1987

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SOCIAL SCIENCE AGRICULTURAL AGENDA PROJECT

PROCEEDINGS OF
PHASE I WORKSHOP

Held at
Spring Hill Conference Center
Minneapolis, Minnesota

June 9-11, 1987

This report is a compilation of unedited papers, discussions, and reports from concurrent workgroups presented or developed at the initial workshop of the Social Science Agricultural Agenda Project. The material is reproduced for limited distribution, mainly as background and guidance for the next phase of the Project.

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PART I

BACKGROUND ABOUT THE SOCIAL SCIENCE AGRICULTURAL AGENDA PROJECT

Chapter 1

INTRODUCTION

This introductory chapter explains the origin, purpose and anticipated uses of the papers, panelist statements and concurrent session reports contained in this compendium. To do this it deals with (1) the origin of the Social Science Agricultural Agenda Project (SSAAP) and its prospectus, and (2) the contents of this compendium and the functions they are expected to play in future SSAAP activities.

The Origins of the Social Science Agricultural Agenda Project (SSAAP) and Its Prospectus

The Social Science Agricultural Agenda Project (SSAAP) grew up out of the relative neglect of the rural social sciences in such agricultural research priority-setting exercises as the World Food and Nutrition Study (WFNS) commissioned by President Gerald Ford and the Commission on World Hunger (CWH) set up by President Jimmy Carter. Related to these two presidential studies are the various subsequent crop and livestock research priority-setting exercises carried out under the leadership of biological and physical agricultural scientists. As the underemphasis on the rural social sciences in these exercises became more and more apparent and as the need for social science research on agricultural technologies, rural institutions, human capital formation and the generation of biological and physical capital became more apparent, Kenneth Farrell of the National Center for Food and Agricultural Policy (NCFAP) and Glenn Johnson of Michigan State University (MSU) became convinced of a need for an exercise to establish research priorities and administrative strategies for the rural social sciences including those basic social science disciplines concerned with agricultural issues and problems. To this end, NCFAP provided a small amount of "seed money" that was used to explore the possibility of establishing a project to deal with research priorities and administrative strategies vis-a-vis the rural social sciences and basic social science disciplines concerned with agriculture (broadly conceived).

This seed money was used to assemble a group of persons to explore the idea. NCFAP provided four persons and MSU four. Representing NCFAP were Kenneth Farrell, G. Edward Rossmiller and, borrowed from the U. S. Department of Agriculture, Gene Wunderlich and David Brown. From MSU came Marvin Olsen, Eileen vanRavenswaay, James Bonnen and Glenn Johnson. The first meeting of this exploratory planning group was held on the day of the Challenger shuttle disaster, January 28, 1986. The morning of that meeting was very productive but headway and productivity were lost on receipt of the news of the shuttle disaster at lunchtime. Subsequent work by Kenneth Farrell and Glenn Johnson, led to a reconvening of the workgroup on March 11, 1987. At this meeting productivity was regained and a prospectus outlining the work of the Social Science Agricultural Agenda Project was developed. The prospectus went through many iterations in the hands of the planning group and particularly in the hands of what later evolved into an Executive Committee for SSAAP. The entire prospectus is presented in Chapter 2. Ken Farrell, the National Center for Food and Agricultural Policy, and Glenn Johnson and James Bonnen, Michigan

State University, worked closely to produce a prospectus establishing the objectives and scope of SSAAP as follows:

Objectives (of SSAAP)

1. To enhance the quality and effectiveness of research (and related activities) in the rural social sciences and in the basic social science disciplines for improving farm and agribusiness productivity, farm and non-farm rural area development, non-farm rural resource development and related aspects of general welfare by

   a. developing a strategic agenda and set of broad priorities for U.S. and international rural social science research, extension, consulting, advising and related activities, and

   b. clarifying the different roles that both applied rural social science experts and disciplinary social scientists should play in making effective contributions to the agricultural research establishment of the United States and the world.

2. To develop wide support in funding, administrative and user communities for the strategic research agenda and priorities to be developed.

Scope (of SSAAP)

1. Our range of concern is with the roles of the rural social sciences and the basic social science disciplines as they pertain to research, extension and related work on problems and issues important

   a. to farms and farmers

   b. to agribusinesses

   c. to consumers -- including the malnourished and inadequately clothed

   d. to non-farm rural residents including disadvantaged groups

   e. to organizations servicing farmers, agribusinesses, consumers and people in rural areas

   f. to state and federal legislative and executive agencies

   g. for natural resources and the environment

   h. for rural communities and infrastructure

   i. for international trade and monetary/fiscal developments as they interrelate with agricultural and rural affairs

j. to U.S., international and non-U.S. agricultural research establishments

k. to other international agencies serving the above.

2. The rural social science areas of concern include agricultural economics, rural sociology and anthropology, agricultural history, the social science aspects of home economics, agricultural law, agricultural political science and the like.

3. The basic social science disciplines of main concern include sociology, economics, geography, anthropology, history, political science and, to a lesser extent, psychology.

4. The range of research and related activities of concern is

a. from multidisciplinary problem solving activities to help solve specific problems for specific decision makers

b. through the generation, assemblage and distribution of information on multidisciplinary subjects (such as technological assessment, disadvantaged non-farm rural people, farm financial stress and food chain contamination) of concern to sets of decision makers facing sets of problems

c. to improvements in the basic social science disciplines needed to facilitate problem solving and subject matter activities.

4. The main related or ancillary disciplines of concern include statistics, mathematics and philosophy.

5. Within agriculture, the work of physical and biological agricultural departments contributes along with rural social science departments to applied agricultural research efforts and, hence, is of concern in this attempt to make social science efforts more effective.

The prospectus has been used extensively in mobilizing funding and sponsorship for SSAAP. Enough money is now committed to SSAAP to guarantee the resources needed to obtain the objective of SSAAP. In addition to monetary sources, SSAAP has received the sponsorship of the Social Science Research Committee, the Experiment Station Committee on Policy, the Extension Service Committee on Policy, the International Association of Agricultural Economists, the U.S. Associations representing rural sociologists, agricultural historians and agricultural economists. SSAAP is also sponsored by NASULGC and NASCARR. As support and sponsorship were mobilized for SSAAP, an Advisory Board was established including representatives of those agencies funding and sponsoring SSAAP. The multidisciplinary and multi-agency composition of the Advisory Board is indicated in the preface pages of this volume along with all sponsors and funders. The Board has participated actively in the development of SSAAP's program.

The SSAAP Program

The SSAAP program is to proceed in three stages. The first stage has consisted of developing and conducting a workshop to provide guidance for subsequent SSAAP work. Workshop participants included leading social scientists, educators, biological and physical agricultural scientists, administrators concerned with scope of the rural social sciences, agribusiness people, farmers, and policy and program officials. This proceeding volume is the report of the first workshop.

The prospectus also calls for two more conferences. After successful completion of the Stage I workshop reported herein, a second four-day conference is planned. The second conference will draw upon and in some cases extend the Stage I effort reported herein with additional commissioned and invited papers. It is anticipated that the second conference will include 240 or more participants and include fuller representatives of the groups identified as under-represented at the Stage I workshop. The emphasis of the second conference will be on working social scientists doing problem solving, subject matter and disciplinary research and related activities important in the areas suggested at the first workshop for additional investigation as subsequently modified by the SSAAP, Executive Committee and Advisory Board. It is anticipated that the second conference will establish research priorities and strategic administrative and funding agendas for the different rural social science areas and the social science disciplines, concerned with agriculture, again broadly defined, that they may contribute more effectively to the (1) multidisciplinary subject matter and problem solving research pertaining to agriculture and (2) to disciplinary social science research relevant for agriculture. As the result of the second conference, a high quality, book-length compendium will be prepared. This compendium will report on and integrate the Stage I and Stage II papers and report the exchanges take place and conclusions reached at the two conferences. A central feature of this report will be the research priorities and administrative strategies that emerge from the Stage II conference. A condensed, summarized version of the book prepared especially for administrators, priority setters and funders will also be produced for use in Stage III.

Stage III of the SSAAP project will include two conferences to place the research priorities and administrative strategies generated in Stage II before appropriate domestic and foreign leaders and decision makers, private as well as public, who support, finance and administer agricultural research and related activities. Endorsement of both reports will be sought from major important science agencies for agriculture. Of the Stage III conferences, one will be held in the U.S. for domestic leaders, administrators and users, and the second at an international location for international and foreign funders, prioritizers, leaders, administrators and users of the international efforts of U.S. social scientists. Efforts will also be made to publish and present results to the rural social scientists at their various association meetings and to the disciplinary social scientists concerned with rural related problems and issues.

The Contents of this Book

Following this introductory chapter are two background chapters presenting SSAAP documents the reader will find it advantageous to study in order to understand more fully the orientation of the eleven papers that follow. The first of these documents is the Prospectus whose origin, objectives, scope and general procedures are summarized above. The Prospectus is Chapter 2 of this book. Chapter 2 is followed by a statement used to orientate and guide the authors, panelists and rapporteurs at the first workshop. This statement is Chapter 3.

Together Chapters 2 and 3 establish a very broad scope for SSAAP and makes it multidisciplinary as well as multidepartmental insofar as agricultural rural social science departments are concerned. Still further, these chapters indicate that SSAAP is concerned with research and related activities across the spectrum running from practical problem solving research for specific problems faced by specific decision makers through multidisciplinary subject matter research in such subjects as agronomy, agricultural economics, animal husbandry, environment pollution, energy and the like to basic disciplinary research in such social science disciplines as economics, sociology, anthropology, political science, geography and history. These two chapters also indicate SSAAP's concern with such ancillary disciplines for the rural social sciences as statistics, mathematics, logic and philosophy. Still further, these two chapters cover the concerns of rural social scientists with the generation of value-free (positivistic) knowledge and knowledge about values as well as prescriptive knowledge useful in solving specific problems. These two chapters also consider the four driving forces for agricultural and rural development, namely technological change, institutional change, human capital formation and, finally, the generation, accumulation and use of the traditional forms of biological and physical capital.

The First SSAAP Workshop

Those participating in the first SSAAP workshop are listed in Appendix A of this book. In total, 55 persons participated, drawn from a wide range of social science and non-social science areas and disciplines, agencies and from administrative as well as scientific ranks.

There were eleven papers in this book that were presented at the first workshop. Two of these papers were overview efforts designed to set the stage for the three-day workshop. One of these papers was prepared by Richard Kirkendall, an historian who attempted to describe the situation in which agriculture now finds itself with due attention to its historical roots. Another paper by Fred Buttel described the situation in which the rural social sciences now find themselves. These two papers were followed by two sets of papers. The first set which elaborated the Kirkendall paper included a paper by Clarence Davan dealing with farmers, agribusinesses and consumers. A second paper by James Hite dealt with natural and rural community resources and the environment and their users. A third paper by G. Edward Schuh dealt with international development and affairs. A fourth paper by Lester Thurow dealt with criticism of agricultural institutions and arrangements. A second set of papers elaborated Fred Buttel's overview paper on social science

institutions, tools and knowledge to address problems and issues. This set of papers included one by Larry J. Connor that examined the social sciences from the perspective of both the rural and basic social sciences. A second paper by Dean Harry O. Kunkel viewed the rural social sciences from the perspective of a land grant college of agriculture research administration. A third paper by Richard Sauer looked at the rural social sciences from the perspective of users and affected persons.

The two overview papers were discussed by a diverse, multidisciplinary panel consisting of Richard Haynes, Department of Philosophy, University of Florida, William R. Freudenberg, Department of Rural Sociology, University of Wisconsin, Leo V. Mayer, Associate Administrator of the Foreign Agricultural Research Service of the USDA, and Russell Perkinson, farmer and farm leader from Thawville, Illinois. Their comments are included in this proceedings volume. The two sets of papers elaborating the two overview papers were also discussed by two diverse, multidisciplinary panels. The panel dealing with the elaborations of the Kirkendall paper included Gary Comstock of the Religious Studies Program, Iowa State University,
Billie DeWalt, Department of Anthropology, University of Kentucky, Kenneth R. Farrell, Vice President for Agriculture and Natural Resources, University of California, Don Paarlberg, retired agricultural economist from West Lafayette, Indiana, Dan Padberg, Chairman, Department of Agricultural Economics, Texas A&M University and incoming president of the American Agricultural Economics Association.

The panel discussion that considered the papers elaborating Fred Buttel's paper included Glenn Nelson, Department of Agriculture and Applied Economics, University of Minnesota, Erwin Johnson, farmer and farm leader from Charles City, Iowa, Alan Randall, Department of Agricultural Economics and Rural Sociology, Ohio State University, William Lacy, Department of Rural Sociology, University of Kentucky, and W. Burt Sundquist, Department of Agricultural and Applied Economics, University of Minnesota.

There were two after dinner speeches, one by Jimmye Hillman on the social sciences in a global context and another by Paul Thompson on philosophy of the social science and ethics.

A major effort at the workshop included the four concurrent sessions to which an entire day was devoted. One of these sessions dealt with farming, agribusiness and consumers under the leadership of Fred Buttel with John Lee serving as rapporteur. Another dealt with natural and rural community resources and the environment and their users with Larry Libby serving as chairperson and James Bonnen as rapporteur. The third concurrent session dealt with international development and affairs under the chairpersonship of Jimmye Hillman with G. E. Rossmiller serving as rapporteur. The fourth concurrent session dealt with administrative and funding strategies with G. E. Klonglan serving as chairperson and Glenn Johnson as rapporteur. Reports of these four concurrent sessions are also included at the end of this proceedings volume.

Functions of this Book

This book is conceived to play three main functions in the total SSAAP program:

(1) To make the papers and conclusions from the first SSAAP workshop readily available to those preparing papers for the second conference.

(2) It is expected to facilitate the second SSAAP conference by providing all participants constructive background information about (a) areas within each of which the second conference should set priorities and (b) alternative administrative and funding strategies to be considered at the second conference.

(3) The third purpose of this book is to inform interested rural social science and disciplinary department administrators and rural social scientists in general as well as administrators and agencies concerned with the rural social sciences about SSAAP progress up through its first workshop.

Overall SSAAP Objectives Were to be Only Partially Attained at First Workshop

Early in this introductory chapter, the SSAAP objectives as expressed in the Prospectus were listed. It should not be forgotten that SSAAP will conduct three conferences and that the objectives of SSAAP could not be fully attained in the first workshop. After all, the first workshop was held for the purpose of gaining perspective and judgment as to how to conduct the second and third conferences so as to attain more fully the objectives of SSAAP as stated in its Prospectus.

Chapter 2

SSAAP PROSPECTUS

A Prospectus, the final version of which follows, was prepared for use in explaining SSAAP to potential sponsors and funders.

PROSPECTUS FOR
PROGRAM OF CONFERENCES ON

SOCIAL SCIENCE RESEARCH AGENDA AND PRIORITIES:
FOOD SYSTEMS PRODUCTIVITY,
RURAL DEVELOPMENT, AND RELATED ASPECTS
OF GENERAL WELFARE

Overall Outline

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• Objectives

- To enhance the quality and effectiveness of research (and related activities) in the rural social sciences and in the basic social science disciplines for improving farm and agribusiness productivity, farm and non-farm rural area development, non-farm rural resource development and related aspects of general welfare by

  - developing a strategic agenda and set of broad priorities for U.S. and international rural social science research, extension, consulting, advising and related activities, and

  - clarifying the different roles that both applied rural social science experts and disciplinary social scientists should play in making effective contributions to the agricultural research establishment of the United States and the world.

- To develop wide support in funding, administrative and user communities for the strategic research agenda and priorities to be developed.

• Scope

- Our range of concern is with the roles of the rural social sciences and the basic social science disciplines as they pertain to research, extension and related work on problems and issues important

  - to farms and farmers

  - to agribusinesses

  - to consumers -- including the malnourished and inadequately clothed

  - to nonfarm rural residents including disadvantaged groups

  - to organizations servicing farmers, agribusinesses, consumers and people in rural areas

  - to state and federal legislative and executive agencies

  - for natural resources and the environment

  - for rural communities and infrastructure

  - for international trade and monetary/fiscal developments as they interrelate with agricultural and rural affairs

  - to U.S., international and non-U.S. agricultural research establishments

  - to other international agencies serving the above.

- The rural social science areas of concern include agricultural economics, rural sociology and anthropology, agricultural history, the social science aspects of home economics, agricultural law, agricultural political science and the like.

- The basic social science disciplines of r[illegible] [illegible]oncern include sociology, economics, geography, anthropology, history, poli[illegible] science and, to a lesser extent, psychology.

- The range of research and related activities of concern is

  - from multidisciplinary problem solving activities to help solve specific problems for specific decisions makers

  - through the generation, assemblage and distribution of information on multi-disciplinary subjects (such as technological assessment, disadvantaged non-farm rural people, farm financial stress and food chain contamination) of concern to sets of decision makers facing sets of problems

  - to improvements in the basic social science disciplines needed to facilitate problem solving and subject matter activities

- The main related or ancillary disciplines of concern include statistics, mathematics and philosophy.

- Within agriculture, the work of physical and biological agricultural departments contributes along with rural social science departments to applied agricultural research efforts and, hence, is of concern in this attempt to make social science efforts more effective.

• Expected Products and Impacts

The above objectives will be attained by generating the following products and impacts:

- Well articulated research strategies and broad priority statements for:

  - the rural social science areas vis-a-vis the scope of research outlined above.

  - the parent social science disciplines and their ancillaries, also vis-a-vis the scope of research outlined above.

- Greater appreciation on the part of both applied rural social science experts and basic social science disciplinarians as to how they can contribute effectively to the scope of research outlined above.

- Endorsement of the above research strategy and broad priority statements for the rural social and disciplinary social sciences by major science agencies.

- Greater understanding on the part of physical and biological agricultural scientists of what can be gained from carrying out research, educational and related activities cooperatively with rural social science experts and social science disciplinarians in doing practical research.

- Improved administration of the rural social science units and related programs (both public and private) in the agricultural research establishment.

- Increased output (greater efficiency in the use of present resources) by the rural social science fields and social science disciplines and, thus, justification for added research budgets for rural social science areas and the disciplinary social sciences in the agricultural research establishment without diverting needed funds from research on technological advance for agriculture and agribusinesses.

- An improved focus of the rural social sciences and social science disciplines on the contributions they can make of the above mentioned types in international agencies and in other countries, particularly in those of the Third World.

• Historical and Geographic Perspectives

Much valuable perspective can be gained with respect to past and potential contributions of the rural social science areas and social science disciplines by examining experiences in different parts of the world at different points in time with attention to roles played by the presence or lack of improvements in (1) technology, (2) policies, programs, and institutions, (3) the development of human skills and capacities, and (4) growth in the quantity of traditional biological and physical agricultural capital.

Appendix I examines experiences with oil palm technology and policy in Nigeria and Malaysia; the impacts of policy changes in Eastern Europe and the Peoples Republic of China; pre- and post-Civil War impacts of institutional and technological changes on southern and northern U.S. agriculture; the roles of human capital, technological advances and policies in the development of Japan, Taiwan and South Korea.

In the agricultural history of the U.S. and geographically around the world, one finds examples of instances in which agricultural sectors have been or are severely constrained by inappropriate policies and institutions, by lack of investments in human development and by the absence of appropriate technologies. The continued existence of such instances attests to the difficulty and complexity of the task of getting all of the parts in place and, hence, of the need for social science research. Technology alone does not do it. Neither do policies and institutions alone. Also, substantial investments in human development without appropriate policies and technologies do not lead to success. Inflows of external capital without human skills, appropriate technologies and supporting policies, programs and institutions lead no where. Contributions to the general welfare have often depended on social and land reforms as parts of the needed supporting policies, programs and institutions. The rural social sciences and the social sciences have much to contribute. A later section deals with implications of the current agricultural crisis for social science research.

• Past Research Agendas for Agriculture and Food and the Social Sciences

President Ford created the world food and nutrition study (National Academy of Sciences, 1977) to establish priorities whereby U.S. agricultural research capacity could make its best contribution to the solution of problems involving hunger and malnutri-

tion. As has been pointed out elsewhere (Johnson, 1985-a), that study examined a broad range of research opportunities for the biological and physical agricultural sciences and established priorities among them. The rural social sciences were allocated a mere three/tenths of one percent of the recommended budgets!

The Presidential World Hunger Commission established by President Carter (1980) had a broader base inasmuch as it included political and agricultural leaders as well as agricultural scientists and researchers. It's final recommendations were somewhat more balanced than those of the World Food and Nutrition Study, but nonetheless placed primary emphasis on technology, to the neglect of research on (1) improvements in policies, programs and institutions (including social reforms) and (2) investments in human capacities and skills (Johnson, 1977, 1985-a).

There have been two international crop productivity conferences to develop research priorities; one, eleven years ago (Brown, et al., 1975) and another recently (Gibbs and Carlson, 1986). Both placed primary emphasis on research and development to generate new technologies for producing crops. The technical agricultural scientists in charge of these conferences were interested in what social scientists could do to prove the importance of technical research and to get that research into use. There was little interest displayed in research on policies, programs and institutions including social reforms or research on human development to help attain balance among the four driving forces that have proven crucial for success time and again. Non-farm rural resources and disadvantaged rural groups, whether farm or non-farm, received little emphasis.

There has also been a conference to set research priorities with respect to animal agriculture (Pond, et al., 1980). Again the emphasis was on technological needs.

The American Agricultural Economics Association conducted a post-conference seminar in the summer of 1985 on "Critical Issues Facing American Agriculture for the 21st Century." Somewhat similar exercises have been conducted by the rural sociologists and home economists. These commendable exercises will provide very useful input for the present attempt to deal with all of the rural social sciences and related basic disciplines.

A conference on agricultural research was held in the Spring of 1986 at the University of Minnesota. Again, the emphasis was mainly on technological research for production agriculture. One group at the Minnesota conference was concerned with the research institutions of the U.S. Department of Agriculture, the Agricultural Experiment Stations and the international research centers with a focus on biological and physical research. Little consideration was given to research on agricultural policies, and programs and rural institutions in general. Research on human development, and disadvantaged rural groups was hardly considered though some attention was given to the development of biological and physical science expertise for staffing the technical research institutes and agencies. Research on community and rural non-farm development, the current farm financial crisis, and disadvantaged non-farm rural groups received little consideration.

When Vannevar Bush (1945) made the case after World War II for much greater investments in United States research, he argued for a balance between applied and basic research. The National Academy of Science and the National Science Foundation have pushed hard toward basic disciplinary research in the biological and physical sciences.

Even for agriculture, the emphasis since Bush advanced his argument has been placed on basic disciplinary research in the "hard" sciences to the neglect of applied research, partly as a result of the Pound report (National Academy of Sciences, 1972). This was unfortunate for research on the food system, community and resource development and for general welfare (Bonnen, forthcoming). It is also unfortunate for the social sciences because applied research is necessarily multidisciplinary in a way that includes the social sciences whereas social science is not nearly so relevant for the disciplinary research of the physical and biological sciences. Concentration on the basic disciplinary research in the biological and physical sciences, at the expense of multidisciplinarity, has contributed to the neglect of the rural social sciences by the agricultural research establishment (Bonnen, forthcoming). It has also resulted in disenchantment of public and private decision makers with the agricultural research establishment -- applied results as well as improvements in academic disciplines are expected by the legitimate clientele groups of the agricultural establishment. With respect to all of the research establishment, neglect of the practical has been noted recently by Shapley's and Roy's book entitled Lost at the Frontier (1985), an obvious sequel to Vannevar Bush's post-World War II document entitled Science: The Endless Frontier (1945).

The current need for applied research, of course, does not justify reduced attention to disciplinary research in either (1) the basic biological and physical sciences or (2) the basic social sciences and the humanities. Our society (with its increasingly complex technologies, policies, institutions and programs and their concomitant demands for high-level human skills and capabilities) needs much more relevant disciplinary research across the social, biological and physical sciences to support its applied research. This prospectus seeks to define the appropriate place in the agricultural and general research establishment for applied and basic social science research.

• Perspective from the Current Agricultural Situation

The current situation for agriculture involves the United States farm financial crisis. Components of this crisis include: lost foreign markets for U.S. agriculture; adverse impacts of international monetary developments for United States and world agricultures; a decrease in the number, if not the proportion, of family farms; farm family crises; financial difficulties for agribusinesses; and the breakdown of community structures in commercial farming areas. In addition, the agricultural establishment is sharply criticized: for generating technologies that contaminate the food chain, pollute the environment and replace labor in agriculture; production controls, surpluses and price supports in the face of world and domestic hunger; wastage of natural resources; the neglect of disadvantaged rural groups in the United States; and the continuation of hunger, malnutrition and poverty problems in the U.S. and in Third World countries. While few disagree with the long term need to expand production (Johnson and Wittwer, 1984), there is much concern over the failure of agricultural research and related activities to go beyond production agriculture to address such issues and aspects of the current agricultural situation as listed above.

There is also increased pressure on the agricultural establishment to devote more attention and research to the ethical aspects of agriculture. This pressure calls into question our agricultural research and science policies as well as our price support, production control, surplus storage and disposal, international trade, poverty alleviation, rural development, resource utilization, waste disposal, energy shortages, and other related policies. Over the past several years at least ten major conferences have been

held on agricultural ethics, some of which have been published (Haynes and Lanier, 1982; Knowles, 1983; Dahlberg, 1986; Edens, et al., 1985). These have considered problems involving environmental pollution, food chain contamination, malnutrition and starvation, erosion and soil conservation, water quality, gender inequality, family farming, family stress, appropriate technology, off-farm migration, regenerative agriculture, the demise of the family farm, multinationals, corporate farming, and the like. In the late sixties and the early seventies, food shortages were a central concern; predictively this concern has been replaced with concern over the current "farm crisis" and surpluses. Agro-ethical conferences have dealt with social issues but have not led to delineation of priorities for social science research. Such conferences have sometimes been more activist than academically objective. An interesting objective development is a joint National Association of State Universities and Land Grant Colleges (NASULGC) and American Association of State Colleges of Agriculture and Renewable Resources (AASCARR) project which is developing undergraduate teaching materials to be used in colleges of agriculture courses involving agro-ethical issues and problems.

A part of the neglect of the social sciences in agricultural research priority setting exercises is attributable to the dominance of logical positivism, the philosophy which finds its most appropriate applications in the work of the physical and biological sciences (Johnson, 1985-b). Logical positivism represses research on values, which in turn constrains prescriptive research on policies, programs and institutions and indeed, for that matter, on technology assessment (Collin, 1985). After World War II, normativistic philosophies lost respectability in scientific circles. So did pragmatism, the philosophy that so often undergirds teaching and research methods in colleges of education, agricultural extension and vocational agriculture. This brief mention of important philosophies undergirding agricultural research (and other related activities) serves to stress the importance of being philosophically eclectic enough in setting social science research priorities and agendas to deal with the full range activities and subjects of concern to society in agriculture.

• Procedures

— It is planned that the overall project will involve one workshop and two conferences (three stages in all). It is tentatively planned that the last conference will be repeated at both a U.S. and an international location.

- **Stage 1.** A three-day workshop is being designed around commissioned/invited papers. The content of these papers will provide guidance for the subsequent conferences. Participants will be primarily leading social scientists and educators, selected leading biological and physical agricultural scientists concerned with our scope of interests, educators from other disciplines, agribusiness people, administrators, and policy and program officials. This conference will probably be held in early 1987. Results will be carefully evaluated before proceeding to Stages 2 and 3.

- **Stage 2.** After successful completion of Stage 1, a four-day "public" conference is planned. This conference will draw upon but, in some cases, extend the Stage 1 workshop papers with additional commissioned/invited papers. Participants (240 or so in number) will include representatives of each of the groups identified in Stage 1 above but the emphasis will be on working scientists doing problem solving, subject matter and disciplinary research (and related activities) important for groups listed under **Scope** above

This conference will establish research priorities and agendas for the rural social science areas and social science disciplines so that they may contribute more effectively to (1) multidisciplinary subject matter and problem solving research and (2) relevant disciplinary social science research.

A book-length report will be prepared reporting on and integrating the Stage 1 and 2 papers and the exchanges that will take place at the Stage 2 conference. A central feature of this book will be the research priorities and agenda that emerge from the Stage 2 conference. A condensed and summarized version of this book will be prepared for Stage 3 (see part A of Stage 3).

The Stage 2 conference will likely be held in the fall of 1987 or spring of 1988.

- **Stage 3.** Assuming successful completion of Stage 2, Stage 3 conferences will place the research priorities and agenda generated in Stage 2 before the appropriate domestic and foreign leaders and decision makers (private as well as public) who support, finance and administer agricultural research and other related activities

  - Part A: Preparation and attainment of endorsement of reports for major important science agencies.

  - Part B: Conference of legislative leaders, funding agency administrators, users and others to present and discuss the report to be prepared in Part A. Two such conferences are planned, one in the U.S. for domestic leaders, administrators and users and the second at an international location for international and foreign funders, prioritizers, leaders, administrators and users. Efforts will also be made to publish and present results to the working rural social scientists and disciplinary social scientists concerned with rural related problems and issues.

— An advisory board will be established from funding and supporting agencies such as USDA, NASULGC, Social Science Research Council, National Academy of Science, Rockefeller Foundation, Ford Foundation, Farm Foundation, Agricultural History Society, American Agricultural Economics Association, agribusinesses and the like and international agencies.

— An advisors group of scholars, consultants, reviewers, and evaluators will be established to be used

  - in evaluating workshop and conference programs
  - in evaluating proposed authors and their papers
  - as discussion panelists and rapporteurs
  - in preparing the Stage 3, Part A, document for approval (hopefully) by major science agencies.

This group will be made up of leading scholars drawn from the rural social science areas, the basic social science disciplines, and users of social science research. Both younger and well-established scholars will be included. Such areas as agricultural history, agrarian political science, geography, and agro-ethics will be represented as well as such better-established areas as rural sociology and its subspecialties;

agricultural economics including farm management, policy, agribusiness, resource economics, trade, agricultural development and the like; and home economics and its subfields that involve the social sciences. In addition, scholars from the basic social science disciplines who are concerned with the work outlined under **Scope** above will be represented.

- Day-to-day operations will be carried out by an executive committee representing the National Center for Food and Agricultural Policy (NCFAP) at Resources for the Future, Michigan State University (MSU) and the U.S. Department of Agriculture with Glenn L. Johnson serving as secretary. This executive committee will carry the major responsibility for keeping the project moving from day to day.

• Needed Support

Two types of support exist and are being sought:

1. administrative and "moral support" from concerned agencies

2. financial support to defray travel, conference operating, editing and printing costs and to commission papers (mainly from persons outside the U.S. agricultural establishment).

Administrative and Moral Support

Supporting agencies other than the National Center for Food and Agricultural Policy of Resources for the Future, the U.S. Department of Agriculture and Michigan State University are providing core financial support and sponsorship. Presently the effort has the formal or informal sponsorship of the Social Science Research Council, National Center for Food and Agricultural Policy; and the Office of the Vice President for Research, the Michigan Agricultural Experiment Station, the Department of Agricultural Economics, the Department of Sociology and the office of the Dean and Vice Provost for agriculture all at Michigan State University, the International Association of Agricultural Economists, the Caribbean Agro-Economic Society, the American Association of Rural Sociologists, the American Association of Agricultural Economics, and the American Association of Agricultural History and the National Association of State Universities and Land Grant Colleges. The following agencies have indicated interest and are being contacted further under the present project: the Agricultural Board of the National Academy of Science, the Agricultural Institute, Ford Foundation, Rockefeller Foundation, the Farm Foundation, the Rural Sociological Society and the International Rural Sociology Association. Private agribusiness firms are also being contacted.

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Chapter 3

THE ORIENTATION AND GUIDE FOR AUTHORS OF PHASE I WORKSHOP PAPERS

Working closely with the Executive Committee, Glenn Johnson, Executive Secretary, and James Bonnen developed a document to orient and guide authors of Phase I workshop papers. That document is reproduced in this chapter to make it available to authors of Phase II papers. As such, the orientation and guidelines statement will help authors for the Phase II SSAAP conference understand the Phase I papers that are available to them in this book. Still further, the orientation and guide will be useful to participants at the second conference who do not prepare papers but who work on research priorities and funding and administrative strategies.

It should be pointed out that the orientation and guide was used at a meeting of Phase I authors attended by a number of Advisory Board members. That meeting was held in Chicago on February 9, 1987.

It is felt that sections of the orientation and guide paper dealing with terminology, the SSAAP plan of action and scope of interests will do much to expand the reader's understanding of the intent of the Prospectus in Chapter 2. Figures 1 and 2 should facilitate comparison by participants in the Phase II conference of the ex ante Phase I workshop plan with what actually occurred at the Phase I workshop as reported in this book.

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ORIENTATION AND GUIDE FOR AUTHORS OF PHASE I WORKSHOP PAPERS

The objectives of the Social Science Agricultural Agenda Project (SSAAP) are detailed in the Prospectus. These objectives are to

> "enhance the quality and effectiveness of research (and related activities) in the rural social sciences and in the basic social science disciplines for improving farm and agribusiness productivity, farm and nonfarm rural area development, nonfarm rural resource development and related aspects of general welfare by
>
> - developing a strategic agenda and set of broad priorities for U.S. and international rural social science research, extension, consulting, advising and related activities, and
>
> - clarifying the different roles that both the applied rural social science experts and the more basic disciplinary social scientists should play in making effective contributions to the agricultural research establishment of the United States and the world."

There is also the objective of developing "wide support in funding, administrative and user communities for the strategic research agenda and priorities to be developed."

It should also be made clear that a project sponsored and financed largely by U.S. organizations should not, and will not, attempt to set research priorities for rural and basic social scientists around the entire world. Instead, our effort attempts the more modest task of establishing priorities and a research agenda for U.S. rural and basic social scientists working both domestically and abroad. Of course, our effort has international significance for two reasons, the first of which is that U.S. rural and basic social scientists do much work abroad on the development of third world economies and societies. The second reason involves the increasingly close interrelationships among the research programs, economies and societies of the different countries of the world. Neither the domestic nor international rural and basic social science agendas of a single country such as those of the United States can be regarded as inconsequential for the rest of the world. We must relate our work to the rest of the world which will be equally required to relate its research priorities and agendas to those of the United States.

Note on Terminology

The complexity and range of problems and the diversity of disciplines/fields relevant to this Project call for careful use of terms. At the same time repetitive use of long strings of descriptors is soporific and distracting. Thus, we have resorted to some short forms and single words to represent a more inclusive idea than often is associated with some terms.

For example, since consideration of real world problems inevitably involve human values, ethics and historical events, the humanities (especially philosophy and history) are necessary companions of any complete social science inquiry into such problems. Rather than keep repeating "the social sciences and humanities" or "the social sciences plus history and philosophy," we understand the term "social sciences" in this paper to include the relevant humanities. Without making research in the humanities a main focus of our efforts, we are required to give them much more than token status if we are to benefit from their potential contribution to our work. Philosophers, historians and students of religion serve on our advisory board, in our group of consultants and will have actual parts in our program.

Many terms are used differently by different groups, such as the word "agriculture," which is often limited to mean farming. We start out making clear that we use this term to include farmers, agribusiness, consumers and all the processes, institutions, functions and human and natural resources that sustain or are sustained by this functional sector of society. But later in this paper its use is repeated often without all the additional language necessary to carry this broader meaning. Similarly the word rural, which we use to be inclusive of the nonfarming, rural community and its resources and social structures, is an ambiguous, difficult to define term. Again our intent is to communicate an inclusiveness in scope in treating problem definition and in identifying the fields and disciplines relevant to a problem. We use the phrase "agricultural institutions" to include the formal and informal organizations, arrangements and rules for controlling the performance of agriculture as broadly conceived herein.

We have limited our use of the term "discipline" (sometimes "parent disciplines") to the fundamental or basic disciplines. When referring to applied disciplinary or multidisciplinary fields and activities, we use the terms "applied" or "rural social sciences" or "agricultural sciences." This distinction is important to our purpose even though we recognize that in practice applied research is done in "disciplinary organizations" and some disciplinary research is pursued in applied or rural fields.

Plan of Action

Since the rural social sciences are not as well developed or institutionalized for agriculture as the biological and physical sciences, bringing agricultural research and related agendas in the social sciences into focus is substantially more difficult. For this reason our effort is divided into several stages over three years to assure that each is executed with clarity before moving to the next stage (see Prospectus for details).

Phase I will be composed of a small workshop whose objective is to identify and organize the important researchable problems and issues into a limited set of categories dealing with different subjects, problems and issues. In Phase II, a large conference will be organized around the categories developed in Phase I. It will prioritize the different lines of inquiry and types of research within each of the categories delineated in Phase I. Phase III will be executed in two smaller conferences -- one domestic, the other international. The results of Phases I and II will provide the information base for both of the Phase III conferences. These conferences will include domestic and foreign research leaders and the decision makers (private and public) who use, support, finance and

administer agricultural research and other related activities. Events will be sequenced as follows:

Meeting of Phase I Authors (a set of SSAAP consultants will be assigned to critique and assist each Phase I author)	Phase I Workshop--will establish categories and tentative priorities among them	Synthesis of Phase I's concurrent session results into an agenda for Phase II by Executive Committee, concurrent session chairs and selected consultants	Phase II Conference (includes consultants) -- will establish priorities within categories	Synthesis of Phase I and II Output by Exec. Com. & Consultants into plan for Phase III conferences including establishment of priorities among categories	Phase III a) Domestic Conf. b) Int'l Conf.

This Orientation and Guide for Authors will be presented and discussed in detail at the meeting of Phase I authors. It is hoped that it will help authors attain more complete and systematic coverage without permitting the taxonomies followed in it to "get in the way."

There are common dangers in any effort to identify and prioritize research for more than one discipline or kind of rural social science department or for more than one category of issues and problems at a time. One of these dangers is misspecification of the scope or content of the major problem sets and their relationships to specific lines and types of inquiry or research. One cannot afford to allow the viewpoint or concerns of any one discipline, group of disciplines, department, research organization or affected group to dominate the establishment of categories and the determination of priorities within each category. In an attempt to minimize this danger in developing the workshop papers, authors are offered the following discussion of concepts and the primary relationships. Each author should consider this discussion in developing her or his paper. This should help keep the SSAAP enterprise balanced and complete in its consideration of the different kinds of research and related activities, different kinds of knowledge handled, the domains of the various multidisciplinary fields (e.g. the various rural social sciences) and related basic disciplines, the different ways social scientists impact the "real" world, and the problems of administering research and related activities.

Scope

The scope of agricultural research and related activities carried out by social scientists has many dimensions that should not be omitted or distorted. These include:

1. the different kinds of knowledge (value-free, value, and prescriptive) used in addressing problems.

2. the broad kinds of research in which social scientists and others participate (disciplinary, multidisciplinary subject matter and problem-solving research which is also multidisciplinary).

3. the appropriate domains of disciplines and the various rural social sciences whose research capability must be brought to bear on problems -- the administrative structure of colleges of agriculture and the disciplinary structures of colleges of social sciences or of arts and sciences are important in the organization of social science research for agriculture and related aspects of society.

4. different ways of changing the real world and improving our capacity to solve or ameliorate the problems one wishes to address including the creation, through research and other scholarly activity, of new human capability; improved technology; new institutional policies, programs and practices; and more or better use of existing natural and man-made capital.

5. accountability for and other administrative aspects of the use of resources by social scientists requires that we recognize the relevant stakeholders in the solutions of problems. The priorities and perceptions of legitimate stakeholders partially rule the answer to the question of what actions should be taken. These stakeholders range from the scientists and researchers themselves to the groups affected by those solutions to problems that are accepted as a basis for action. While research has intrinsic value, the stakeholders value research primarily for its extrinsic value or usefulness in solving problems.

This rather substantial number of dimensions that SSAAP must keep in focus in setting agricultural priorities for the rural social sciences and the basic social science disciplines deserves the following discussion.

In his 1956 book, The Image, Kenneth Boulding examined different dimensions of the "real" world (we can call the changes in these dimensions the sources of change or the sources of increased societal capacity) and the kinds of knowledge necessary to solve problems. His discussion identifies technology, institutions and people as important. Today we call changes in people changes in human capital or changes in human capability meaning the same thing as did Boulding.

Boulding argued that man creates and holds two images or kinds of knowledge about these three aspects of reality. He characterized one image as value-free or positivistic knowledge about technology, human capability and institutions. The other image was of the values attached to human capability, technology and institutions. It is noted that there have been at least ten national conferences in recent years focused on the ethical aspects of issues and problems currently important for agriculture.

Boulding's conception can be advantageously extended. In addition to human capability, technology and institutions (including policies and programs), there are the conventional (man-made and natural) biological and physical resources that can be increased to improve the capability of society. In agriculture, for example, improved soil fertility, new buildings, and larger and better herds, and orchards all improve capability to produce the means of solving problems. Thus, there are four of these primary sources of change (see Figure 1) to be studied by social scientists concerned with improving the agricultural and rural related aspects of society.

There are two distinctly different forms of normative knowledge. C. I. Lewis, in his book entitled The Ground and Nature of the Right, distinguishes knowledge about values from the prescriptive knowledge necessary for solving a problem. Attempts to solve a problem ultimately reach a stage where decisions must be made. When a decision

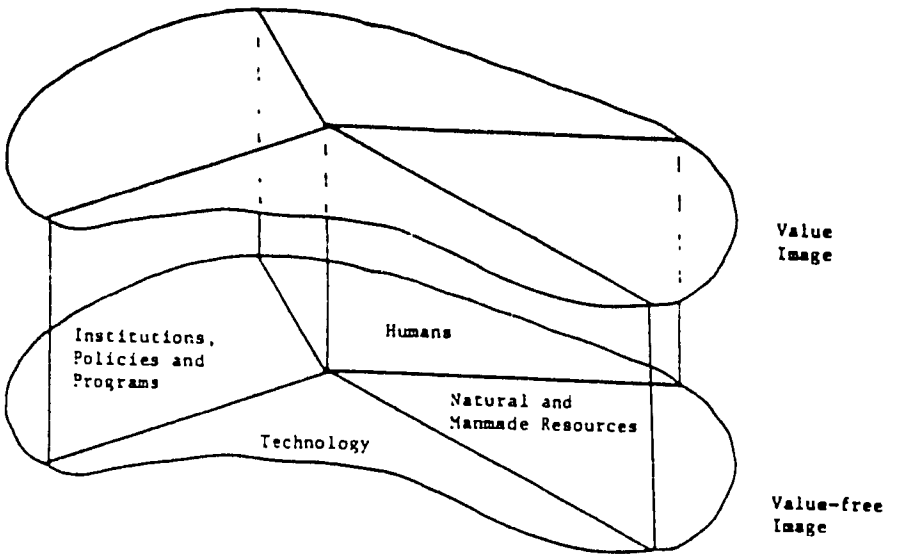

Figure 1. Boulding's Images with a Modification

is made a conclusion is drawn about what "should" or "ought to" be done. All such "should" or "ought" statements are prescriptive. So are "should not" and "ought not" statements. Prescriptions are based on both value-free knowledge as well as value knowledge which is about goodness and badness. When we have to minimize net losses, it is sometimes right to do that which is bad. However, when we can maximize net gain, it is wrong to do that which is good if it is possible to do something still better with the same resources. The decision rules we use to transform value-free and value knowledge into prescriptive knowledge involve distributions of power. Political scientists and historians study the distribution of political, military and police power in the making of decisions important to agriculturalists. Among other things, sociologists study social and religious power, while economists study economic power. Such studies make important contributions to the solution and resolution of agricultural and rural related problems and issues.

Thus, it is important in setting priorities in the social sciences to recognize not only the need for value-free knowledge but the need for knowledge about values, as well, and the roles both play in generating a prescription as to which actions "should be taken" to solve a problem. Failure on our part to consider any of the three different kinds of knowledge discussed above would bias the social science research priorities to be established in our effort.

The importance of recognizing Boulding's three (we added a fourth, Natural and Manmade Resources, in Figure 1) dimensions of society can be seen in the fact that the major structural problems of society create a need for some combination of new human capital, new technology, improved institutions and more biological and physical capital to use in the resolution of those problems. Typically, governments and social units act when individual and market forces do not elicit needed structural changes. Such actions often impose losses and gains on different groups thereby raising severe measurement problems for social scientists assessing welfare.

Some problems are primarily technological, although practically all such problems also have human capability, institutional and/or resource dimensions that must be

recognized. In the long run almost all technologies and even some institutions are embodied in some degree in conventional biological and physical capital and natural resources or less conventional institutional and human capital, i.e., they are expressed through objects and arrangements in the real world.

All four of the broad sources of change considered herein have been studied by social scientists in the past and are likely to need further study in the future. Investigation of specific problems and issues usually suggests more limited sets of knowledge, lines of inquiry and kinds of research that may be needed with respect to each of the four. Examples of past social science research on the four driving forces include T. W. Schultz's Nobel Prize winning research on human capital formation, Ruttan's and Hayami's research on induced technical change and related work on induced institutional change. Sociologists, political scientists, agricultural historians and human ecologists have also made significant contributions to the study of these driving forces which go beyond the "induced change" approach.

In addressing the question of priorities for social science research and related efforts, Boulding's notions can be extended by adding a dimension dealing with three fundamentally different kinds of research and related activities carried out in our agricultural institutions. The three kinds are: disciplinary, multidisciplinary subject matter and problem solving. Each of these is discussed in the following three paragraphs.

The object of problem-solving research is to produce prescriptive knowledge about what "should" or "ought to" be done to solve a specific practical problem. Such research is typically multidisciplinary not only within but also beyond the social sciences. Problem-solving activities can be viewed as using knowledge from a number of disciplines to solve one specific problem faced by a specific decision maker or set of decision makers. Problem-solving efforts convert knowledge about values and value-free knowledge into prescriptions by using decision rules. Such rules typically involve one or more distributions of power and property rights imbedded in some sort of social covenant.

At the other end of the spectrum, disciplinary research may produce a kind of value-free knowledge, knowledge of values, or both. The social sciences often generate both value-free and value knowledge. Some disciplinary social science research may also be abstractly concerned with prescriptive knowledge, since maximizing or optimizing models and computations are used to (1) predict the behavioral consequences of optimizing behavior on such variables as participation, prices, incomes, alienation, farm incomes, institutions, socialization, technological change, political activities such as voting and the establishment of coalitions, improvements in human capability, and capital accumulation and the like, and (2) generate prescriptions about what ought to be done.

Finally, subject matter research is multidisciplinary research that creates more or less well-defined multidisciplinary bodies of value-free and/or value knowledge relevant to some more or less well-defined set of problems faced by still another more or less well-defined set of decision makers. Since problem-solving knowledge is generally of very short-lived value, society organizes around longer lasting subject matters (as in professional schools and institutes) to establish and maintain the knowledge base for subsequent problem-solving efforts. Administrative units in colleges of agriculture, agricultural ministries and departments, and agribusinesses are often multidisciplinary, subject matter units and departments. For instance, an agronomy department in the typical college of agriculture brings to bear the expertise of chemists, physicists,

geneticists, entomologists, pathologists, plant physiologists and the like on different parts of the subject of agronomy to generate bodies of multidisciplinary knowledge to serve important groups of farmers facing important sets of problems. Similarly, the rural social science departments are multidisciplinary enough to be identified with rurality and to deal with subjects important to significant sets of rural and rural related decision makers addressing sets of rural and rural related problems. In the SSAAP effort, it will be important for us to determine if the different typical rural-social science units are addressing subjects significant to important sets of decision makers and, if not, how we should restructure our administrative units to address more relevant subjects in an effective manner. Closely related to this are questions about the present effectiveness or lack of effectiveness of the basic social science disciplines in providing appropriate knowledge for rural and rural related problems either directly or via the rural social sciences.

Figure 2 attempts to portray the above discussion so as to illuminate the task faced by SSAAP. While an over simplification, Figure 2 trys to relate the dimensions of SSAAP's work identified thus far to the domains of the disciplines and multidisciplinary fields necessarily involved in doing research to solve societal problems. One starts in the center of Figure 2 with "societal problems" and proceeds outward through the concentric circles. The existence of societal problems "creates a need for some combination of new human capability, technology, institutions (including programs and policies) and biophysical capital."

Improving human capital, technology and institutions can be addressed in part through the research process (parenthetically, we need to recognize that more than research is involved in problem solving). Thus, new combinations of human capital, technology and institutions are developed in part through the multidisciplinary problem-solving and subject matter research efforts of our agricultural institutions and in which social scientists should participate as appropriate. These efforts, in turn, are "supported by knowledge produced by relevant basic disciplines including those of the social science disciplines." Thus, as one goes from the center of Figure 2 to the edge, one progresses through (1) multidisciplinary problem-solving research focused on single problems through (2) the supporting knowledge generated by multidisciplinary subject matter research on sets of problems often but not always done in the biological, physical and social science based departments in colleges of agriculture supported by (3) the knowledge generated in the relevant basic disciplines. Figure 2 can also be viewed as a process proceeding through the development of new human capital, technology, institutions and biophysical resources to increase societal capacity for solving the problems society defines for itself, the sciences being part of society and hence participants in the definition of societal problems.

Following and extending Boulding's treatment of kinds of knowledge, the dimensions of the Figure 2 schematic can also be viewed as existing at three levels, i.e., in terms of each of the three types of knowledge: value-free, value and prescriptive knowledge. It is important to recognize that in the social sciences one cannot take a purely positivistic or purely normative position but must be prepared to deal with all three types of knowledge as they are relevant to the purposes to which research and related efforts are addressed. To do anything less in the social sciences would be to distort the research process and to limit the capacity of the social sciences to contribute to the problem-solving efforts. Doing less would also distort the agendas for relevant disciplinary research, which we also seek to establish in this effort. Problem-solving research requires methodological flexibility with respect to the various philosophic orientations undergirding different research techniques and methods.

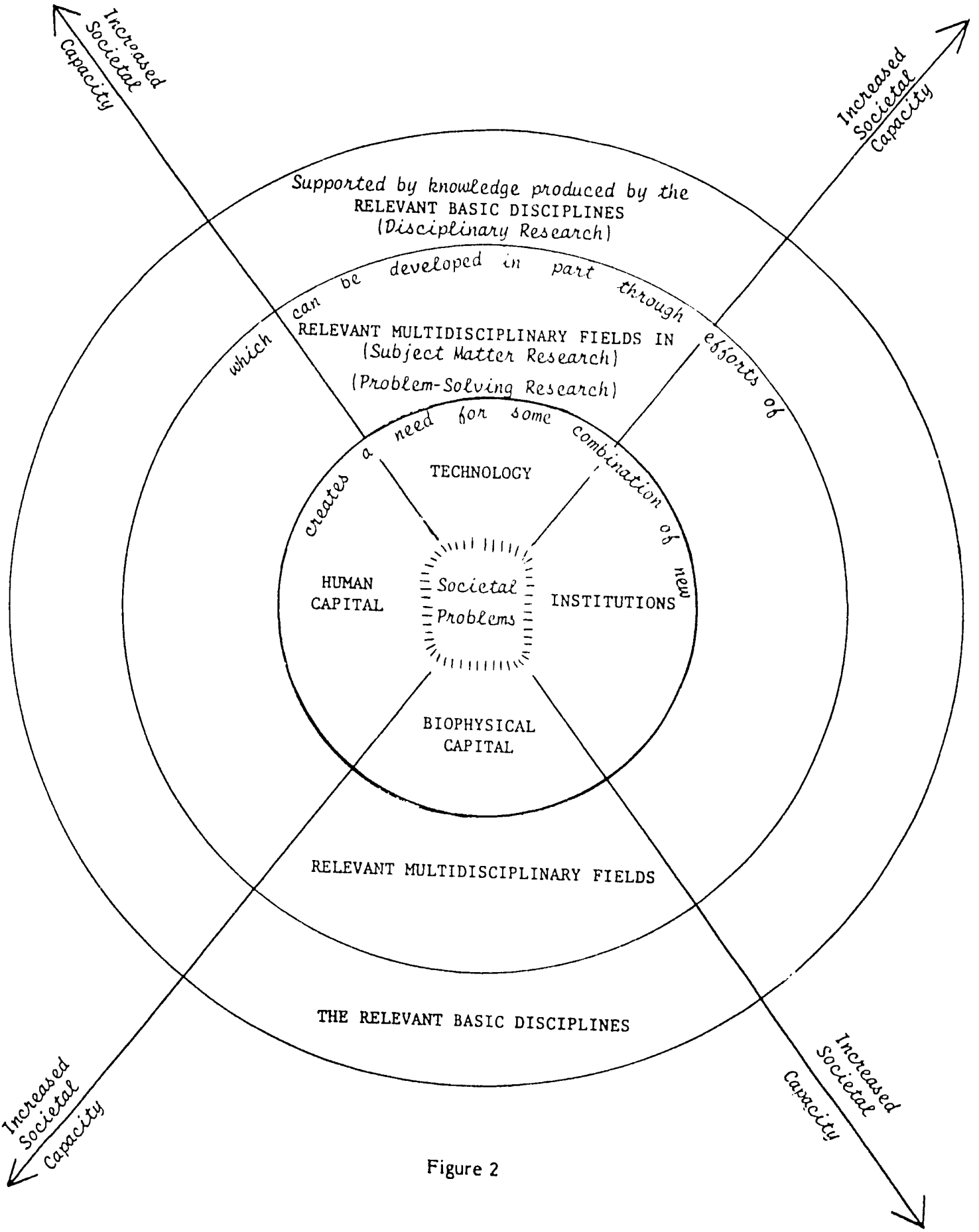
Increased Societal Capacity
Increased Societal Capacity
Supported by knowledge produced by the
RELEVANT BASIC DISCIPLINES
(Disciplinary Research)
which can be developed in part through efforts of
RELEVANT MULTIDISCIPLINARY FIELDS IN
(Subject Matter Research)
(Problem-Solving Research)
creates a need for some combination of new
TECHNOLOGY
HUMAN CAPITAL
Societal Problems
INSTITUTIONS
BIOPHYSICAL CAPITAL
RELEVANT MULTIDISCIPLINARY FIELDS
THE RELEVANT BASIC DISCIPLINES
Increased Societal Capacity
Increased Societal Capacity

Figure 2

Finally, our SSAAP enterprise needs to recognize that research and related activities must be accountable. Various groups in society and in agricultural institutions have a stake in the solutions of problems and their voices are necessary for the support and evaluation of different types of research. If doing disciplinary research, the relevant peer group to judge that research is limited to the informed members of the discipline and those who fund disciplinary research though, even in this case, practical peers may be useful in judging the relevance. By contrast, the groups that support and appropriately evaluate subject matter research are substantially broader and include not only relevant disciplinarians from more than one discipline but researchers in other multidisciplinary, rural related fields as well as those groups that have a stake in or are affected by the problems addressed and their solutions. In the case of problem-solving research, the appropriate peer group involves not only the multidisciplinary problem-solving researchers but, most importantly, those affected by actions based on solutions to the problems addressed. Thus, the three SSAAP conferences proposed in the Prospectus provide that participants should range from disciplinarians through researchers in multidisciplinary subject matter departments; administrators of research; the politicians and agencies that fund research; and the various critics of agricultural institutions to more ultimate users and those who bear the consequences of research. We must recognize that our research has both positive and negative impacts on the welfare of various groups in society. We are not free to assume that research is neutral or has only neutral and positive impacts. Experience proves it wise to pay attention to affected groups and we have an obligation to do so in a priority setting process such as SSAAP.

PHASE I WORKSHOP

DAY 1 — AM

OVERVIEW SESSION

In addition to this Orientation and Guide for Authors, two overview papers are to be prepared well in advance. All three will be distributed to all authors while they are preparing papers scheduled for the afternoon of DAY 1 and for the morning of DAY 2, as well as to the leaders of concurrent groups for DAYS 2 and 3.

NOTE: These two overview papers are to be prepared, critiqued and evaluated by SSAAP consultants assigned to them, and then be rewritten before being sent to authors of papers for the afternoon of DAY 1 and the morning of DAY 2, and to leaders of concurrent work groups on DAY 2.

Paper 1 — Situation, Problems, and Issues - Today and Tomorrow

- This paper will present a broad issue- and problem-oriented overview of trends, current and emerging issues in food and agriculture, natural and rural community resources, the environment, and international development.

- It will emphasize the changing nature and causes of problems and issues, and their links within and across food and agriculture, natural resources, and internationally within both the developed and less developed worlds as well as between those two worlds.

- The four sources of change in societal capacity, as outlined above, will be considered. Other appropriate taxonomies may also be used.

- Should identify the groups in society affected by agricultural research and related activities -- why and how they are affected -- biological and physical as well as social science research -- in agricultural and rural related institutions.

- Agricultural and related science policy issues should be considered -- with some emphasis on the role of the social sciences.

Paper 2 — Social Science Research Institutions, Tools and Knowledge for Addressing Problems and Issues

- Also a "big picture" paper exploring the nature, missions and roles of rural and disciplinary social science institutions, the actors, clientele, and products.

- Discuss types of social science contributions to solutions of agricultural and rural related problems using the distinctions among problem-solving, subject matter and disciplinary research. The relationship of the subject matter and problem-solving research (in which rural social scientists participate) to research by agricultural biological and physical scientists should be considered.

- Outline the state of the social sciences as disciplines -- their theories, quantitative techniques and basic measurements. Include attention to the constraints, strengths, and weaknesses these disciplines exhibit for contributing to resolution of farm, agribusiness and rural related societal problems and issues.

- Discuss the agricultural and related rural research and information delivery system, particularly its flexibility and ability to respond to problems and issues in a dynamic environment -- include, wherever appropriate, attention to (1) problems of obsolescence and performance of the administrative structures for the rural social science areas, (2) obstacles to understanding and acting on agricultural and related rural and societal problems due to gaps in existing disciplinary knowledge.

- Perhaps as a result of the same intellectual forces that led to the establishment of SSAAP, other groups including ECOP, ESCOP, various regional committees, and agricultural administrative groups are attempting to prioritize rural social science activities. This broad overview paper should summarize these efforts. SSAAP is being designed to build on and use the results of these efforts rather than duplicate them as SSAAP has the long life expectation necessary to do this.

Panel Discussion -- Reactions to both papers from:

1. Policymakers
2. Research administrators
3. Researchers
4. Private sector users
5. The media and critics of agricultural institutions

Many of the reactors will be SSAAP consultants.

Open Discussion

DAY 1 - PM

SITUATION, PROBLEMS AND ISSUES TO BE PROBED

Scope and Design of Papers: There are four papers for this afternoon session on four different broad subjects. Given the major shocks and long-term changes in the external environment of the subject addressed in each of the morning papers, as well as the internal structural changes directly involved in the area covered by each paper, what are the major critical issues and problems? Each paper should identify:

- The broad categories of problems and issues (within each author's subject) which he/she believes require research. This classification will be input for the concurrent sessions on DAYS 2 and 3. It should be remembered that the primary output of the concurrent sessions will be a list of subareas within which Phase II and between which Phase II and preparations for Phase III will establish priorities.

- For each area, the papers should identify the relative importance of the four basic paths to greater societal capacity to solve problems (i.e., improved technology, greater human capacity; improved institutions, programs and policies; and increases in biological and physical capital). This knowledge will help lay the background for specifying the different categories within which the Phase II conference will establish priorities.

- Each author should consider the values or changes in what is known about values that affect problem definition, the delineation of issues and research design. This information should, in turn, help in specifying needed social science research as well as the social science disciplines and rural social science areas that should carry out the research.

- The kinds of relevant knowledge already known and therefore the relative future emphasis on kinds of research still needed (i.e., disciplinary, multidisciplinary, subject matter or problem-solving research) and the kinds of knowledge needed (different varieties of value-free, value and prescriptive knowledge).

- The relevant multidisciplinary applied social science areas within whose domains the needed knowledge can be generated.

- Needed contributions from the relevant parent (particularly social science) disciplines on which the multidisciplinary fields above ultimately depend for theory, techniques and basic measurements.

- The major stakeholders with respect to the problems and issues identified, (1) in the research process, and (2) in the prescriptive solutions likely to evolve out of the research.

<u>NOTE</u>: The authors of the four papers in this DAY 1-PM session are asked to furnish the three authors of the DAY 2-AM session with outlines and early working drafts of their papers as soon as possible. These same outlines and early working drafts should be sent to the SSAAP consultants assigned to each author. The consultants are to assist each author by providing critiques of their outline and early drafts from their different perspectives.

Paper 1 — Farmers, Agribusinesses and Consumers

This paper addresses all of the matters associated with food and agriculture from production through to consumption. The scope should be defined broadly to include not only production agriculture and farm management, but input, post-harvest and marketing issues important for agribusinesses, consumer welfare, nutrition, health, environmental and family issues, as well as traditional agricultural policy, international trade and related macroeconomic influences. This paper should deal not only with major economic and social dimensions, but also with the important cultural, ethical, psychological and political issues and problems that may exist.

- The issues and problems addressed should include major ones requiring important governmentally induced transformations as well as the market and individual adjustments that are usually made without the help of societal interventions. Social science roles in technology development, transfer and assessment as well as in institutional improvements and in human and biophysical capital formation should be included.

- The author of this paper is expected to take into account the increased international interdependency among the farm and rural societies of the world. Their internal development as well as the trade, monetary/fiscal, military and political affairs are now inextricably interrelated.

- This paper should not be confined to agricultural economics or economics. The issues and problems to be covered have sociological, business administration, political science, anthropological, home economic (social aspects), ethical and historical dimensions. The author is expected to consider all of the rural social sciences and the basic social science disciplines on which the rural social sciences depend.

- The author should familiarize her/himself with all recent priority establishment efforts by rural social scientists and others that are relevant for this paper.

- The author should give particular attention to the expected contributions listed above under the "scope and design" discussion that is addressed to the authors of all four papers for this session.

Paper 2 — Natural and Rural Community Resources and the Environment and Their Users

As is true for the other three papers for this afternoon, this paper should be widely inclusive even if it means some overlap with the others. There are very substantial interactions between agricultural production, marketing processes and consumption and (1) natural and rural community resource and environmental problems, (2) international development and affairs, and (3) the criticisms now commonly leveled at agricultural institutions and arrangements.

In the paper on natural and rural resources and the environment:

- All of the basic social sciences and rural social sciences are to be considered as appropriate. Political science and administrative studies of local government and local semi-private institutions are important. There are fundamental roles for sociologists, anthropologists, historians, geographers, and human ecologists.

- Social science work that is problem solving or focused on a subject matter area is also related to subject matter and problem-solving work involving the biological and physical scientists. These areas of multidisciplinary and multi-subject matter collaboration need to be identified.

- The author should familiarize her/himself with recent priority setting efforts by rural social scientists and others that are relevant for this paper.

- Do we have the research bases in the rural social sciences and basic social sciences to provide the information necessary to respond to societal problems and needs? Where gaps exist, what research is needed? By what rural social scientists or social science disciplinarians?

- What relative emphasis should be placed on the development of new technologies, new policies and institutions, new human capital and on the generation of traditional biological and physical capital? Where are the needs greatest for each of these? What governmental interventions need to be investigated?

- There are important disadvantaged non-farm rural groups whose plights reduce the quality of rural life and community structures. These groups include racial minorities, female headed families, migrant workers, disadvantaged groups of racial majorities, distressed farmers and the like. What research is needed on their situations and problems and on the broader societal issues raised by their existence and problems?

- Again, the author should cover the points listed above under the "scope and design" discussion addressed to the authors of all four papers for this session.

Paper 3 — International Development and Affairs

U.S. social scientists in and outside agriculture are deeply involved in research roles internationally. What responsibilities does this entail for researchers, their institutions and professional organizations? What are the international development problems and issues that are important parts of the domain of the basic and related rural social sciences in the U.S., especially in the areas of food and agriculture, natural and community resources and the environment. International trade and monetary activities as well as development in all of its other dimensions should be considered. This paper has as its central purpose exploration of research and related activities on the important interdependencies between the U.S. and the rest of the world and, indeed, among the countries of the world. Duplication with the other three papers seems inevitable and therefore desirable.

- When viewed from a world perspective, what are the high priority problems and subject matter areas that need to be addressed by researchers, especially social science researchers?

- The author is expected to examine the need for contributions from all the rural social sciences and basic social science disciplines. Sociologists and anthropologists have contributions to make. So do historians and political scientists, as well as human ecologists, geographers and students of public and business administration. What are the roles to be played by these disciplines and related rural social scientists?

- The author is expected to take into account the results of recent priority establishment efforts by rural social scientists and others that are relevant for this paper.

- This paper should include consideration of the international agricultural R&D system and the role of the social sciences in that research system.

- When looking at the needs and problems of the world, what new institutions and policies, improved human capabilities and technologies are important?

- Again, the author should address the points found above in the introductory "scope and design" discussion addressed to the authors of all four papers for this session.

Paper 4 — The Agricultural Institutions and Arrangements Under Fire

Within the range of activity and problems covered in the first three papers (not only in the U.S. but worldwide), what are the major problems and issues causing great concern among those who criticize the performance of the agricultural and related research as well as the associated information delivery, marketing, social and political systems? Understanding and responding constructively to these criticisms and concerns requires objective contributions from many different rural social scientists and social science disciplinarians. What contributions should be expected? What roles should be played? How should these criticisms and concerns be addressed? Where are the failures and gaps?

- The author is expected to familiarize her/himself with recent efforts of rural social scientists and others to establish priorities for this area. The author is also expected to survey the results of ten or more recent national efforts to address agro-ethical questions and issues.

- The author of this paper is also referred to the points made in the introductory "scope and design" discussion addressed to authors of all four papers for this session.

- The author of this paper is referred to the bullet under paper 3 concerning disadvantaged rural non-farm groups.

Panel Discussion -- Reactions to the above four papers from the viewpoints of:

1. The rural social sciences
2. The basic social science disciplines

3. Research administrators
4. Action agency administrators
5. Farmers, agribusinesses and consumers
6. Critics of agricultural institutions and arrangements

SSAAP consultants will be included among the above reactors.

Open Discussion

AFTER DINNER SPEECH: Social Science in a Global Context

To identify and explore the nature and meaning for the social sciences of the food and agricultural interdependencies among nations, regions, people and their problems. This speaker will be asked to consult the Orientation and Guide for Authors in preparing his/her presentation. He or she is asked to relate her or his paper to the large amount of development research and related work done by U.S. social scientists abroad on U.S. university projects, in the international agricultural research centers (i.e., IRRI and CIMMYT), for AID, for FAO, The World Bank, private businesses and the like. He or she is also asked to relate his or her paper to the trade, monetary, political, military and ideological problems and issues.

DAY 2 — AM

SOCIAL SCIENCE KNOWLEDGE AND TOOLS TO ADDRESS PROBLEMS AND ISSUES

Scope and Design of Papers: The three papers in this session should--

- Suggest the broad categories of problems and issues within which the Phase II conference is to establish priorities. These suggestions will also be treated as inputs for the concurrent sessions taking place in the PM of DAY 2 and in the AM of DAY 3.

- Extend and focus on the implications of

  1. The two overview papers of the morning of DAY 1 which are to be available while these papers are being prepared, and
  2. (more extemporaneously) the four problem and issue oriented papers presented the afternoon of DAY 1. The authors of the four papers for DAY 1 are asked to furnish the authors for this AM session with outlines and early working drafts of their papers as soon as available.

NOTE: The authors of the three papers in this DAY 2-AM session are asked to furnish the four authors of the DAY 1-PM session with outlines and early working drafts of their papers as soon as possible. These same outlines and early working drafts should be sent to the SSAAP consultant assigned to each author. The consultants will assist each author by providing critiques of their outline and early drafts from their different perspectives.

Paper 1 — From the Perspectives of Both the Rural and Basic Social Sciences

The perspectives of both rural social scientists and social science disciplinarians are important. The former are typically part of the agricultural establishment while the latter have much to offer in support of rural social scientists, both directly and in their own right. The future of both groups depends substantially on the contributions they can make not only to farming but to agriculture as broadly conceived herein. This paper is expected:

- To address this topic from the perspective of all the rural and basic social sciences rather than only from the author's own rural social science area and/or basic social science discipline.

- To place emphasis on

    1. the adequacy or inadequacy of theories, techniques and measurements in the basic social science disciplines relative to
    2. the problems and issues resolvable, in part, by the work of rural social scientists.

- To relate potential social science contributions to the improvement of

    1. institutions, policies and programs,
    2. technology,
    3. human development, and
    4. capital growth (biological and physical) and the conservation and development of natural resources

  needed in food and agriculture, natural and community resources, and the environment -- both in the U.S and internationally.

- To relate potential social science contributions to the improved knowledge of monetary and nonmonetary values required to solve anticipated problems and resolve issues.

Paper 2: From the Perspective of Research Administration

Relevant administrators are regarded to include those who administer the research and instruction (including extension), and the advising and consulting activities of rural and basic social scientists. The perspectives of both public and private sector administrators are of concern here. This paper is expected:

- To indicate how well rural and basic social scientists are doing in the organizations managed by these administrators.

- To indicate what problems, shortcomings and difficulties administrators are encountering when administering the work of social scientists

- To describe the needs of administrators for social science research involving that of technology; institutions, programs and policies; human capability; and resources.

Paper 3: From the Perspective of Users and Affected Persons

Here we seek the perspectives of those served by rural and basic social scientists and their administrators: farmers, local governments, agribusinesses, consumers, commodity groups, community organizations, disciplinary colleagues, critics, students, non-farm rural residents and the like. This paper is expected:

- To cover the interests of all farm and rural related persons and organizations.
- To cover international as well as domestic persons and organizations.
- To cover technological, institutional and policy, human, and resource issues.
- To assess the performance of research policy and institutions in addressing the problems and issues in the overview papers of the morning of DAY 1 and the four problem and issue oriented papers of the afternoon of DAY 1.

Panel Discussion: Reactions from the four perspectives of the papers from the afternoon of DAY 1:

1. Farmers, agribusinesses and consumers
2. Natural and rural community resources, the environment and their users
3. International development and affairs
4. Agricultural institutions under fire

Open Discussion

DAY 2 — PM (CONTINUED INTO THE AM OF DAY 3)

CONCURRENT SESSIONS ON RESEARCH NEEDS AND APPROACHES

All participants will convene after lunch of the second day to hear pre-assigned workgroup leaders review the workshop flow to this point, and to outline the charge to workgroups, i.e., to move from the present Situation/Problems/Issues and the Institutions, Tools and Knowledge of the Social Sciences to a delineation of the broad areas within which Phase II participants will establish priorities. Each group is expected to consider the areas now existing in the rural social sciences and underlying basic social science disciplines that are important enough, vis-a-vis each group's assignment, to justify a Phase II effort to establish priorities within it. What existing areas should be omitted from Phase II consideration? What new areas should be considered? Each workgroup will include SSAAP consultants from the different rural social science areas and parent social science disciplines. All four sessions should pay attention to the needs of the users of social science research. Workgroups will meet concurrently in the afternoon of DAY 2 and morning of DAY 3. The workgroups are:

Group 1 -- Farmers, Agribusiness and Consumers

Some of the areas which should be given further Phase II consideration include demographic studies, farm management, national agricultural accounts, the history of farm organizations, social impact analyses, marketing, nutritional status, family stress analyses, trade analyses, impacts of international monetary/fiscal operations, agricultural credit, family financial management, production control programs, price support programs and policies, farm organizations and their political power, cooperatives, industrial organization studies, supply and demand studies, sector analyses and the like. This incomplete list is only illustrative of the kinds of areas that should be considered by this concurrent group.

Group 2 -- Natural and Rural Community Resources and the Environment and Their Uses

An incomplete illustrative list of some of the areas which should be considered by this concurrent group follows: solid waste management, the internalization of external pollution and food chain contamination, rural recreation development, quality of rural life studies, disadvantaged non-farm rural groups, local government studies, community roles, public community services, zoning ordinances, flood control, irrigation systems, drainage, youth development studies, the impacts of international developments on rural resource use and of deregulation.

Group 3 -- International Development and Affairs

This concurrent group should consider the development, trade and monetary/fiscal dimensions of the international work of rural social and basic disciplinary social scientists vis-a-vis agriculture and rural related welfare. While the impact of trade and international monetary/fiscal operations should also be considered by Group 1, these same phenomena are important in the development studies and related work done by U.S. social scientists abroad and in international agencies. More specifically the incomplete, illustrative list of areas that might be considered include: induced technical, institutional and human change, self-generation of capital, agricultural science and R&D policies, parastatal roles, equality studies, land reform and tenure, farming systems studies, technology diffusion and adoption studies, marketing studies, rural community development studies, government finances including debt service and recurrent expenditures, self-sufficiency policies, trade studies, political stability studies, modernization and socialization studies. Persons in the group from the different rural social sciences and basic social science disciplines are expected to provide a balanced consideration of the various areas within each of which participants in the Phase II Conference will establish priorities.

AFTER DINNER SPEECH — DAY 2: Philosophy of Social Science and Ethics

To identify and explore the implications of the philosophy of the social sciences and of ethics for the research of rural social scientists and basic social science disciplines. This speaker will be asked to consult the Orientation and Guide for Authors in preparing the presentation.

DAY 3 — PM

REPORTS FROM CONCURRENT WORKGROUPS

Open Discussion

EVENING OF DAY 3 AND DAY 4 — POSTLUDE

After the main conference ends, the concurrent session leaders and rapporteurs will participate in a meeting with the SSAAP Executive Committee and selected advisory board members and consultants to eliminate ambiguities and inconsistencies among the areas within which the Phase II conference will establish priorities.

PART II

OVERVIEW

Chapter 4

THE SITUATION, PROBLEMS, AND ISSUES--TODAY AND TOMORROW

(Up to Now: A History of American Agriculture from Jefferson to Revolution to Crisis)

Richard S. Kirkendall*

Introduction

To define the agenda for the agricultural and rural social sciences, we must understand the present situations in agriculture and rural life and the ways in which they are moving, but to accomplish that, we must first comprehend the forces and decisions that brought us to the present and that are influencing the future. We must, in other words, gain historical perspective. We must go as far back as the beginning of the nation and emergence of an American version of ideas about the fundamental importance of farming. We must also trace the development of institutions and attitudes that would make the Great American Agricultural Revolution. We must explore that revolution, the sense of power that it, along with the needs of other nations, gave some American leaders, and the consequent sense of great opportunities that emerged among farm people in the 1970s. Only then will we be able to interpret the present, the sense of crisis that now pervades American rural life, and the possibilities that appear to lie ahead. The social sciences should, I assume, explore, clarify, and define those possibilities, providing bases for decisions.

American Agrarianism

Farming and farm people have always occupied special positions in the American mind. The belief that they deserve high status and that the nation should be based upon them was part of the American heritage from Europe, running back to Ancient Rome, the Renaissance, English writers of the seventeenth and eighteenth centuries, and the French physiocrats and other continental writers of the eighteenth century (Johnstone). This heritage maintained that farming was the best way of life and the most important economic activity, that it conferred psychological as well as economic benefits, and that it produced the best citizens and soldiers. These ideas encouraged people to believe that America was a superior place for it supplied more and better opportunities to farm than Europe did (Eisenger).

Americans both accepted and reshaped these ideas. In this development Thomas Jefferson was especially important (Griswold). The greatest "agrarianizer,"1/ he tried to construct a nation with an agricultural base. He took ideas that had not been identified with democracy, at least not exclusively, and democratized them, arguing that to be democratic a nation must have a farm foundation. Although a planter himself, Jefferson emphasized the political value of the family farm, a farm owned and worked by members of one family and large enough to supply their needs. In his view, such a farm conferred independence, since the people on it

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worked for themselves, not others, and it required self-reliance and hard work. Its most important product was the personality type required for a democracy, rather than the debased type that appeared to grow out of European urban conditions. With family farms as democracy's essential foundation, farming's importance transcended the economic goods produced by farmers.

Jefferson did not advocate fully self-sufficient, non-commercial farms. He saw value for the United States in Europe's need for food. It meant that there would be many good opportunities to farm in America. To prosper, American farmers should produce a surplus; they should grow more than farm families needed and more than the nation needed. Thus, the agrarian politican opposed obstacles to American trade with Europe, including protective tariffs and French control of the mouth of the Mississippi River (Appleby, McCoy).

Jefferson and other American agrarianizers saw western lands as even more valuable than the European market. More perhaps than any other feature, they distinguished the United States from Europe. They must be available to farmers, free of control by Indians and Europeans, and sold at a low price or given away. Their importance justified the purchase of Louisiana, for, by greatly enlarging the land possessed by the United States, the purchase guaranteed the success of American democracy and the continuation of American superiority (Pearce, pp. 56, 67, 70, 153; Berkhofer, p. 157; Henry Nash Smith, prologue and ch. 11).

Jefferson came to accept manufacturing but within narrow confines. Fascinated by technology and fearful of over-dependence on Europe, he also feared an urban proletariat. Thus, he insisted that American factories must be small and placed in rural settings and must employ only a small percent of the total American population. Farmers must continue to be the American majority (Bender, pp. 21-28).

Jefferson's democratic agrarianism achieved its most spectacular victory in 1862 with the passage of the Homestead Act. Giving 160 acres to those who would make farms out of them, this land policy seemed to be a way of making the lands truly valuable and the nation healthy and strong. And giving lands away seemed beneficial to urban workers as well as farmers, for it offered those workers a "safety valve." Giving them a way of escaping or avoiding oppression, it enabled them to develop a personality that differed from that of the European proletariat and was compatible with democracy. Or so it seemed to American agrarians (Henry Nash Smith, chs. 15, 20).

Alternative Visions

The Jeffersonian vision competed with alternative conceptions of what the United States should be. The competitors included plantation agriculture. Its defenders maintained that plantations, which were larger than family farms and worked by slaves, were the basis for good citizenship for they freed planters from constant toil in the fields, but critics condemned them as violations of democratic agrarianism and insisted that they must not be spread over the West (Henry Nash Smith, chs. 12-14).

The Civil War and Reconstruction abolished slavery but did not redistribute southern land in family-owned units. It substituted sharecropping rather than family farming for plantations worked by slaves. Involving heavy dependence of croppers

on landlords and merchants, sharecropping violated the agrarian democratic creed (Woodman; Fite, 1984, ch. 1). Midwestern agriculture, composed mainly of commercial family farmers, conformed much more closely to the Jeffersonian model.

Democratic agrarianism did not even dominate the distribution of western land (Schieber, Winters). The national government sold land to speculators and gave it to railroad builders as well as farm makers. Champions of land grants to railroads often argued that they would help farmers and encourage growth of the farm population, but the policy also served another vision of what the nation should be: that of the industrializers.

The granting of land for educational purposes constituted yet another way of using land at the time. Agrarianism exerted some influence on this. Farming and farm people were so important, advocates of land-grants for colleges maintained, that they deserved help from government and higher education. The benefits of those institutions should not be monopolized by other groups. Education for farmers, the argument ran, would hold people on the land and encourage others to settle it by raising the status of farming and farmers and increasing the chances for success in that occupation.

Nevertheless, many agrarians and most farmers opposed land for colleges. They doubted that farm people wanted or needed help of this type for they could learn from experience and from one another, rather than from books. Such critics of the idea preferred giving land to farmers; they feared that speculators would gain control of the land granted to the states for educational purposes, charge high prices for it, and slow the development of the West (Gates, 1943, pp. 8-26; Rainsford, pp. 87-95). They also feared that college education would encourage farm boys to desert farming. After the land-grant colleges went into operation, agrarians often criticized them for inadequate service to farmers.

The greatest push for the land-grant system came from critics of the farmers. Men such as Justin Morrill maintained that American farmers were not good farmers. Inferior to Europeans, they exhausted the soil and then moved west. Consequently, American agriculture could become incapable of serving American needs, and farmers needed colleges so as to become more efficient and take better care of the land (Kirkendall, 1986a, pp. 6-10).

In addition to the hope of changing farm practices, the idea of social mobility also influenced the land-grant college act. Its advocates, Morrill above all, insisted, as the language of the law indicates, that the curriculum of the new colleges should not be limited to agriculture but should include "other scientific and classical studies" and should promote the "liberal" as well as the "practical education of the industrial classes in the several pursuits and professions of life." Behind this language lay a non-agrarian version of democracy that identified it with social mobility, doubted that farm life was superior to city life in all ways, regarded the farm as preferable only as a training ground, not as an outlet for talent and ambition, and encouraged movement away from the farm (Wyllie, p. 78). According to this conception of things, colleges should prepare people for a broad range of opportunities. Established colleges were too narrow in curriculum and student body; the new colleges should not repeat that mistake by becoming another kind of narrow college; education should not lock people into a place in society, even a farm. Morrill and others who thought like

he did hoped to open up educational opportunities and thus opportunities for upward mobility for farm boys, among others (Kirkendall, 1986b).

The Morrill Act, in other words, was influenced by a vision of America that differed significantly from Jeffefson's. The act's vision was linked with the vision of the industrializers. In fact, Morrill worked for tariff protection for American manufacturers as well as land-grants for colleges.

The industrializers hoped to build a manufacturing base for the nation. At first, they had tried to deal with the agrarian fears of factories as inevitably creating a large, debased, corrupt working class. They argued that machines would enable women and children to do the manufacturing while men continued to farm; they maintained that European merchants were the corrupting influences most to be feared; they pointed out that American workers had alternatives in the West, and they developed factories in small communities. As time passed, however, the industrializers grew bolder, no longer felt compelled to make concessions to agrarian fears, and proclaimed that industrialization would supply the means of developing the wilderness, thereby freeing it from savagery, and would liberate people from drudgery and scarcity (Marx, pp. 145-226; Bender, pp. 1-52; Kasson, pp. 3-51).

As it advanced, industrialization affected farming and farmers in major ways. Most obviously, it promoted the urbanization of America. Nearly all Americans had lived and worked on farms when the nation began. By 1890, only 42.3 percent of the people did (Historical Statistics, p. 457). Rather than the majority status that Jefferson had regarded as essential, farmers had become a minority, although still a large one (Fite, 1981, ch. 1). In addition, the advance of industry and the city drew farmers increasingly into the market (Hahn and Prude, Atack and Bateman). Frontier farm families depended almost entirely on themselves, producing their food, clothing and many other products (Riley, 1981, 1988). East of the frontiers, nineteenth century farmers produced much of their food and clothing and also such items as energy, seed, and fertilizer, but as producers of food and fiber, they moved more and more into the market. In fact, their ability to produce a surplus beyond the needs of their families made it possible for a growing number of Americans to live in cities and work in factories. In other words, the expansion of American agriculture and agricultural production contribated significantly to the frustration of the hope for a nation composed mainly of farmers.

The decline of farmers to a minority position as well as other features of the new America contributed to the late nineteenth century mass uprising known as the Populist Revolt (Goodwyn). Largely white, middle-class, landowning farmers in the South and on the Great Plains, the participants produced cotton and wheat, crops that sold now in an over-crowded world market. Served by an inadequate money system, farmers suffered falling prices and thus had difficulty paying their debts or achieving prosperity. Influenced by democratic agrarianism, they felt that the America they believed in had been displaced and that they were exploited in the new America by an immoral, unproductive "money power" or "monopoly capital." Convinced that they were virtuous, hard-working people, they believed they deserved to flourish, so they tried to change, not farmers and farming, but the political and economic systems within which they functioned. Not seeking a "Golden Age" free of cities and factories, they pressed for political reforms

that would give farmers political power and for economic reforms that would destroy monopolies, change the money system, and free farmers from dependence on off-farm economic institutions and thereby permit family farmers to enjoy independence and good times. They failed, although some of their specific proposals became laws later on. The new America of factories and cities moved forward.

The Land-Grant Colleges

Some of those who envisioned a new urban industrial America hoped to fit the farmer into it by means of agricultural science and education. Congress gave them a boost in 1887 by passing the Hatch Act that supplied federal funds for experiment stations connected with land-grant colleges (Marcus), and the stations quickly enlarged the body of knowledge the colleges could pass on to farmers. Emphasizing research to make farmers more productive, the colleges gained some strength by the beginning of the twentieth century. Not many future farmers enrolled in the four-year programs. Instead, they educated agricultural teachers and scientists and people for off-farm agricultural businesses. To reach farmers, the colleges developed extension programs with the farmers' institutes as the main feature in the early days. These institutes encouraged farmers to change their ways so as to become more efficient and productive -- to diversify their production, to use more fertilizers, to substitute technology for people and make other alterations. Some farm organizations, the Wisconsin Dairyman's League, for example, became enthusiastic supporters, but many farmers resisted the advice (Kirkendall, 1986a, pp. 8-11).

In hope of overcoming that resistance, Congress passed a major piece of legislation in 1914, the Smith-Lever Act. To a significant degree, it was a product of the Country Life Movement. Not a farmers movement, it was composed mainly of people who had been born on farms but had moved to cities. A number of features of farm life in the early years of the Twentieth Century -- large-scale migration to cities, tenancy and absentee ownership, overworked women, poor health, inadequate roads, poor schools and churches, misuse of the land, inefficiency -- troubled them, causing them to fear that soon the nation would not have the large, productive, and politically responsible farm population it must have to survive and prosper. The high food prices of the time seemed a sure sign of trouble ahead. Thus, the Country Lifers, people such as Liberty Hyde Bailey and "Uncle Henry" Wallace, tried to persuade people capable of becoming good farmers to remain on farms. To accomplish this goal, they assumed, rural life must be improved and made more like urban life. Thus, they promoted a number of changes, including the consolidation of schools, and, in spite of considerable resistance from farmers, they exerted influence (Bowers, Danbom, Fuller, Madison).

The most significant victory for the Country Life Movement, the Smith-Lever Act supplied federal funds for extension programs. It reflected a strong desire to change farm practices and assumed that persuading farmers to do so was not an easy task. Many were poorly educated, even illiterate, and did not have a high regard for colleges and science. The legislation helped to finance a new instrument of change: the county agent. Educated in the agricultural sciences, these officials resided and worked in farm communities throughout the year so as to bring the developing knowledge into the daily lives of farm people (Scott; Rasmussen, 1960, pp. 180, 187-8, 195-6).

In spite of the fact that many famers were black, the land-grant system offered little to black farmers. Because most of them were in the South and the system of segregation prevailed there, few blacks could enroll in the institutions aided by the 1862 legislation. Special legislation, a second Morrill Act, had been passed in 1890 to develop a land-grant system for blacks, and the legislation contributed to the growth of colleges, but they emphasized teacher training, not agriculture, and derived few benefits from federal support for agricultural experiment stations or extension. Federal support for research and extension in these institutions would amount to little until at best the late 1960s and would not become substantial until the 1980s (Williams and Williamson, 2-11).

Revolution and Evolution

The county agents and the forces that stood behind them, including the United States Department of Agriculture, then primarily a research institution, were potential revolutionaries, but the Great American Agricultural Revolution would not begin for a quarter century after passage of the Smith-Lever Act. Some parts of American agriculture had experienced a technological revolution in the nineteenth century. Rooted in a number of inventions just before the Civil War, it had moved forward during the war because of the shortage of farm labor relative to the demand for farm products and had continued at a rapid pace for a number of years after 1865. The revolution involved the development and use of machines such as cultivators and reapers and the substitution of animal power for human power in some farm jobs (Rasmussen, 1962, 1965; Gates, 1965). Late in the century, inventors, industrialists, and farmers also put the steam engine to use in the wheat harvest. The new technology permitted farmers to work faster and accomplish more and reduced the human drudgery on the farm, but it did not eliminate hard work for farm people. Work with horses was often hot or cold and difficult; farmers, especially in the cotton South, continued to do nearly all of their work by hand. Even in the Corn Belt, farmers themselves did such sweaty tasks as pick and husk corn. And the revolution's impact on the farm home was limited largely to the introduction of the sewing machine (Fite, 1981, ch. 2, 1984, chs. 1-2; Hurt; Quick).

Given the available technology, the nation still needed a large number of farms and farmers. The new machines did reduce the needs for hired hands on established farms in the Middle West (Argersingers), but the city population was growing rapidly while overall agricultural efficiency was growing slowly. In 1830, before the revolution hit, one farm worker in the United States supplied the needs of 4 people; by 1890, after the revolution had worked its wonders, one farm worker served 5.8 people (Historical Statistics, p. 498). Rather than promote a decline in the farm population, the new technology encouraged expansion, especially on the Great Plains where land was available and machines and horses could be put to work, helping to plant, cultivate, and harvest wheat. Thus, the new technology was compatible with Jeffersonian agrarianism in at least two major ways: it reduced the farm family's need to hire labor and encouraged further expansion of the farm population. Perhaps it would be accurate to suggest that the technology helped to prolong the life of this form of agrarian thought into the twentieth century.2/

In the early years of the twentieth century, farming continued to depend on the labor of people and animals, large numbers of both. The farm population had grown

to nearly 25 million by 1890, which was more than six times the population of the entire country a century earlier, and American farm people increased the number of farms from less than 1.5 million in 1850 to over 4.5 million in 1890, making that forty-year period the greatest era of farm making in American history. The pace of change in these categories slowed after that, but the number of farm people continued to grow, reaching 32.5 million by 1916 while the number of farms increased to nearly 6.5 million (Historical Statistics, p. 457; Cochrane, chs. 5-6).

Technological development in agriculture moved at a predominantly evolutionary rather than revolutionary pace during the first four decades of the twentieth century. A new device with revolutionary potential -- the gasoline-powered tractor -- became available early in the century, but only a thousand were in use on American farms by 1910. Wartime demand for farm products encouraged the use of tractors, which reached 85,000 by 1918, with most of them on the Great Plains where farmers brought even more land into production. The farm population dropped slightly during the war, falling to 32 million and reversing a trend that extended back to the beginning of the nation, and declined further during the 1920s, moving to 30.5 million as the nation continued to grow more urban. The number of tractors more than tripled during the decade, rising to 920,000 by 1930, but that was less than one for every six farms. And the coming of the Great Depression reversed the population trend that had been running since 1916 for some people saw farms as a refuge from urban unemployment. The farm population expanded to 32.4 million by 1933. The number of tractors increased only to 1 million by 1935 (Historical Statistics, pp. 457, 469).

The Farm Bureau and McNary-Haugen

By the 1930s, a strong farm organization had emerged and was battling for change in farming and profit for the farm business. This was the American Farm Bureau Federation. It was an anti-radical group very different from the Populist Revolt. It had emerged in the second decade of the century in counties and states, aided by urban business organizations interested in the farmer, the extension services and their county agents, and the U.S. Department of Agriculture, and had become a national organization by 1920, though one that recognized the minority status of farmers, did not attempt to become a mass movement, and tried instead to derive strength from organization -- organization of the "right" people. Conceiving of farming as essentially a business and composed mainly of the more substantial commercial family farmers in the Middle West and South, the organization joined in efforts to make farmers more efficient by means of education, organized farmers into cooperatives, and pressed for legislation favorable to farmers (McConnell, Campbell).

By the mid-1920s, the AFBF was the main farm organization supporting the McNary-Haugen plan. Designed largely by a farm machinery manufacturer, George N. Peek (Fite, 1954), who recognized that he could not sell plows to "busted" farmers and feared agrarian radicalism, the plan sought to solve the "farm problem" of the 1920s by finding new markets abroad and guaranteeing a profitable price for the crops sold on the American market. The plan defined the problem as low prices, not the power of big business or poverty among tenant farmers and farmers with poor land or not enough land and equipment, and it focused on raising farm prices, not reshaping rural life or the rural social structure or reducing business power.

Rather than attack the giant corporations as the Populists had, the McNary-Haugen movement advised farmers to accept the high protective tariff and employ a two-price system, one price for the domestic market and a lower one for the foreign market, as major industrial firms did. Congress endorsed the plan in 1927 and 1928; President Coolidge defeated it with vetos both times, but it helped to prepare the way for action by the federal government on behalf of higher farm prices.

The New Deal for Agriculture

The New Deal for agriculture that began in 1933 sought to maintain a large farm population, and the number of farm people did remain large at the end of the decade, but this political movement did facilitate the substitution of technology for people in agriculture. The New Dealers attempted to safeguard and strengthen American farming by raising prices for farm products and tried to do that by taking parts of farms out of the production of major crops. They assumed that excess output had become the basic farm problem and rejected suggestions that natural forces should be relied upon to shrink the number of farms and farmers to the size that would enable American agriculture to operate at a profit. But the farm population did decline, dropping to 30.5 million by 1940, a decrease of nearly 2 million since Franklin Roosevelt had come to power. The decline came mainly in the Middle West where mechanization moved forward and on the Southern Plains where drought and dust encouraged people to migrate out of the region. The number of farms fell from 6.8 million in 1935 to 6.1 million five years later while the number of tractors on those farms rose from 1 to 1.6 million as New Deal agencies helped farmers obtain funds that they invested in these machines. As the largest government payments and loans went to the largest operators, they were the ones most capable of investing in the new technology, using it to farm even larger units, and buying land from their neighbors so as to use the technology efficiently.

By the late 1930s, the pace of technological change in rural America was accelerating. While nearly 25 percent of the farms had tractors by 1940, equipment designed to be used with tractors was also being introduced, and farmers had more cars and trucks. Also by 1940, 75 percent of the farmers in the Corn Belt were using another new technology, hybrid seed corn (Bogue, Brown), and throughout the nation, farmers were making greater use of commercial fertilizers and electricity. Such changes frustrated efforts to cut back on production by reducing the acreage devoted to major crops, and thus farm prices remained below goals and surpluses piled up (Historical Statistics, p. 469; Kirkendall, 1975, 1980; Saloutos; Fite, 1981, ch. 4).

Some change took place in the rural South, but the obstacles to it there, including the need for a large labor force to cultivate and harvest cotton, remained strong. The number of farms operated by sharecroppers fell 30 percent during the decade, in part because of the increased use of tractors, but the number of farm laborers increased significantly and the total southern farm population increased by a small amount. Although southern farmers did expand their use of tractors, only 8 percent of those farmers had tractors by 1940 while 55 percent of Iowa's farmers had them. To encourage widespread use of those machines, the South needed other technological changes, above all the development of a mechanical cotton picker (Fite, 1984, chs. 6-7; Daniel, 1985, books 2-3).

Surplus People

The agricultural situation in the late 1930s encouraged a number of people in the agricultural colleges, the United States Department of Agriculture, and other places to argue that there were too many people in agriculture. This, rather than other factors, such as class exploitation and racial discrimination, explained, it was argued, the large volume of poverty among farm people. The proposed solution was the substitution of technology for people. That change would permit the operation of larger farms, increase efficiency, reduce costs, and make farming profitable for the people who remained in it (Fite, 1984, pp. 143, 148, 151-2, 161).

The Secretary of Agriculture, Henry A. Wallace, had become an especially significant propenent of the theory of the surplus farm population. Earlier, as a participant in the battle over farm policy in the 1920s, he had embraced the old agrarian theory about the need for a large farm population and had issued warnings about the consequences of further urbanization of the American people (Kirkendall, 1983, 1984). By the late 1930s, however, he was arguing that the solution to the nation's farm problem depended heavily on expanded industrial production, low industrial prices, full urban employment at high wages, and the migration of large numbers of people to the cities (Kirkendall, 1967). "There is a normal excess of births over deaths of from 400,000 to 500,000 on the farms of America every year," he advised Eleanor Roosevelt in 1939. "When the Nation was expanding, this increase in population had opportunity either on new land or in the growing cities. The closing of opportunity in those two directions has resulted in damming up on the farms of millions of people who normally would have been taken care of elsewhere."3/ His intellectual change on the highest level in farm politics was an important part of the preparation for a revolution that would substitute technology for people in farming and move millions of people from farms to cities and towns. On other levels and in other places -- in colleges and corporations and on farms -- other preparations were also being made.

The Impact of War

World War II not only ended the great farm crisis of the 1920s and 1930s; it also began the Great American Agricultural Revolution. The war accomplished the first by creating a vast new market for American farm products and bringing a high level of prosperity to American farmers. And as farmers moved into the new economic boom, technological change moved forward at a stepped up pace, enabling farmers to expand production in spite of only a small increase in land devoted to crops and a sharp decline in the farm population. For some years, the agricultural colleges, the farm machinery companies, and other producers of new farm technologies had encouraged farmers to invest in them, but financial difficulties had restricted the ability of farmers to do so. Now, the decline in the farm labor supply provided added stimulus, and improving economic conditions removed the main obstacle. Even in the South, many farmers could now afford to accept the advice. Thus, farmers increased the number of tractors on American farms from 1.6 million in 1940 to 2.4 million five years later and also made greater use of hybrid corn, mechanical corn and cotton pickers, combines, hay balers, peanut harvesters, milking machines, and chemicals. In spite of heavy wartime demand for commodities like steel and chemicals, government policies encouraged the production of things farmers needed to meet wartime goals.

The technological developments resulted in other changes. The size of farms expanded while the number declined, though by only a small amount, moving from 6.1 to 5.9 million. Yields increased much more rapidly than they had for many years; total farm output and output per farm worker rose even more rapidly.

A new type of agriculture was taking shape, one that needed fewer animals and fewer people. During the war, large numbers of people moved off of the farms and into the armed forces and city jobs. Many moved eagerly, hoping to escape underemployment and low incomes.

The migration reduced the farm population sharply, more so than ever before. It dropped by more than 6 million from 1940 to 1945, from 30.5 to 24.4 million. From 1916 to 1920, the farm population had declined 1.5 percent; from 1920 to 1925, the drop had been 2.5 percent; from 1925 to 1930, 2.2; from 1933 to 1940, 6. Now the decline was 20 percent!

Wartime conditions reduced the number of farms by a much smaller percentage, only slightly above 3. The migration consisted mainly of young people, not farm owners. It was also a movement of sharecroppers, with the number of farms operated by sharecroppers in the South falling from 541,291 to 446,556 or 17.5 percent as machines replaced people. Technology pushed pushed people off of farms; opportunities, both civilian and military, pulled them off (Historical Statistics, pp. 457, 465; Cochrane, ch. 7; Fite, 1981, ch. 5, 1984, ch. 8).

The Great American Agricultural Revolution

The revolution continued long after the war, contributing to the emergence of a nation that was very different from what Jefferson had envisioned (Shover, introduction and ch. 5; Fite, 1981, ch. 6-13). Unlike the revolution of the nineteenth century, this one affected farming everywhere in the nation, nowhere more than the South, and was demographic as well as technological. The technological side of the revolution reduced needs for people in the established farming areas, and, in contrast with the nineteenth century, there were no lands available for making new farms.

Long established agencies of change promoted the technological dimension of the revolution. They included the agricultural colleges, the experiment stations, and the extension services. These agencies trained people for the off-farm parts of the agricultural system, conducted much of the basic research on the new technologies, and encouraged farmers to adopt them. These institutions worked mainly with farmers who were most capable of accepting and making good use out of the advice, the substantial commercial ones, and were influenced significantly by only one part of agrarianism: the enthusiasm for farmers as producers. Seeking to make the farmers more efficient and productive, the institutions were not swayed by a desire to hold a large population on the land. Instead, the belief that there were too many people there affected the work (Kirkendall, 1986a, pp. 15-21).

Corporations such as John Deere, Pioneer, and Monsanto also functioned as revolutionaries. Important parts of the rapid expansion of American industry during these years, they produced the new technologies and promoted their use (Broehl, Williams, Lee, Kloppenburg).

The farmers who could afford the changes welcomed the products of the revolutionaries. The new ways seemed capable of reducing work and increasing efficiency, thereby making farm life easier and the farm business more profitable. Farmers were no longer a conservative group, at least in their attitudes toward technological change. Two decades of low financial rewards for their hard work had helped to make them receptive to suggestions that they should change their ways. They gave up their old hostility to "book farming" and were not held back by agrarianism.

The technological change had several components. The most obvious was the mechanical: the substitution of the gasoline engine for animal and human power (Rasmussen, 1962). This involved further increase in the use of tractors. By 1970, farmers employed 5 million of them, well over one for each American farm. And they became increasingly powerful and fast, pulling two-row planters and cultivators at first but capable of hauling eight and twelve-row devices by the 1970s. Cornpickers increased from 110,000 in 1940 to 792,000 in 1960; grain combines rose from 190,000 to 1 million in the same period (Historical Statistics, p. 469).

There were also biological and chemical components to the revolution. Hybrid corn had completely displaced its competition by the late 1940s; the consumption of commercial fertilizer increased from 9.4 million tons in 1940 to 39.6 million in 1970 (Historical Statistics, p. 469). Other chemicals attacked weeds, insects, and other enemies of crops, eliminating jobs that had been performed by hand.

American farms were also electrified. Few had had electricity in the early 1930s; virtually all farms had it soon after World War II. This change was especially important for farm women. Making it possible for them to use a wide array of appliances, it reduced their work loads in their houses and gave them more time for other activities. Electricity affected men's labor as well, making possible, for example, an increase in the number of farms with milking machines from 175,000 in 1940 to 712,000 fifteen years later.

These spectacular technological changes made the people who worked on farms much more productive of food and fiber for human consumption. The mechanical component, for example, released some forty to fifty million acres from feed production; the application of chemicals and hybrid seed increased yields per acre.4/ Consequently, the number of people served by one farm worker rose from less than 11 in 1940 to more than forty-seven three decades later (Historical Statistics, p. 498). Thus American farmers developed the capacity to serve a rapidly expanding urban population that more than doubled in those thirty years. And those farms produced much that could be sold in foreign markets as well.

As the technology of American agriculture changed at a revolutionary pace, the nation also experienced a demographic revolution. People moved in massive numbers from farm to city and town with the volume -- over thirty million -- similar in size to the movement of Europeans to the United States from 1815 to 1914. This time the pace was much more rapid for only a third of a century was required to accomplish the shift that earlier had taken a full century.

The technological changes supplied much of the force behind the movement of people. They cut farming's need for people by reducing the amount of human energy required to produce a unit of output or, to put this another way, by increasing the goods that each person on the land could turn out, but the new machines and other

technologies were more expensive than the ways they displaced, and they put pressure on farmers to expand their land holdings so as to caputre the full potential of the technology. Consequently, farmers who could do so sought to buy out their neighbors, and many farmers chose to sell their land for they could not hope to match the capital requirements of a modernized farm.5/ Thus, as some farmers participated in the revolution by adopting the new technology, others did so by migrating away from farming.

Had the prices that farmers received for their products been higher more farmers might have been able to resist the pressure from the technology and hold on to their farms. Economists spoke of the "cost-price squeeze," giving it much of the credit for the migration, and price levels did persuade many farmers to sell their land and others to farm only part time and rely upon off-farm jobs for much of their income. Farm prices that seemed too low also stimulated some farmers to rebel, such as those who joined the National Farmers Organization and participated in efforts to force price rises by holding commodities off the market. But how different would the results have been if prices had been higher? Perhaps the more efficient farmers would have used their expanded resources to make offers for land that other farmers could not have refused.

Higher farm prices might have weakened somewhat the pull from the cities and towns. As things were, off-farm job opportunities had much to do with the migration. They were unusually abundant most of the time from 1941 to 1969, and they pulled people off of the land by offering, or at least appearing to offer, better opportunities than it supplied. Apparently, many farm people did not believe that farming provided a superior way of life.

Thus, the farm population dropped sharply. The number of people on American farms dropped from 30.5 million in 1940 to 9.7 million in 1970. In 1940, the farm population made up 23.1 percent of the total; by 1970, the percentage had dropped to 4.8 (Historical Statistics, p. 457). As people moved off of farms, the country church declined, and the one-room school house surrendered to the forces of consolidation (Fuller, p. 245).

In the South, the transformation was especially large (Fite, 1984, chs. 9-10; Daniel, 1985, book 4). The region experienced an enormous reduction in the numbers of farms and farm people. Farms dropped from 3 million in 1940 to 1.16 million in 1969. In the Middle West from Ohio and Michigan to North Dakota and Kansas, the decline in the same period was from 2.1 to 1.15 million; in Iowa, the number moved from 213,000 to 140,000. The southern farm population dropped even more sharply than the number of farms, falling from 16.4 to 4 million. By comparison, the farm population of the Middle West moved from 9.3 to 4.5 million; of Iowa, from 931,000 to 565,000 (Historical Statistics, pp. 458-9).

Change struck all parts of southern agriculture. The cotton South, untouched by the first technological revolution, was transformed by this one. Only 11.7 percent of the cotton farms had tractors in 1945; 73 percent had them in 1970. Mechanical cottonpickers harvested only 5 percent of the cotton in 1949 but 96 percent twenty years later. Scientists, technicians, and manufacturers also changed the cotton plant itself so that it was compatible with the new machines, and they supplied chemical weed killers and insecticides and more chemical fertilizers. The technological changes ended the hard labor that had been involved

in chopping and picking cotton and cut the hours required to produce a bale of cotton from 140 to 25 (Fite, 1980).

The region long dominated by cotton became a very different place. It had fewer mules, fewer croppers, fewer blacks, and more wage laborers. Plantations, which had been fragmented in the sharecropper era, were integated once again, although with machines and day laborers rather than the gangs of slaves now doing the work (Kirby). And the region raised much less cotton than before as much of it was shifted west to flatter lands. In its place, southern farmers grew grass, hay, corn, soybeans, wheat, and timber and raised livestock and poultry. The last was transformed from a minor enterprise present on most farms to a huge factory-style operation in confinement facilities.

The sections of the South devoted to tobacco and rice also changed. The tobacco harvest relied mainly on the labor of people until the 1960s when these farmers began to use mechanical harvesters. The results were a rapid expansion in the size of tobacco farms, a decrease in the number of them, and a decline in the number of people. Rice, a part of southern agriculture that had been affected by the first technological revolution, was remechanized by the second as the combine was put to work in the rice harvest. This technological change, like the others, resulted in a sharp reduction in the number of people involved in agriculture (Daniel, 1984).

Other changes accompanied these transformations. They raised the income of the average southern farmer substantially, though they did not wipe out the poverty that had long plagued the rural South. (It remained substantial, especially among rural blacks.) The region became increasingly urban and industrial. The developing southern factories provided jobs for people moving off of farms. In 1940, more than 43 percent of the southerners worked on farms; by 1970, less than 7 percent did.

In spite of this mass movement off of farms, the United States did not become totally urban. Instead, the rural population remained quite large, declining only from 57.2 to 53.9 million from 1940 to 1970, a decline of less than 7 percent that left the nation more than 26 percent rural (Historical Statistics, p. 11). Many rural communities survived and prospered by changing their economic base, shifting from agriculture to manufacturing, trade, services, and government. The number of rural counties dependent on farming declined from over 2,000 to about 700 from 1950 to 1970. Thus, many farm people moved into towns rather than cities, and some, including some farm women, continued to live on farms while taking on jobs in towns as a consequence of industrialization and other economic changes in rural areas. The industrialization of rural areas and increased participation in the labor force by farm women raised the standard of living of and reduced the amount of poverty among farm people.6/ Many rural communities, including many in Iowa, however, did not reduce their dependence on agriculture and thus declined as the farm population did (Korsching).

The Contributions of Government

Government policies contributed both negatively and positively to the Great American Agricultural Revolution. In spite of the rapidly shrinking number of farmers, the federal government remained actively involved with agriculture (Cochrane and

Ryan; Shover, ch. 7; Fite, 1981, chs. 6-11). This was so, in part, because farmers had effective organizations in Washington, such as the American Farm Bureau Federation, the National Farmers Union, and various commodity groups. Furthermore, skillful and well-placed representatives of farmers served in Congress and helped shape policy. Also, agrarianism remained a part of the scene, helping farmers get government programs. Latter-day Jeffersonians continued to employ the rhetoric about the value of family farmers, the need to keep them on the land, and the importance of government programs for that purpose. The programs emphasized were those designed to make farming an efficient and profitable business.

Government policies had a somewhat ambiguous relationship with the demographic dimension of the revolution. Washington made no effort to plan the migration. There was a strong tendency to regard planning as "unAmerican" during much of the period, and Congress had destroyed the main agricultural planning agency. Secretary Wallace had given that responsibility to the USDA's Bureau of Agricultural Economics in 1938, and the BAE had been authorized to develop state and local planning committees to help with the work, but these developments had generated fears in the Farm Bureau and among its allies in Congress, and they had killed the planning committees during the war and taken away the BAE's responsibilities as central planner in 1946 (Kirkendall, 1982, chs. 9-13). So the migration went forward in an unplanned way.

The federal government also scrapped efforts to hold the rural poor on the land by improving their conditions there. The New Deal had established agencies for that purpose, most notably the Farm Security Administration, but they too ran into trouble with the Farm Bureau and other powerful participants in farm politics, and Congress destroyed the FSA in 1946, replacing it with the much less ambitious Farmers Home Administration that never had much money to help poor farmers improve their operations and become owners of farms (Baldwin). There continued to be talk about the problems of the rural poor but little action, even during the War on Poverty during the 1960s.

The nation relied mainly on economic forces to solve the problems of the rural poor. There was not even a substantial effort to train rural people for urban life. Thus, the migration advanced without much guidance, regulation, or assistance and contributed to the major riots in American cities in the second half of the 1960s.

Washington also failed to enforce the acreage limitation principle of national reclamation law. The principle had been designed to guarantee that federal irrigation projects would increase the number of family farmers by opening up new land for farming that would be available only to them and forcing the breakup of large farms in established farming areas when reclamation projects were established in them, but enforcement was now defined as unrealistic, especially in the gigantic Central Valley Project in California. Enforcement of the principle there, its foes argued, would deprive corporate farms of the large holdings they had earned and interfere with economic growth (Pisani; Kirkendall, 1964, 1979; Goldschmidt; Koppes).

The federal government tried but failed to eliminate the cost-price squeeze. National policymakers maintained the price-support system that had been established

by the New Deal. Some politicans, most notably Ezra Taft Benson, the Secretary of Agriculture during most of the 1950s, talked of getting the government out of agriculture (Schapsmeiers, Peterson), but the real debate focused on the level of price supports. Washington also tried to enlarge demand, making use of Public Law 480, the school lunch program, and the food stamp plan, to move American farm products into foreign and domestic markets. But in spite of such efforts, the cost-price squeeze remained a problem and was especially severe in the mid-1950s.

What all of this means is that the federal government made some efforts to slow migration but rejected others. Obviously, given the size of the movement off of farms, the efforts that were made to hold people on the land were not effective. Perhaps the emphasis on farm prices was misguided. Perhaps the policymakers should have looked more closely at the problems farm people faced. And policymakers certainly did not help the cuase of family farming by passing tax laws that made farm land a tax shelter, thereby encouraging city people to invest in it.

Government policy had a clearly positive relationship with the technological dimension of the revolution. As Don Hadwiger argues, the 'special interests" that dominate the shaping of agricultural policy have been "firmly committed to a developmental strategy," one that encourages the "trend toward large efficient farms" and aims at "a productive and efficient U.S. agriculture" (forthcoming). "The support of the Farm Bureau, regional commodity interests, and the co-ops helped make technology a reality in agriculture," William P. Browne wrote in a comment on an earlier draft of this paper. "It was hardly imposed from the outside."7/ National agencies supported prices and made payments and loans to farmers, and they frequently used the resulting resources to buy technology and land. The government supplemented what farmers could obtain from the market and from private credit agencies and made the largest payments and loans to the largest farmers, thereby helping them to expand their operations still more (Cochrane, 1985, pp. 1005-6). And policymakers rejected proposals to place a low cap on payments, to eliminate subsidies to the largest farmers, and give special funds to smaller operators. In addition, the federal government conducted and financed research that contributed in basic ways to the revolution, and the research that received federal funding was dominated by the interest in making farming productive and profitable, not holding people on the land (Hightower; Hadwiger, 1982; Newby, pp. 130-2, 138-9).

The Agricultural System

With Washington making important contributions, the agricultural revolution moved forward, and as it moved, it reconstructed the agricultural system. Although often called "agribusiness," the system included government agencies and public educational and research institutions as well as urban, town, and farm businesses (Fusoni; Rasmussen, p. 3408-13; McGovern, pp. 496-518; Shover, Ch. 6; Merrill; Goldschmidt). Except for the number of farms and farmers, all parts of the system including the farms, grew larger, and the farmers grew more dependent on the system's other components.

The revolution reduced the number and enlarged the size of American farms. The number dropped 56 percent in 30 years, moving from 6.1 million in 1940 to 2.7 million in 1969. The average size expanded from 175 to 373 acres. By 1960, 23,000 farms grossed over $100,000 per year and produced and sold 17 percent of the total farm output. A decade later, although the price rise had been small, 53,000

farms grossed over $100,000, and they, although only 2 percent of the farms, produced and sold 34 percent of the national farm product (Cochrane, 1985, pp. 1002-3).

The revolution cut the number of family farms but did not destroy the type. The system also included plantations and industrialized corporate farms, both of which employed the latest technology and people who worked for salaries and wages (Newby, 148-53). Another type, part-time farms were worked by families who often used the new technology but depended heavily on income earned from nonfarm jobs. Owner-operated farms had reached a peak of 3.96 million in 1945, but dropped to 3.92 million by 1950 and 2.95 million in 1959. A decade later, the number had fallen to 2.37 million. Yet the owner-operated family farm continued to be the most numerous type. In fact, it became a larger part of the total than ever before. In 1945, owners operated 67 percent of the farms. By 1969, they operated 87 percent. Tenancy dropped from approximately 40 percent of the total in 1940 to about 15 percent three decades later. And sharecropping in the South virtually disappeared, falling from 446,556 farms in 1945 to 121,037 in 1959 and becoming so small in number thereafter that the Census Bureau ceased treating it as a special category (Rhodes; Rasmussen, pp. 3474-83; Historical Statistics, p. 465).

The revolution had not substituted industrialized corporate farms for family farms. Instead, nearly all of the family farms that had gone out of existence had been absorbed by other farms of the same type. Capable because of the new technology of farming larger units, some family farmers had expanded their operations by buying their neighbors' land. As one critic of the process, Wendell Berry, suggested, "farmers became convinced that it would be better to own a neighbor's farm than to have a neighbor...."

The revolution also enlarged the size and importance of the off-farm components of the agricultural system (Newby, 146-8). They included all of the businesses involved in the production and distribution of food and fiber, such as the feed, seed, chemical, and farm machinery companies and the firms that processed and distributed farm products. As the revolution moved forward, it shifted functions, such as the production of energy, seed, and fertilizer, off of farms, making farmers more dependent on the market -- and on corporations and cooperatives -- than ever before for they now not only sold on it but bought more things, including more food. And off-farm corporations also shifted risks and management off of some farms by developing contract farming, most notably in the poultry business.

Performing a wide variety of functions, the off-farm firms in the agricultural system obtained most of its income. Better than half of the dollars consumers spent on food and fiber went to the processors and distributors, while the firms that supplied commodities to farmers obtained most of the rest, leaving much less than half of the dollars spent by consumers on agricultural products for the people on the farms.

Farmers did not depend solely on the market for their income. They received some from another important part of the system, the federal government.

Agripower, the Food Crisis and the Boom

By the 1970s, the United States had developed a new and enormously productive agricultural system, and during the decade, that system seemed unusually valuable for the world as well as the nation. It seemed to give the U.S. substantial power, comparable to what some other nations obtained from oil, especially in a world in which food appeared to be a scarce commodity. Thus, once again, as in the world wars, the federal government encouraged American farmers to put all of their land into production, and they enjoyed a boom.

The idea that agriculture supplied a power base that could be used to accomplish political objectives had a long history, but the idea was now given a new name: "agripower" (Weber). It had been expressed in such slogans as "King Cotton" and "Food Will Win the War," in the programs of overseas relief following the world wars, in foreign aid, in Point Four, and in Public Law 480 (Rasmussen, pp. 3195-3209, 3229-37, 3100-5; McGovern, pp. 454-61, 518-30). Now, Earl Butz, among others, expressed the idea with great clarity. "Food is power," he insisted. "Agripower will be more important than petropower." "Food is a tool in the kit of American diplomacy."

Applying to international affairs the belief in the superior importance of agriculture, especially American agriculture, agripower was influenced by new worries about American power. The nation had failed to manage the Vietnam War successfully and then encountered pressure from the oil-producing states, especially the Arab nations in the Organization of Petroleum Exporting Countries who embargoed the export of oil to the United States late in 1973 to protest against American support for Israel. The theory assumed that food was of basic importance, more vital than oil or weapons, and the American agricultural system was vastly superior to all others, and the theorists suggested that the U.S. could, if the federal government controlled the nation's agricultural exports whenever and wherever that was necessary, become once again the most powerful nation, capable of influencing others, including the Arabs and the Soviets.

Even before the oil embargo, Washington employed the theory in its dealings with the Soviet Union. That nation faced a number of agricultural problems, including an inefficient agricultural system, shortages of agricultural machinery, inadequate rainfall, and a perceived need to increase meat consumption. The Nixon administration, hoping for detente as well as the expansion of exports, negotiated a large grain deal in 1972. Using agripower in a positive way, the United States sold to the Soviets 19 million tons of grain, one-fourth of the American crop, at low prices.

Talk of a world food crisis contributed to the developing sense of power from American agriculture (Shover, ch. 8). The crisis seemed especially severe in 1973-74 when widespread drought and soaring fertilizer prices dropped food supplies and resulted in millions of deaths in parts of Asia and Africa. Although too much production rather than too little had been defined repeatedly since 1920 as the basic farm problem, now some students of such matters maintained that the new crisis was a long-term rather than a temporary phenomenon, resulting from a "population explosion" throughout the world and inadequate agricultural systems in most of it. To some, it seemed that the predictions of Thomas Malthus about the inevitable pressure of population on food supplies had come true. And the

crisis existed in spite of the "Green Revolution." Represented most prominently by an agricultural scientist from Iowa, Norman Borlaug, who worked in Mexico and then Asia and received the Nobel Prize for his contribution to the expansion of world food production in the late 1960s, that revolution now seemed to be faltering.

Exponents of the crisis theory often criticized Americans. They received criticism for their consumption of red meat, which had increased spectacularly since World War II as a consequence of unprecedented prosperity. To the critics, this seemed a wasteful way of using grain. They also objected to American consumption of alcohol, energy, and chemicals, charging that American practices deprived other people of food they needed to survive.

The idea of a food crisis generated various proposals. One, "Triage," a concept derived from military medicine, divided nations into those that could be saved and those that could not and recommended that efforts be concentrated on the first group. A few reformers proposed that the amount of land devoted to agriculture should be increased, but others insisted that nearly all land capable of being used for agriculture was in use. A more frequently proposed solution, population control, encountered difficulties for it was opposed by groups as different as the Vatican and the Peoples Republic of China and depended upon a change in attitudes as well as the distribution of the required technology. To most of those concerned about the food problem, one key to its solution was agricultural development, which would include the production and use of new crop varieties, the application of fertilizer, the use of insecticides, irrigation, reforms in government and in land systems, and the introduction of new systems of cropping, information, and incentives.

Development depended on outside help. It had to come from the already developed nations and also the oil-rich countries organized in OPEC. Those groups had to supply capital and technology on a massive scale. The United States had to contribute some of the capital, much of the "knowhow," and most of the emergency supplies of food. To do the last, the U.S. needed to stop limiting farm production and store and distribute grain.

Much controversy attended the discussions of agricultural development. At times, debate revolved around the size of the American contribution. Controversy also focused on the role of government, for, while some participants in the discussion insisted that only government could respond adequately to needs, others believed in the superiority of private agencies. This was a dividing line between the Republican and Democratic administations during the decade.

Controversy also swirled about the applicability of the American model. This part of the debate focused on machinery. Critics of the model emphasized the large supplies of human labor in the developing countries and did not welcome the demographic revolution involved in American development. Critics also objected to the large role of chemicals in the American system, stressing the threat to the environment.

As the debate moved along, leaders in the United States Department of Agriculture responded in 1973 to the idea of the food crisis by promoting full production. Now headed by Earl Butz, an agricultural economist from Purdue University, the

department relaxed controls on production and urged farmers to plant fence row to fence row. Farmers, most of whom had never liked government controls, welcomed the new advice. To participants in the agricultural system, it seemed unlikely that foreign markets would disapper or that surpluses would reappear.

In 1975, the food situation began to improve somewhat. The change resulted in part from heavier rainfall in some areas, though that was offset by poor harvests in the Soviet Union and much of Europe and continued reduction in the use of fertilizer. The improvement resulted also from a record grain harvest in the United States that enabled the nation to expand food aid and sales.

U.S. agricultural exports reached a record high, rising 70 percent above the 1970 level by 1976. With grain exports especially large, the nation became the leading grain exporter, supplying more than half of the world's exports of grain compared with a third in the late 1960s and a fourth in the mid-1950s. The farm exports compensated for the increased cost of oil imports, chiefly from the Middle East, and of expensive items from Japan and Europe. Although the new agricultural system had some critics, including Jim Hightower and Wendell Berry, these results seemed to prove its great value (Cochrane, ch. 8; Fite, 1981, ch. 11).

The exports pleased farmers but alarmed some consumers, creating a difficult situation for the Ford administration, which also wanted good relations with the Soviet Union and looked upon grain as capable of serving that end. Selling 10.3 million tons of grain to the Soviets in 1975, the administration encountered protests from consumer and labor groups. So in late summer-early fall of that year, Washington used agripower negatively, embargoing grain as a means of pressuring the Soviets into a long-term agreement and responding to domestic forces, but farmers, the Farm Bureau, leading Democrats, rural congressmen, including Republicans from farm states, and the grain companies howled in protest. In these circumstances, the administration worked out an agreement to sell to the Soviet Union at least 6 million tons of grain per year from 1976 to 1980 as long as supplies at home were adequate.

Political leaders now backed farther away from the negative use of agripower, though some theorists continued to favor that. The Ford administration considered a grain embargo early in 1976 as a means of pressuring the Soviet Union to withdraw Cuban troops from Angola but rejected the idea and then joined the Democrats in criticizing negative use of agricultural resources. Jimmy Carter, the Democratic candidate for the presidency, promised that he would not embargo grain as Ford had. All of this suggested that agripower would be used only in positive ways, ones that would enlarge rather than reduce the market for American farm products and thus make use of the great productive capacity of American agriculture.

Viewed as enormously important in the foreign relations of the United States, American farmers enjoyed a boom similar to those they had experienced during the world wars. It began with a doubling of the world prices for wheat, rice, feed grains, soybeans, and other products from 1972 to 1974 and continued with smaller increases in 1975. Per capita income from farming rose above the off-farm level in 1973, reaching 110.2 percent, more than 35 points above the levels of the 1960s. Although net farm income dropped from the high of $33.3 billion in

1973, it remained quite high in 1974 ($26.1 billion) and 1975 ($24.5 billion) compared with the 1969 figure ($14.3 billion).

The farm situation weakened in 1976-77 as farm prices dropped while the costs of commodities like fuel and fertilizer rose, and this triggered a new episode in farm protest. Net farm income fell to $17.8 billion by 1977, and a new farm organization, the American Agricultural Movement, emerged. It staged a series of demonstrations from 1977 to 1980, often with farmers (obviously modern farmers) mounted on their tractors in Washington, D.C. and other places of political importance. "... these were large farmers ... who had embraced technology, gotten themselves in trouble with high interest rates, and wanted a bailout," William P. Browne maintains. "They might be called technocratic proponents who wrapped themselves in the ... 'agrarian myth.'"8/ They criticized established farm organizations and programs, demanded 100 percent of parity, and threatened farm strikes, seeking to take advantage of the great importance of farmers by neither planting crops or buying city-produced goods. The AAM did attract serious attention, and the government did expand its help to farmers in 1977-78, but the strike threat failed, and the movement did not get a law guaranteeing parity prices at the 100 percent level. Most commercial farmers and the established farm organizations refused to support the movement, and consumer groups and their political representatives opposed it.

Many farmers had grown concerned about consumers. Now enormous in size compared with the farm population, they appeared to have become too powerful and to lack sympathy for farmers. So the latter embarked upon public relations campaigns, hoping to gain more appreciation in the nation's cities.

The farm situation improved in 1978 and 1979. Net income from farming rose from $17.8 to $26.1 and then $31 billion. And the per capita income of farmers compared with nonfarmers rose from 87.1 to 102.4 percent.

The boom enhanced the value of land ownership. As farmers continued to substitute technology for people, the farm population dropped 38 percent during the decade, which exceeded the percentage drops of the 1940s and the 1950s and equaled that of the 1960s. Moving from 9.71 to 6.05 million, the farm population fell below 3 percent of the American total by 1980. The increase in yield per acre for most crops slowed down, so farmers expanded output mainly by increasing the acres devoted to crops and livestock. In these circumstances, land values soared, rising over 200 percent during the decade (Cochrane, 1985, p. 1003), and the ownership of land provided a rich resource on which farmers borrowed to buy technology and additional land. Credit organizations, including government ones, promoted the borrowing, even raising credit limits as land values rose.9/

The boom slowed but did not halt the decline in the number of farms. The number had dropped 30 percent in the 1950s and 26 percent in the 1960s, but it fell only 18 percent in the 1970s, and nearly all of that took place in the first half of the decade. The numbers suggest that the desire and ability to hold on to a farm had increased, but they also indicate that the desire and ability to expand holdings still had considerable strength.

The figures also meant that production for the market was concentrating on fewer and fewer farms. The farms grossing over $100,000 per year, 11 percent of the

total number of farms, now produced and sold 66 percent of the total farm output (Cochrane, 1985, p. 1003). This development aroused the concern of a liberal Secretary of Agriculture, Bob Berglund, in 1979-80, but this was rather late to express such a concern for the new structure of American farming had been taking shape for many years.

The boom contributed to what some observers called a "rural renaissance" as rural America, in spite of the continued decline in the farm population, grew more rapidly than urban America. But agricultural prosperity was not the main factor responsible for the renaissance for in places like Iowa where many rural counties still depended chiefly on agriculture, those counties lost population during the decade. Obviously, even during the farm boom, rural counties needed to industrialize or reduce their dependence on agriculture in other ways in order to enjoy growth (Korsching).

For many farmers, the 1970s was a relatively good time, one in which they could operate their businesses at a profit. Highly productive, they were encouraged to produce even more and received praise as people who could save the world from starvation and make the United States the most powerful nation. As a consequence, their basic resource -- the land -- seemed unusually valuable. Government officials and bankers urged them to farm all the land they had, expand their land holdings and update their technology so as to become more efficient and productive, and borrow money for these purposes. Thus, farm debt mounted. Farmers with a sense of history might have recalled that similar circumstances from 1915 to 1920 had ended in disaster, but many farmers -- and many people who advised farmers -- believed they had entered a new situation that would continue indefinitely (Cochrane, ch. 8; Fite, 1981, chs. 11-13; Fite, 1984, ch. 11; Soth).

The New Crisis

In 1981, however, the boom of the 1970s ended, as the boom of World War I had in 1920. Farming and rural life had been revolutionized since the great crisis of the 1920s and 1930s, but the new crisis, just like the one before it, was especially severe for those who entered it heavily in debt. For them, the crisis threatened their survival as farmers. And many faced death as farmers even though in most ways they were good farmers who owned substantial farms and the latest technology. They faced extinction even though they had participated in the revolution and in the efforts to feed the world and make the United States a powerful nation.

Several forces produced the new crisis (Harl, Stanley Johnson, Gratto).10/ One was the enormous productivity of American farmers. What had seemed a blessing now felt like a curse. Inflation also contributed. It had begun with the nation's fiscal policy during the Vietnam War, had worsened as a result of the sharp increase in energy costs after 1972, and had become an anticipated part of life by the late 1970s. Decisions made by many people assumed that prices would continue to rise at a rapid pace. The huge debt burden on many farmers was still another factor. Older farmers eager to bring young family members into farming had some of the debt, but young farmers shouldered most of the burden. The decisions that these different groups of farmers had made raised the farm debt in the nation from less than $50 billion in the early 1970s to over $200 billion by the early 1980s.

The debt situation made farmers highly vulnerable to any difficulties that might emerge in the farm economy. The situation was especially dangerous for those with debts equal to or above 40 percent of assets. In the nation as a whole, 20 percent of the farmers were in those circumstances; in the Middle West, the percentage was even higher, as high as 38.3 in Iowa in 1986 (Harl, 1987).

Two moves by the national government hit and harmed these farmers. Beginning in October 1979, the Federal Reserve Board attacked inflation by forcing interest rates to rise sharply. The policy cut inflation from about 15 percent to 3-4 percent within a few years. Then, in 1981, President Ronald Reagan proposed a sharp cut in taxes, and Congress responded with the Economic Recovery Act. One major consequence was massive deficits in the federal budget.

These policies had two important results for farmers. They cut exports by strengthening the dollar; they raised costs of production by pushing up interest rates.

Other factors contributed to the worsening of the situation. Of these, the expansion of food production in the countries that competed with American farmers and in the developing countries was especially important. Although starvation continued to be a problem in some places, the "world food crisis" now appeared to be a myth. World corn production by 1986-87 was more than 40 percent higher than it had been a decade before while soybean production had risen 61 percent and wheat output had expanded 20 percent (Harl, 1987). Furthermore, the slowing down of economic growth and other economic troubles in countries that had been major purchasers of American farm products reduced their ability to import food.

The various forces came together to produce an especially large drop in American agricultural exports. They fell from $43.8 billion in 1981 to $26.3 billion in 1986. Exports of corn and wheat dropped by especially large amounts; those of cotton and rice decreased by smaller quantities. American exports to Europe, the Soviet Union, and the developing nations fell off. These trends indicated that American agriculture was not as important as had been assumed in the 1970s and that alternatives to it had more strength than had been believed.

The Carter administration's negative use of agripower has also been blamed for the crisis. Responding to the Soviet invasion of Afghanistan in 1979, the administration embargoed grain sales to the Soviet Union. In doing so, Carter violated the agreement that had been made four years before. According to critics, this not only slashed the Soviet market for American grain but generated doubts throughout the world about the United States as a reliable supplier of farm commodities. A recent report by the Economic Research Service indicates, however, that U.S. losses of international market share were not caused principally by the embargo.11/ As Lauren Soth summarized the report, the embargo and the earlier ones did not affect U.S. exports "significantly." "Grain exports declined after 1981, to be sure, due to world recession, the high-valued dollar and increased production of grain in other countries," Soth writes. "The embargo evidently didn't persuade importers that the United States was unreliable, though of course they claimed it did in their trade bargaining."

The crisis hit agriculture throughout the country but struck the Middle West the hardest blows. The prices of agricultural commodities dropped although not as sharply as they had in 1920-21, 1929-33, and 1952-53, 12/ and did so while prices

of most other goods and services rose, although more slowly than they had a short time before. The prices of farm land also fell. Grain prices, which were so important in the Middle West, dropped farther than farm prices generally. And in Iowa, the price of the average acre of farm land plummeted from $2,147 in 1981 to $787 in 1986 (Des Moines Register, hereafter DMR, December 19, 1986).

Net farm income fell and would have dropped farther if government payments had not been raised. Income, which had reached $31 billion in 1979, $33 billion in 1973, moved close to $24 billion in 1986. Government payments to farmers, which had been less than a billion dollars in 1975 and not far above a billion in 1980, rose to $9.3 billion in 1983, $10 billion in 1986.13/ The average per farm, which had been only $320 in 1975, was $3,922 in 1983 (Statistical Abstract, p. 646). Writing of Iowa, a state heavily dependent on the export market and increasingly dependent on grain as beef shifted out of the state and poultry advanced at the expense of beef, an agricultural economist, Stanley R. Johnson, observed in the mid-eighties: "We used to have crops and livestock. Now we have crops and goverment payments!" There had been, in other words, a significant increase in the farmers' dependence on one part of the agricultural system: the federal government.

The crisis had a number of consequences. More than a normal number of farmers lost their farms through foreclosure. Many had to spend their savings, cash their insurance policies, sell some of their land and machinery, reduce health care for themselves and their families, and take off-farm jobs. And many of those hit hardest were among the most productive farmers. They tended to be the younger, more ambitious farmers with substantial, highly capitalized farms.

And the crisis reached beyond the farms and farmers. It affected entire rural communities (DMR, February 10, 1987). Their businesses lost sales as farmers cut their purchases and activities sharply, and their governments lost tax money and were forced to cut back on budgets for schools, health facilities, and other public services. The crisis damaged larger communities also, places such as Waterloo, Iowa where John Deere operated large facilities for the manufacture of farm machinery. Many of the firms that emphasized sales to farmers could not find customers for their products, could not obtain payments for goods they had sold earlier, and obtained assets of low value when they foreclosed. "Many of the industries that support agriculture -- fertilizer, farm chemicals and machinery -- overexpanded right along with their customers during the boom years of the 1970s," a writer for the Des Moines newspaper commented recently. "And with agriculture itself, they've been struggling in the last several years to adjust to much leaner times" (DMR, February 9, 1987).14/ In Iowa, one of the states with an unusually high level of dependence on agriculture, the state as a whole suffered an estimated loss of 33,000 people from 1981 to 1986 (Korsching).

The crisis resulted in serious distress for financial institutions. The Farm Credit System lost $2.7 billion in 1985; sixty-eight agricultural banks failed that year, and further distress seemed likely for many of the borrowers from such institutions, especially those operated by the federal government, had very heavy debts. The circumstances persuaded the institutions to charge high interest rates compared with those outside the farm areas, thereby forcing farmers who were not in financial difficulty to pay for those who were. The difficulties generated pressure for actions to help both borrowers and lenders, debate over

how to do so, and fear that the crisis would last so long that both the farming and the finance sectors of the system would be severely damanged (Brake).

The crisis had psychological as well as economic dimensions (Lasley). Stress levels rose; there was more tension between farm husbands and wives; farm children had more problems in school, and rural neighbors clashed more frequently with one another. And there was evidence of growing pessimism among farmers. The Iowa poll reported in 1986 that few farmers had plans for expansion, a number intended to scale down by selling or renting some land or losing it through forfeiture, 12 percent planned to sell out, 8 percent expected to be foreclosed, more than 3 percent planned to file for bankruptcy, and a growing number believed that the quality of life for farm people was deteriorating.

Unlike earlier periods of farm crisis, this one has not generated a mass uprising of farmers. It certainly has not produced a movement comparable to the Populist Revolt in which millions of farmers joined in a gigantic protest movement (Goodwyn). Perhaps the demographic revolution is the key. It has not only reduced the number of farmers capable of engaging in rallies and demonstrations, but by doing so, it may have given farmers a sense of powerlessness. Small in numbers now, they may feel incapable of doing much about their fate, at least through political action of a Populist variety. On the other hand, the role of government in agriculture, especially the government payments, so much larger now than in earlier crises, may explain why farmers have not rebelled as they did earlier. Those payments, of course, resulted in part from political action but of a different type than the Populists employed. It involved pressure group efforts by organizations like the Farm Bureau. That group's leaders do not appear to feel powerless.15/

The Final Crisis?

There has been some protest during the current crisis, much of it on behalf of farmers rather than by farmers themselves. And the protest has revealed that agrarianism has survived for that is the ideology expressed by the protesters. One theme in the rhetoric seems especially significant. It is the prediction that this may be the final crisis of the family farm. That institution that once had millions of representatives may die out as a consequence of the crisis, concerned people insist. The family farm may be displaced by the industrialized corporate farm owned by stockholders and worked by employees. "Rural crisis spawning new corporate owners as family farms fade," a headline in the Des Moines Register proclaimed on February 8th of this year. "... the farm crisis has become a fundamental force in hastening the end of a society built on independent farms, small towns and an economic equality that made the rural Midwest a special part of America," the article reported. "It was not in Thomas Jefferson's native Virginia, but in places such as O'Brien County [Iowa], where the Jeffersonian vision of an agrarian nation came closest to reality." "To many observers," the journalist added, "it seems evident that the next decade or two may wring the last shred of meaning from the term 'family farm.'"

Although there are people inside and outside agriculture who maintain that farming is valuable only as a source of food and fiber or an opportunity to succeed or fail, that farms must continue to grow larger and that farmers who cannot get big must get out (e.g., Merrill Oster in Comstock), other participants in the

farm politics of the present find other values in farming that must be preserved, have not been, and are now threatened with extinction. These agrarians include Wendell Berry, a Kentucky farmer and writer; Jim Hightower, a writer and Texas Commissioner of Agriculture; Senator Tom Harkin of Iowa; the National Catholic Rural Life Conference and the Catholic bishops; the Rev. David Ostendorf of the United Church of Christ and Prairiefire Rural Action, and groups like the Iowa Farm Unity Coalition, the North American Farm Alliance, and the Center for Rural Affairs. Such individuals and organizations offer a way of interpreting the crisis that makes it appear to be much more than trouble in one sector of the American business system (Comstock; Agriculture and Human Values).

These agrarians express a number of old themes. They speak and write of the great value of close contact with nature. They protest that big business and big government, including parts of the agricultural system -- the Farm Bureau, the land-grant colleges, the agribusiness corporations -- are insensitive and oppressive. They argue that many farmers are treated unfairly and that threats to family farmers are threats to the nation. They talk of returning power to the people and of a farmer-labor alliance, and they insist that government should supply more help to real farmers: family farmers. In this view of things, the "cost-price squeeze" is a mythical version of the crushing of family farmers between giant corporations on each side of the system allied with and aided by the government. The results are large profits for the corporations and concentration of land ownership.

Above all, these Jeffersonians of the late twentieth century warn that if the situation is not changed, family farms will disappear and all farming will be done by corporations. "Since World War II, corporate power and government programs have combined to eliminate three million small farms and accelerate big-business domination of farming," Hightower has written. "But until now, the family farmers have persisted, hunkered down, and become more efficient. Reaganculture promises to finally drive them to the suburbs and the factories." According to Maurice J. Dingman, recently retired as the Catholic bishop of Des Moines: "A corporate takeover is imminent. Family farms are disappearing. A national policy should be adopted stating clearly and forcibly that the ideal type of farm is that of family farming." People such as this repeat the argument that family farms are important for democracy for they distribute power and shape strong personalities; they insist that family farms are highly efficient, more so than large corporate farms, and they maintain that family farms guarantee better care of land and animals, reasonable prices for and a continuous supply of food, and superior communities (e.g., DMR, February 10, 11, March 8, 1987).

Is there any justification for the prediction that this may be the final crisis of the family farm? There are some supporting facts, including the survival during the crisis of the giant operators, those with gross annual sales of over $500,000 per year. Seldom family-owned and worked farms, they obtained over one-third of the farm income and kept their expenses under control more satisfactorily than mid-sized farmers. Because of their size, they could work out good deals on purchases and credit and could finance much of their operations (DMR, March 3, 1987). Furthermore, they obtained higher payments from government. While the average payment in 1983 was under $4,000, the average for farms with these large sales was nearly $47,000 (Statistical Abstract, p. 646).

There are other bases for the prediction. The farm population has continued to drop, falling from 6.05 million in 1980 to 5.75 million in 1984; the number of farms has continued to decline, moving from 2.43 million in 1980 to 2.285 million in 1985 (Statistical Abstract, pp. 633, 635). And the decline has taken place mostly among the middle-sized farms in acres and sales, those that are, in most cases, owned and operated by families, while big farms have survived and even increased in number. By 1985, less than 5 percent of the farmers produced and sold nearly half of the total farm product while 70 percent of the farmers contributed 13 percent of the total. As Cochrane points out, "the restructuring of the farm sector continues at a rapid pace in the direction of fewer and fewer and larger and larger farms" (Cochrane, 1985, pp. 1003-4).

Yet, other facts pose difficulties for the prediction. Even after the great decline in farms from 1940 to 1980, only a tiny fraction of the remaining farms were genuine corporate farms, owned by stockholders and worked by people paid wages and salaries. In 1982, there were only 1,143 corporate farms that were not owned by families and were owned by eleven or more stockholders. Nearly all corporate farms (over 50,000) were essentially family farms, owned by families and fewer than eleven stockholders (Statistical Abstract, p. 638). And, as has been true since the beginning of the revolution, nearly all recent purchases of farms have been made by other farmers, not by corporations or other urban investors, although the actual purchases by corporations and other outsiders have been large enough in some places to generate alarm (DMR, February 9, 1987; Farmline, April 1987, as reported in Ames Tribune, April 27, 1987).

Furthermore, farms are not declining rapidly enough for family farms to disappear in the near future. While the number of farms dropped 6 percent in the first half of the 1980s and this exceeds the 4 percent decline from 1975 to 1980, the rate is far below that of each five-year period from 1950 to 1975. Then, the percentage was never below 12 and reached as high as 15. Even in Iowa, where the rate of decline in the 1980s is above the national average, the decline is slower than it was in the 1960s, the decade in which the number of farms in the state fell most rapidly (DMR, February 8, 1987). Some of the people who are alarmed now distinguish between the present decline and the ones during the revolution, suggesting that most of the earlier migrants from farm to town and city were incompetent farmers while those who are leaving now are good ones and most of those who left before the 1980s did so voluntarily while those leaving during the crisis are being forced out. As Harkin has put this: "What is happening in rural America is nothing less than the greatest forced migration in our nation's history." Perhaps these assumptions are correct, although many of the earlier decisions to migrate were made under heavy pressure and bad business decisions by farmers in the later Seventies-early Eighties contributed to the loss of farms in the Eighties. Perhaps the pace of change will accelerate, but it will need to do so very significantly for the prediction to be fulfilled.

In addition, there are several social, economic, and political factors working for the survival of family farms as the main type of American farm. These include the efficiency of the wisely capitalized, well-managed family farm. There is also the desire of some people to farm, a desire that is so strong with them that they are willing to accept a relatively low rate of return on their investment and labor (Newby, 144, 148). Another factor is the poor investment opportunity that farming offers as compared with other prospects open to corporations and

those who would build them. Here, the tax reforms of 1986 made a contribution by attacking tax-loss farming. And that change in policy suggests another possibility that could help family farms survive. Government policies, and also corporate policies, could be developed that would serve this goal, perhaps more effectively than it has been served in the past (DMR, February 15, 1987).

Even the weather favors family farms. In the Middle West, at least, corporate farming appears to be advancing only in areas like poultry and livestock, ones that are not affected significantly by normal changes in weather. Thus, their work forces can be employed each day and for regular hours. Work on crops is, however, affected by weather and best done by people with flexible schedules. As a family farm combines a home and a business, the people on it are able to work long hours when the weather permits, cut back when it does not.16/

Conclusions

The trend toward fewer and fewer farms continues and seems certain to persist, yet it seems unlikely that the current situation is the final crisis of the family farm. Perhaps the prediction that it is is only an effort to continue to derive political benefits from Jeffersonian agrarianism. But if this is the final crisis, or if a new technological revolution featuring biotechnology and new information systems finally destroys family farming (Office of Technology Assessment), should the nation as a whole be upset by such a turn of events? Isn't the present too late to become concerned? Now that the number of farms and the size of the farm population have become so small, what difference does it make to the nation whether our farms are plantations, corporations, or family units? Certainly, one can no longer argue convincingly that the survival of democracy depends upon the survival of the family farm. If that poltical system must have such a base, then democracy in America must have perished long ago! We have only a few family farmers now -- and had only a few before the current crisis hit. In 1980 as well as in 1987, farm people constituted less than 3 percent of the total American population.

The only way to make family farms significant from a democratic point of view would be to increase the number substantially. That would involve a large-scale program of land reform emphasizing redistribution so that many more people would own land, live on it, and depend on it for their livelihoods. It would require that large farms be broken into small units and that the resulting structure of small-farm agriculture be preserved.

Although there are advocates of land reform of that type, 17/ there seems little possibility of such a change. Surely, few of the existing family farmers favor it. Furthermore, some analysts argue that it would move America as a whole in an undemocratic direction for it would mean higher food prices, a factor of great importance in he lives of all people and especially those with low incomes that must be devoted to the necessities of life. In addition, the theory of the surplus farm population has reemerged in American thinking about agriculture, providing a rationale for yet more reduction in the number of farms and farmers, although also stimulating suggestions for more intelligent management of migration this time (Gauthier). There is, of course, a large problem confronting this solution to farm problems: the nonfarm economy is not producing jobs as abundantly as it did earlier.

In the circumstances that now exist, the farm policy debate seems much more likely to focus, as it has since the 1920s, on the issue of strengthening farming as a business than on the question of building a base for democracy. The circumstances are basically those created by the Great American Agricultural Revolution: a complex and highly productive agricultural system that includes within it a small number of farms and farmers compared with what existed only a half century ago. The debate over how to make those farms profitable businesses has developed three major sides.18/ One emphasizes more effective government control of production so as to balance supply and demand at a higher level of prices. A second group advocates recapturing the world market for America's highly productive farmers by lowering prices and improving marketing opportunities. And the third option is reliance on science and technology to develop additional crops and improved livestock and poultry and to devise alternative uses for farm products and farm land.

These proposals, unlike the one for land redistribution, accept the agricultural system that history has produced so far. Although people can break with the past, as the concept of revolution implies, the possibility of doing so does not seem large at this juncture. The would-be revolutionaries appear to have little strength. There seems little likelihood of anything more than modifications in the system, perhaps a reduction or redesign of the role of government for the costs of the farm programs have become enormous, much of the money goes to farmers who are not in financial difficulties, and the programs have not prevented farms and farmers from declining in number and have even contributed to the decline, "helping," as Willard Cochrane puts it, "one group of farmers do in another group" (Cochrane, 1985, pp. 1006-9). Even proposals for change of this magnitude would surely encounter, and are encountering, strong opposition from general farm and commodity organizations who are responsive to the larger, more financially secure farmers. Fearing loss of price support funds, they dislike proposals to target benefits to the weaker farmers. 19/

Strengthening the farm business is not the same as guaranteeing the survivial of family farms. The American historical experience during the past half century clearly makes that point. Thus, if one of the policy options triumphs and works to make farming more profitable, and even if its label proclaims that its purpose is to save the family farm, we can expect that family farms will continue to decline in number as new mergers are worked out. This need not mean, however, that corporate farms, owned by stockholders and operated by employees, will become the major type of farm in the United States.

If we wish, we can maintain the system in which most of the farms are owned and operated by families. Champions of the "1890" land-grant universities and Tuskegee University, those that were exclusively black institutions in the past, maintain they have much of value to teach the other land-grant schools for while the latter were encouraging migration out of farming by small farmers, the black schools were working with such farmers, helping them survive. And these schools have been strengthened by federal legislation in the 1980s supplying more adequate financial support for research and extension and have been drawn into national research and planning efforts (Williams and Williamson, 8-17).

Further decline in the number of family farms need not mean that small communities must continue to decline and die (Guither). Instead, they could develop new

bases, depend less on agriculture and agricultural policies, more upon industrial and cultural policies, including ones that help elderly people who have returned to rural communities from the cities (Williams and Williamson, 15-16). Reducing rural America's dependence on agriculture would not be a new move. Instead, it would continue a trend that has been underway for a number of years, and thus planners and policymakers could draw upon available experiences. Those experiences need to be explored and analyzed, as do the implications for communities that do depend on agriculture of proposed agricultural policies, such as those that would take acres out of crop production (Korsching).

To be useful now, the agencies of change in rural America, above all the land-grant universities, must have a broad outlook. They must serve all rural interests, not only the interest in making the farm business more productive and profitable, and seek to enrich rural society in various ways. To do so, the universities must have strength in both the basic and the applied sciences and in the social sciences and humanities as well (Bonnen). Efforts to orient these universities in these ways seem certain to generate conflict of the sort that was so prominent in the early years of the land-grant system, although the parties to the controversy are more highly developed now (Glenn Johnson, 1984).

The agricultural system faces several serious challenges. The decline of the number of farms has alienated some people from it. So has pollution of the environment and the food supply by modern farming's heavy use of chemicals. The production of surpluses has also suggested to some that expenditures on the system, especially its research branch, should be slashed. Its economic troubles, along with the small number of people raised on farms in recent years, threaten the system from yet another angle: it may not attract the "human capital," including the supply of well-trained scientists, needed for continued development (Hadwiger, forthcoming; "Human Capital Shortages"; Allan T. Smith).

The entire agricultural system, not just the farming sector, may decline, but working for its survival is the long-recognized importance of the commodities it produces. This element of agrarianism, if no other, still seems to have some ability to build support for American agriculture. It may persuade the appropriate people that they must do what they can to make or maintain a superior agricultural system.

The quality of the system depends in large part upon the quality of its intellectual life. It depends upon its science, including its social science, which has the capacity to sort out myth and reality in agriculture and explore, develop, and evaluate ways of making the system function more effectively (Bonnen).20/ And the need for evaluation of both proposals for change in the system and the system itself points to a significant role for the humanities (Glenn Johnson, 1982; Comstock; Haynes; Billington).

These conclusions no more than suggest topics for social science research, but I have not assumed that spelling them out was my responsibility or even within my realm of competence. Rather, my task has been to supply insights into the present situation by exploring how it has come to be. The definition of next steps in research as well as policy must rest upon a realistic appraisal of what exists. How realistic I have been and how useful should be determined by discussion.21/

FOOTNOTES

1/ My colleague, Gary Comstock, suggested this term, offering it as the opposite of "modernizer" and preferable to "traditionalist."

2/ William P. Browne, in his commentary on a draft of this paper, helped me see this possibility.

3/ June 7, 1939, Eleanor Roosevelt Papers, F. D. Roosevelt Library.

4/ Willard W. Cochrane to author, April 13, 1987.

5/ Kenneth L. Deavers clarified my thinking on these and other parts in a letter of April 24, 1987.

6/ Kenneth L. Deaver's letter of April 24, 1987 was especially helpful on these points.

7/ Letter to author, April 21, 1987.

8/ Letter to author, April 21, 1987 (see Browne).

9/ Conversation with William G. Murray, April 19, 1987.

10/ In addition to these articles, remarks by Dennis Starleaf, Robert Wisner, Gene Futrell, William Meyers, Daniel Otto, Michael Duffy, Gratto, and Harl at the Agricultural Leaders Conference, Iowa State University, Feb. 25, 1987; regular reading of the Des Moines Register; frequent conversations with William G. Murray, and participation in Kellogg-funded workshops at Iowa State in 1985 and 1986 have influenced my understanding of the crisis.

11/ Deavers to author, April 24, 1987.

12/ Willard W. Cochrane to author, April 13, 1987.

13/ Deavers points out in his letter of April 24, that ERS has recently made new estimates "resulting from Census benchmarking and other adjustments." They show net farm income in 1979 of $27.4 billion, 1985 of $30.5 billion, and 1986 of $28 billion "(subject to upcoming revision)" and direct goverment payments for 1986 of $13 billion, also subject to revision. In a memorandum to me on April 14, Harl maintains that "total government price support expenditures were over $25 billion in 1986." Cochrane writes, "the net money costs of price supports and related activities in fiscal 1983 amounted to nearly $19 billion. And the net money costs ... for fiscal 1985 is estimated to approximate $15 billion" (Cochrane, 1985, p. 1004).

14/ Firms on the other end of the system -- those that processed and sold farm products -- did not suffer similar difficulties (DMR, March 8, 1987).

15/ This is another place where Deaver's suggestions proved helpful.

16/ Conversation with William G. Murray, May 20, 1987.

17/ For example, John Hart of Carroll College (Montana), adviser to the Catholic bishops, author of The Spirit of the Earth, and participant in a conference entitled "Is There a Conspiracy Against Family Farmers?" and held at Iowa State University, February 27, 1987.

18/ I am grateful to colleagues in the College of Agriculture, Iowa State University, especially Neil Harl, Stanley Johnson, Robert W. Jolly, William Meyers, and Donald G. Woolley, for helping me understand the alternatives that are being considered. The national participants in the Agricultural Leaders Conference (Midcourse Corrections in Agricultural Policy), February 25, 1987, also contributed, making me, for example, more aware that there is also a proposal to "decouple" government payments from the planting of crops.

19/ Neil E. Harl to author, April 14, 1987. Cochrane, 1985, 1007-8.

20/ William P. Browne to author, April 21, 1987.

21/ One of the commentators on this paper, the agricultural economist Willard W. Cochrane, draws less than optimistic conclusions from his examination of the

historical record. In a letter to me of April 13, he wrote: "Now what do we learn from all this? What I learn is the following. Agriculture is an inherently unstable industry oscillating between prosperity and depression in a completely unpredicatable fashion. In the 20th century, however, rapid and widespread farm technological advance has caused supplies of farm products to press against demand almost continuously except in wartime, and thus hold agriculture in a depressed state.

"The current farm crisis could be relieved by two bad crop years in a row around the world (always a possibility). Or the crisis could be deepened by the inception of a world wide economic depression (a distinct possibility as of 1987). The only safe prediction is that the future of U.S. agriculture, economically speaking, is unpredictable."

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Chapter 5

SOCIAL SCIENCE INSTITUTIONS, KNOWLEDGE, AND TOOLS TO ADDRESS PROBLEMS AND ISSUES

Frederick H. Buttel*

Introduction

Preparing a paper such as this--one that purports to be an authoritative overview of several rural social science disciplines, their historic and potential future contributions, their strengths and limitations, and their institutional environments--is both an exciting and humbling task. I am trained in and a practitioner of one such discipline. rural sociology. Yet in this era of growing specialization in science in general and the social sciences in particular, I am only marginally familiar with some of the major subdisciplines of my own field (particularly demography, education and careers, domestic rural development), let alone with the several other disciplines I will cover in this paper. Because the scope of this paper extends far beyond the normal span of my work, the arguments of this paper should be recognized as being tentative and preliminary.

The initial portion of the paper will be devoted to laying out a framework for understanding the role of and challenges facing the rural social sciences (as well as other disciplines in colleges of agriculture and home economics). I will then provide an overview of disciplinary, subject-matter, and problem-solving research in the two major or "mainline" rural social sciences, agricultural economics and rural sociology. The first part of this section presents some observations on the historical development of these two disciplines. The second discusses the contributions of the rural social sciences to problem solving, which is followed by a brief treatment of the state of the rural social sciences as disciplines. I will consider six disciplines other than my own: agricultural economics, history, anthropology, political science, geography, and philosophy [1].

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1. I must, nonetheless, apologize for the fact that because of the limited time available for preparing this paper, I have elected not to treat home economics or human ecology and education at all. Regrettably, I have so little knowledge of these fields that it is better that I say nothing rather than risk generating or perpetuating half-truths. I will also not treat the communication sciences as a separate "discipline" because of the inherent multidisciplinary character of departments of communication, agricultural journalism, and so on. Persons in these departments have typically been trained in such a wide range of disciplines (including sociology, psychology, journalism, and the humanities) that it is impossible to examine such programs as a single discipline. I will also not treat community development as a discipline. Community development,

I then turn to some major issues pertaining to the rural social sciences and the information delivery system. My concluding comments provide a set of suggestions for enhancing the role of the rural social sciences in the future.

Finally, let me emphasize that what follows is a personal perspective on the rural social sciences and their future role in solving agricultural problems. I will strive to make my assumptions and biases explicit so that, in particular, those who disagree will know clearly where I am coming from.

A Perspective on the Social, Political, and Economic Structure of U.S. Agricultural Research Institutions: A Brief Statement

Agricultural research (which, in a first approximation, will be defined as biological or engineering research that increases agricultural productivity and output) exhibits a paradox, the analysis of which is central for understanding the role of the rural and agricultural social sciences. The paradox is that agricultural research, an activity from which so many are said to benefit, has such a limited base of political support. Why, given the benefits of agricultural research to farmers, consumers, agribusiness, the rural or nonmetro population, and so on, has it been difficult to sustain agricultural research appropriations, especially at the national level?

At this level of first approximation we can provide several answers to this paradoxical question. First, and perhaps most important, is the fact that agricultural research is not unambiguously of benefit to farmers as a whole, taken as a national aggregate of producers whose principal markets are national ones. This argument has, for example, been made in direct fashion by T. W. Schultz (1977) and inferentially by others (such as Cochrane, 1979). The logic of the argument is that agricultural research, by increasing productivity and especially agricultural output, tends to reduce agricultural product prices and to set in motion a technological treadmill that results in some fraction of farmers being forced out of business or attracted to higher-paying nonfarm employment. This tendency is largely accounted for by the fact that most agricultural commodities have low price and income elasticities of demand; accordingly, farmer benefits from research are least and ambivalence about research is greatest for commodities with the lowest price and income elasticities of demand (i.e., the "basic," staple food commodities). Some fraction of farmers does, to be sure, benefit from productivity-increasing agricultural research--namely, early adopters of technology who receive innovator's rents until a point at which a certain proportion has adopted the technology and caused declining product prices and precipitated a technological treadmill. Nonetheless, these early adopters are a minority of the agricultural population, while those who receive little or no

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like the communication sciences, is inherently multidisciplinary. Further, community development has a very small research base in the land-grant system outside of rural sociology, agricultural economics, and home economics.

benefit are generally a majority. Also, given the tendency for agricultural productivity increase to place continual downward pressure on product prices, farmers' political interests tend to be far more ones of product price maintenance than of research and new technology.

Thus, it is not surprising that at the federal level farmers have tended not to be a strong, dependable voice in support of agricultural research appropriations. This is not so much because many--let alone a majority--of farmers actively oppose research. It is probably more accurate to say that the rank-and-file of farmers tends to be ambivalent about research, neither actively opposing nor actively supporting research. Where there is some modest active farmer support of research at the federal level, this support has tended to come from farmer groups in which early adopters of technology (i.e., potential recipients of innovator's rents) are numerically predominant. Historically, these groups have principally been the American Farm Bureau Federation and commodity groups, though it should be noted that in this time of farm crisis and deteriorating commodity prices the soybean commodity group has begun to oppose some types of research on their commodity for the reasons alluded to earlier--that productivity-increasing research, especially if it can be transferred to foreign countries, will lead to expanded supply, lower product prices, and further financial stress for soybean producers.

Second, it is generally said that consumers have historically been the major beneficiary of agriculture research in the U.S. and elsewhere. Some critics of American agricultural research have challenged this notion, typically by arguing, with some justification, that raw agricultural product increasingly is a small component of retail food prices and that the increased processing, transportation, and merchandizing component of the food bill has kept food prices higher than they should be. Nonetheless, as a general historical proposition the notion of consumer benefit from agricultural research has a strong level of validity.

Why, then, have consumers not actively supported agricultural research at the federal level? The answer lies in two aspects of the "consumer posture" on productivity-increasing agricultural research. The general posture--that of the rank-and-file of citizens who benefit from cheaper food to a greater or lesser degree each year--is such that consumers receive benefits that are far too diffuse or intangible to cause citizens to mobilize in support of federal research appropriations. Each consumer each year receives benefits that are far too small to be part of their "policy consciousness," even though small gains each year have resulted in big gains over the decades. The more specific posture--that of "consumer groups"--is even less favorable to federal appropriations for research, since these groups have often been critics of the agricultural research establishment on the grounds that this research has resulted in the use of potentially harmful pesticides and food additives and in too high a level of food processing and merchandizing cost for the consumer. Thus, consumers, while the single most important category of agricultural research beneficiaries, tend to offer very little support for federal agricultural research appropriations.

Third, organized groups of nonfarm rural or nonmetropolitan residents rarely have actively supported federal agricultural research

appropriations. This is likely due to a complex combination of factors. One is that to the degree to which agricultural research has improved rural community conditions, the benefits to any one rural or nonmetro resident in any year is small and diffuse, much like that observed above for consumers. Another is that productivity-increasing research, by putting downward pressure on commodity prices and causing labor displacement and a decline in the farm population, will be detrimental to rural communities that are heavily dependent on agriculture. Also, the U.S.D.A. has historically never had a major rural development program; the vast bulk of rural development activity is typically identified with the land-grant system (especially extension) and with federal agencies other than U.S.D.A., state government agencies, and private, voluntary rural development groups. The small base of the U.S.D.A. rural development effort makes it so that federally-funded agricultural research (construed broadly to include rural development and home economics) is rarely viewed by persons interested in rural development as a locus for benefiting the interests of the nonfarm rural population.

Thus, the historical experience of the political support base of agricultural research at the federal level has been that there have been two major groups of supporters: agricultural research administrators and agricultural researchers themselves, for obvious reasons, and agribusiness firms, for the reason that they might benefit from plant, animal, engineering, or social science research. This support base has been small and federal appropriations modest, especially funds that support the research of the land-grant system, the cornerstone of the U.S. agricultural research effort.

Yet the American agricultural research establishment by world standards is quite large despite this modest base of support at the federal level. The reason for the large scope of the national agricultural research system despite a modest base of political and financial support at the federal level is, of course, the relatively high level of state government appropriations for agricultural research at their state agricultural experiment stations (SAESs). For most SAESs state funds are several-fold those from federal sources. At the larger SAESs state funds tend to be 10-fold to 20-fold or more those from the federal government. Over the past 25 years the stagnation of federal agricultural research funding and the expansion of state appropriations (which were related to general state university expansion in response to the baby boom, and which began to stagnate in the late 1970s when the baby boom expired) have led to an SAES system in which the funding backbone is state government dollars.

Indeed, the federal-state partnership in research has led to a largely beneficent resolution of the problem of a lack of political support for agricultural research. Its basic logic is that, on one hand, states have an interest in at least matching federal funds in order to obtain these federal resources and, on the other, that it is in the interest of farmers in any state to support research at "their" SAES that helps them compete with farmers in other states. (A similar logic pertains to higher education in agriculture and extension--particularly the latter, since extension should ideally be a instrumentality for expanding a land-grant university's clientele and generating political support for the university as well as transferring technology.) In particular, farmers, rather than

being ambivalent about research as they have largely been at the federal level, can be induced to be dependable supporters of research at the state level. This has been the organizational genius of the American agricultural research system, which has made it the largest and most accomplished in the world. This is also, in a sense, an important explanation of the expansion of the Agricultural Research Service (ARS), which has been based partly on the creation of decentralized research stations that do what the SAESs have historically been quite good at doing: creating locally-adapted knowledge, materials, and technologies that benefit farmers in a particular region over farmers in others.

It is important to recognize the strengths and limitations of this research structure in relation to ongoing trends in agricultural science and the agribusiness industries. The raison d'etre of this decentralized SAES system whose funding backbone derives from state legislatures rather than the Congress or White House is to conduct applied, locally-adapted research, the benefits from which are at least partially capturable by localized groups of farmers and other rural residents. The status of applied, locally-adapted research as the organizing principle for sustaining the SAES and larger land-grant system is, however, in some doubt. This is due to several reasons. First, it is widely recognized that the cutting-edge of modern agricultural research lies increasingly in biotechnology (based on molecular and cell biology and biochemistry)--that is, in relatively basic or fundamental research--and that applied researchers and their agendas have become less important over the past decade. Second, the SAESs have rapidly expanded their biotechnology research FTEs, roughly from 4 percent of FTEs in 1982 to 8 percent in 1986, a rather startling reallocation of research resources at the margin. Third, biotechnology researchers will, at least for the foreseeable future until these new scientific exemplars have become routinized in the agricultural research system, tend to produce generic technology (i.e., technology of broad, national-scale applicability) rather than locally-adapted technology. Fourth, the dominant thrust of recent federal politics relating to research has been to urge the land-grant system to move more toward basic biology (to assist the U.S. effort in global technological competition) and to deemphasize applied, problem-solving (and, some would say, routine or low-quality) research. Fifth, there has been a significant increase in industrial funding of SAES research (though, it should be noted, to a lesser extent than was widely anticipated in the early 1980s; Buttel et al., 1986); accordingly, industry has become a more important clientele and, at least de facto, local farmer groups less so.

Sixth, industry has become the major performer of agricultural R&D, accounting for perhaps as much as two-thirds of annual agricultural R&D expenditures (Ruttan, 1982), while the public sector has increasingly become a minority component of the national research system. Indeed, it could perhaps be said that industry research, rather than SAES and ARS research, is now most predominant in inducing new technological directions in American agriculture (broadly construed to include the larger food system). Finally, several SAESs have found themselves under pressure because of this new constellation of research activities and clientele. A few SAESs, for example, have been pressured by farmers concerning bovine growth hormone (bGH), which is a good example of a biotechnology produced in cooperation with industry (including industrial funding of SAES

research) and of a generic technology that farmers in a particular state are not in a privileged position to benefit from. At the same time several SAESs have received countervailing pressures--for example, from financially-strapped farmers who want their SAES to provide them with locally-adapted research that will help them reduce their input costs. These new trends and pressures have enormous implications for the future role of agricultural researchers, including social as well as biological scientists. These implications will be discussed below.

What, then, do these observations have to tell us about the roles of the rural social sciences (other than the fact that a social science analysis undergirds this assessment)? One obvious implication is that the rural social sciences will largely rise or fall depending upon the viability of the land-grant and SAES systems. Second, we all know that the first approximation of the content of agricultural research employed above is too narrow. The agricultural research system performs many activities other than directly or indirectly increasing agricultural productivity. A partial list of these other activities include research on the environmental consequences of agricultural technologies, nutrition, home economics, rural development, natural resources, and so on. Social and nonsocial research also provides essential contributions to teaching, extension, international development, and "institution building." Each of these activities serves one or more of the following functions: (1) providing an inherently necessary adjunct to productivity increase (which I now define broadly to include the reduction of input usage and socioeconomic and environmental sustainability of production systems as well as output expansion), and (2) maintaining or building the political support base for the land-grant system.

Third, the very processes which generate farmer ambivalence about research at the federal level--differential benefits from research and the technological treadmill--have combined to create a startlingly diverse farmer clientele. In a sense, it is no longer accurate speak of "farmers" as a particular group, since the profound differentiation among farmers has, at a minimum, generated three "agricultures" in the U.S. (OTA, 1986). These three agricultures include: (1) very large--typically "larger-than-family" or "industrial"--farmers who primarily rely on a hired labor force, (2) medium-sized, largely full-time "family" farmers who rely principally on family labor, and (3) small, often part-time, farmers who rely heavily on off-farm earnings. Very large and very small farms have recently increased in prevalence (in terms of the level of sales accounted for and proportion of farm numbers, respectively), while the medium-sized, full-time, family farmer category has probably been in relative as well as absolute decline for 15 years. Each is an important clientele, but most importantly each has several distinctive technical/information needs. The land-grant system can no longer serve the farming community by producing a single constellation of technologies intended for use by some imagined entity of "farmers as a whole," which for all practical purposes no longer exists.

Fourth, the SAESs and the larger land-grant system have a number of other nonfarmer clienteles, some of which it must serve to fulfill its land-grant mission (e.g., farm laborers, state-level agribusinesses, rural communities and their residents), others of which it must serve to ensure transfer of

technology and information (e.g., out-of-state agricultural input and output industries), and still others of which are of key importance in maintaining and building the political support base (e.g., rural youth, consumer groups desiring nutritional information). Fifth, the interests of these diverse clientele groups are not necessarily consistent, and may in fact be in opposition. For example, farm workers and their industrial farmer employers are an obvious case in point. Thus, sixth, the SAES and larger land-grant portfolio is, intentionally or not, a mix of activities in which benefits (and costs) are distributed across the clientele groups, which can have major implications for clientele perceptions of the system and for its political support base.

A final--and, in many respects, uncomfortable--implication of the foregoing is that while, on one hand, we and our nonsocial science colleagues as trained scientists are most comfortable with matters technical and scientific, there is an irreducible political element to agricultural research institutions. The very structure of these institutions is derivative of some basic parameters of the political demand structure of agricultural research. Their future structure and prospects depend upon what are, for all practical purposes, political strategies for maintaining and expanding upon the clienteles that we can serve well and for dealing with the differences of interest and opinion among these clienteles.

The Establishment of the Rural Social Sciences and Their Contributions to the Solution of Agricultural- and Rural-Related Problems

The Development of the Rural Social Science Disciplines

With this background, let us turn to the historical development of the rural social sciences, focusing primarily on agricultural economics and rural sociology. It is useful to begin by noting that the founding of the land-grant system essentially predated the agricultural and rural social sciences as we know them today. The purpose of the Morrill Act was largely educational, and in 1862 it could be said that agricultural science scarcely existed. Indeed, the origins of agricultural research were in the large colonial empires of the several preceding centuries (Busch, 1981), and since the U.S. was not a colonial power it had a very small research establishment. At the time of the passage of the Morrill Act agricultural research in the U.S. was limited to the work of a few agricultural chemists in Ivy League universities and state governments and to the importation and distribution of seeds by the federal government. The passage of the Hatch Act and the implicit modeling of the SAES system on the German agricultural experiment stations and research universities signaled a slow but significant reorientation of the land-grant system. Though hampered by the lack of trained scientists and a lack of knowledge in agricultural biology and genetics, research activities increased in prominence by the turn of the century. Then, with the "rediscovery" of Mendelian genetics shortly after the turn of the century, the subsequent discovery of hybrid corn in the 1920s and 1930s, and continued soil fertility and crop nutrition research in the tradition of Liebig, the momentum of research increased decisively.

Just as in the early decades of the land-grant system when trained scientists in the conventional sense were hardly to be found, the social

sciences as we currently understand them were essentially not present at all. If land-grant personnel were neither agricultural nor social scientists, what were their backgrounds and activities? In the main, they were clerics, engineers, former farmers who had received higher education, and so on. Indeed, with the exception of economics, the social science disciplines as we know them today--especially sociology and political science--did not exist in American universities.

The roots of the social science presence in land-grant and SAES institutions lie in problems experienced by the land-grant system in encouraging farmers to use new technology and to improve their management practices. For all practical purposes agricultural economics emerged as farm management economics and was oriented to assisting farmers in allocating their resources more effectively and profitably. Rural sociology was largely created in the aftermath of the Country Life Commission, which recommended that the SAESs engage in social science research to assist in the transfer of technology while at the same time preserving the social and moral fabric of rural communities. At many land-grant universities rural sociology programs were established before sociology departments were.

After the passage of the Smith-Lever Act in 1914, the progress of the rural social sciences until World War II occurred more though extension and through U.S.D.A. funding and little because of formula-funded research. For example, to the best of my knowledge rural sociology received essentially no Hatch funding until after World War II, and the most active rural sociology research programs were in the U.S. Department of Agriculture, especially during the Depression. Much the same could probably be said about agricultural economics, except that I am not familiar with the history of its funding sources. Nonetheless, at the land-grant level the activities of the rural social sciences at this time were heavily oriented to extension and public service activities (in addition to teaching) and were only modestly directed to research activities.

Before proceeding, it is useful to make some preliminary comments on the rural social sciences as "disciplines." The two "mainline" rural social science disciplines (i.e., the two with the closest connections with the liberal arts social sciences) are agricultural economics and rural sociology. Each can be considered a discipline in a certain sense (i.e., each includes a number of subject matter areas, involves a clear identity among its practi[illegible]s, has its own scholarly organization and journals, and has some cor[illegible] of theories and methods). Yet agricultural economics, for [illegible], could as readily be considered a subdiscipline of a larger discipline [illegible] economics. Likewise, rural sociology could be seen as a subdiscipline of sociology. Moreover, there are several land-grant rural sociology programs (e.g., Michigan State, Iowa State, North Carolina State, Colorado State, Utah State, Washington State, Kentucky, Montana State, Georgia, Louisiana State) that are integral parts of larger sociology departments. (There are, to the best of my knowledge, only two agricultural economics programs [Iowa State and North Carolina State] that are part of larger departments of economics.)

Nonetheless, the land-grant social sciences (as well as its biological and physical science departments) are disciplines in a particular sense--that is, they involve the institutionalization of a set of subject-matter foci into a discipline in a somewhat arbitrary way. The source of this arbitrariness, of course, is the land-grant system. That is, the rural social science disciplines are essentially coterminous with the mode in which these scientists are organized into land-grant departments. The logic of land-grant funding and departmental organization has caused them to be perceived--and, in most respects, to function--as disciplines.

But as will be stressed below, agricultural economists and rural sociologists conduct disciplinary research in two different, though overlapping ways. One is for an agricultural economist or rural sociologist to do work on problems that are seen to be of broad importance to her or his agricultural economics or rural sociology colleagues, to employ the theories and methods that are seen to be at the cutting edge by large numbers of these colleagues, and to direct this work largely or entirely to professional colleagues. The second is similar to that of the first, except that the referent is the larger discipline (economics or sociology).

Agricultural economics and rural sociology historically exhibited quite different routes to their current status as disciplines. Agricultural economics was largely born outside of the larger discipline of economics. This apparently was because of the fact that the impetus for and early nature of agricultural economics was highly applied and public service oriented--namely, farm management. Agricultural economics has largely remained relatively isolated from the larger discipline with only a few exceptions, though, as I will suggest below, this has begun to change. The vast majority of its practitioners have received Ph.D.s in agricultural economics rather than economics. Relatively few agricultural economists are active in the American Economics Association. Very few agricultural economists, other than a handful of development economists, have been widely known in the large discipline.

Rural sociology has had a considerably different history. Its institutional roots were less immediately applied (in the sense of generating information to be of direct use to specific clientele groups). Rural sociology was very closely integrated into the larger discipline until the 1930s, when the rural sociology section of the American Sociological Society broke off in 1937 to form the Rural Sociological Society. Even so, rural sociology has retained relatively close ties to sociology. Several prominent rural sociologists have served as presidents of the American Sociological Association. Often, as noted earlier, rural sociologists are members of departments of sociology. Perhaps half or more of contemporary rural sociologists received their Ph.D.s in sociology (rather than rural sociology). Probably two-thirds or more of land-grant rural sociologists belong to the American Sociological Association. Many rural sociologists publish routinely in "general" sociological journals and participate actively in national or regional sociological associations.

Disciplinary, Subject-Matter, and Problem-Solving Research in Agricultural Economics and Rural Sociology

Before proceeding to a discussion of the contributions of the major rural social sciences to solving agriculture- and rural-related problems, it is useful to discuss briefly the nature of research in the two major rural social sciences. It is most convenient to begin with subject-matter research foci, since these foci have a major influence on the basic research questions that are emphasized and the types of problem-solving activity that is typically undertaken.

Agricultural economics' major subject-matter areas are: (1) farm management/production economics, (2) marketing, (3) resource economics, (4) domestic rural-community development, (5) international development, (6) agricultural finance, (7) policy, and (8) farm and agribusiness labor economics (though this latter area is small relative to the preceding seven). The major subject-matter areas in rural sociology are: (1) sociology of agriculture, (2) sociology of natural resources, (3) domestic rural-community development, (4) international development, (5) demography and population studies, (6) youth, careers, and rural labor markets, and (7) family. These two lists suggest a striking degree of overlap in the subject-matter foci of agricultural economics and rural sociology. Indeed, given this overlap, it is, in a sense, surprising that there has not been more interdisciplinary problem-solving research involving agricultural economists and rural sociologists who are interested in comparable subject-matter areas. This issue will be addressed below.

Nonetheless, there is a clear division of labor between agricultural economics and rural sociology that is belied by the apparent similarity in subject-matter foci. This historic division of labor has been the far greater emphasis of agricultural economics on agriculture on one hand, and the far greater emphasis of rural sociology on rural communities and rural development on the other. This division of labor probably has declined significantly over the past decade, particularly given the rather substantial shift of rural sociology toward greater emphasis on the sociology of agriculture over the past decade (Buttel et al., 1987). Nonetheless, this division of labor largely remains intact and, in particular, continues to have a major impact on the disciplinary and problem-solving research that agricultural economists and rural sociologists do.

Disciplinary research in agricultural economics and rural sociology is quite disparate. It would appear that the predominant thrust of disciplinary research in agricultural economics is methodological in nature--that is, the incorporation of new analytic, mathematical, and computational tools from the larger discipline of economics. This is, in large part, due to the close identity of theory and method in economics in the mathematical-quantitative realm. Disciplinary research in rural sociology, on the other hand, is largely two-fold, reflecting the lack of consonance between theoretical and methodological advances in the larger discipline of sociology. The theory and methodology communities in sociology are largely insulated from one another, and this isolation is to some degree reflected in rural sociology (though, in my view, far less so

in rural sociology than elsewhere in sociology). Nonetheless, disciplinary research in rural sociology tends to consist of either: (1) exploration of theoretical notions from sociology or a kindred basic social science, or (2) adaptation of a quantitative-methodological innovation from sociology or elsewhere. These two categories seldom overlap substantially.

Problem-solving research activities in agricultural economics and rural sociology have tended to reflect the historic division of labor between the two disciplines and, perhaps moreso, some of the ideological and institutional concomitants of this division of labor. There is a continuing tendency for problem-solving research in agricultural economics to be directed primarily to the needs of agricultural clienteles: major farm groups (e.g., commodity organizations), agribusinesses, and powerful farm policy-making groups. Rural sociology's problem-solving research has continued to be more directed to rural community-oriented clienteles. There is also an ideological dimension to this division of labor. Those attracted to agricultural economics have tended to be more conservative than those pursuing a career in rural sociology. Accordingly, problem-solving research in agricultural economics tends to be more oriented to the information needs of relatively powerful and privileged groups than that of rural sociology. Put somewhat differently, the historic culture of rural sociology has been to place high priority on doing research relevant to the needs of underprivileged constituencies. The division of labor between agricultural economics and rural sociology has also been sustained for institutional reasons. SAES and extension administrators have tended to see agricultural economists as "agriculture people" and rural sociologists as "rural community development people." This has particularly been the case in extension. It has only been a few years since there have been rural sociology extension staff whose principal responsibility has been agricultural constituents. Whether this division of labor should be sustained or broken down is a matter to be discussed later in the paper.

Contributions of the Rural Social Sciences To Problem Solving

It is quite difficult to summarize briefly and adequately the contributions of the two major rural social sciences to agriculture- and rural-related problem solving. There is simply too great a diversity among SAES rural social scientists, the clienteles they serve, and the research they conduct to permit a convenient, exhaustive summary. Therefore, what follows is an illustrative overview of the types of problem-solving research conducted by rural social scientists organized roughly in terms of the institutional context of the research and information transfer.

The first category of problem-solving research is that principally conducted for transfer within extension channels to traditional extension clientele. This category includes research done in preparation for outlook conferences, farm management research conducted to be transferred by extension agents to farmers, marketing and production economics research to be transferred to commodity groups and agribusinesses, public policy research and education, rural community needs assessments, surveys among farm and rural residents, and research done in association with SAES "commodity teams."

The second category of problem-solving research is that intended to be transferred directly to private groups and agribusinesses. It should be noted that the boundary between this and the first category is fluid and sometimes problematic. That is, it has been the historic role of extension to transfer information to clientele groups--in general without remuneration to the researcher over and above base salary. Nonetheless, there has probably been a growing trend for rural social scientists (especially agricultural economists, as well as sociologists who do communication research) to aim their work directly to one or another private group through a research contract or consultancy arrangement. This trend is likely accounted for by the increasingly national and multinational character of many agribusinesses and the growing importance of proprietary information. There is nothing inherently wrong with doing research of this type, but problems do inevitably arise when the social scientist doing the research has an extension appointment which involves a commitment to transfer public-domain information free of charge to clientele groups.

The third category of problem-solving research is that conducted on behalf of "public interest groups." The impetus for such research often is the claims or arguments made by public interest groups, typically in opposition to the interests and claims made by more powerful or dominant groups. Generally, unlike the second category of research discussed above, SAES social scientists do not receive either remuneration or significant funding for problem-solving research directed to the needs and interests of public interest groups. It is probably the case, though, that more of this type of research is being moved within the rubric of extension (i.e., the first category) as many extension establishments have come to embrace issues and groups (e.g., environmental concerns, organic or low-input farming) that historically were ignored by extension staff.

The fourth category consists of policy research done primarily for federal, state, and local policy makers, the results of which are typically transferred outside of extension channels. This type of problem-solving research has ebbed and flowed over the years. It is probably fair to say that this type of research has tended to be in greatest demand during periods of crisis--for example, the Great Depression and the current era of farm financial stress, federal fiscal crisis, and economic uncertainty. The heyday of such research arguably was that of the Great Depression when large teams of agricultural economists and rural sociologists moved to the U.S. Department of Agriculture and played a pivotal, though temporary role in New Deal policy-making. The demise of the Farm Security Administration and Bureau of Agricultural Economics in the immediate post-New Deal period should remind us that there is a certain political instability in this style of problem-solving research.

Policy research directed to public decision-makers declined in demand and importance from the 1940s to the mid-1970s. Much of the policy research done in agricultural economics, for example, came to be commodity-oriented policy work, directed to private constituent groups. Policy research has, however, experienced something of a renaissance over the past decade due to the rise of public interest groups concerned with agricultural issues, the farm crisis, fiscal crisis, and so on. Nonetheless, many agricultural- and rural-related institutions--commodity programs, soil conservation programs,

agricultural districts, and so on--have their origins in the policy/institutional-design research of rural social scientists.

The fifth category of problem-solving research is that conducted within SAES biological or physical science "teams." This category, to be sure, clearly overlaps with other categories (e.g., commodity teams, multidisciplinary international development research). Nonetheless, this can be considered a distinctive category of problem-solving research in that it is a relatively new focus of SAES research and can be distinguished from traditional "commodity team" research in its closer partnership among persons from several disciplines and in its stronger interdisciplinary character. This type of problem-solving research has increased in prevalence because of the growing recognition by SAES administrators and nonsocial scientists of the importance of the socioeconomic context of technological adoption and change. Research of this sort has also increased due to expansion of interest inside and outside of the land-grant system in ex ante socioeconomic impact assessment of new agricultural technologies. Useful examples of research in this category are the multidisciplinary cooperation among social, biological, and physical scientists at Washington State University in designing solutions to soil erosion problems and the collaboration between agricultural economists and animal scientists at Cornell University in projecting the socioeconomic impacts of bovine and porcine growth hormone products.

The final category of problem-solving research--international development research--also overlaps with previous categories (especially multidisciplinary team research and research directed to public decision-makers). This category, however, deserves special mention because of its unique institutional character (in particular, its dual connections with public and private development agencies and with recipient country governments and groups).

International development research is also a problematic area of work. On one hand, it can probably be said that the land-grant universities have tended over the past decade to diminish their commitment to international development work, save for keen interest when large contracts can be signed with the U.S. Agency for International Development for one-shot technical assistance projects. As SAES and land-grant funding has tightened, land-grant officials have had an understandable tendency to pare international development program staffing and to bolster staffing in areas that will help them appeal to state legislators and federal and industrial funding sources. Also, it has long been recognized that because of the nature of international development research--long periods of time away from campus, long gestation times in generating data, and so on--young social scientists working in this area often have difficulty in career advancement. On the other hand, there are many people who, with considerable justification, say that the land-grant system has an obligation to the rest of the world to put greater effort into international development work. The African development crisis has begun to recrystallize interest in resurrecting the land-grant commitment to development work (i.e., in terms of major staff commitments, rather than merely pursuit of large AID grants).

The State of the Rural Social Sciences as Disciplines

Up to this point my comments have been almost entirely devoted to agricultural economics and rural sociology, the two major social science disciplines in colleges of agriculture. I will now explore the strengths and limitations of the rural social sciences as disciplines, and in so doing will examine the two major social science disciplines and as well as several other disciplines. These other disciplines tend to be largely absent from colleges of agriculture and SAESs. But, to anticipate one of the points that I will make in my concluding remarks, land-grant universities should consider renewing their land-grant commitment as universities, not merely as colleges of agriculture and home economics. Thus, the social science disciplines other than agricultural economics and rural sociology represented on land-grant university campuses should be seen as potential contributors to the land-grant mission.

Agricultural Economics

As noted earlier, agricultural economics developed historically as farm management economics. Further, as American agriculture became increasingly specialized and as marketing and policy became recognized as being crucial to profitable production, agricultural economics rapidly became dominated by commercial agriculture-oriented personnel whose principal roles generally involved serving major commodity groups. Two decades ago the majority of agricultural economists functioned within this framework, while perhaps up to 40 percent of SAES agricultural economists today are principally concerned with commercial agriculture and oriented their work substantially toward commodity groups.

As noted earlier, agricultural economics remains very "agricultural," at least relative to rural sociology. But since the institutionalization of agricultural economics, a substantial number of other subject-matter areas--several of which are nonagricultural--have been added so that agricultural economics today can often be referred to as applied economics rather than agricultural economics. This has, by and large, been a very positive development, since it has militated against excessive specialization and has encouraged some cross-fertilization across subject-matter areas. It is almost certain, though, that the matter of whether there should be further diversification of agricultural economics programs will be a crucial issue for the future. Many observers argue that agricultural-commodity specialists are at the front line of generation of and transfer of knowledge to the land-grant system's most important clientele group(s)--farmers--and that it would be unwise to dilute this strength. Others suggest that the nonmetropolitan economy has exhibited a progressive decline in the role of agriculture and that land-grant applied economics efforts should shift accordingly in response to the needs of new constituent groups. It should be recognized, though, that the very nature of this debate is a reflection of the specialization of agricultural economics; it could be argued that the resolution of this apparent problem would be to train and hire staff who have expertise in two or more subject-matter areas so that zero-sum trade-offs would not need to be made.

Agricultural economics has long been highly applied. Busch and Lacy (1983) in their study of research problem choices of land-grant scientists found agricultural economics to be one of the most applied disciplines in the SAES system--substantially moreso, for example, than rural sociology. Yet it is widely assumed that agricultural economics has become increasingly disciplinary (see, for example, Schuh, 1986). There is an element of truth in both notions. As noted earlier, the disciplinary nature of agricultural economics has been largely manifest in its methodology, so that the character of published research in the field, particularly that which receives discipline-wide awards, has increasingly taken the form of sophisticated mathematics and analytical procedures, often with "policy implications" tacked on in conclusion. This portrait of the disciplinary aspect of agricultural economics should not be exaggerated. Agricultural economics remains a basically applied field, and most research remains oriented to real-world problems and issues. Put somewhat differently, while the vast bulk of agricultural economics research remains subject-matter or problem-solving in nature, the specific issues explored, the methods, and perspectives are often discipline-driven; the "new" or "contributory" aspect of a published article--what, in fact, makes it publishable--is increasingly not its policy implications, but rather its methodology.

This dual cast of applied-basic research in agricultural economics is a two-edged sword. On one hand, this trend has had several positive consequences. Improved training in theoretical economics has put agricultural economics on a sounder empirical basis, making published research more precise and analytically stronger than was the case three or four decades earlier. This improved training and the disciplinary research that it have afforded have enabled agricultural economics to begin to mitigate one of its most important limitations--its historical overemphasis on microeconomics and neglect of macroeconomics. Indeed, agricultural economics has long been criticized for deemphasizing macroeconomics, and the nature of the contemporary agricultural economy, in which macroeconomic phenomena such as interest rates and exchange rates have been pivotal, has dramatized the importance of a macroeconomic knowledge base. To the degree that there has recently been more attention to the macroeconomics of agriculture, it is largely an outgrowth of the tendency toward more thorough training in general economic theory as well as in the economic developments of the 1970s and 1980s. It has also likely been a reflection of the trend for recent cohorts of agricultural economists to come from nonfarm backgrounds. Finally, new tools in econometrics have enabled agricultural economics researchers to make progress in quantifying, and hence rendering more precise, phenomena that formerly were not quantifiable (e.g., "endogenous policy behavior").

On the other hand, there have been some significant problems with the strong trend to disciplinary research in agricultural economics. One, as stressed by Schuh (1986), is an increased tendency for disciplinary-oriented researchers to be primarily interested in communicating with each other, rather than with constituent groups. Intradisciplinary communication is, of course, not bad in and of itself. It becomes problematic only when it takes on a life of its own, creates increased barriers to transfer of information outside of the university, and lacks meaningful ties to subject-matter and problem-solving research.

Indeed, the major threat from of an increased emphasis on disciplinary research in agricultural economics is that it will lead to focusing on trivial problems that readily lend themselves to quantification. Along with the trend toward disciplinary research in agricultural economics there has developed a belief that, ceteris paribus, something that is quantified is inherently superior to something that is not. Unfortunately, not all important questions (from the vantage point of national policy and impacts on the dynamics of the agricultural industry and rural social structure, as well as constituent needs) can be easily quantified or involve data of sufficient quality so that methods in disciplinary favor clearly apply. Moreover, disciplinary econometric research has become increasingly removed from the cognitive plane at which most land-grant constituents operate, further increasing the threat of disciplinary research becoming irrelevant to problem-solving. As Schuh (1986) has lamented, these tendencies are currently being reinforced by new incentive systems in land-grant universities. These incentive systems, which are largely driven by interuniversity competition for prestige and funding and the increasingly thorough disciplinary training of new Ph.D.s, encourage young staff to do rigorous scientific analyses, sometimes of relatively trivial problems, and to publish as much of this material as possible in disciplinary journals. There currently is something of a generational conflict over this new incentive system. Older cohorts of agricultural economists tend more than their younger colleagues to favor a style of research in which, first, problems are selected for their importance (on the basis of constituent needs or interests, national relevance, etc.), and then the methods are chosen in terms of the dictates of the problem at hand. Younger agricultural economists, though still a clear minority, tend to be the most likely to begin from an economic theory or method and to select problems in terms of their suitability for inquiry with the preferred theoretical or methodological approach.

A further concomitant of the increased emphasis on econometrically-oriented disciplinary research has been the virtual disappearance of "institutional economics." Institutional economics has been almost totally eschewed by recent cohorts of agricultural economics Ph.D.s for disciplinary and career reasons. Virtually all contemporary practitioners of institutional economics are approaching retirement. Save for Michigan State, Wisconsin, and, to a lesser extent, Cornell, institutional economics hardly exists in the late 1980s.

The disappearance of institutional economics also has pluses and minuses. It has arguably decreased the prevalence of unsupported assertions passing as research. Yet the strength of institutional economics was its ability to focus on important questions and to deal with institutional realms--politics, power, social class, ideology, values, and so on--other than that of the market economy. Institutional economics was also more at home with macro phenomena (though generally not the issues surrounding fiscal and monetary policy and interest and exchange rates of major concern to macroeconomics) than was disciplinary neoclassical agricultural economics of a decade ago.

It should also be noted that the trend toward highly-quantitative, disciplinary neoclassical agricultural economics is occurring at a time in

which data availability is declining. Federal and other public data data series are being truncated, if not terminated, due to fiscal problems. Also, with fewer farmers and the increased frequency with which they are surveyed, it is becoming more and more difficult to acquire primary data sufficient for advanced econometric techniques.

Finally, agricultural economics, like the other rural social sciences that have been institutionalized within the land-grant system, tends to be quite parochial in the sense of lacking a comparative perspective on the other advanced industrial countries. The parochial character of the rural social sciences largely derives from the tendency for SAES administrators to steer as much of the research they support as possible to issues that pertain directly to their states. As a result, only a handful of agricultural economists has a strong base of knowledge on the farm and food economies of other advanced societies. Many opportunities for problem solving and institutional design based on the experience of other countries have no doubt been eschewed.

Rural Sociology

In contrast to agricultural economics, rural sociology has not exhibited a demonstrable trend toward more disciplinary research over the past decade or so. As noted earlier, rural sociology has never been so insulated from its parent discipline as has agricultural economics. Also, rural sociology research staff have not had the close, intimate, longstanding relationships with client groups that have characterized agricultural economics for some time.

The principal common trend affecting agricultural economics and rural sociology has been the tightening of standards for scholarly advancement and the increased incentive to publish many papers. This multiplication of published papers in rural sociology tends to have the effect of fractionalizing knowledge and to increasing the separation between theoretical reasoning and empirical data.

Despite this common trend, rural sociology as a discipline is undergoing changes that are substantially different from those of agricultural economics. Perhaps the most important is that rural sociology is currently in the process of being transformed from a peripheral to a more central research program in SAESs. For decades rural sociology was, to put it frankly, merely tolerated in SAESs. Rural sociology programs were maintained for teaching purposes and for their contributions to extension-oriented activities such as rural, community, and youth development. Perhaps with hesitation, SAES administrators have come to see the social sciences, especially rural sociology, as being crucial to many issues faced by the land-grant system.

Rural sociologists and their SAES administrators are, however, slowly feeling their way through this unexpected new partnership. Given the historic marginality of rural sociology in the SAES research enterprise, rural sociologists have not always been well prepared for their new role. Rural sociologists historically had often been critical of prevailing institutional arrangements, and it has sometimes been problematic to make the transition from critic on the periphery to policy researcher at the

center. There is probably fault on both sides. To effect public policy, the rural sociological social-critic impulse must sometimes be tempered. At the same time, land-grant administrators probably tend to expect results too soon, too easily, too mechanically, and too much on their own terms.

The increased centrality of rural sociology in the land-grant system is largely the fortuitous consequence of a major transition in the discipline in the mid- to late-1970s: the establishment of the sociology of agriculture as a largely new subject-matter area. This is not to say that rural sociology lacked a research tradition in agriculture before that time. From the teens to the 1940s, rural sociologists had actively researched agriculture and farm organization from the vantage point of rural life and community structure. During the 1950s and 1960s rural sociological research was heavily focused on the diffusion of innovations in agriculture. Nonetheless, the emergent sociology of agriculture tradition in the 1970s can be seen as a new subject-matter area in that its emphasis was on the antecedents and consequences of farm structural change as phenomena in their own right. Its emphasis was also largely macrostructural--particularly by contrast with the diffusion of innovations tradition. The sociology of agriculture, it should be emphasized, emerged autonomously within the discipline, unprompted by SAES administrators.

The rise of the sociology of agriculture over the past 10 to 12 years is also significant in its having mirrored the lack of articulation between theoretical and methodological advances in sociology and rural sociology. As the sociology of agriculture was being codified in the mid-1970s, rural sociology, much like the larger discipline, was exhibiting a strong trend to more sophisticated methodological procedures, which tended to be applied to microsociological or demographic research issues. The "sociology of agriculture movement" was in many respects a critique of the priorities, methods, and theories that characterized rural sociology over the preceding decades (see, for example, Newby, 1980). Persons actively involved in the early years of research in the sociology of agriculture frequently argued, for example, that: (1) rural sociology had overemphasized microsociological approaches to agriculture and underemphasized macrosociological or structural perspectives, (2) rural sociology was too dominated by functionalist approaches and had given too little attention to neo-Marxist theories, (3) rural sociology had tended to be biased toward researching questions that lended themselves to quantitative precision and had eschewed historical, documentary, and qualitative research methods, and (4) rural sociology had failed to take advantage of major theoretical breakthroughs in the larger discipline (see, for example, Goss, 1979; Newby, 1978). Accordingly, the bulk of the literature in the sociology of agriculture is structural (rather than microsociological) in orientation, and much of it is based on neo-Marxist or parallel neo-Weberian theories and on nonquantitative methodologies [2]. This literature also is arguably more

2. It should be emphasized, however, that the lack of articulation between theory and method and, more specifically, the nonquantitative character of the contemporary sociology of agriculture can be exaggerated. There have, for example, been a number of examples of exploring hypotheses from neo-Marxist theory in the sociology of agriculture with quantitative data (e.g., Perry, 1982). Also, the sociology of agriculture should not be seen as largely neo-Marxist and/or nonquantitative in nature. My argument

theoretically sophisticated and more rooted in general sociological theory than that in rural-community development, demography and population studies, and so on.

The sociology of agriculture thus exhibits a paradox. On one hand, its general characteristics--its tendencies to structural, political economy, nonquantitative, and disciplinary-theoretical approaches--would seem to make it less relevant to--perhaps even an alien presence in--colleges of agriculture. Yet, on the other hand, the sociology of agriculture is, in substantial measure, the leading edge of a more useful rural sociology in colleges of agriculture--a rural sociology that can grapple effectively with the complex economic, political, and ideological forces that now perplex and concern land-grant administrators and other public officials.

The paradox can be stated somewhat differently, by comparison with the contemporary status of agricultural economics as a discipline. Rural sociology, as typified by the sociology of agriculture, is less strong than agricultural economics in terms of quantitative precision. This is in large part due to the fact that in economics there is a close unity of theory and method due to their common rooting in advanced mathematics [3], while in sociology the theory community tends to emphasize conceptual innovations that are most suitable for historical and qualitative inquiry [4]. Theoretical innovations in sociology often take the form of developing notions for understanding the interrelations among institutions and the complex processes through which societies develop and change. Accordingly, rural sociology is stronger than agricultural economics in its ability to understand institutional interrelations and to place problems in a larger context.

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merely is that neo-Marxist, political economy, and nonquantitative approaches are more common in the sociology of agriculture than in the other subject-matter areas of rural sociology.

3. It should be noted, however, that this characterization of the unity of theory and method in mathematics in economics is moreso the case in North America than elsewhere. In many other western countries econometrics is not nearly so dominant in theoretical economics as it is in the U.S. Elsewhere institutional and Marxist economics is far more prominent than here.

4. For example, it is arguably the case that Anthony Giddens (1979, 1984) is the most productive, provocative, and influential theorist in western sociology today. Yet Giddens' theoretical work involves a conceptual vocabulary such that its empirical testing will in all likelihood remain confined to historical analysis (see, for example, Giddens' [1985] own test of his earlier [1981] ideas on capitalism and the modern state) or "interpretive" or "phenomenological" analysis. It should also be noted that U.S. sociology is substantially more quantitative--and the status and predominance of social theory as a specialty area far less--than in virtually every other advanced industrial country. Thus, the highly quantitative character of American sociology parallels the situation of its economics discipline.

Many will be tempted to conclude on the basis of this comparison that either agricultural economics or rural sociology is the superior or more useful discipline in terms of agriculture- and rural related problem solving. But I think a more persuasive assessment would be that agricultural economics and rural sociology are complementary disciplines; the strengths of the one are the weaknesses of the other. In particular, agricultural economics and rural sociology reflect the divergences of ideology and perspective that are so often manifest in major social policy issues in agriculture. Both disciplines, with their differing conceptual and methodological styles, are necessary for obtaining a broad perspective on policy issues within the land-grant system.

This assessment admittedly could be made far more confidently if there were a higher incidence of collaborative work between agricultural economists and rural sociologists. Historically, such collaboration has been rare, mainly because of conceptual, methodological, and ideological differences and of the lack of encouragement by land-grant administrators. Also, given the fact that agricultural economics staff at land-grant universities tend to outnumber rural sociologists by 4:1 or more, many agricultural economists no doubt feel little incentive to acknowledge that their poor cousins even exist. Many rural sociologists would rather work alone than be outnumbered and overwhelmed by agricultural economists.

There are, however, encouraging indications of greater collaboration between agricultural economists and rural sociologists in problem-solving research on issues of mutual interest (e.g., the Washington State University collaborative research on soil erosion and conservation referred to earlier). SAES administrators probably should have insisted on greater collaboration in the past and should see it as indispensable today.

It was noted earlier that perhaps the biggest strain in agricultural economics today is a largely generational difference of perspective about whether methodological matters should drive the selection of research topics. The principal strains in rural sociology tend to be substantially different. One such strain, which is probably most manifest in the 40 percent or so of rural sociology programs that are attached to larger departments of sociology, is the degree to which these rural sociologists should be attentive to one or the other of their dual masters: SAES officials in colleges of agriculture or sociology chairs and deans in colleges of arts and sciences. In a sense, then, there has been a longstanding struggle over how "rural" a rural sociologist should be in order to make an appropriate contribution to the SAES which provides a partial salary. Accordingly, for many rural sociology programs housed in liberal arts sociology departments there are typically stresses and strains between the arts and sciences and SAES sociologists. Arts and sciences sociologists are typically most concerned with their national visibility in the discipline, feel that their rural sociology colleagues help very little in this regard, and tend to invoke higher publication and disciplinary standards for tenure and promotion than the rural sociologists or the SAES would like. Rural sociologists in these dual programs often struggle with their arts and sciences colleagues over whether rural sociology extension is an appropriate activity for a department of sociology.

The strains between arts and sciences and SAES sociologists are obviously fewer in universities where rural sociology has a separate department or a joint department with agricultural economics. However, at universities where rural sociology is located outside of an arts and sciences sociology department, the relations between the two groups of sociologists are generally poor. Often, these rural sociology departments must operate totally separate, self-contained programs (with the duplication of effort and lack of economies that this implies) because of the fact that they have no influence on the curricula of arts and sciences sociology departments.

As suggested earlier, rural sociology, while somewhat more cosmopolitan than agricultural economics in its closer ties to its parent discipline, tends to be equally parochial in its lack of a base of comparative knowledge. Again, this lack of a comparative perspective on social institutions and problem solving derives from the tendency for SAES-funded rural sociology research to be focused on problems directly related to a particular state.

Finally, it should be noted that unlike agricultural economics, which has decent-sized programs at virtually all land-grant universities, rural sociology programs are very unevenly distributed across the land-grant system. About 10 land-grant universities have no rural sociologists at all. Another 15-20 have one to three rural sociologists, which is too few to have anything beyond a bare-bones teaching, research, and extension program. Only about a dozen land-grant universities have rural sociology programs of sufficient size to offer the Ph.D. degree and to be a major presence in their SAESs. These larger, Ph.D.-granting rural sociology programs have five or more faculty. Whereas agricultural economics departments often have 40 or more faculty, rural sociology programs with more than 10 faculty are quite rare. The largest of rural sociology programs in U.S. land-grant universities have slightly more than a dozen faculty.

Anthropology

Anthropology is the first of the nontraditional rural social sciences to be considered in this paper. Of the three nontraditional rural social sciences I will discuss, anthropology has the greatest presence in SAESs at the present time. While no SAESs, to the best of my knowledge, support rural or agricultural anthropology programs, there are currently several anthropologists appointed in SAES positions (generally in rural sociology, community development, and home economics programs) across the country. Nonetheless, it is very uncommon for anthropologists appointed in SAES positions to have any connection with their disciplinary department in a college of arts and sciences.

Anthropology as a basic discipline is older than sociology, having emerged as a discipline focused on the study of nonindustrial societies. The traditional foci of anthropology have been archaeology/physical anthropology (the study of prehistorical peoples) and social/cultural anthropology (the study of contemporary preindustrial societies and tribes). Thus, there has historically been a clear division of labor between anthropology and sociology, with the former focused on prehistorical and preindustrial societies and the latter on contemporary,

modern societies. It should be noted, however, that this division of labor is somewhat arbitrary and has begun to break down over the past one or two decades; contemporary anthropologists have begun to devote greater attention to modern industrial and developing societies while sociologists have done an increasing amount of research, occasionally on preindustrial societies, using historical methodologies (Chibnik, 1987).

Anthropology has historically been the least quantitative of all the mainline social sciences. While, for example, most sociologists or rural sociologists will at least occasionally employ quantitative methods, contemporary anthropologists do so infrequently. The tendency toward nonquantitative research is a reflection of the importance of the study of prehistorical societies in anthropology. It is also a concomitant of anthropological theories that stress the importance of "deep" (and, hence, not directly measurable) cultural phenomena and of the unity of the institutional realms of society in the complex totality referred to as "culture." Anthropological methodology typically revolves around intensive fieldwork and very close familiarity with the thought and activities of the subjects of research. Anthropologists rarely rely on survey or documentary data, since such approaches would not afford the in-depth understanding of society and culture that is stressed in the discipline.

Anthropology currently plays its major role in agricultural problem solving in the area of international development (see, for example, DeWalt, 1986). Anthropologists' skills have proved to be quite valuable in field-work-intensive international agricultural technical assistance projects. Only a small amount of this anthropological research in international development projects is done in connection with the land-grant system, however. The vast bulk is undertaken through international development agencies such as AID, the international agricultural research centers, and so on. There have, nonetheless, been a number of anthropologists who have been hired on land-grant-administered agricultural development projects over the past decade, though few of these anthropologists have permanent appointments in an SAES.

Domestic agricultural and rural development has only recently been a significant focus in anthropology. Save for a few pioneers such as Goldschmidt (1947) and Bennett (1982) (all of whom, to my knowledge, had no connection with the land-grant system), very few anthropologists did work of this sort prior to the mid-1970s. The diversification of anthropology into domestic (and international) agriculture is probably, at least in part, a reflection of the tight job market in traditional academic anthropology and of the need to make anthropology more relevant to applied or problem-solving concerns. There is now a flourishing community of several dozen scholars who do agriculturally-oriented research under the rubric of the Anthropological Study Group on Agrarian Systems. Many of these anthropologists have close relationships with rural sociologists who share common interests. A good many are members of the Rural Sociological Society and active participants in the Society's annual meetings and other activities. Indeed, there are strong commonalities between the work done by members of the Anthropology Study Group on Agrarian Systems and that done by many who work in the sociology of agriculture.

It is my observation that while the tightness of the anthropology job market has led to more attention to agriculture and other applied matters, the legitimacy of applied anthropology in the American Anthropological Association is probably no greater--and perhaps may be less--than it was a decade or two ago. That is, as the funding for anthropological fieldwork abroad through traditional sources such as the National Science Foundation has become tighter, the response of the major departments of anthropology to scarce resources has been to "purify" the discipline and make it more scholastic. This will mean that the encouraging growth of applied anthropology in areas such as international development and domestic agriculture will depend on the ability of these anthropologists to secure positions in development agencies, land-grant universities, and other nontraditional employing organizations. The reinforcement of the scholastic nature of anthropology may also make it more precarious for persons interested in applied anthropology to receive a Ph.D. from a major anthropology graduate program (though economic anthropology, the specialty area of anthropology most germane to agricultural problem solving, continues to be a recognized and viable component of the larger discipline).

Anthropology has several strengths in relation to rural- and agriculture-related problem solving. One is its more comprehensive understanding of culture and human values than is typically the case in rural sociology and the other rural social sciences. Another is the tradition in anthropology for detailed, comprehensive, multiple-method field work, which provides a more thorough understanding of particular cases or situations than is usually afforded by practitioners of other social science disciplines. The work of anthropologists is often nicely complementary to that of rural sociologists, since they are often interested in very similar phenomena but use different theories and methods. Anthropology's weaknesses are its tendency to functionalist theorizing [5] and to downplaying phenomena such as social power and conflict. Anthropology has, in particular, been ineffective in conceptualizing the political structures and politics of advanced industrial countries. Anthropologists, because of their tendency to use nonquantitative methods, sometimes find their work being rejected by "harder" scientists, including rural sociologists and agricultural economists.

Political Science

There are, to my knowledge, no political scientists who are appointed in SAESs in the U.S. This is, in a sense, surprising, since so many of the problems faced by SAESs and agricultural researchers today are irreducibly political in nature (see, for example, Hadwiger, 1982). Nonetheless,

5. Functionalist theories are those that explain social phenomena with reference to the "functions" they provide in meeting the "needs" of society as a whole. Functionalist theories thus may tend to be teleological (i.e., the phenomenon to be explained is simultaneously used as its own explanation) and to have a conservative bias (i.e., there is an implicit assumption that if a phenomenon exists, it must be functional in some way for the society).

political science, much like anthropology, has almost totally remained an arts and sciences discipline even though every land-grant university has numerous political scientists on its faculty.

The absence of political scientists from SAES programs has several explanations. First, agricultural politics is a very minor area of political science, and the number of political scientists who specialize in this area is probably no more than a couple of dozen. Thus, most land-grant universities lack a political scientist whose major area of work is agricultural politics or policy. Second, given the lack of prominence of agricultural politics within the discipline, its status as an area of work and as a focus for graduate training in political science is even more precarious. Third, SAES officials probably have, until recently, been hesitant to acknowledge the political aspect of their programs by supporting the work of political scientists.

Despite the low stature of agricultural politics within the discipline and SAESs, agricultural politics is of immense relevance to rural and agriculture-related problem solving. Given my earlier comments, no further elaboration is necessary on this point. Nonetheless, there are several political scientists (e.g., D. Hadwiger, R. Talbott, R. Hopkins, D. Puchala, W. Browne, K. Dahlberg) who have done sufficiently sound work on agricultural and international development politics that they have been able to secure the respect of their political science colleagues and to make significant contributions to ongoing policy debates relating to agriculture and rural America.

One of the unfortunate consequences of the dominant position of agricultural economics in SAESs is that the area of agricultural policy is de facto considered to be the almost exclusive province of this discipline. Accordingly, the agricultural policy work done in the land-grant system tends toward being technical exercises which proffer policy suggestions that should be adopted by rational policy makers if there were not a highly politicized overlay of competing interests and a political structure that decisively limits policy options. But there is, like it or not, a politics of agriculture that must be understood and taken into account in agricultural policy analysis. Political scientists are in a unique position to contribute to agricultural and rural policy analysis--and hence to contribute to problem solving. Other social science disciplines have important insights to offer as well. Unfortunately, the land-grant system has elected to restrict agricultural policy research to only one discipline, and the country and the land-grant system are poorer for it.

One of the key strengths of political science in complementing the other rural social sciences is that this discipline is substantially more oriented to comparative knowledge and insights than are the major rural social sciences. Comparative politics is one of the major areas of political science and is significantly more prominent in this discipline than are comparative sociology or comparative economics in theirs.

Twenty years ago political science was largely a nonquantitative discipline--far less quantitative than sociology, for example. Since that time political science has become far more quantitative, and today it is equal to or greater than sociology in the extent to which quantitative

methods are used in papers in major disciplinary journals. Agricultural politics, however, has largely remained a nonquantitative specialty area of political science. It is unclear whether this is largely due to the subject matter or to the training that agricultural politics specialists have received.

History

There are virtually no historians appointed in SAESs, despite the fact that agricultural history is of palpable relevance to land-grant institutions and the fact that agricultural history has been in existence for many decades. For example, Agricultural History, the journal of the Agricultural History Society, has been published since the 1920s. This absence of agricultural history from SAES programs has likely been the case for two reasons. First, the institutionalization of the land-grant social sciences largely derived from the Country Life Commission and the agricultural extension movement of the first two decades of this century (see, for example, Danbom, 1979), and there was no call for a major role for history in the SAESs, to the best of my knowledge [6]. Agricultural economics and rural sociology became established in the aftermath of the publication of the Commission report, while rural and agricultural history did not. Second, agricultural history, much like agricultural politics in political science, has tended not to a high status area of work in the larger discipline of history. Today there are very few faculty in major, nationally-respected departments of history who identify themselves as agricultural historians [7]. The bulk of contemporary agricultural historians are located in second- or third-tier universities (in terms of the reputed strength of graduate programs in history). Without the generosity of the University of California, Davis and the Economic Research Service of the U.S. Department of Agriculture the Agricultural History Society would probably have a difficult existence. Nonetheless, because of the marginality of agricultural history in the discipline of history and in its major Ph.D.-granting departments, there are few agricultural historians in American universities, including but not limited to land-grant universities.

Agricultural history is arguably of less direct relevance to rural- and agriculture-related problem solving than the two other nontraditional disciplines discussed previously. Given the very subject matter of this discipline--especially the emphasis on historical precision and detail--historians will not often have the tools and background for solving problems of the here and now. Not only do historians have relatively little background in the specifics of contemporary agricultural problems and institutional structures, but the discipline of history tends to deemphasize generalizing theories about the connections between historical data and larger patterns of social change. But agricultural and rural

6. This is, in a sense, ironic, in that many of the leaders of the land-grant system at the time of the Country Life Commission were trained in the humanities.

7. By comparison, agricultural history is a highly respected specialty in departments of history in most European universities.

history can be said to be of demonstrable indirect significance in delineating the context of problem-solving research and public service in land-grant institutions. Students in colleges of agriculture today tend to receive virtually no background on the historical development of American agriculture and agricultural institutions, especially about the agricultural colleges at which they study. Land-grant administrators and scientists likewise tend to have a selective historical vision, largely confined to the positive contributions of their land-grant institution to agriculture in the state. Seldom, for example, have students, faculty, and administration become aware of the research by A. I. Marcus, R. S. Kirkendall, M. W. Rossiter, or D. B. Danbom on the conflictual and meager scientific character of the agricultural colleges and SAESs in the late nineteenth and early twentieth centuries. Seldom has the land-grant community been aware of the work of P. W. Gates on the subversion of the Homestead Act by rampant land speculation, the widespread tenancy and indebtedness that resulted, and the connections between the founding of the land-grant colleges and farm real estate speculation.

Our tendency in the land-grant system to ignore our history and to paint self-serving historical portraits innocent of actual historical data is, at a minimum, one of the alarming limitations of land-grant undergraduate programs. The lack of a historical perspective on agriculture and agricultural research is part of a larger pattern of neglecting the liberal arts in undergraduate instruction in agriculture--a problem that only recently has begun to be addressed due to its having been prompted by catastrophic declines in college of agriculture enrollments across the country [8].

A more historically-informed land-grant milieu might also indirectly improve the scope and quality of problem-solving research in the SAESs. Historians are in a unique position to educate us all about the rapidity of change in the past as well as historical continuities that are not often recognized. For example, in this centennial year of the Hatch Act it is striking that technological change and transfer have become highly politicized, much like the situation of the agricultural colleges at the time of the passage of the Hatch Act. The implicit role of historians--debunking extant historical mythology promulgated out of self interest along with placing the present in historical context--is very much needed in today's land-grant system. As technological development and transfer have become more politicized, uncertain, and subject to accountability to external groups, we seemingly alternate between celebration of imagined utopias of the past and congratulation of the ability to solve the problems of the present. Closer integration of agricultural history into the land-grant system would help us to place the present in context and to learn from the past.

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8. It should also be noted that, somewhat ironically, one of the major forces behind reevaluation of land-grant undergraduate curricula has been agribusiness criticism of the training of agriculture students. Agribusiness has become increasingly critical of land-grant university curricula which, in their view, place too much stress on the traditional production sciences (e.g., agronomy, horticulture) and underemphasize training in the basic biology, the liberal arts, and writing.

Philosophy and Ethics

Philosophy is the epitome of the learned disciplines that the architects of the Morrill Act and the land-grant system hoped to overwhelm with practical science, pragmatism, and concern for the "common man." The vision behind the land-grant system was to create a more democratic system of higher education that would reduce the role of the aristocratic disciplines that dominated private universities during the mid-nineteenth century and to substitute practical curricula geared to the needs of the rank-and-file of rural people. While every land-grant university today has a philosophy department, the land-grant system has "succeeded" in steering the college of agriculture curriculum away from the humanities and in emphasizing matters scientific, technical, and pragmatic. We are now just realizing the costs of this narrowing of background and vision.

A decade ago there was probably not a single philosopher with any significant connection to a college of agriculture. This has changed to a small degree over the past several years, thanks largely to the role of the W. K. Kellogg Foundation in spearheading a national "Agriculture and the Liberal Arts" program [9]. Still there are probably a half dozen or fewer philosophers, broadly construed to include "ethicists" of various stripes, in colleges of agriculture today.

Unlike agricultural history or agricultural politics, there currently is no large subdisciplinary cadre in the area of "agricultural ethics" that can make an immediate contribution to the land-grant system and its problem-solving activities. Philosophy today, not unlike the situation in the mid-nineteenth century, remains a very scholastic discipline. Applied philosophy is generally not highly valued in the discipline. There are only a few substantive areas in which applied ethics is considered an appropriate disciplinary activity (e.g., biomedical and legal ethics), and agriculture is clearly not among them. With the partial exception of the University of Florida, graduate training in agricultural ethics does not exist.

Philosophy and applied ethics can make several contributions to the land-grant system and problem solving. By prompting agricultural scientists and research administrators to consider issues they face from an ethical standpoint, their vision may be broadened and the quality of their work improved. Students, faculty, and administrators could all benefit from acquaintance with the perspective of philosophy of science (particularly in terms of the critique of positivism and the limitations of positivist approaches to problem solving). It should be noted, however, that philosophy of science has been one of the most common areas of philosophical inquiry and has been available to college of agriculture undergraduates for decades, with little interest on the part of either land-grant students or faculty.

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9. Other precipitating factors leading to a larger role for philosophers in colleges of agriculture have been curriculum concerns (see fn 8) and the fact that many issues now facing the land-grant system (e.g., animal rights, patenting of novel life forms) have an "ethical" component.

Agriculture is among the last of the major professions to welcome philosophers and ethicists into their fold. A good many schools of law, medicine, and business have staff philosophers or established linkages with ethicists. But even the more forward-looking professions with many years of experience with ethicists tend to look to philosophical input in a fairly mechanical way--one that may not be compatible with the work a philosopher would prefer to do. Professional schools, organizations, and other institutions want philosophical input so that practitioners can be given guidelines for avoiding "unethical" conduct (and so that the professional group can avoid embarrassing public scrutiny). This dichotomization of individual conduct into the ethical and unethical typically is alien to a disciplinary philosopher or ethicist who will often resist such a "cookbook" approach to matters ethical and moral.

The future of philosophy, ethics, and the other humanities in colleges of agriculture is quite unclear at this time. Through the Kellogg Foundation program, these humanities disciplines have a discernible, but tenuous footing in agriculture colleges. With the impending termination of Kellogg funding, the future of these efforts lies in the priorities of RICOP and in the response of colleges of agriculture to declining enrollments. It is probably sad but true that linkages between the humanities and agriculture are now stronger and more secure in the liberal arts colleges that have received Kellogg funding than in the land-grant institutions that have been funded. This is probably because of the absence of agricultural scientists and other professionals in liberal arts colleges and the greater latitude on the part of philosophers and ethicists to do their work on their own terms. But, unfortunately, the growth of agricultural ethics programs in liberal arts colleges will have little impact on agricultural practitioners and the research and decision making they undertake.

Geography

Many reject the very notion that geography is a discipline, strictly speaking. Geography is arguably more eclectic than economics, political science, sociology, anthropology, and history. In fact, geographers are often given to borrowing freely from the theoretical traditions of the other social sciences, particularly economics. Geography and its closely related fields of regional science and urban and regional planning can perhaps best be viewed as "interdisciplines."

Geography is a field of enormous diversity. Not only does its (largest) branch draw on several of the major social sciences and exhibit a wide range of specialty areas--regional geography, economic geography, geography of development, agricultural geography, environmental geography, geography of natural hazards, geography of urbanization, and so on--but the discipline also contains a minority of physical geographers who draw just as eclectically on meteorology, geology, soil science, botany, and the like. Even in agricultural geography there is great heterogeneity. The diversity of agricultural geography can be gauged, for example, by

contrasting the work of Fuller (1984), Gregor (1982), and Vogeler (1981) [10].

Geography is of substantial relevance to the land-grant system. Clearly, its principal relevance would be in the area of rural development. Economic geography--especially the geography of industrial and employment location--could be highly complementary to the work of sociologists and economists who work in the rural development area. This field of geography is also a fairly large one, with most land-grant universities having one or more geographers whose work has relevance to rural development.

Agricultural geography is potentially even more directly germane to SAES programs. Research in the geography of agriculture could be highly complementary to agricultural economics and rural sociology research, especially since both of the mainline rural social sciences tend to give relatively little attention to spatial aspects of agricultural economies and social structures. Agricultural geography, however, is not a large specialty area in the discipline, and the typical land-grant university lacks a person with such expertise. Again, it would appear that the small size of the agricultural geography community is accounted for by same reasons that have led to the modest scope of agricultural history. In particular, agricultural geography is not a high status specialty area in the discipline, particularly by comparison with its higher status in most European countries.

The Agricultural-Rural Research and Information Delivery System

The agricultural-rural research and the agricultural-rural information delivery systems are currently at a crossroads, the outcomes of which are quite unclear at this point. Most broadly speaking, the agricultural-rural research system finds itself cornered in the midst of a triangle of forces over which it has little leverage. These triple forces are as follows: (1) National-level institutions and organizations, primarily agribusiness firms and the executive branch of the federal government, want the land-grant system to undertake a nationally coordinated effort to pursue basic biological research, largely for generic application across the country. These results of this research into new opportunities for increased agricultural productivity are to be transferred to industry for their own benefit and to assist in the U.S. effort to compete in high technology with other countries. (2) Public interest groups and other social justice and environmental critics of the land-grant system want the land-grant system to restrain the development of (actual or potentially) socially and environmentally disruptive technology and to put the needs of people above the imperative of efficiency. These groups prefer that efficiency and productivity in the traditional sense be downplayed as criteria for research problem choice and that new criteria--ecological sustainability, the needs of small and family farmers, human health and nutrition--be pursued with equal or greater vigor. (3) State-level groups and institutions, historically the major constituencies of the land-grant

10. Fuller's approach is largely sociological, Vogeler (1982) sees his book as being an "interpretive atlas," and Vogeler is a Marxist political economist.

universities, want the land-grant system to continue to give highest priority to the needs of traditional state client groups and to be cautious about diverting land-grant resources to pursuing national agendas.

In some ways extension, the bulwark of the land-grant system's information delivery system, faces a similar triangular configuration of forces and pressures. The federal government, particularly the Office of Management and Budget, wants extension to serve national needs, rather than merely to coordinate a patchwork of state-oriented programs. Social justice and environmental critics of the land-grant system want to heighten the social and ecological sensitivity of extension staff and to induce extension to expand its clientele in the direction of small farmers, organic farming, and so on. Established state-level client groups jealously guard their prerogatives against encroachment by national and social justice/environmental competitors.

In addition, extension faces further problems--particularly its severe fiscal problems and the fact that the traditional county-agent-based extension system has begun to lose its relevance in the current milieu of agriculture. Ironically, at the same time that social justice and environmental critics of extension began to scrutinize extension's tendency to work most closely with large farmers, many of these large, technologically-dynamic farmers were beginning to bypass extension as their principal source of technical information. As farmers become increasingly well educated, many have technical backgrounds that rival those of county extension staff. These farmers have increasingly come to rely upon agribusiness sales representatives, private management consulting services, and direct contact with land-grant faculty as information sources. Thus, whereas the land-grant research system faces competing claims on its services and allegiance, extension's problem is, in part, the ominous trend for some of its historically important client groups to go elsewhere for services.

These dilemmas facing the larger research and extension systems are currently being experienced unevenly across the rural social sciences. Agricultural economics, for example, has historically been, and continues to be, very closely tied to state client groups, mainly through extension. Rural sociology, on the other hand, generally has close relationships with client groups only in its rural-community development extension and public service programs; rural-community development, however, does not have a large research base (i.e., it is heavily extension oriented) and is progressively being downplayed by the majority of land-grant universities. There is, as yet, only a small extension component in the sociology of agriculture, despite the fact that the research base in the sociology of agriculture has expanded by leaps and bounds over the past decade and is already quite substantial. Also, rural sociology, community development, the communication sciences, and perhaps other rural social sciences are among the land-grant departments that rely least on extension for information transfer, which at times creates discomfort among extension administrators. In contrast to the SAES biological sciences, there is generally little pressure on the land-grant system from national-level institutions for the research services of the rural social sciences. Finally, the land-grant social sciences, especially rural sociology, are in some sense a contributor to the pressures currently being exerted on the

SAESs and extension by public interest groups (e.g., by conducting ex ante socioeconomic impact assessments of new agricultural technologies that are drawn upon as ammunition by public interest groups). Not surprisingly, many land-grant administrators are less than happy when their own staff help add to these pressures and especially when they represent an internal source of opposition to the traditional priorities of the research and extension systems.

I would, admittedly somewhat unconfidently, offer some observations on why the SAES social sciences tend to accomplish less than they could. First, my experience at several land-grant universities suggests that SAES administrators, who are primarily recruited from the biological and physical sciences, tend not to understand the social sciences very well and tend not to have a broad sense of the range of contributions that the social sciences can make. Each SAES should ideally have at least one social scientist among its research directors in order to increase the likelihood that the rural social sciences will be used most effectively. Second, the rural social sciences appear to be underused in terms of collaborative research with scientists from the nonsocial science disciplines. SAES administrators should create incentives to encourage such collaborative research, the specific composition of which would depend on the strengths of a particular SAES' social science staffs.

Third, it is my observation that SAES administrators tend to have major limitations in evaluating the performance of the rural social sciences. Other than generating grants and publishing papers, the principal criterion employed in evaluating the rural social sciences tends to be the effectiveness of the linkage between research and extension. The extent of research-extension linkages is not an irrelevant criterion, but perhaps a more important criterion would be the linkages between disciplinary, subject matter, and problem solving research. For large social science departments, such as agricultural economics, this criterion should be applied to a department as a whole. For smaller social science programs, as rural sociology tends to be, the criterion would need to be applied with reference to the SAES social science departments as a whole.

Fourth, I am persuaded by the notion that many SAES and land-grant administrators have yet to grapple on an intellectual basis with the social forces that affect their programs. Many still seem to hold out hope that the increasingly politicized milieu of agricultural research of the past decade will disappear. Many yet view the symbols and personalities of the past two decades--Rachel Carson, the Pound Report, Jim Hightower, Jeremy Rifkin, organic farming--as aberrations that are destined to disappear sometime soon. It is my guess, however, that the research politics of the past two decades is here to stay. To the degree that this is the case, the rural social sciences should be integral to problem solving and institutional restructuring.

Fifth, it is surprising how little the land-grant social sciences have been employed to do research on the land-grant system. Social scientists have many skills that could be allocated effectively to researching the organization and effectiveness of research and extension. To date very little of this type of social science research has been done. These efforts have been largely confined to IR-6 (which has coordinated the

"returns to research" activities of agricultural economists), to a small cadre of rural sociologists who work in the area of the sociology of agricultural research, and to occasional social science research in international technical assistance projects. Social science research resources should be drawn on far more aggressively in assisting in the design and evaluation of agricultural research and information delivery systems.

These preceding observations largely apply to extension and the larger information delivery system as well. In addition, it can probably be said that extension organizations have been even less given to internal critiques and less aware of the broader social forces affecting the land-grant system than have their SAES colleagues. Extension largely functions within a state-bounded milieu, so that many extension administrators do not experience the national and international forces affecting the land-grant system in the course of their daily work.

Arguably because of the historic lack of flexibility in the extension system over the past two decades, extension now finds itself in a crisis. Ongoing reactions to the crisis may lead to some long-overdue changes--particularly the expansion of extension clientele, a major revamping of the county-agent-based information delivery system, and the conduct of applied research by extension faculty. But there is also some threat of overreacting or making more radical changes than may be warranted.

For example, a recent report of the Commission on the Future of the Cornell Cooperative Extension System, appointed by Cornell President Frank Rhodes, has proposed some far-reaching changes that may be too much of a good thing. These recommended changes include: (1) a significantly increased emphasis on "urban extension," (2) the establishment of an industrial extension service in connection with the College of Engineering, (3) greater emphasis on water pollution and solid waste management, (4) expanded programs to help the elderly and immigrants become more active participants in society, (5) expanded programs to assist youth in metropolitan areas to achieve productive employment, (6) new programs to solve problems of homelessness and a lack of affordable day care, and (7) major efforts to solve public health problems such as premature birth, low birth weights, high infant mortality, and AIDS. Accordingly, the Commission recommended that extension services to farmers be reduced.

To the degree that these changes recommended for Cornell Cooperative Extension are implemented, it would come perilously close to becoming a social service agency. Not surprisingly, the state Farm Bureau was quick to express its displeasure with the new directions recommended for Cornell extension. Moreover, this dramatic proposed expansion of the programs and clientele of Cornell extension may have little or no payoff in terms of bolstering the political support base of the land-grant university.

Extension stands in need of a major restructuring. But the changes that are made should be carefully selected, preferably on the basis of research which considers the two major roles of extension: transferring information to client groups and building political support for the land-grant university.

Two other principles should be considered in redesigning the land-grant social science research and information transfer system (as well as the research and information delivery system as a whole). First, as sketched several times in the foregoing, the land-grant system currently finds itself at the center of a number of socioeconomic forces and interests. The long-term legitimacy of the land-grant system will likely lie in assuming a posture of institutional neutrality. The land-grant system must be perceived as being neither captured by nor hostile to any of its clientele groups: big farmers or small farmers, "conventional" or "organic" farmers, state-level or multinational agribusinesses, public interest groups and private interests, and so on.

Second, colleges of agriculture and home economics should bear in mind that they are only part of--rather than the entirety--of land-grant universities. That is, universities as a whole, rather than merely colleges of agriculture and home economics, have been assigned the land-grant mission. This means, on one hand, that agriculture and home economics colleges have no necessary monopoly on agricultural and rural matters and, on the other, that land-grant administrators often have untapped resources (including but not limited to the "nontraditional rural social sciences") elsewhere in the university to draw upon.

Most faculty in contemporary land-grant universities--in agriculture and home economics as well as the liberal arts and professional colleges--understand the nature of the land-grant university only very little. Liberal arts and professional college faculty rarely see themselves as part of a land-grant university and its mission. Agriculture and home economics faculty see agricultural and rural matters as their exclusive province and often resent it when others claim expertise or interest in these areas. As my colleague Lawrence Busch has suggested, one of the most healthy things a land-grant university could do would be to reaffirm publicly its land-grant commitment as a university as a whole. Such a reaffirmation would not only have important public relations benefits, but may over time expand the resources that agriculture and home economics staff can call upon in problem solving research.

Some Concluding Comments on the Status and Future Roles of the Rural Social Sciences

In my view, the rural social sciences have made major strides over the past decade. Yet there remain several significant limitations to the social science research effort in colleges of agriculture and home economics. These problems cannot be attributed solely to either the disciplines or land-grant university administrations; each bears some responsibility, and each must be part of the solution.

From my perspective the major limitations of the rural social science effort are as follows. First, there is a far too rigid division of labor among the rural social science disciplines and the rural social science programs in SAESs. For example, agricultural policy is generally the exclusive province of agricultural economists, even though several other disciplines could make major contributions to agricultural policy analysis. At the same time, agricultural economics has largely moved out of rural-

community development, and on many campuses this work is largely relegated to rural sociology. With the exception of a handful of agricultural economists, rural sociologists tend to be the only rural social scientists interested in devoting major effort to research on farm structural change. By the same token, one of the more encouraging developments in the rural social sciences is that a number of disciplines are beginning to focus on the causes and consequences of technological change in agriculture. The increasingly multidisciplinary character of research on technology change should be a blueprint for militating against the specialization present in most other areas of rural social science research.

Second, the incentive systems in colleges of agriculture and home economics are such that scientists--be they social, biological, or physical--are given the greatest rewards for conducting disciplinary research and publishing many papers. The shift of land-grant incentive systems is this direction is not entirely unwelcome in that land-grant research historically has tended to be parochial and not as productive as it could be. But there are several possible concerns about the nature of these evolving incentive systems. One is that decisions about promotion, tenure, and rewards have de facto been increasingly transferred to professional organizations whose journal editors and well-placed scholars have tremendous influence over land-grant personnel decisions. Another concern is that disciplinary research may have little or no relevance to or implications for problem solving. Further, the structure of the incentive system may steer future cohorts of the best and brightest of graduate students away from problem-solving research.

Fourth, as noted earlier, there has been relatively little attention to the linkages between disciplinary, subject matter, and problem solving research in the rural social sciences. The biological sciences in the land-grant universities are probably well ahead of us in this regard, since the trend to basic research in SAESs has at least raised the issue of the articulation between research efforts at various points along the continuum from basic to applied [11]. Land-grant administrators, department chairs, and professional organizations have done relatively little to address this issue in the social sciences.

Third, rural social science research is largely uncoordinated with the "production sciences" in the land-grant system. This comment should not be construed to imply that social science research should be approached merely as an adjunct to the technical activities in other land-grant departments. Rather, the social sciences typically have little influence on the research of other departments and vice versa. It is only recently that the land-grant system has encouraged multidisciplinary team research on high-priority problems.

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11. This is not to suggest that the biological sciences have solved the problems of articulating research along the continuum from basic to applied. Rather, the articulation between basic and applied research is an issue that is more widely discussed and considered to be a more important issue in the agricultural-biological sciences than in the rural social sciences.

Fourth, virtually no efforts have been made to incorporate the "nontraditional social sciences" (anthropology, political science, history, and philosophy) into the land-grant social science effort. It would, of course, be gratuitous to recommend a major financial commitment to the nontraditional social sciences at this time of general fiscal austerity in the land-grant system. Nonetheless, the traditional rural social sciences lack some major areas of expertise in problem solving that can most readily be provided by persons from the nontraditional disciplines. Judicious incorporation of faculty from these nontraditional disciplines would, moreover, reinforce the notion that universities as a whole, not colleges of agriculture and home economics alone, have land-grant responsibilities (and opportunities).

Finally, owing largely to the ample funding of the land-grant system during the three decades after World War II and the historically anarchic system of research problem choice in SAESs, the rural social sciences have done little to establish collectively priorities for future research. I regret that time limitations have prevented me from considering the priority-setting activities that have been undertaken thus far by and for the rural social sciences. Nonetheless, given the prospect of tight funding in the future, the rural social science disciplines have a responsibility to assist SAES administrators in allocating their social science research resources more effectively. For the rural social sciences to obtain special research appropriations from the federal government (e.g., as ESCOP has been able to do for biotechnology), they will need to demonstrate that the particular area of research is of high scientific priority and of major importance to a broad segment of the population. Statements of priorities, however, should be more than a ranked list of topics. Statements of priorities, to be realistic and useful in an agricultural research system in which annual SAES research expenditures vary from roughly $4 million to $80 million, must take into account the extant division of labor among SAESs. Some SAESs, for example, will be in a position to do a great deal of disciplinary research, and others very little. A generic statement of priorities will be more applicable to some states than to others. Priority setting can be done well or done poorly [12]. Nonetheless, statements of priorities are an important exercise of peer judgment and collective grappling with past accomplishments and future needs.

12. For example, statements of priorities may be motivated more by narrow disciplinary concerns (especially defense of its funding base) and thus reinforce existing divisions of labor between the disciplines.

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Chapter 6

PANEL DISCUSSIONS

Richard P. Haynes*

By beginning with Jefferson and focusing on the struggle between industrializers and agrarianizers Richard Kirkendall's paper reinforces what I shall call the establishment version of the farm crisis debate. This version focuses attention on the desirability of preserving the "family farm." In doing this Kirkendall ignores other traditions which are more connected to "alternative" agriculture. Contemporary agrarianists should not lose hope, Kirkendall argues, for there is a certain resilience and natural advantage to the well-managed family farm that will ensure its survival in some quarters. But that is no consolation to agarianists like Wendell Berry. A well-managed family farm may still be highly industrailized - dependent upon inputs which are produced off-farm by means of a technology whose components can be mastered only by specialists. While the skills in using this technology can be passed on to other family members on the farm site, the externalized production costs that Berry is so concerned about may elude the grasp of this farmer. The model of the caring farmer that Berry develops finds little place in the agrarian tradition that agrarianizers have appealed to. To find that model, one must go outside of the style of agriculture imported from Europe, a style whose impact on the environment has been described by William Cronon in his book Changes in the Land. Kirkendall mentions in passing US policies designed to "reduce savagery" by taking the use of lands out of the hands of indigenous people. But if his history had started at an earlier date, and included an account of the social and environmental changes caused by the agriculture practiced by the European "settlers", alternatives to the common orthodoxy shared by both agrarianizers and industrializers would be more apparent. Components of Berry's vision of agrarianism is shared today by various practitioners of "alternative" agriculture. The agricultural establishment has done little to assist this mode of farming. Recognition of its value is now being given by some researchers in international development. Even many of the proponents of "low-input" agriculture still envisage commercial control of it technologies. "Caring farmers" with detailed site specific ecological knowledge equipped with a variety of survival strategies engaged in continuing experimental farming could provide a valuable resource for a region whose agricultural future is uncertain. If Lester Thurow's scepticism about the likelihood of creating new major export markets to solve our abundance problems (see paper this volume) is true of all new technologies that are developed to establish new national comparative advantages, we should prepare for cutbacks in our national standard of living. Decentralization and local productive autonomy will increase in importance as a way of avoiding politically unacceptable levels of deprivation. Rural social scientists, who played such a major role in converting the rural economy to industrialization should not suddenly become libertarians because of the positivist orthodoxy of their disciplines. Here is one agenda to explore that Kirkendall's paper overlooks

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Buttel's paper acknowledges the role that philosophers might play in helping to exorcise the ghosts of Hume from the social scientists' fetters to positivism. They have already done this work, but it has failed to penetrate social science practitioners to any depth. This is a testimony to the limitations of "multidisciplinary" research. But my scepticism is different than Buttel's about the acceptability of philosophers. Buttel thinks that agricultural ethics programs will not develop in colleges of agriculture because of the resistance of agricultural scientists. I think that the constraints on the involvement of philosophers in agricultural research issues lies more on the side of the liberal arts colleges. Buttel acknowledges this difficulty. Philosophy, like many liberal arts disciplines, according to Buttel, is "scholastic", i.e., addressed to the community of scholars that constitute the discipline. Given the reward structure of universities seeking increased prestige, neither subject matter nor problem solving research is likely to produce publications that will be acceptable to the "well-placed" scholars that "guard the gates" to the disciplinary journals. Even though the "professionalization" of academia has received justified criticism, philosophy may be one of the last disciplines to let go of its hard-won professional status, for it is a discipline that constantly finds difficulty in defining its area of expertise and in being taken seriously by other disciplines. Although philosophers who have received the type of training that is traditional in US institutions since the 1950s can play an important role in cutting through some of the basic distinctions that oversimply problems, revealing alternative "paradigms" and a new range of solutions to be considered, as partners in transdisciplinary research (research that cuts through disciplinary boundaries) they must be informed of an enormous body of theory and literature. And their co-researchers must be equally informed. One especially relevant body of literature that has become transdisciplinary is Science and Technology Studies (STS). Only in the last decade have these studies begun to penetrate agricultural research thinking. Given the present structure of land-grant colleges, well-informed philosophers can play an important role in professional development programs for agricultural scientists, and an even more critical role in helping to restructure agricultural education. But I think that significant contributions to research will be made by philosophers at this stage primarily by raising neglected issues or identifying limiting assumptions and paradigms. Whether a philosopher whose main task is to challenge orthodoxy can survive without the protection of a parent discipline that understands this role remains to be seen. But to perform this role well, our philosopher may also have to challenge the orthodoxy of both the parent discipline that frowns on problem-solving research and the liberal arts faculty that supports it.

The Relevance of Science and Technology Studies Literature

STS is clearly relevant to a critical analysis of social science research in agriculture. A state of the art report provides extensive bibliographies of material that is concerned with the "ethical and value" implications of science and technology (Durbin). Some of this literature has already been applied to agricultural research (Lacy and Busch), and more is relevant. Literature that falls in the areas characterized as (1) Professional Ethics, (2) Social Responsibilities of the Scientist, (3) Technology, Social Change and Future Societies, and (4) Environmental Ethics is clearly applicable to agricultural research. I shall briefly discuss the relevance of only the first two.

Literature in the area of professional ethics includes critical examinations of ethical problems created by the exercise of professional skills and knowledge, such as the appropriate roles and moral responsibilities of professionals, how these standards can be incorporated into practice, and whether professional codes of ethics define the limits of responsibility. This literature is germane to questions about the social responsibility of scientists who are pursuing professional careers, belong to professional associations, and claim to have their careers judged by the ideals and standards of these associations. In this regard, issues about the social responsibility of scientists clearly overlap issues about the professional responsibilities of researchers. Some of the difficulties associated with assessing professional responsibilities arise out of the contexts in which many professionals work, and in the relationship between individual and collective responsibilities. Professional ethics, as a subject matter, is concerned with problems associated with determining the responsibilities of persons who occupy specific social roles. Literature concerned with the conceptual, historical, and sociological foundations of professional roles and their social status and function, as well as with general role theory in ethics, is relevant to discussions about the social responsibilities of agricultural researchers. Historical and sociological studies provide the empirical base for evaluating claims about the social function of the professions and the social stratification of professionalized societies. Accounts of the norms by which professional groups purport to govern themselves provide valuable background for attempting to understand the social and political role of these norms and their legitimacy as codes of ethics (Kultgen, Newton). Studies in the sociology of science and technology also provide an important background for discussions about the social responsibilities of scientists. These studies have already been applied to an analysis of the social implications of the values of agricultural researchers (Busch & Lacy). Merton's approach to understanding the institution of science in terms of its goal of attaining "certified knowledge with maximum efficiency", has been used to justify the institutional norms that make achievement of this goal possible. These same norms are used by the scientific community to police themselves (Gaston). Various sociological studies of reward systems provide material for identifying areas of conflict of interest for researchers (Gaston, Larson, Collins).

There is another area of sociological analysis that is relevant to discussions about the responsibility of scientists. In this area, competing models are given of the relationships between the projects of individual scientists, the paradigms of professional disciplines, and the total scientific enterprise. For example, the justification for the "corporatization" or "collectivization" of science on the basis of a "Baconian Model" of the scientific enterprise (Busch & Lacy) is challenged by the Kuhnian and other recent philosophical analyses of the relationships that actually hold between practicing scientists. This challenge may be taken to suggest that scientists must take an increased responsibility for viewing their own work in relation to overall social goals for science (e.g. Dundon, Perkins).

Science and technology policy studies is another area of scholarship that has application to agricultural research ethics. Discussions about the criteria for selecting priorities for the allocation of research funds, and about the role of

the scientist and technologist for the assessment of social impacts are all significant (Crane). Discussions concerning this area suggest a strong emerging connection between policy group criteria and individual problem-choice criteria, as competition for limited resources for research increases. The use of the type of criteria suggested by Weinberg has serious implications for the use of the basic/applied distinction to insulate scientists from responsibility for impact. They bring into stronger focus problems concerned with the relationship between institutional goals and individual scientist-employee goals. Questions about individual scientist-employee responsibilities are further complicated when research decisions are made largely by administrators. This is another area that is especially relevant for agricultural research to the extent that policy, even for basic research in agriculture, emphasizes accountability rather than autonomy (Nicholson). Literature on the freedom and the responsibility of the scientist in the role of advisor and advocate (Crane), and in the role of public disseminator of information also has some obvious application to agricultural research ethics. This is especially true of literature in the general area of the philosophy of technology, which is concerned with criteria for evaluating the social role and effects of types of technology, as well as the effect that technology has on human value and on the quality of human life.

The emerging literature and scholarly activity in this field, suggest a number of topics that apply to agricultural ethics. These topics are each concerned with estimating the degree to which the agricultural scientist or technologist should be held accountable for enlarging the conception of their field of responsibilties. (1) What goals should public-sector agricultural researchers pursue, who should be the clientele and the beneficiaries, and what are the appropriate criteria for selecting research problems to help ensure that benefits and costs are appropriately distributed? (2) How should the mode of classification of research by type (e.g. basic, disciplinary, etc.) affect the autonomy or accountability of the reseacher? (3) To what extent are the individual researchers, the professional disciplines, the research community in general, and the organizations to which they belong, responsible for assessing the consequences of research, for identifying research needs and for choosing research problems accordingly? (4) What should be the role of technology in modern society? What should be the respective responsibilities of the researcher and the general public in determining that role? How should conflicts be resolved? To what extent are agricultural researchers responsible for conforming their research according to well-thought out resolutions of views about this role? (5) When doing research, what are the appropriate professional norms to follow (e.g. Merton) concerning the use of evidence and hypotheses, secrecy, scholarship, value neutrality, impact distortion, scepticism, open-mindedness to innovation, etc.? How should these norms be interpreted and what priority should be given to them when they conflict with norms regarding social responsibilities? (6) What responsibilities do researchers have when functioning as political advisors or as advocates? (7) What personal values or ideals influence problem-choices, methodology choices, and solution-ranges? Should a researcher allow these ideals and values to function in this way? What responsibility do researchers have to examine their own values, ideals and assumptions? (8) What responsibilities do professionals have to expand their areas of expertise? To become generalists? (9) What responsibility do researchers have to explore unconventional and alternative techniques, technologies, etc.? (10) What criteria should be used in setting research

priorities, at a personal level, professional level, organizational and national level? (11) What general obligations do researchers have in serving the interests of clients? To consider adverse effects on others at risk?

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PANEL DISCUSSIONS

William F. Freudenburg*

We have just been presented with a pair of very competent overviews, of large bodies of work, by people who've done their homework very well. One of the hardest things in the world is to summarize a broad area competently and fairly, but both of these papers have managed to accomplish that task quite well. Outside of a few quibbles, I basically want to commend the authors and to tell the rest of you that if you haven't read these papers, you should be all means read them on the plane on the way home. They're full of good stuff.

That's almost the end of my "standard commentary" on the papers themselves, although it's far from the end of what I have to say, for reasons I'm about to point out.

When I was first asked to be a discussant, I wasn't quite sure why I'd been selected. My own background includes very little that has obvious relevance to the history or study of agriculture. For much of my career, I've studied rural industrialization, community change, social impact assessment and the so-called "energy boomtowns." During the last three to five years, I've been spending much of my time on nuclear waste and sociology of risk. That kind of background has only marginal relevance to agriculture as traditionally defined; none of it would exactly be considered part of the central emphasis of this session.

Thus my initial assumption was that I'd been brought in simply to offer a fresh or outside perspective. As I thought about it further, however, I realized that it might be a useful contribution to our deliberations if I were to focus on, rather than avoid, the whole question of marginality. Accordingly, that's exactly what I plan to do in these remarks.

For starters, marginality has always been important in community studies. The best informants in a community are often not the "core" members of the town, so to speak, but the marginal members--people who are close enough to the day-to-day interactions to be able to see what kind of a town it is, and yet far enough removed that they can focus on the forest as well as the trees.

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Similarly, in biophysical ecology, the most productive ecosystems are often at the margins. The middle of an ocean, for example, is essentially a desert, but there is tremendous productivity at the margins, where the ocean meets the shore. And maybe, I started thinking, maybe the traditionally "weak" or marginal position of social sciences within Colleges of Agriculture should be thought about a bit differently. Maybe, in short, our traditional weakness should be seen as a source of strength today. That's the point I'd like to make in these comments. I'll try to do so in three steps--first of all by asking you to think about a concept; second, by giving a couple of examples; and third, by noting some of the implications.

To begin by emphasizing the obvious, these are challenging times. The future, as the old saying goes, "ain't what it used to be." From farm crises to faltering institutions, the trends of the times seem to say that the continued pursuit of business as usual may soon put us all out of business. What the Kirkendall paper points out, however, is that times have been challenging and changing for at least the last forty years--or seventy, or a hundred. What's remarkable about the history presented in Dr. Kirkendall's paper, if we stop to think about it, is the extent to which our reactions within Colleges of Agriculture have always been to close our ranks, to circle the wagons around, and to try to keep out those external forces that we didn't like. To borrow Fred Buttel's phrase, we've tended to fall into agricultural fundamentalism.

This brings us directly to the concept I'd like to emphasize; it has to do with a trade-off between two polar tendencies. On one extreme of this trade-off is the tendency to focus, specialize, or draw the wagons tightly around the camp; at the other extreme is the tendency to hedge your bets, to diversify, or to bring in dissenting points of view.

This concept of the trade-off between focusing and diversifying is similar to a basic notion from economists' work on investments. It's well know that there is a risk-versus-return trade-off on investments. In general, the highest returns tend to come from the riskiest investments, since riskier investments need to pay a higher rate of return to be able to attract people's money. What that means is that if you're highly confident in your predictions, if you're in a situation where there are likely to be no surprises, and if the institutions in which you invest don't go belly-up, then the rational thing to do is to make the "riskiest" investments you can find. If none of your investments self-destruct, then you'll be the person on the block with the highest rate of return.

What happens, of course, is that surprises sometimes do show up. In those situations, you tend to get not a high rate of return, but a lecture on not putting all of your eggs in one basket.

Similarly, in biophysical ecology, the difference between a monoculture and a diversified ecosystem is that, if someone guesses right on pesticides, fertilizers and so forth, a monoculture can get a tremendous level of productivity out of a given piece of turf. In biophysical ecology, however, it's an old saying that diversity equals stability--that in the long run, the plant communities that tend to be most stable are the ones that are most diverse.

As a crude rule of thumb, scientists tend to get ahead by being focusers, rather than diversifiers. Perhaps three-fourths of the time, as a rough guess, scientists appear to get ahead more rapidly by focusing their efforts, ignoring minor problems and minority points of view. But even if that means that scientists are

"rational" to narrow their field of vision "most" of the time, it still leaves us with the other fourth or so of the time--or fifth, or tenth, or whatever--where the usual approach will prove to be distinctly unwise. These are the times when we will only know afterwards that we wish we had hedged our bets at the outset.

Land-grant universities, I am suggesting here, have tended very much toward the specialization end of the continuum. Our tendency has been to focus on increasing production, to home in on congenial specialties and perspectives, and essentially to ignore dissenting or critical voices. What I'm about to argue, however, is that one of the primary reasons for having social scientists in land-grant colleges, or at least one of the potential reasons, is that we can provide a counterbalancing tendency, a tendency toward the diversification of perspectives.

That's a potentially dangerous prescription, particularly in the subset of our institutions that consider it an act of disloyalty, rather than of loyalty, to point out that the emperor is wearing no clothes. It's also a bit of an irony for it to fall to social scientists to bring alternative perspectives to the very kinds of colleges that brought the concept of hybrid vigor to general public consciousness. In fact, the whole discussion raises the question of why we don't already find a strong tendency toward diversification in land-grant colleges--and that leads directly to a couple of examples.

The first of them comes from a town I visited last week--Caliente, Nevada. Those of you who've done community studies may remember a famous article by Fred Cottrell (1951) called "Death by Dieselization." The article had to do with a small town in eastern Nevada that had been a division point for coal-fired steam locomotives. When the railroad switched from coal to diesel, the trains only needed to stop half as often, and Caliente was one of the unlucky towns that was axed. What's more, Caliente had no obvious reasons for existence other than to be a railroad town. Cottrell wrote an article on Caliente's impending death, and on the injustice of it all. The injustice may have been real, but having visited the town thirty years later, just this last week, I'm happy to tell you the rumors of Caliente's death were greatly exaggerated. It's still not exactly the healthiest economy, but the community is definitely still there, and it's not about to disappear; the "fact" of its impending death was obvious, but wrong.

Another example, as several of us have noted, is the current agricultural crisis. Ten years ago, any number of people were saying that farmers needed to borrow more money, buy more land, and plant more crops. The farmers who took that advice weren't the ones who were ignorant or behind the times, but the award-winning, progressive and aggressive ones. The people offering the advice weren't a handful of weirdos or critics of the system, but part of the mainstream of the land-grant system and the agricultural establishment. I remember thinking at the time that the advice and logic were obviously on target--but it turns out now that they weren't.

Whenever I'm told, therefore, that we need to "face the facts," I swallow a little bit harder than I used to; I also think of something geographer Bob Kates (1985) once said: "Science often fluctuates between humility and hubris." My willingness to tell someone else to "face the facts," in short, is starting to be tempered by the realization that sometimes, what we expect to be the facts will turn out to be something else. As someone else once remarked, making predictions is always hard, but predicting the future is especially so.

Another set of studies had to do with a place where, fortunately, I've never been, namely the Nazi death camps. The "obvious" guess would be that the people who were in the death camps would have hated and despised their captors, but what often happened was that some prisoners started dressing like, acting like, and essentially identifying with the Nazi captors. Years later, when the U.S. military draft was made random (i.e., on the basis of birthdays), there was an interesting study that brought together a group of draft-age men to watch the birth date "numbers" being drawn and to fill out a couple of questionnaires. Soon after the results came out, the young men were asked how much they liked the other participants in the study--something we would normally expect to be essentially random with respect to the day of the year on which someone was born. In fact, the people whose birthdays were in the low numbers--i.e., the ones who were almost sure to get drafted--started being seen as much less popular. It's possible that their behavior changed because they were worried about getting shot, but it's also possible that there's something about a crisis that causes many of us to shun those who are in trouble, and to redouble our commitments, often, to the very system that got us into trouble in the first place. There are informal reports of the same kinds of tendencies, incidentally, in the current farm crisis, with farmers shunning rather than supporting their colleagues who are in the greatest difficulty--almost as if there's a worry that failure might prove to be a contagious disease, if only psychologically.

To move back to my larger concept, the "circle the wagons around the land-grant system" tendency may involve organizational and institutional factors, not just individual-level ones. At the researcher level, as we've already said several times today, there's a tendency for promotions to emphasize an individual's contributions within a discipline. If you spend an hour on a problem-focused piece of research, odds are you're spending at least half of that hour on something that won't get you tenure or bring you promotions within your discipline. (While several of us have discussed the problem, I should probably say that those of us who really enjoy multi-disciplinary, problem-focused research may get enough hybrid vigor out of that research that maybe we're still better off in the long run.)

I want to move beyond the forces that encourage specialization at the researcher level, however, and to talk about what happens a couple of levels higher, among our upper administrators. The Peter Principle is a good-humored way to describe it: If people do a job well, they get promoted, and if they do that job well, the get promoted again. That keeps happening until they get to the point where they're not doing their job well--and that's where the promotions stop. The net result, by this humorous perspective, is that people tend to get promoted out of the jobs they do well, and into jobs they don't.

It gets a bit less humorous, unfortunately, when it comes to universities, because there are different "screens" through which we need to pass. The way to get tenure, in general, is to specialize--to do one thing in a way that is focused, efficient, and specialized, and to do it very very well. People who don't pass the tenure test are no longer "available"--they're not part of the pool from which we'll draw for promotions to upper administrative levels. I say "unfortunately" because administrative positions call for something very different--not necessarily someone who gets through the "specialist" screen, but someone who doesn't get screened out because of an inability to see the bigger and broader picture. If what you need to succeed as a specialist, 75 percent of the time, is to be someone who takes a narrow view, then it may be that what you need 75 percent of

the time to be a good administrator is to be a generalist--to be someone who instinctively looks for the broader view, not the narrower one.

Which brings us back to the papers, and I hope to the whole conference. I frankly am still not sure what the Social Science Agricultural Agenda Project is about, even though Glen Johnson has been kind enough to explain it to me four or five different times. It may be, however, that one of our broader functions is to provide a counterweight to the forces of focus. We need to acknowledge the importance of what the land-grant system has traditionally done well, to be sure, but we may also need to remind our colleagues, and ourselves, not to overlook the larger picture.

The papers frankly are excellent, first of all, because they are examples of looking at the bigger picture. More importantly, they are successful examples of the very kinds of bigger-picture analyses that both of them advocate.

Second, they show the importance to social scientists of permeating those semi-permeable membranes that separate our disciplines--of having rural sociologists talk to agricultural economists, for example, rather than throwing rocks at them, and vice versa--and also for bringing in some of the "nontraditional" social sciences (I would add geography and psychology to the ones that Fred Buttel mentioned, and I see by his nodding that he would probably concur).

Third, and still more significantly, these papers help show the importance of having some of the critics on the inside--not throwing rocks at the system from outside the circle of wagons, but welcomed inside as valuable contributors to the system--and for at least two reasons. One is that it's by having a variety of points of view inside the system that we can maximize the opportunity to improve the system: I'd much rather be told my faults by my friends than by my enemies, in general, partly because my friends are kinder to me, but partly because I'm more likely to listen to them. For this function, even if no other, we need friendly people in the system who don't share the "orthodoxy," to use Richard Haynes's term. The other reason is a point in Fred Buttel's paper that I want to emphasize. Particularly when times are changing and there are new and complex forces at work politically, it's vital to the long-term survival of the institution that it be seen as institutionally neutral--as neither fighting for nor against any one set of combatants in an ongoing controversy. Given that the institution itself can't afford to take sides, perhaps the safest countermeasure to partisanship is to make sure that the critics have a legitimate role inside of the system.

Fourth, I think the papers are important because they allow a discussant to expand at least one additional step. It's important for the future of all of us, I would argue, that we look at more than just "tradtional agriculture," writ narrowly. Instead, we need to expand in at least two ways. One is that, even if we're just looking at "agriculture," perhaps the majority of what's influential in agriculture take place not in rural area, but in urban ones. Whether we're talking about banks, middlemen, consumers, Congress, or other influences, perhaps the majority of the forces that shape agriculture are outside of the "agriculture" that's defined by the borders of specific farms. Second, it's important to expand not just beyond rural areas in looking at agriculture, but rather to expand beyond agriculture in looking at rural areas. Even if we're simply being pragmatic, we need to ask whether we want to put all of our eggs in any one basket, let alone one that's being carried by a segment of the population that, once a majority, is now down to 3 percent and is still shrinking. And if we're responding to

humanitarian or intellectual motivations, we have still more reason to look at other rural activities that do provide significant hope for rural areas. Given what we're hearing here about the likely future of American agriculture, it only makes sense to ask if other activities might provide hope for rural diversification, whether through traditional rural activities, such as forestry, fishing, or even mining, or through other activities that are taking on increasing importance in rural areas today, in activities such as tourism and recreation.

What happened in Caliente, to oversimplify, is that Cottrell overlooked the importance of transfer payments and of the fact that people simply wanted to live in that community, the place where their friends and families were. It seemed logical to expect that people would "obey the economic facts of life" and that, if they weren't going to get much in the way of income, they'd leave. That expectation turned out to be wrong, however, because it ignored "the cultural facts of life." Even our emphasis on money, an anthropologist would remind us, is a culturally defined preference. What the residents of Caliente found more important than maximizing their income was maxianizing their well-being, through family ties, community "roots," and so forth. That does not mean, by any sense of the imagination, that they didn't care about money; they did, and they still do, maybe more intensely than your average academic, because money is such a crucial and scarce commodity. Yet the real bottom line was the fact that they weren't willing to give up other things they also wanted for the sake of money alone.

In short, Caliente has survived, in a sense, by hedging its bets, by diversifying and by finding other ways to support its population. Similarly, we may find that the way for all of us to survive in the long run is by hedging our bets and by diversifying our perspectives, both as social scientists and as citizens of Colleges of Agriculture.

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PANEL DISCUSSIONS

Leo V. Mayer*

It is a pleasure to have the opportunity to review the Kirkendall and Buttel papers. They contain the kind of information that is essential for establishing a framework to consider the goals for this conference. I have taken the liberty of listing one of those goals as "Gearing up the Social Sciences for the 21st century." I am not sure that Glenn Johnson would agree with that simplistic objective.

From the Washington perspective however, simplicity itself is an objective. And it has also been an objective of land grant universities. "Making two blades of grass grow where one did before" is perhaps the best example. Unfortunately, that goal has left something to be desired from the standpoint of the social sciences in the land grant universities. That's the other side of the simplicity coin.

One cannot read through these two papers without gaining an increased appreciation for the role that the social sciences have had on land grant universities and on rural America. Buttel reviews those contributions and ends by suggesting that "one of the most healthy things a land grant university could do would be to reaffirm publicly its land-grant commitment." If by this he means its problem solving orientation, I can understand the recommendation. If not, then he may want to explain it in more detail.

There is another broader view of the contributions that land grant universities have made that I also like. I was reminded of it as I read the Kirkendall paper. Kirkendall observed that the Jeffersonian ideal "achieved its most spectacular victory in 1862 with the passage of the Homestead Act." That may be accurate political history but having read biographies of what I consider to be our greatest president and visited his home (Monticello) in Charlottesville, Virginia with all its innovations for that time period, I suspect that Jefferson's goals for improving rural America were also achieved with the establishment of the land grant colleges. The only disappointing part of that historical review was to be reminded that "the greatest push for the land-grant system came from critics of the farmers" rather than from farmers themselves.

It is the implications of this point that I want to pick up on in my few minutes this morning. What was true in 1862 is still true today. It often takes leadership to discover where the self interest of American agriculture lies, or to put it more into economic terms, where among the many competing ends we ought to apply our scarce resources. Left to their own devices, farmers often view the need for research and extension through micro level glasses. The result is a heavy emphasis on state-oriented, production-oriented research.

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Under certain conditions, this would not be all bad. For example, in an environment in which markets are growing fast enough such as existed very early on in this century in this country (with its enormous in-migration and rapid income growth) and again during the war periods of 1914-17 and 1941-47, a production-oriented research and extension policy can make a positive contribution in and by itself. Unfortunately, this represents the exceptional period rather than the norm. The remainder of the time, markets have not expanded automatically to absorb all the production that farmers with their new technology can create. Instead, idle capacity has been the rule, measured in terms of both land and stockpiles. This has been the record of the last half century although as I look at the land grant universities today, I must say in all honesty that I do not find much indication that they have learned from the experience. No one to my knowledge is asking how to shift the U.S. demand curve for farm and food commodities. Shift the supply curve they do; the demand curve is someone else's responsibility.

Of course, I must add on caveat. So long as government is willing to step in and buy up all the excess product that farmers are willing to produce at the guaranteed prices government provides, it is little wonder that farmer supported universities do not allocate more resources to increasing the understanding of marketing, especially overseas marketing.

This caveat also moves us into the area of public policy. The question now becomes how long the public will stand for a support-price storage-program policy. It is a question that has been asked numerous times over the past 30 years and is again being asked today. I don't know the answer and as Buttel points out, there are no political scientists in the state agricultural experiment stations to answer questions like this.

My conclusion however, is that whether the public will withstand the cost of a "support and store" policy or not, it is an ill-advised policy for the long term. American agriculture should be better served than this. The land grant universities should reexamine their focus and assure their support base that their mandate includes not only producing commodities at the lowest cost but also marketing them in the most effective manner possible. In the global market the agricultural industry now faces, marketing includes a broad range of social science disciplines, including those that can help us understand other cultures, their tastes and preferences, their income levels, as well as the policies of their government relative to phytosanitary restrictions, customs requirement and other trade polices.

Obviously, selling this kind of package of new research challenges to the taxpayers of any one state will not be easy. In fact, I would argue that this is a challenge that should be borne by the Federal Government. What is needed is a new Hatch Act devoted to supporting our export efforts. Otherwise, we should begin to question whether is makes good sense to create all this excess capacity that must then be held out of production under one or more expensive government programs.

In closing, I want to compliment Glenn Johnson for drawing this conference together to look at the land grant universities' social science agenda. As we all know, universities are institutions and institutions are strange entities

whether they be universities, federal agencies, county governments, or whatever. Most tend to run on automatic pilot most of the time. It is unusual for their incumbents to offer their thoughts on where these publicly supported entities should go, and what they should do. We had a period of that kind of assessment in the 1950's and 1960's but the success of the 1970's returned them to complacency. Now in the 1980's, we can see the problems that arose from that "success" period and we should be more than ever convinced that there is no time for complacency. To prove our usefulness to society, an inquiring attitude is essential, a questioning approach must be maintained at all times, and meetings like this to evaluate the future are always productive. I commend its originators.

PANEL DISCUSSIONS

Russell Perkinson*

Social problems, their recognition and definition as applied to rural people--for what purpose? Social science disciplines as purely academic studies have little appeal to me. Social science disciplines as they can function to shed light upon human problems make their pursuit very worthwhile. The purpose of the SSAAP workshop is to help me and my neighbors. I do not need the help, so let us concentrate on my neighbors. Since George Washington was a little boy, people have been leaving the farm to engage in non-farm pursuits. As industrialization progressed and more alternatives to make a living were available, people have sought work which offered them the greatest rewards. Farmers, as well as others, are making these same choices today.

The most recent crisis in agriculture was largely precipitated by (1) politically motivated agricultural programs and (2) inept loan policies of the Farm Credit Administration. "New Deal" policies born in the depression years of the 1930's can be excused as a desperation program--an attempt to do something. But continuing government "interference" in agriculture is a disservice to both agricultural and non-agricultural people. Government does have functions in both agricultural and non-agricultural economy. It should facilitate change, ease transition and not be a roadblock to adjustments that are economically dictated. Government can help to reduce the stress to farmers and others in a rapidly changing society. Social sciences can do much to identify problems and suggest solutions.

Loan policies of the Federal Land Bank and PCA encourage the escalation of land prices and over expansion in agriculture. The increase of money available for the purchase of capital items encouraged farmers to bid actively for land, tractors, combines, etc. When problems of repayment of loans began to develop, loans were reduced or withheld and problems were artificially created. For example, a hog farmer was loaned money to build a farrowing house. When he had problems of repayment, he was forced to sell his breeding herd. How will he repay his loan if his source of money for repayment is gone?

The role of the social science researcher is to provide accurate data and relative information about the problem so that timely decisions can be made by the user of the research results. Research should be user oriented to the extent that research should be planned with the user in mind.

Communication is the final step in this process of user oriented research. Results, data, and information must be communicated to the user to justify research.

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* Farmer, Thawville, Illinois

I am a pork producer, and I will make some analogies between your business and mine:

1) If we want to stay in business, we must know the consumer and produce a desirable product.

2) Methods that we use must be cost effective.

3) The best product we can produce is of no benefit if we have an inadequate marketing system. We must have a method to deliver our product to the user.

4) As producers, our goal is the consumer. The "customer is always right."

PART III

THE SITUATION, PROBLEMS, AND ISSUES TO BE PROBED

Chapter 7

FARMERS, AGRIBUSINESS AND CONSUMERS

(Identification and Prioritization of Researchable Questions in Agricultural Economics: Where Are the Potential Payoffs?)

Clarence F. Davan, Jr., Roland P. Robinson, and Clark Burbee*

Introduction

This research project to "Identify and Prioritize Researchable Questions in Agricultural Economics" was commissioned by the Cooperative State Research Service, United States Department of Agriculture (CSRS/USDA), June 1986. This project is about fifty percent completed. The results presented in this paper are preliminary; however, any changes should have little effect on the ultimate Conclusions and Recommendations of this study.

This paper presents the results to date of the CSRS/USDA research project. The paper is organized as follows: Introduction, Situation, Methodology, Indentification and Prioritization of Major Agricultural Problems, Identification and Prioritization of Researchable Questions in Agricultural Economics, Comparative Matrix on Present Agricultural Economic Research, Users of Agricultural Economics Research Results, and Conclusions and Recommendations.

Identifying and prioritizing researchable questions in agricultural economics must not be based on problems or changes that have taken place in the past agricultural environment. Instead, they must be based on problems or changes that are expected to take place in the future - we must anticipate emerging problems affecting agriculture. If we continue to follow historical trends, follow the current research agenda, and use the same economic and research tools, we will always be too late with our research results and recommendations to have any meaningful effect. T.W. Schultz summarized it best as follows (Schultz, December 1964, 1004-1014):

> A particular profession can become obsolete. We, too, are subject to these risks. Thus it should be salutary, now and then, to remove our workday blinders and look at our approach to agricultural economics, the problems on our research agenda, the tools we use, and the way we are organized. Yet I marvel at how often we do this and how little of it is conducive to any beneficial results.

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J.P. Jordan, administrator of CSRS/USDA, made several important points in his paper before the 1985 AAEA annual meetings in Ames, Iowa. Agriculture and its sciences are facing new challenges today and are at a pivotal point in history. Further, the first basic research need is to predict change rather than trends. In particular, there will be no increase in research funding within a discipline - any discipline - without the development of priorities and the clear, concise articulation of researchable questions (Jordan, 67 (5) December 1985, 1247-1250). The purpose of this CSRS/USDA research project is to assist the agricultural economic profession in this matter and is detailed in this paper.

Situation

The farm debt has soared from $141 billion in 1979 to over $212 billion in the mid eighties. We have gone from a labor intensive to a capital intensive agriculture. During the same period farm assets, primarily land, has dropped about $100 billion, creating a big imbalance in the farmer's debt-equity ratio. This coupled with overproduction, drop in agricultural exports, greater competition by foreign producers, and low commodity prices created the present situation:

- The highest number of farm and bank failures since the 1930 depression.
- With the farms going out of business and low and even negative farm incomes, many agribusiness, and even small towns are going out of business. The agricultural business infrastructure is changing at an accelerated rate.
- Farmers have been educated to be production oriented - farmers cannot only be production oriented and survive in today and tomorrow's agriculture environment, they must understand and employ marketing and financial management strategies. Most farmers know very little about the marketing and financial planning side of their business.

Agriculture in the United States, and the rest of the World is facing many changes in the market place and in the very structure of the agricultural industry. Traditional agriculture is giving way to a new form of "Farm Management" which can best be described as "Total Agricultural Systems Management". More emphasis is being placed on managing the total agricultural system, especially the marketing and financial functions. Agriculture including agribusiness remains a major factor in the economy of the United States, employing about 20 percent of the nations labor force.

New challenges confront agriculture in the United States and the World. These challenges create an urgency for a consensus process to identify and respond to present and future needs to research, educate, train, and guide farmers and farm related groups in the "Total Agricultural Systems Management". Also, there is a need to provide timely data information, and recommendations to local, state and federal policy makers, and to agricultural related activities.

Considerable independent basic research work has been and is being accomplished by most agricultural economist at all universities. Less effort has been made to apply agricultural economics research on future agricultural problems. The major farm and farm related problems of today and the future need considerable

cooperative effort by agricultural economic researchers. If our answer is, we are already conducting cutting edge agricultural economic research, then my question has to be "Why is agriculture in so much trouble today"?

Partial research achievements will not automatically assure continued future growth in productivity and industry well-being. Vast changes are underway in the soical and economic fabric of our society. We are passing into an information/service society that will have a major impact on the agricultural and industrial sectors. The results of cooperative agricultural economic research will have a decisive influence on the direction of our economy (Naisbett, 1982).

Changes in world marketing institutions have made obsolete the results of research undertaken earlier on the structure, conduct, and performance of major world food and fiber marketing systems. New research efforts must focus on assessing the efficiency and performance of agricultural institutions, involved in world markets instead of just the domestic market. (AGR 101, USDA p. 34, 1984).

Michael J. Phillips summarized the major finding of a government study in an informational letter to the National Governors' Association, that stated, "The Federal-State-Private agricultural research system is working under a number of constraints that diminish its effectiveness. These include lack of well-defined national agricultural research goals, lack of a national research priorities process, under investment in research, confusion over the role of research participants, and an organizational structure that inhibits the system from having a national focus". During the past few years, the leadership in the United States Department of Agriculture, especially the Cooperative State Research Service, has created a strategic operating plan that set national goals on agricultural research, set-up professional advisory groups, and is identifying research priorities in various agricultural disciplines.

The United States and foreign agricultural environment is changing so rapidly that it is unclear where the agricultural economic research program should focus its efforts in the Cooperative State Research Service, United States Department of Agriculture. There has been a significant decline in funding support for agriculture economics from CSRS administered sources. In 1977, 12.8% of CSRS administered funds were allocated to experiment station agricultural economic research programs. By 1983, only 5 years later, this relative share had declined to 8.2% (Christensen, Robinson 67 (5) December 1985: 1251-1255). The objective of this CSRS research study is to develop an operational plan for Agricultural Economics that identifies in a clear concise manner and sets priorities on researchable agricultural economic questions that offer substantial return on investment and which will address critical state, national, and international agricultural issues.

The research on these questions would provide answers for a strong, viable competitive U.S. Agriculture that will make our commodities and products more competitive in the world market and provide the U.S. consumer with high quality food at a reasonable price. It could help prevent rural towns from going out of business. It should provide the needed agricultural economic research results for agribusinessmen, policy makers, and others in agricultural activities.

This research project is not attempting to establish the research agendas for the entire agricultural economic research program. It is designed to justify a new competitive grants initiative for agricultural economic research programs.

Methodology

The methodology that is being used to conduct the CSRS/USDA research study, to identify and prioritize researchable questions in Agricultural Economics, is similar to what agribusiness industries use. That is to obtain available data and information on a timely basis from many expert sources in the discipline being researched; therefore, permitting timely recommendations and decisions. The methodology was designed in five phases. Each phase is an entity; therefore, if the study stopped at the end of any phase, conclusions and recommendations can still be made.

Phase I: The Literature Was Summarized and Personal Interviews Were Conducted of Persons in Various Segments of the Agricultural System - From the Farm Input Industry Through to the Consumer (Domestic and International).

Various types of literature (1982-1986) dealing with research priorities in agricultural economics, were reviewed that had been written by agricultural experts in the agricultural industry, academics, and government. Experts in farming, agricultural industry, academics, and government were interviewed to seek their professional information and advice on: 1) problems in agriculture (present and future), 2) researchable questions in agricultural economics, 3) recommendations for participants on an advisory committee for the research project, and 4) methodology to conduct the research study. This information was analyzed and was the basis for Phase II.

Phase II. The Steering Committee Was Selected, Final Methodology Was Developed, and Information and Data is Being Collected From Various Knowledgeable Agricultural Disciplines.

The steering committee members represent agricultural experts from: farm suppliers, banking, farming, cooperatives, international, commodities, congressional committee, american agricultural economics association, world bank, experiment station, extension service, farm foundation, consumer, food processing, national governors' association, retail food, restaurants, national academy of science, and the economic research service/USDA. The general purpose of the steering committee is to provide direction, support, guidance, and counsel. The specific purpose of the steering committee is to help determine what we need to know (develop a questionnaire), what agricultural groups to survey, arrange meetings with the agricultural groups to be surveyed, provide information and/or papers on studies related to this study, and provide linkage with other similar studies being conducted.

The questionnaire was designed to identify: 1) the major problems in agriculture (domestic and international), 2) the researchable questions in agricultural economic, and 3) the users of the results from the agricultural economics research on the final researchable questions. It was determined that all surveys would be personally conducted on the agricultural groups

that were selected by the steering committee. The groups being surveyed are representative of the groups represented on the steering committee (groups being surveyed represent the total agricultural system).

Phase III: Identify the Major Problems in Agriculture, and Prioritize the Researchable Questions in Agricultural Economics.

These prioritized researchable questions derived from the survey will be compared to those identified in the literature review and personal interviews in Phase I. Also, these prioritized researchable questions will be compared to the agricultural economic research that is presently being conducted to determine research opportunities.

Phase IV: Determine the Cost and Requirements, Time, and Benefits of the Identified and Prioritized Researchable Question in Agricultural Economics.

In this phase, an executive presentation and format will be developed for budget preparation, and develop an operational plan for Agricultural Economic Science support through the Cooperative State Research Service, USDA.

Phase V: Follow-Up to Determine the Effectiveness of the CSRS/USDA Operating Plan.

Prior to the personally conducted surveys of each group in Phase II, a simple model of the dynamic U.S. Agricultural System was discussed with the group. The model discussed, was the agriculture suppliers ---> farmers ---> Farmer Marketing ---> Processing/Servicing/Transportation/Marketing/etc. ---> Consumer (domestic and international). Also discussed, was the domestic and foreign macro-economic environmental effects on the dynamic U.S. Agricultural System.

The next step in Phase II of the survey for each group is for each individual in the group to fill out a one page questionnaire. The two questions on the questionnaire are, list the major agricultual problems, and list the most important researchable questions in agricultural economics to solve the agricultural problems. These questionnaires are collected. This is done so that the concensus of the entire group can be compared to each individual within the group.

The next step in Phase II of the survey is group discussion about the two questions on the questionnaire; thus producing a group concensus of the problems and researchable questions. Also, discussed in the group is what users should be targeted, before the research is undertaken, for the research results from the researchable questions. Therefore, the research will be "results oriented" for specific users.

Identifications of Major Agricultural Problems

The Joint Council on Food and Agricultural Sciences, a congressionally mandated group representing the participants of agricultural research, extension, and teaching in government, universities, and the private sector, set the following national agricultural priorities (Joint Council, FY87 Priorities):

- Increase agricultural profitability through management;
- Improve water quality and management;
- Expand biotechnology efforts on plants, animal, and microbes;
- Develop necessary scientific and professional human capital;
- Improve human nutrition and understanding of diet/health relationship.

All the priorities set by the Joint Council warrant economic research consideration. There is no shortage of major agricultural problems affecting domestic and foreign agriculture. There is a lack of clear, concise, and prioritized researchable questions in agricultural economics based on the future environment.

The major agricultural problems identified, to date, in this CSRS/USDA study are derived from seventeen separate surveys, approximately 325 people, representing all disciplines in the total agricultural system (refer to Methodology section of this paper, page 4-5 for details on how the survey was conducted).

Identification and prioritization of the present and future major problems affecting the total agricultural system will aid in the identification and prioritization of the researchable questions in Agricultural Economics.

Following are the prioritized major agricultural problems identified to date from the CSRS/USDA study (prioritized on a scale of 1-10, 10 being highest):

Major Agricultural Problems	Priority
• Foreign countries are becoming more competitive in agricultural production and marketing.	10
• United States producers and agribusinessmen have inadequate international marketing skills and knowledge about the marketing system.	10
• U.S. and foreign import/export trade policies discourages free trade.	10
• New U.S. Agricultural production and marketing technologies are being transferred internationally without determining long run economic consequences.	10
• Overproduction of agricultural commodities - is encouraged by U.S. and foreign farm policies.	10
• Macro-economic policies have unknown consequences in U.S. agriculture.	9
• United States farmers are production oriented and don't adequately know marketing and financial management.	8
• Research, teaching, extension, and research communications by the Universities and government have not changed to meet present and future challenges in agriculture.	7

- Diet changes are occurring in the United States and foreign countries with unknown impacts on future demand for commodities. 7

- Agriculture in the United States is highly export dependent which increases market instability. 6

- Regidity and stagnation in United States agricultural policy - sending the wrong signal to the U.S. agricultural producers. 6

- Deteriorating infrastructure, income, and employment opportunities in rural communities - which is increasing the input and marketing cost to agriculture. 6

- Farm income is very dependent on government programs. 5

- Research results are not directed to specific users (audience) that needs the results to make a prudent decision. 5

- A lack of alternatives have been identified for crop and livestock production when they become cronically non-profitable. 5

- Limited known non-food and industrial uses for agriculturally produced commodities. 5

- Use of inappropriate soil and water conservation practices are increasing the long-run costs to agriculture and society. 4

- Overvalued agricultural assets. 4

- Too many resources committed to agricultural production. 3

- Third world debt has negative impacts on U.S. agricultural exports. 3

- Consumers are indifferent to the farmer's problems and their consequences. 2

Identification and Prioritization of Researchable Agricultural Economic Questions

The emphasis of agricultural economic research, from the 1950's to the 1980's shifted from production and organizational research to financial, marketing and management information systems research (Litzenberg, Schnieder, 1985).

The 1982-1986 literature review from fifteen different agriculture disciplines, recommended that future agricultural economic research should be concentrated in the following major areas (in order of priority): 1) International agricultural trade and development, 2 Agricultural management, marketing and finance, 3) Agricultural price, income and policy analysis, 4) Community and human resources, and 5) Theory.

The researchable agricultural economic questions identified, to date, in the CSRS/USDA study are derived from seventeen separate surveys, approximately 325 people, representing all disciplines in the total agricultural system (refer to Methodology section of this paper, page 4-5 for details on how the survey was conducted).

Following are the prioritized researchable questions in agricultural economics identified to date from the CSRS/USDA study (the researchable questions are prioritized in three separate groups - on a scale of 1-10, 10 being highest; also, the researchable questions are prioritized within each group):

Group 1, priority scale from 8-10 (highest priority group):

1. What agricultural products and processed products, do foreign countries want from the United States?
2. How competitive are the United States agricultural commodities and processed products in the world markets?
3. What are the United States comparative advantages in world agriculture, by each commodity and processed products, to other producing countries?
4. How to improve quality in the United States agricultural commodities and product characteristics traded internationally?
5. How can the United States become better merchants in international markets?
6. How should the United States structure, its agricultural policy, and trade policies to be on the competitive edge in international markets?
7. Will cutting our agricultural production costs make the United States competitive in the world markets?
8. What impact have United States policies had on agricultural trade volumes and patterns?
9. What is the impact of foreign government policies on United States agricultural exports?
10. What role should the United States play in the world agricultural market over the next fifty (50) years?
11. How competitive should United States Agriculture be in world markets, in the years 2000, 2025, and 2050?
12. What would United States agriculture look like and how competitive would it be in the world market if the United States had no government farm support programs over the next five (5) and then (10) years?
13. How should the United States transfer to and receive - new technologies from foreign competitors and at what price - what is the overall economic impact of such transfers?
14. What is the national, and international economic feasibility and overall effect of each major new technology (biotechnology included) coming to the marketplace?
15. What would be the economic and political consequences of the United States not being on the competitive cutting edge of world biotechnology and computer application research?
16. What changes will take place in the United States and foreign agricultural industry during the next twenty-five (25) years? analysis)?
17. What are the sources of timely factual information and data on foreign countries (country by country basis) for foreign agribusiness and policy maker decisions?

18. What is the profitability effect of macro-economic policy on agriculture, including agribusiness?
19. What are the linkages between macro-economic policies and international trade?
20. How should we train agricultural producers (farmers) in marketing and financial management?
21. What are the effective methods for reducing the financial difficulties in United States agriculture?
22. How should agriculture be financed in the future?
23. What data and information and in what forms does the agricultural producer need to make timely and profitable decisions?
24. What are and will be sources of equity for individual agricultural proprietors?
25. How should we be training future agricultural students to cope with the changing agricultural environment in agribusiness and farming?

Group 2, priority scale from 5-7 (10 being the highest):

1. What restructuring needs to be made in the agricultural research, educations, and communications (extension) programs at the universities and government agencies (USDA) to cope with the future changes in the United States and world agriculture?
2. What are the major factors affecting the domestic and international demand for food?
3. What are the consumption patterns for food eaten away from home?
4. What are the changes that will occur in the domestic and international food and fiber demands in the years 2000, 2025, and 2050?
5. How should we develop interdisciplinary agricultural research efforts within and between the public and private sectors?
6. What would happen to U.S. farm income, by farm size and enterprise, in the short and long-run without farm subsidies?
7. What do we do with the agricultural production and marketing resources that can't compete in the world agricultural market?
8. What are the policy alternatives for diversifying and diverting resources within and out of agriculture?
9. What are the impacts of agricultural structural changes on agricultural inputs, food processing, and grain trade industries?
10. What are the consequences of subsidies for agricultural land, labor, and capital?
11. What are the probabilities of crop disasters, on a worldwide commodity basis?
12. What type of farm and rural structure does society want and how much is society willing to pay - who pays, and who decides who pays?
13. What are the impacts of rural economic development on farm family employment and income opportunities?
14. How can employment opportunities be increased in rural areas?
15. What are the alternative policies (methods) to improve human capital in rural areas?
16. What policies and programs are needed to facilitate adjustments in rural areas?
17. To what extent can vertical and horizonal integration improve the competitiveness of agriculture?

18. What is the economic feasibility of alternative agricultural production systems?
19. What are the non-agricultural economic uses of agricultural land?
20. What is the economic potential for new agricultural products being produced (value added), and new markets, including non-food markets, for United States agricultural commodities?
21. What is the future of agricultural coops?

Group 3, priority scale 4 and below (10 being the highest):

1. What will be the effect of higher energy costs on United States agriculture, marketing, and agribusiness?
2. How can we economically manage or reduce ground water being contaminated by agriculture?
3. How does foreign economic development, such as PL480, effect both supply and demand for agriculturally produced products?
4. How to economically, and politically raise income in the third-world countries?
5. What new policies are necessary to raise the income of third world countries?

Comparative Matrix on Present Agricultural Economic Research

This section, when the study is completed, will compare what research is being conducted at what university to what is recommended in the CSRS study to define and prioritize researchable questions in agricultural economics. This should help point out to researchers the opportunities that can be undertaken in agricultural economics research. Also, it will aid in putting together joint research studies on a regional, national or an international basis.

This portion of the paper is a description of what is being prepared for the final report. This section of this paper has been prepared by Drs. Clark Burbee, and Roland R. Robinson, principal agricultural economists, CSRS/USDA; the researchers, and authors of the new Agricultural Economics Research Information System (AERIS) as described in this section.

AERIS is the acronym for Agricultural Economics Research Information System. AERIS is being designed to complement the existing Cooperative Research Information System, CRIS, by satisfying additional information needs primarily of administrators of agricultural economics research programs. This information will consist of three categories. One is the raw data routinely provided to CRIS each year. The second is program analysis results describing program activity, funding allocations and other statistics useful for planning and decision making purposes at the department and State Agricultural Experiment Station (SAES) level of management. The third category is a set of performance indicators at the department, SAES, of some regional mix level of aggregation. The latter category is best suited for comparison purposes at this stage of development until more sophisticated analytical methods are developed and adopted. Further, AERIS may serve as a prototype to satisfy similar informational needs for other science disciplines.

What information will AERIS provide? AERIS will be an annualized inventory of all research projects having an economics science component as indicated by the CRIS classification process. The system should include all projects being conducted by traditional agricultural economics departments and those projects of other departments in the State Agricultural Experiment Stations (SAES) having an economics component. The latter departments are labeled nontraditional and will be treated as a separate class.

For each project, AERIS has on file the CRIS accession number, SAES, type of department responsible for the project (traditional or nontraditional), type of agreement (HatchRRF, McIntire-Stennis, special grant and state), Regional Research Number, start and termination years, percent of the project that is classed as economics (K-2630), source of funds by seven Federal and four non-federal categories, a weighted classification of the economics portion of each project by the recently adopted agricultural economics 4-digit classification code system and a new 5- and 6- digit classification code system that provides more detailed information about the objectives and output. The system is being compiled for the year 1985.

Program management information consists of research funding sources by type and amount, the absolute and relative importance of the several sources and their use by project, class of research, department and SAES level. Source and use totals and percentages will be available for regional research activities and by the 5- and 6- digit research classification system.

Performance indicators are being developed for several purposes. One is a set of results that will enable managers to compare their resource and activity situations with other departments and SAES or regional or national tabulations. These statistics are solely for comparison purposes with any judgemental interpretation left to the user. Another set of indicators is being devised to provide a measure of research effort or emphasis on particular issues. Examples are dollars of research expenditure per million dollars of annual state cash farm receipts, dollars of research expenditure per thousand farms by states, and rural development research expenditures per one hundred thousand of rural residents. These measures will be useful initially for state comparison purposes.

Who is developing AERIS? AERIS is being developed by agricultural economists at the Cooperative States Research Service. The project is being conducted as part of the larger study to identify and prioritize agricultural economic researchable questions under the direction of Clarence Ruvan, the contractor, and Roland Robinson of CSRS, USDA.

When will AERIS be available? AERIS is being developed by administrative regions with the progression being with the 12 state North Central Region followed by Northeast, South and West. The tentative schedule is to complete the North Central Region during the spring of 1987, the Northeast in the summer of 1987, the South during the fall of 1987 and the West early in 1988. Plans are to provide results at meetings of SAES Directors and Agricultural Economics Department heads beginning with the American Agricultural Economic Association meetings at East Lansing, Michigan in August 1987. Results may be obtained by contacting the Agricultural Economics Program at CSRS.

What is the potential for expanding AERIS? Plans are being considered to expand AERIS to include detailed information and indices on output for research and teaching and add data on all sources of funding for traditional agricultural economics departments. This will make AERIS a more comprehensive management information system.

AERIS is linked to CRIS through the project's accession number, which is identical for both systems. Therefore, items of information such as names of principal investigators, titles, objectives, procedures, progress reports, publications, etc. for each project can be obtained by accessing the present CRIS system.

Because of limited time for this study to identify and prioritize agricultural economics researchable questions, AERIS is initially confined to the 1862 Land-Grant Universities and SAES. AERIS can be expanded to incorporate all economic projects reported to CRIS by other institutions. This would include economic research projects conducted by the USDA, the 1890 and other cooperating Institutions. Expension beyond the CRIS data base would require AERIS linkages with other data bases by direct survey. Prospects for linking AERIS with other existing data bases are being explored.

Users of Agricultural Economic Research Results

Hopefully, all agricultural economic researchers identify the user (audience) groups for their research efforts. It is of utmost importance to review the needs of various agricultural groups to determine the information and data necessary to make timely decisions. If the research is to have maximum value to its user, the user must be considered as an intregal part of the research planning process, for example:

1) There is a tremendous need for agricultural input industries to identify periods of major economic changes well in advance of their occurrence. This requires accurate forecasting, which is a must to remain on the competitive cutting edge.
2) The farmer is in desperate need to know the alternative marketing techniques, alternative financial approaches, alternatives in organizational management, and alternatives to government programs for survival and profitability.
3) United States agriculture has increased its dependence on the international market, therefore, government policy makers and agribusinesses trading internationally, need economic information and data on the competitiveness of United States commodities in the world market to make fair and equitable trade decisions. Also, it is important to these groups to understand the foreign countries trade policies and their effect on trade.
4) The consumer needs to be provided information to understand the impacts of government policy and subsidy programs for agriculture. Misunderstanding could result in new policies unfavorable to the agricultural sector.

The CSRS/USDA survey identifies and prioritizes major users of the research results from researchable agricultural economic questions as follows:

- National, regional, state, and local policy makers
- Lobbyist
- Agribusiness and related groups
- Farmers
- Consumers
- Agricultural consultants
- Farm organizations and commodity groups
- University administrators
- Consumers
- News media
- Extension Service
- Researchers

Most of the groups being surveyed expressed that a process is needed within a USDA governmental agency for defining, pursuing, and disseminating research results, data, and information at strategic times on key issues affecting agriculture. There was complete agreement from participants in the survey, that if results from agricultural economic research were not communicated to the ultimate user in an understandable and timely manner, there was little need to conduct the research. Also, it was agreed by those in the survey that it was the responsibility of the researcher to communicate the results of their research to the users.

Conclusions and Recommendations

The United States total agricultural system is and will continue to be faced with many critical problems. Agriculture is the largest U.S. industry, and is a key component for a viable U.S. economy and our overall competitiveness in the world markets.

Given today's economic realities, future agricultural economic research can't be justified only on saving the consumer dollars, or minimally lower the per unit cost of production; but also must be based on profitability and competitiveness in the world markets.

Agricultural economists have contributed significantly to the understanding and operations of the agricultural system. However, the demands for tomorrows knowledge, and for timely decision making should be our basis for conducting future agricultural economic research.

Agricultural economists can take a leadership role in influencing the future changes that will take place in the United States total agricultural system, by accepting the challenges identified and prioritized in the agricultural economic researchable questions in this study.

The challenge to each of us is to utilize our areas of expertise, select the agricultural economic researchable questions identified and prioritized in this study that fits our area of expertise, develop a clear, concise proposal statement, directed toward a specific user (audience), that can be used to garner both societal support and adequate funding. Then conduct the research manner that timely decisions can be made by the user of the research results.

Following are major research areas and selected researchable agricultural economic questions, identified in the study that need immediate attention (for details on major agricultural problems and researchable agricultural economic questions that have been identified and prioritized in this study, refer to those sections in this paper):

I. Research Area - International Agricultural Trade and Development.

Agricultural Economic Researchable Questions:

- What agricultural products and processed products, do foreign countries want from the United States?
- What are the United States comparative advantages in world agriculture by each commodity and processed products, to other producing countries?
- How to improve quality in the United States agricultural commodities and product characteristics traded internationally?
- How can the United States become better merchants in international markets?
- How should the United States structure its agricultural policy and trade policies to be on the competitive edge in international markets?
- What impact have United States policies had on agricultural trade volumes and patterns?
- What is the impact of foreign government policies on United States agricultural exports?
- How should the United States transfer to and receive - new technologies from foreign competitors and at what price - what is the overall economic impact of such transfers?

II. Research Area - Agricultural Management, Marketing, and Finance.

Agricultural Economic Researchable Questions:

- How should we train agricultural producers (farmers) in marketing and financial management?
- How should agriculture be financed in the future?
- What data and information and in what forms does the agricultural producer need to make timely and profitable decisions?
- What are and will be sources of equity for individual agricultural proprietors?
- How should we be training future agricultural students to cope with the changing agricultural environment in agribusiness and farming?
- What are the major factors affecting the domestic and international demand for food?
- What are the consumption patterns for food eaten away from home?

III. Research Area - Agricultural Price, Income and Policy Analysis.

Agricultural Economic Researchable Questions:

- What role should the United States play in the world agricultural market over the next fifty (50) years?
- How competitive should United States Agriculture be in world markets in the years 2000, 2025, and 2050?

- What would United States agriculture look like and how competitive would it be in the world market if the United States had no government farm support programs over the next five (5) and then (10) years?
- What is the national, and international economic feasibility and overall effect of each major new technology (biotechnology included) coming to the marketplace?
- What changes will take place in the United States and foreign agricultural industry during the next twenty-five (25) years?
- What would happen to U.S. farm income, by farm size and enterprise, in the short and long-run without farm subsidies?
- What are the policy alternatives for diversifying and diverting resources within and out of agriculture?

IV. Research Area - Community and Human Resources.

Agricultural Economic Researchable Questions:

- What restructuring needs to be made in the agricultural research, educations, and communications (extension) programs at the universities and government agencies (USDA) to cope with the future changes in the United States and world agriculture?
- What type of farm and rural structure does society want and how much is society willing to pay - who pays, and who decides who pays?
- What are the impacts of rural economic development on farm family employment and income opportunities?
- How can employment opportunities be increased in rural areas?
- What are the alternative policies (methods) to improve human capital in rural areas?
- What policies and programs are needed to facilitate adjustments in rural areas?

Where are the potential payoffs? Applied research results from the prioritized researchable agricultural economic questions identified in this study, will positively influence the future competitiveness and profitability of U.S. agriculture in this rapidly changing world; therefore, everyone in the agricultural system will be winners.

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Chapter 8

NATURAL AND RURAL COMMUNITY RESOURCES AND THE ENVIRONMENT AND THEIR USERS

(Rural People, Resources and Communities: An Assessment of the Capabilities of the Social Sciences in Agriculture)

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Introduction

The task to be accomplished by this paper is daunting. It is to assess the capabilities of the social sciences to address in meaningful, practical ways the problems of rural America. Deliberately excluding the production and marketing of farm products, the subject matter embraces rural people, their health, education, family lives and civil participation, rural communities and their instititutions, the economic geography of rural regions, and natural resource management and conservation.

So broad is the scope of the subject matter that it is probably impossible to do justice to it in a way that satisfies demanding, critical readers. This paper can only survey the field, painting the scene with broad strokes that suggest, but do not depict, all the subtle and important details.

The paper is divided into three major parts. The first part focuses upon the nature of the manifest problems facing rural America at a time of historic change in agriculture and in the economic structure of rural regions. The second part focuses upon the epistemological assets and liabilities of the social sciences for addressing these problems. The final part examines problems within the community of social science scholars, both within the land-grant university system and beyond, that bear upon addressing the very real and serious adjustment problems rural America must confront.

Rural America in Change

Rural Regions in a Post-Modern World

Rural America is undergoing profound economic change in the late twentieth century. As Kirkendall notes, the exact meaning of this change with regard to farm families and the location and organization of agricultural production is open to question. So, too, is the meaning of this change for the rural non-farm population. Yet there is good reason to believe that a combination of political, social, and technological developments are now in place that are as significant in their implications for rural America as the great historical transformations that accompanied other quantum changes in the dominant mode of production (e.g., as during the industrial revolution.)

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Agricultural Technology. The first of these factors is the technological change in agricultural production, particularly that associated with the computer and with biotechnology. Social science is not very sophisticated in doing technology assessment. Yet the recent efforts by the Office of Technology Assessment to examine emerging technologies in agriculture suggest that technologies expected to come into use by early in the next century will: (1) greatly reduce the land required to produce those agriculture products that can be absorbed by the market at prices equal to, or greater than, production costs, (2) accentuate the trend toward larger farm production units, and (3) shift agriculture production toward those areas able to make effective use of computer-driven irrigation systems.

The implications of these changes are perhaps most troublesome to areas at the extensive margin of present agricultural production, primarily the South, where large amounts of land now used for farming could become redundant. There are also troublesome implications for the Midwest, however, where the modest-sized, family-owned and operated farms will be under increasing competitive pressure from large farming operations in the irrigated areas of the Southwest that are better positioned to take advantage of new sophisticated technology, particularly if federal policy persists in subsidizing provision of irrigation water to Southwestern agriculture.

Geopolitical Change. The second factor underlying change is geopolitical. The breakdown of colonialism after World War II produced many more independent agents in the buying and selling of goods and services in world markets. American sponsorship of a world economic order centered on (more-or-less) free trade expanded the markets in which American farmers and rural communities participated. Yet it also expanded the potential competition for American producers of both agricultural and manufactured products. American and European programs of technical assistance to developing nations expanded the capabilities of many countries to meet their own agricultural needs from domestic production and to become exporters of agricultural commodities and manufactured goods. A global economy has emerged as a result (See Drucker, Deaton and Weber).

No longer is it sufficient that a region possess comparative advantage within the U. S. market. To achieve economic prosperity a region must be able to compete successfully in the new global economy --- i.e., it must have comparative advantage in world markets.

While American agriculture, particularly the grain-oriented agriculture of the Midwest, appeared to have worldwide comparative advantage into the 1970s, it is no longer clear that the U. S. occupies such a favorable position. New production centers in the Southern Hemisphere are favored by lower land costs and cheaper labor. Moreover, the technology that gave the U. S., and the Midwest, comparative advantage in agriculture through the 1970s is developing along lines that are unlikely to reenforce the position of family farms in the country's rural heartland.

Although the prospects for the rural Midwest are ambiguous, they are much less so with regard to the economic base of the South and other rural areas

where manufacturing has replaced agriculture as the dominant sector. Long suffering from an excess of labor relative to capital in agriculture, the South was successful in programs of rural industrialization during the third quarter of the century. The work of agricultural social scientists was highly significant in achieving that success. The strategy was based primarily upon selling low-cost labor to manufacturers by attracting branch plants of U. S. firms expanding to fill niches in the markets for manufactured goods left empty by the wartime destruction of industrial capacity in Western Europe and Japan. The South (and some other rural regions) built a new, non-farm economy by working the end of the product cycle.

Success in pursuing such a strategy was due to exploiting a set of historical conditions that were, by their very nature, transitive. Industrial capacity in Europe and Japan was bound, sooner or later, to be restored and to produce acute competition for American manufacturers. Moreover, advances in the technology of transportation and communications were to make manufacturing production feasible in many labor-surplus parts of the world. Even though there remains (and likely will remain) important advantages to locating manufacturing within the American market, those advantages are often not great enough to offset the labor cost savings to be achieved by locating activities at the end of the product cycle in developing countries. Domestic U. S. manufacturers are having a difficult time competing with offshore operations in labor-intensive production. Since low-cost labor is one of the principal attractions for rural industrialization, there is good reason to doubt whether manufacturing remains a viable alternative as part of the economic base of many rural communities (Rosenfeld, et. al.).

The reason for the doubt is that there does not seem to be much opportunity for rural regions to compete for economic activity higher on the product cycle, or in the service sectors. Jane Jacobs, Niles Hansen, and a number of geographers have made convincing arguments that urban centers have inherent advantages in the early stages of the product cycle, and in the provision of those sophisticated services requiring professional competence. The emergence of new manufacturing techniques such as "just-in-time" inventory management only reenforce the economies of agglomeration available in urban locations. Indeed, the reasoning put forth by Jacobs, Hansen, and others leads to the conclusion that all rural regions are simply part of the economic hinterland of some primal city to which those regions are tributary. The role of these rural areas in a modern market economy is tied inextricable to the fate of the economy of that primal city.

The way in which changes in the mode of production has affected regions and systems of cities has been illuminated within a historical context by the work of the late French economic historian, Fernand Braudel. Braudel calls the primal city the "global city," and he traces the shift of the locus of economic activity from Venice to Lisbon to Amsterdam to London to New York over a period of more than three centuries. Braudel's analysis is consistent with the theory of central places put forward by Christaller. British geographers, particularly Massey and Dunford and Perrons, have independently examined the same phenomenon (on a less than global scale) in

the British Isles. The results of this analysis does not indicate that the economic role of rural areas need necessarily be menial or poorly compensated. Yet neither does it promise that the role will be otherwise. Some activity will take place in every region, but that activity may require few people and great amounts of land.

Shifts in the locus of the global city, sometimes (but not always) associated with changes in the mode of production, have meant, according to Braudel's analysis, great spurts of growth and prosperity for heretofore backwater regions and communities, and dramatic declines in the status of once prosperous communities. Whether the fate is boom or bust, both people and community institutions can be traumatized. Hence, shifts in the comparative advantage of rural regions associated with changes in agricultural technology and the emergence of a global economy imply major social adjustments for much of rural America. Public policies may be capable of making the adjustments less chaotic and painful for individuals and communities, but it is probably neither possible nor desirable that such policies can make the adjustments unnecessary.

Changing Policy Environment. The third change may be simply a result of the first two and not exogenous to history. Yet in seemingly simultaneous occurence, the environment in which public policy is formulated in the United States is undergoing change. Our attention to cycles in the policy arena has been summoned in a recent book by historian, Arthur Schlesinger. The New Deal era, which corresponded to one phase of a cycle, gave way to what some predict is a new era of conservatism in political, social, and economic behavior.

It is entirely possible that the changes noted with the election of Ronald Reagan to the Presidency are simply random and ephemeral, associated with some bubble on a demographic sea. Yet it is also possible that the changes are part of a logically-connected pattern of evolution within a relatively free, individualist society.

Whatever the source of the changes in the policy environment, the environment is not static. Under American political institution and in the presence of a dynamic technology, that environment is driven by the political equivalent of the motivation to sell a product in the marketplace. Such, at least, is the insight that brought the 1986 Nobel prize in economics to James Buchannan. While the award to Buchannan came as shock to many overseas economists, it had long been expected by many in the U. S. where the public choice school of economics founded by Buchannan had become influencial in high policymaking circles. That high influence is held by persons who take such a radical (by standards of the old political science) premise for theory speaks a great deal about the political environment that has arisen.

Webber and Wildavsky (p. 25) provide a conceptual model that allows for explanation of not only shifts in the political environment as a generic phenomenon, but also the shift toward the individualist, libertarian axis that could be hypothesized as now being evident in the U. S. If that hypothesis is true, fundamental assumptions about how people conduct themselves relative to government must be altered. While it is not

necessary to abandon rent-seeking activities, the rationale stated openly for public policies must be reformulated to seek to the commonly-held precepts (what Garry Wills calls, the "common sense) of the body politic.

The ramifications of such changes in the policy environment for rural people, resources, and communities requires more careful thought that is possible here. Yet they possibly include such significant structural shifts in the social welfare function as to include reduction in the value placed on rural life as part of the nation's cultural heritage, a growing attitude of laissez-faire toward lagging regions, a reduction in the value placed on public, as opposed, to private wealth, and stronger local autonomy for natural resource management and use. Even marginal shifts in these directions would likely have major implications for rural America.

Rural Natural Resources

Concerns about regional land use and the natural environment are the link between regional development and problems of natural resource management and use. It is entirely possible that whatever comparative advantage rural areas possess in the next century will be related, in some way, to what they will have that urban areas do not have --- relatively large expanses of open space and quasi-natural environmental amenities.

The state of the environment and the management of the society's natural resource endowment are subjects that do not require a rural focus. The urban environment and urban land use, for example, are subjects that receive considerable attention in their own right. Moreover, the use of natural resources as inputs into production processes is of concern to the general economy independently of the implications for rural people, communities, and regions.

Yet the greatest mass of our land is, and will remain, rural in setting; most of the nation's forest, wildlife, and water resources are, and will continue to be, located in rural areas, and the extraction of mineral resources often is associated with a rural environment. The rural environment (or, to be more accurate, rural environments) is, and will continue to be, perceived as an important part of our collective national wealth. Rural America, therefore, has important interests in the management and use of natural resources.

For the lay public, and for social scientists, the 1970s were a time of unparalleled interest in resource and environmental issues. Public policy initiatives have succeeded in dealing with the most obvious and pressing of these issues. While some social scientists (particularly economists) remain less than satisfied with the content of important policies, air and surface water pollution has been reduced, tougher steps have been taken to deal with environmental problems associated with mining, and machinery has been established to deal with groundwater contamination and control release into the environment of toxic substances. Serious problems remain, as recent news stories about a wandering barge filled with garbage attest, but it appears that a consensus on the general direction of public policy has been established and the remaining problems are primarily ones of detail and implementation.

Less can be said with regard to a whole range of resource management issues especially important to rural America. Among these issues, those associated with federal management of public lands and multi-purpose development of water resources loom especially large. Long established policy regarding federal leasing of mineral and grazing lands, harvesting of timber from the national forests, and provision of irrigation water have numerous sharp critics both within the academic community and among residents of communities directly affected by federal management programs. The critics sit on both the right (e.g., Baden) and on the left (e.g., Reisner) side of the political aisle. Western dissatisfaction has become so intense as to create a quasi-movement known as the Sagebrush Rebellion. Yet despite efforts by both the Carter and the Reagan Administrations (in the case of water projects and of public lands management, respectively) to institute policy reforms, much of rural America remains a colony with its most valauble natural resources controlled by the central government in Washington.

These resources remained controlled by Washington because a substantial part of the population, particularly urbanites and Easterners, tend to see the public domain as a great "national park" reserved for the benefit and enjoyment of the whole country. That is not the view of rural residents, particularly in the West, who tend to see the resources of the public domain as part of their local resource endowment for developmental use to enhance their own utility. This fundamental difference in viewpoints shows no signs of converging, and as long as it persists, issues in resource management will remain. Demography, as much as anything else, is likely to determine which viewpoint dictates public policy because population will determine how Congress and the Electoral College will be apportioned.

Demography changes, in turn, are a function of land use in rural areas (as, conversely, rural land use is a function of demography). Demographic trends suggest that even in rural communities the divergence in viewpoints over management of natural resources will intensify. With an aging population in the country --- a population that need not have jobs within commuting distance of the residence --- rural areas may become populated by a disproportionately large number of the elderly seeking to live the end of their lives in places with attractive environmental amenities. Substantial population growth in some rural areas could be associated with an influx of retirees (Serow and Charity), and, at the margin, this influx will improve the political position of rural areas in national councils. Yet, if these elderly are drawn to rural communities by environmental amenities, they may be less than sympathetic to the concerns of the natives desiring greater latitude in logging, mining, grazing, etc. So the demographic trends, as they are now evident, are not favorable to a political resolution of issues over control of natural resources in favor of greater local autonomy, especially if that autonomy would result in increased developmental use of those resources for private economic gain.

Two topics that may engender new national policy are pricing policies regarding irrigation water from federal projects and soil conservation. The former is much too complicated to be treated here even in a cursory way except to note the growing acceptance among intellectuals of a more market-

oriented approach to western water (Anderson, 1983). Such an approach, should it be adopted, would have profound implications for the agricultural geography of the country and perhaps restore whatever comparative advantage Midwestern agriculture may be losing. The general direction of federal policy toward soil conservation is perhaps suggested in the Sodbuster and Swampbuster provisions of the 1985 farm law, particularly its focus upon cross-compliance --- i.e., conformity with certain land-use restrictions in oder to qualify for farm income and price support payments (Reilly). In both cases, the policy trend is influenced not so much by grassroots concerns of people in rural areas as by the interests and concerns of urban governments and urban-based conservation groups.

As already noted, the aging population in the country may provide a new economic base for some rural communities, particularly those in proxmity to medium-sized centers of urban services in areas with desirable climate and other environmental amenities. The Ozarks, the Carolina mountains and foothills, the coastal counties from the Chesapeake Bay to the Rio Grande, some parts of the desert Southwest and certain areas of the Pacific Northwest seem destined to be become meccas for retirees. Yet if the elderly move to rural areas for environmental amenities, the re-development of those rural areas may require that these amenities be guarded and enhanced. Such agriculture as remains will need to be compatible with the desired environmental amenities, whether that agriculture is centered around part-time or commercial farms. Similarly, other types of economic activities will need to be suborinated to the protection of these amenities. Public policy aimed at protecting these amenities, be it coastal management, land-use control, farmland preservation, or something else, is likely to emerge primarily at the state level and to be viewed as tactical measures in support of the overall state development strategy.

Rural Human Resources and Community Institutions

Compared to urban centers, the transferable human capital held in rural America, even on a per-capita basis, is relatively low. Rural Americans are less well-educated, on average, than their city cousins, in part because: (1) on a per-pupil basis, education in rural areas is more expensive than in an urban setting, and (2) with few exceptions, rural areas have less resources to finance education than do urban areas (Gilford, et.al., p. 100; see also The People Left Behind, pp. 41-57). The current economic distress in agricultural areas appears to be undermining the ability of many communities to support public education at adequate levels (Hite and Ulbrich). This implies not only that the opportunities for adjustment to new economic and social conditions have been more limited for rural than urban people, but also that during a time when the adjustments are likely to be more challenging than before, the limitations on opportunities are becoming more severe.

Backwater areas typically contain a population with relatively large numbers of older and younger persons. The working age population migrates to other locations for jobs, but the elderly, and often the children, are left behind. Not all rural areas are destined to be backwater areas. Yet the possibility must be seriously entertained that more areas will be in the future than now are. Such a situation will exacerbate the human capital

problem in rural America, posing serious difficulties for funding schools for children and for providing medical and related care for the elderly. Even those communities that are successful in selling environmental amenities to relatively affluent retirees could encounter fiscal problems because of the political microclimate likely to arise when retirees become a significant fraction of the population.

It is generally known that older people vote in greater proportion to their number than other groups. They are also less likely to support taxes for public education, the benefits of which to them are not very clear. Yet investment in human capital through improved public education may be a necessary strategy for many rural areas both to: (1) improve the abilities of their young people to migrate and find rewarding jobs in other areas with growing economies, and (2) improve the competitive position of rural communities in attracting investment that provides jobs at the top end of the product cycle. Without such investments in human capital, many rural areas will have even more diminished prospects for a viable economic base in the second quarter of the 21st century than they face presently, and the outlook will become increasingly bleak with each successive generation.

Moreover, success in attracting retirees could produce other serious fiscal difficulties for rural regions. Even the relatively affluent retiree is potentially a burden on the state Medicaid budget. Prolonged stays in nursing homes can exhaust the assets of moderately well-to-do persons. While Medicaid is funded with both federal and state dollars, states with disproportionately large populations of older persons could be placed under very difficult fiscal pressures. Rural regions would seem to have a particularly strong interest in solving the puzzle of financing long-term and catastrophic medical care.

There is a positive side, however, to the possible influx of retirees into some rural communities. Retirees represent a valuable supply of human capital to their new communities that may help to offset the loss in human resources associated with out-migration of the more ambitious, able, and aggressive members of the working-age population. Retirees represent a potential pool of community service volunteers who have both the time and experience to contribute to civic activities. If they are not blocked from participation in community life by sociological barriers erected by the indigenous population, these retirees can provide leadership in helping rural communities adapt and change. Sokolow notes, however, that considerable empirical research is needed to determine the extent to which small rural governments can substitute volunteers for professional or other paid staff. Similarly, Sokolow suggest that friction can result when the agendas and ambitions of activist volunteers clash with those of local officials and professional civil servants.

Finally, the subject of rural human resources cannot be examined without some attention to the continued presence in rural communities of relatively large numbers of native Americans, blacks, and other ethnic minorities that remain on, or beyond, the edge of the mainstream culture. Twenty years ago, the President's National Advisory Commission on Rural Poverty noted the special difficulties of these rural Americans. The stripping away of government-sanctioned racial segregation has produced some gains for

minorities, but has produced material benefits for relatively few persons. If the well-being of minorities has improved in the past 20 years, the improvement has been marginal.

Minority rural Americans face all the same problems that beset most rural Americans, but because of their special history and different cultural roots, the problems are compounded. Yet the one problem that minorities face in a much bleaker reality than other rural Americans is poverty. If minority groups have been able to achieve only marginal material progress during a time when rural America generally achieved significant economic gains, it seems likely that they will be especially adversely affected during the years ahead when the economic success stories in rural American may be rare. That is not to suggest that public policies can address effectively the problems of minority groups in rural America, particularly when those minority groups are treated as passive targets of policy. Some contemporary opinion that doubts the possibility of success has been given serious reception (Gilder, Murray). Even so, these problems demand good-faith efforts to be understood as integral to the tasks that social scientists in agriculture must address. Even if democratically organized, an individualistic, laissez-faire society in a bad temper has the potential of satisfying at least one of Hobbes' conditions for a state of nature --- nasty.

Epistemological Capabilities of the Social Sciences

Framework for Assessment

The epistemological characteristics of the social sciences as they relate to agriculture generally are addressed in another paper. There is neither the need, nor the room, to address those characteristics in this paper. Yet there does appear to be a need to undertake a reconnaissance across more limited terrain in an effort to assess the capabilities --- the assets and liabilities --- of the social sciences to address the particular sets of problems identified above.

Johnson provides a useful guide for classifying the information that is gained from such a reconnaissance. He divides the activities of the social sciences into three categories: (1) disciplinary activities, those aimed at advancing the discipline, particularly its theory without much explict concern for relevance to pragmatic problems, (2) subject-matter activities, almost always multidisciplinary and focused upon such generic matters as community development, regional growth, public administration, or natural resource policy, and (3) problem-solving activities, also usually multidisciplinary, and directed at finding answers to pragmatic questions arising out perceptions of objective reality.

Given the human, community, and resource problems sketched above, the prime concern in this part of the paper is with capabilities in the third category of activities. Yet problem-solving capabilities often must rest upon subject-matter and disciplinary assets that also require attention in this reconnaissance. The reconnaissance involves an examination of theory and methods, data resources, and problem-solving capabilities.

Theory and Methods

Theories are the way we explain facts in evidence and the basis for hypothesizing about facts not in evidence. In the absence of theory we are unable to explain and organize, to separate the relevant facts from the almost infinite numbers of facts that might be ascertained. In the social sciences, the development and testing of both theories and methods is largely the work of disciplinary and subject-matter activities.

There are only bits and pieces of theory for explaining and organizing facts about regional change and adjustment in rural America. Although there are some candidate general theories in the work of Marx, in the urban-centered concepts advanced by Jane Jacobs, and in modifications of Schumpertian development theory emerging in the work of Vernon and Markusen, none are yet capable of generating hypotheses suitable for rigorous testing in ways that satisfy the requirements of logical positivism. At best these potential general theories provide little more than a basis for speculation about the regional change and community development.

The result is that many of the social scientists working on regional subject-matter are, epistemologically, instrumental phenomenalists. They have made extensive use of location theory, particularly the work of von Thunen, Weber, Losch, and Christaller, and the spatial equilibrium models of Samuelson. Greehut and his students have made progress in intergrating location theory into neoclassical microeconomics. The production models of Leontief (and the derviative input-output models) have been widely adapted for use by regional analysts. There are at least a half-dozen regional growth theories, ranging from export base models that can be grafted onto a Leontiefian system to the cumulative causation theories of Kaldor and Myrdal (See Deaton and Weber). In each case, however, these theories have been used primarily as the basis for developing tools or defining a perspective to examine particular segments of regional phenomena.

Perhaps more than in most other subject-matter activities, social scientists working on regional concerns have been able to develop some useful, institutionalized ways of working together across disciplinary boundaries. Much of the credit for that accomplishment goes to regional science. Regional science was the brainchild of Walter Isard who hoped that it would develop its own unique theory and set of methods independent of the other social sciences --- i.e., become an independent discipline. That has not happened (Miernyk). Still, a useful multidisciplinary forum has been institutionalized.

Even though institutionalized regional science has been dominated by economists, it has attracted some gifted geographers (particularly in Europe) and a scattering of scholars from sociology, demographers, political science, and even engineering (especially systems engineers). Still, large parts of the social sciences dealing with regional and rural problems have remained outside regional science, most notably the rural sociologists. The result is that much of the work in rural sociology has remained distant, isolated, and misunderstood by regional scientists, particularly by the economists (see Hite).

At the risk of being overly harsh, it might be said that while it is clear that rural sociologists talk to each other, it is not clear they make a habit of talking to any other social scientists. Regional economists, on the other hand, have talked to anyone they could force to listen, but sometimes demonstrate an unwarranted arrogance toward the other social sciences.

In a series of recent papers, Randall (Randall, 1985, in Lynne and Milon, and in Phipps, et. al.) has explored with insight and subtlety the various strains of theory in natural resource economics (see also Batie, Bromley, Milen and Lynne, Shabman). Unlike regional science with its poverty of comprehensive theory, resource and environmental economics, Randall suggests, has great theoretical riches. Those theoretical strains, sometimes intertwined but perhaps never fused, include the reductionism of neo-classical microeconomics (which, in turn, can be sub-classified into at least two component parts), the wholistic methodoloy of the institutionalist claiming legitimacy in the pragmatism of Henry James and John Dewey, and the individualism of the quasi-Austrian school of so-called "new resource economists." Given the policy process in the United States, Randall makes a strong case that this great diversity of viewpoints in natural resource economics is an asset of considerable value.

Having spun off a number of theoretical nuances of note in the past twenty years, particularly in the area of welfare theory, natural resource economics appears to command greater intellectual respect within the mainstream of the economics discipline than does regional economics. Moreover, resource economists have paid greater attention to the policy process than many other social scientists (with the probable exception of some political scientists like Lindblom) (see Nelson, Randall, 1986, Shabman). There is no credible evidence yet, however, to suggest that this attention to the policy process has produced additional influence for resource economists in policy formulation. But perhaps it is unreasonable to expect such evidence to appear just yet.

The most serious epistemological liability of the natural resources subject area is lack of vigorous, on-going dialogue across disciplinary boundaries, particularly across those boundaries separating the economic from noneconomic social sciences (see Newby). The institutionalists have built some bridges to legal scholars and political scientists, but, with few notable exceptions, they have ignored geographers, anthropologists, historians, and even rural sociologists. Among those notable exceptions is the synthesis regarding common-access resources fashioned by Ciriacy-Wantrup. Although they have sometimes offered brilliantly provocative insights, the new resource economists have seemed particularly insular in constructing analytical paradigms, and consequently, stand in jeopardy of not exploring the subtle nuances of the individualist philosophical approach and uncovering insights for understanding how political environments change.

Given the nature of the resource problems likely to face rural America, particularly the critical issues concerning Western water policy that could shape the future of American agriculture, the absence of an on-going

dialogue between the various strains of resource economics and the other social sciences risks the formulation of policy without needed and attainable information. The fault lies not in any failures of individual professionals but in the failure of institutions to evolve. If that institutional failure is not addressed and remedied, the credibility of the "agricultural" social sciences could be seriously compromised.

While regional science has been a tool-building and tool-testing venture, resource specialists have, with some few exceptions, been content with the generally-used analytical tools of their disciplines, finding them adequate for most undertakings. A noteworthy exception has been development of a technique known as contingency valuation, a method of measurement of the demand for non-market environmental amenities. The tool is still not perfected, but considerable progress has been made in the last ten years. Resource specialists also have played a major role in refining benefit-cost analysis, although they can hardly claim credit for the tool itself and although much work still needs to be done in development of non-economic accounts.

Data Resources

All of the subject-matter areas of concern to this paper --- regional science, community development, natural resource and environmental management and use, human resources --- are plagued by inadequacies in institutionalized data series. Those inadequacies are well documented in a 1981 National Research Council study, Rural America in Passage: Statistics for Policy (Gilford, et. al.). This study also recommends some quite basic steps that should be taken regarding development and classification of needed statistical series. Some of the recommendations, as for example, establishment of state statistical service centers, have been carried out in some states, but others, such as the mid-decade census, seemed further from realization today than when the study first appeared.

One point emphasized in the NRC study that merits extra attention here is the need for small area data. Recognizing that the costs of obtaining reliable data for small areas limits the possibilities of breadth in both the data series and the regularity of collection, the NRC study recommends standardization of existing reporting systems with county coding and establishment of benchmarks through the mid-decade census to allow use of new statistical procedures for estimating intercensual small area parameters.

The data resources problems have many implications for analysis. One such implication is a tendency for social science analysis of change in rural areas to lag behind the realities of that change, with potentially serious impacts on the formulation of relevant, effective public policy. Hite and Ulbrich, for example, were seriously hampered by lags in reporting data for non-metropolitan jurisdictions when trying to make an assessment of how the financial crisis in agriculture in the 1980s was affecting the fiscal health of rural governments. Similarly, researchers using input-output models produced by the Bureau of Economic Analysis of the U. S. Department of Commerce are forced to work with matrices containing coefficients based on technology and price relations that are at least five years out-of-date.

In periods of rapid change and social flux, the lags mean (metaphorically) that policymakers shoot at a target moving faster than the speed of light.

Some of these data problems cannot be remedied at any reasonable cost. Since it is very difficult to show the marginal benefits of a data series, determination of the optimal stock of data is a matter of subjective judgement in a great many cases. An argument might even be made, following the logic offered by Shabman and Nelson, policy decisions seldom turn on social science analysis and so it makes little practical difference to policy whether reliable, timely and appropriate data are available. Even if one concedes some validity in such logic, social scientists would renounce the continued search for knowledge if they allow cynicism about policy formulation to influence design of rational, cost-effective schemes for improvements in data resources.

One promising new avenue for enhancing data resources is through remote sensing. Urban planners have made effective use of aerial photography for almost half a century. Except for geographers, however, few other social scientists have explored the possibilities of obtaining certain useful data from remote sensing. The advances in remote sensing technology associated with the space programs make the potential for its uses as a tool of social science worth attention. Combined with computer cartography and other new technology-aided analytical tools, remote sensing might allow social scientists in all the relevant subject-matter areas to achieve significant breakthroughs in insight and predictive capabilities concerning land-use, human ecology, and spatial development patterns.

Problem-Solving Capabilities

Given the difference in the mix of assets and liabilities of the two major subject areas --- e.g., regional science (including community development) and natural resources management and use, the two specialities have quite different current problem-solving capabilities.

Regional development/community development specialists can answer numerous well-defined empirical questions of a specific nature. Lags in data, however, often mean that the ability to do so is confined to questions about what "has been." The capacity for understanding "what is" occurring contemporaily, or to predict what is likely to occur, is, arguably, pseudo-scientific, requiring assumptions about facts not in evidence. Such assumptions are tenable as pragmatic expediencies only if there is a well-tested theory with which they are consistent. The theoretical deficiencies of regional anaylsis place very severe constraints on the defensible use of such assumptions. Particularly troublesome is the capacity of regional specialists to make predictions about the outcomes of alternative macro (or even some micro) policies that are likely to provoke structural change.

In some sense, however, regional specialists have greater problem-solving capabilities than students of macroeconomic policy. To the extent that many large American businesses as well as many governmental agencies are willing to subscribe to macroeconomic forecasting services, laying out impressive sums to pay for these services knowing that imprecision and errors are inherent in the forecast, there is a suggestion that the problem-solving

capabilities of regional specialists have more than trivial social value. Regional specialists can measure regional impacts of various sorts within a comparative statics framework, and they can make these measurements with ever-improving levels of precision. To ask that they break out of the comparative statics framework, however, would be to ask for more than the present state of the sciences will support.

Resource specialists have a greater range of competence in problem-solving. While making use of the impact measuring capabilities of regional specialists, resource specialists can also determine, with reasonable errors, the market-realized benefits and costs associated with alternative resource policies. In a growing number of cases, they can also identify the gainers and losers, affixing reasonable approximations to the market value of the gains and losses experienced by various segments of the population. The capability to estimate nonmarket-realized benefits and costs through contingency valuation or other indirect means is still embryonic, but improving. Greater collaboration among economists, sociologists, and psychologists would seem to offer a relatively high probability of payoff for improvements in contingency valuation.

The other notable gain of recent years in competence by resource specialists has been through application of public choice paradigms to prediction of behavior in policy formulation and in regulatory administration (See Niskanen, Runge, and papers by Downing and by Yandle in Lynne and Milon). These developments open up exciting posssibilities of inserting feedback loops into various models of natural resources public administration, perhaps along lines suggested by systems research. The result would be a capability to predict the dynamic consequences of alternative policies and programs. But that capability is still to be realized.

The Community of Social Science Scholars

Number of Scholars

There will probably always be too few hands for the tasks to be done. Yet one of the biggest liabilities of the social sciences in addressing the problems of rural people, resources, and places is too few scholars.

This generalization applies to all the social science disciplines considered here. Even though the American Agricultural Economics Association numbers more than 2000 economists among its members, a great number are involved in study of commodity-oriented problems in production, management, and marketing. Perhaps no more than one out of ten agricultural economists works regularly on problems of rural regional and community development, rural human resources, or natural resource management.

The total number of rural sociologists in the country is no greater than about 1000. While perhaps a large majority of rural sociologists have professional interests that transcend production agriculture, there are few concentrations of rural sociologists in any agency or university, many administrators apparently being content with tokenism in employment of rural sociologists. Lacy and Busch (in Dillman and Hobbs, p. 410) report in

1982 that 25 land-grant institutions employ three or fewer active members of the Rural Sociology Society. The lack of critical mass in many institutions is a problem, especially in collaborative research. The low numbers also create another problem noted by Dillman and Hobbs (p. 418):

> Because of being one of the few, and sometimes the only noneconomic social scientists in the land grant agricultural universitier, rural sociologists are frequently called upon to respond to problems that exceed our skills.

Forced to cover too many bases in too many ballparks with far too few players, the considerable potential of rural sociology is often dissipated.

The only other professional social scientists (if they may be so classified) employed by more than a few agricultural institutions are lawyers. Increasingly, agricultural economics departments within the land-grant universities have been adding agricultural lawyers to their faculties. Yet many of these lawyers focus their work on the problems of farm and agribusiness firms rather than on rural communities and natural resource management. Perhaps fewer than a dozen are employed regularly in roles directly related to the substantive concerns of this paper.

Geography is the social science that, perhaps, might best serve as a catalyst for multidisciplinary subject-matter work directed at rural people, resources and places. In the past half-century, geography has move well beyond the descriptive discipline that it is often thought to be, and scholars working at the cutting edge of theoretical and quantitative geography make use of analytical tools equal to the most sophisticated employed in the other social sciences. Although no hard data are available on the subject, casual observation indicates that professional geographers are rarer in the land-grant agricultural colleges than bikinis in Antarctica. Indeed, more than a few land-grant universities have no organized academic geography departments that might provide scholars who could collaborate with agricultural economists and rural sociologists. A plentiful supply of well-trained professional geographers is available, especially if the European scholars are accounted for, and the addition of geographers to the faculties of agricultural colleges could substantially increase the capabilities of those colleges for understanding the problems of rural America.

The U. S. Department of Agriculture does employ a broader mix of social scientists than do most land-grant agricultural colleges. USDA has long supported a small, but influencial, program in agricultural history, and utilizes a sprinkling of demographers, geographers, and other social scientists on its staff. But the bulk of the professional social acience staff in USDA, as in the land-grant colleges, is accounted for by economists oriented toward commodity problems. Similarly, the programs in agriculture and (what used to be known as) home economics at non-land-grant universities seldom contain social scientists other than economists and sociologists, few of whom are free to devote substantial energy and time to anything other than the traditional core concerns in farm management, agribusiness, and home economics.

There is a substantial number of social scientists with competencies and interests in problems of rural regions, communities, resources, and people outside the institutions usually identified with agriculture. These institutions include colleges of liberal arts and business administration, and even engineering. Academic departments of urban and regional planning also involve themselves in problems of rural communities and people. In addition, there are small cadres of scholars in such privately-funded research institutes as Resources for the Future and similar "think tanks." Taken as a whole, the contributions to rural studies of these scholars employed outside of the traditional agricultural institutions probably equals that of the "in-house" scholars of the agricultural establishment.

On balance, it may be fair to say that if all agricultural economists are considered, the total number of social scientists available to work on problems of rural communities, human resources, and resource management is adequate to the need. The problem is that the composition of this body of scholars is not well-suited to meeting the needs of rural America. Too many economists are employed in studying production agriculture and agribusiness in comparison to the relative size of the agriculture sector in the American economy, and too few are employed in dealing with the problems of non-farm rural America, given the relative importance of the non-farm population. Unfortunately, a simple reallocation of the available manpower might not be adequate since many agricultural economists are not well-trained to deal effectively with problems other than those of production agriculture and agribusiness. One prominent resource economist (without any insidious intentions) observes: "Production economists do not retread well."

Recruitment and Training of Replacements

In some respects, the numbers problem regarding social scientists in agriculture will intensify by the end of the present century.

The long-term capabilities of the social sciences to deal with the problems of rural America depend upon recruiting and training talented young people who will enter the various relevant professions. Currently, the recruitment and training of regional economists gives reason for concern.

Interest in regional economic development in the United States appears to move in cycles; that interest peaked during the New Deal years of the 1930s and again during the Great Society years of the 1960s. Since about 1970, interest has been on the wane. Young scholars, with a practical eye on their futures, are apt to move with the cycles. The result is that few graduate students in economics or agricultural economics are now choosing regional economics and related subjects as an area of concentration.

Since the number of job openings for new Ph.D.s with specialization in this subject area has been few, it is reasonably clear that these young scholars have made solid, practical career decisions. And since a relatively large cadre of scholars was trained in this speciality in the 1960s, there remains a core of experienced professionals who are still active scholars. These 1960-vintage regional economists will be retiring in the 1990s, however, and if they are not replaced, there will be serious manpower

limitations upon addressing the substantive problems discussed in this paper.

Within the land-grant agricultural colleges there are currently no more than a handful of doctoral programs offering specialization in regional economics and related areas of regional science. A similar situation exists with regard to the graduate programs in general economics outside of colleges of agriculture. Regional economics is so different in its orientation that it is not easy, and perhaps undesirable, to force-fit persons trained in other specialities into the field. Hence, the precursors for a fairly serious manpower problem in regional development economics are now evident.

There is less evidence of a problem in natural resource economics. The great interest in natural resource and environmental policy in the 1970s brought an influx of talented young scholars from a variety of disciplines into this subject area. Fewer and fewer graduate students are opting to specialize in resource economics today. Even so, institutions seeking candidates to fill openings for natural resource economists generally find themselves in a buyers' market, suggesting no shortage of relatively well-qualified scholars. The job market in this speciality may tighten in the 1990s. Still, given the relatively large number of scholars of the 1970s vintage who will not begin to retire in large numbers until early in the next century, no manpower crisis appears imminent in the natural resource subject area.

It is not as easy (as least for me) to assess the situation regarding recruitment and training of rural sociologists and other noneconomic social scientists Two institutions --- Cornell and Wisconsin --- train at the graduate level two-thirds of all the rural sociologists in the country (Lacy and Busch, p. 409, in Dillman and Hobbs). Given the relatively small number of positions traditionally open for rural sociologists, it appears that there has not been room for many institutions to obtain sufficient students to offer high-quality programs. Should there be a significant increase in the demand for rural sociologists, however, it is likely that most of the recruiting of trained scholars would be forced to concentrate on graduate programs in general sociology.

Similarly, all other noneconomic social scientists will have to be recruited from graduate programs outside the colleges of agriculture. Going to these programs, however, does not indicate any serious problem. There are some very good graduate programs in geography in the United States and many others in Europe. High-quality graduate training in anthropology and political science is available at more than a score of American universities.

Institutional Environment

The institutional environment in which the social sciences of concern here operate also is a factor in assessing their capabilities. The general range of these institutions --- land-grant systems, USDA and other government agencies, non-land-grant academic programs in agriculture and home economics, and private research institutes and foundations --- were

observed in the section above. An encyclopedic treatment of this environment is not practical in this paper; hence, only the most salient features can be examined.

The first of these features is the relationship between the social sciences and so-called "hard sciences," particularly within land-grant colleges of agriculture. In the land-grant environment, the social scientists tend to occupy a position relative to other scientists not greatly different in form from that occupied by rural sociologists in departments dominated by agricultural economists. They are given all formal acknowledgement and treated with personal respect, but as practioners of inscrutable disciplines of embarassing imprecision, they are not quite members of the scientific club.

Social scientists do almost nothing that gives rise to increased physical productivity in agriculture. Increasing physical productivity is the mission with which the land-grant colleges of agriculture have been most successful, and so the social sciences may seem to some to be tangentially revelant to what colleges of agriculture are all about. The fact that social scientists are prone to question the validity of increasing the physical productivity of agriculture only exacerbates the difficulties of their position.

The situation is even more acute for social scientists working on community development, regional growth, resource use and management, etc., work that has policy as its primary focus. While it is relatively easy for "hard" agricultural scientists to concede the need to find markets for the increased physical output (which may imply management studies) it is much more difficult for many to grasp the significance of policy. Thus the legitimacy of studying commodity futures markets, or the economics of pest control, or irrigation, or even of farm real estate markets --- generally, the kind of studies undertaken by production and marketing economists --- has now been accepted, even if the work is sometimes considered less than scientific. But studies of community development and natural resource policy seem to lack legitimacy because, in addition to carrying all the other baggage of the social sciences, they treat subject matter that itself is only superficially understood by many non-social scientists.

No where in the land-grant institutions is the denial of legitimacy more evident than in extension programs. Even an exhaustive study of extension programs might not provide the basis for a definitive assessment of extension effectiveness. Yet casual observation suggests that: (1) most states have credible programs in farm management, marketing management, financial management, etc., (2) most states have only nominal and floundering programs in community development, and (3) most states have no program worthy of name in resource development and policy. True, some states have succeeded in developing both of the latter types of programs, but these states are the exception rather than the rule.

While the problem of legitimacy of the subject matter no doubts contributes to the failures of extension to develop effective community development and resource policy programs, the poor matchup between the programs and the traditional extension clientele ought not to be overlooked. In many cases,

the decision makers who can use, and sometimes request, the problem-solving assistance of community development and resource policy specialists do not normally have a relationship with the county extension offices. These decision makers are government officials at the municipal, county and state levels, professionals in planning, development, and resource conservation agencies, and leaders in citizen participation organizations who are not accustomed to seeking information from the county agent. In those states where county extension personnel play a major role in shaping the priorities of extension administrators, both the perceived lack of legitimacy and the lack of demand for services from traditional client groups causes community development and resource policy programs to be good candidates for step-child status.

The practical consequence of this step-child status, where it occurs, is either: (1) that needs that could have been met go unserviced, or (2) researchers spend substantial parts of their time in quasi-extension roles dealing with the various types of decision-makers identified above. When the latter condition prevails, the demands for "public service" on researchers reduces their ability to pursue sustained lines of inquiry and, consequently the rate of expansion of intellectual capital in the social sciences is reduced.

The fact is that the demand for the services of social scientists working on non-farm rural problems is substantial and growing. In many cases, those making such demands are willing and able to pay for the services at (at least) marginal cost. The demand, however, is for very applied analysis of very specific problems. It is not sufficiently strong in most states to support overhead costs related to the depreciation of intellectual capital, and as a result, those researchers who have been forced to augment meager experiment station budgets by scurrying after many small research contracts are using up their intellectual capital without any replacement. On the positive side, however, the scurrying for nickels and dimes in contracts by some experiment station rural development researchers has kept lines of communication open with users of the research product.

On the whole, social scientists in colleges of agriculture within land-grant universities have advantages over their colleagues in other academic environments because the experiment stations provide a funding base for their work. So long as the scholar's salary is covered by experiment station "hard" money, the researcher has some flexibility to work on problems which are still not perceived generally by client groups. The degree of flexibility varies from experiment station to experiment station, but it means the researcher does not have to worry unduly about making sure there is enough grant and contract money around to pay his or her salary for research time next year. Only social scientists who are outside the experiment stations and who depend upon grants or contracts to purchase release time for research can fully appreciate that advantage.

Identification with the land-grant college of agriculture also carries some benefit (although it could also be argued, some liability) for social scientists. In many states, the agricultural experiment station is the largest on-going social science research entity with the largest concentration of professional social scientists to be found at any single

institution in that state. Occupying such a position, both the college of agriculture, as an institution, and the social scientists on its staff are well placed strategically to participate in work that will be utilized by various actors for policy formulation and program implementation. While the results of work by social scientists are not often decisive in policy outcomes, often they are used in the arguments leading up to policy decisions. Some college administrators have grasped these strategic possibilities and are using them to shape the future of their their institutions, but most seem to have not.

Neither the problem of legitimacy, nor the derivative problem of step-child status in extension, is amenable to quick solutions. The affected social scientists are most adversely impacted by the problems, and will probably have to assume the initiative in dealing with them by being out-reaching. There is simply no pressing reason why "hard scientists" should feel motivated to learn about community development and natural resource policy. Administrators who are sometimes perplexed by social scientists, however, do have a responsibility to learn enough to overcome that perplexity. Unless administrators in agricultural colleges develop a better appreciation of the social sciences in general and of their relevance to rural America, there is a serious risk that the land-grant system will become increasingly irrelevant to the great majority of rural Americans who are not on farms and see no reason why tax money should be used for increasing the physical productivity of commodities in worldwide surplus.

Summary and Conclusions

The charge for this paper was to assess the capabilities of the social sciences in agriculture for dealing with a changing set of problems in rural regions and communities, in the rural population, and in the management and use of natural resources. In three major sections, the changing situation in rural America was interpreted, the epistemological capabilities of the relevant social science subject-matter areas were critically evaluated, and the salient features of the affected community of social science scholars were described.

Any such task becomes, in the end, an assessment from the unique and limited perspective of the person with the assignment. It is useful mostly to the extent that it provokes and stimulates others in making their own assessment. Others making such an assessment may adopt very different premises. Some, while accepting the premises implicit in this paper, will come to different conclusions. Still others will come to much the same conclusions but with different nuances. All that is not only to be expected, it is to be wished.

The conclusion of this assessment is that the social sciences in agriculture, using existing working relationships with disciplinary and subject-matter groups outside the traditional agricultural institutions, are not in a position to prescribe scientific remedies for the problems of rural America. Few social scientists of reputation even claim to understand what is going on in rural America well enough to make predictions about what policies would work. Even the most confident libertarian social

scientist will make predictions only in terms of general trends that could be expected with libertarian policies.

Yet the social sciences in agriculture have demonstrated capabilities for providing useful information. Even when these sciences cannot produce answers, they can often reformulate the questions so that a rational plan for securing answers can be implemented. That capability is worth a great deal to society, and there is evidence in many states that there is a willingness to pay for such capacity.

Aware of the effective demand for their services, in-house scholars working in regional/community development and resource management are generally more confident of the futures of the subject-matter areas than they are of the future of the colleges of agriculture as institutions. The concern is that the traditional obsession of agricultural colleges with increased physical productivity will blind administrators to the needs of non-farm rural people in the hard times ahead.

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Chapter 9

INTERNATIONAL DEVELOPMENT AND AFFAIRS

G. Edward Schuh*

Agricultural economists have made important contributions to our understanding of economic development. They have made far fewer contributions to our understanding of how the international agricultural economy functions, or to the role of economic (especially agricultural economic) forces in international diplomatic relations and international political and economic power.

Interestingly enough, a fairly well-integrated system of food and agriculture has emerged on the international scene in the period since the end of World War II. This has not been a volitional choice by national governments, but instead has been the consequence of significant technological developments in the transportation and communication sectors. One consequence of the emergence of this food and agricultural sector is the virtual disappearance of famines in this period. The famines we have had, and there have been significant ones, have occurred because governments declined to advise the international community until it was too late to get the available food where it was needed because of logistic problems, or actually impeded the channeling of food to the affected groups. The African experience of recent years has not been an exception to that rule.

Despite the emergence of this food and agricultural system, which helps make food and agricultural products available both for those who do and do not have the wherewithall to acquire them, the system is far from efficient and equitable. Barriers to trade in agricultural commodities have not been reduced in the same way that barriers to trade in manufacturing products have been reduced by successive rounds of multilateral trade negotiations. In fact, if anything these barriers have increased over time.

The international agricultural economy can best be described as in a massive disequilibrium. A major share of the world's food and agricultural output is produced in the wrong place on efficiency criteria. The developed countries, especially the United States, the European Community, and Japan, provide high levels of protection and income support for their fairly well-to-do farmers. The developing countries, in contrast, discriminate seriously against their producers by means of highly marketing boards which buy cheap from farmers and sell dear on international markets, and in general pursue a variety of predatory over-valued currencies, prohibitions against exports, parastatals and

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* Director, Agriculture and Rural Development, The World Bank, Washington, DC. The views expressed herein are the author's alone and in no way should be construed as official views of the World Bank. I have benefitted from comments on an earlier version of this paper by Glenn Johnson.

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policies designed to extract the surplus from agriculture and transfer it to the nonfarm sector.

The disparities which are a consequence of these policy distortions and massive disequilibra have a number of important dimensions. Resource productivities vary enormously from one part of the world to another, whether one focuses on land productivity or labor productivity. In the United States, for example, the "average" farmer produces food for over 50 consumers, despite the fact that a major share of US agriculture is part-time in nature due to climatic conditions. In most developing countries, in contrast, the bulk of the farmers produce little more than enough to feed their own families, despite climatic conditions that make it possible for them to produce two or three crops per year.

Other problems in international agriculture are legion. For example, the United States and the European Community are currently engaged in an export subsidy war that has driven the price of major agricultural commodities significantly below long-term trend lines. This "war" has penalized producers in developing countries and reduced their foreign exchange earnings, even though many of these countries have undertaken significant policy reforms to get their economic houses in order and to earn foreign exchange to service their debt. The US and the EC frequently play "chicken" with each other over agricultural policies, with pervasive threats that the export subsidy war might well expand to a more general trade war.

The developing countries, with their perceived high rates of interest, exploit their soil resources and create environmental damage, thus trading short term benefits for longer-term costs and a decline in sustainability. Rain forests are chopped down for short-term gain, with the result being longer-term threats to the supply of oxygen for the world as a whole. The consumption of fossil fuels increases the carbon dioxide in the air and threatens a green-house effect, with potentially pervasive affects on global agriculture and economic activities as a whole. And rapid population growth pushes agriculture on to marginal areas, with massive erosion the result.

Population pressures and failure to generate economic activities at a sufficiently rapid rate lead to massive migrations of population. One important such stream is into the United States with significant implications for agriculture and the rest of the economy. Another stream is occurring in Indonesia, where relocation is viewed as the only means of alleviating the pressure of men and women on the land. And still another (or better, others) occur in Africa, with important political, economic, and environmental consequences.

To summarize, what one sees in viewing the global food and agricultural system is very uneven rates of agricultural and economic development, very unequal distributions of income, highly distorted economic policies, a set of international institutions that provide neither for equity nor an internally efficient use of agricultural resources, severe environmental damage and a lack of sustainability, and severe international conflicts.

The sector of the economy which can in most countries be the engine of economic growth and a source of international power is instead a barrier to economic growth and a source of weakened international political influence.

To address the substance and subject matter behind these issues, my paper is divided into three parts. The first part describes the international food and agricultural system and the issues that arise in it. The second part considers the issues in the economic development of agriculture. And the third discusses issues in international affairs. At the end there will be some concluding comments.

The International System

As the international economy entered the post-World War II era it could best be described as a collection of fairly autonomous national economies tied together with relatively small amounts of international trade. International capital markets were almost non-existent, except for transfers from government to government - commonly labeled foreign aid. The global economy was for the most part on a system of fixed exchange rates, and most economies could be described and managed as closed economies.

Today's world could not be more different. The last twenty years have witnessed a veritable transformation in the structure of the international economy. This transformation, still only poorly understood, has completely changed the basis for economic policy, while at the same time changing the market conditions for both consumers and producers.

Let's consider the major changes in the structure of the international economy and consider the implications for agriculture and for agriculture's research agenda. The first major change has been the increased dependence on international trade. This has been a phenomenon of the entire post-World War II period, since international trade has persistently grown has persistently grown at a faster pace then global GNP. But international trade accelerated in the 1970's, in large part as a consequence of liquidity created by the increase in petroleum prices in 1973 and later in 1979.

For most analytical purposes it is perhaps best to understand this increase in dependence on international trade in terms of its obverse - the increased openness of national economies. This increased openness means that national economies are increasingly beyond the reach of national economic policies. This has become an increasingly important source of frustration in recent years as domestic policies no longer affect the economy as they once did. ES commodity policies basically designed in the 1930's, are an important example. The government has been spending large sums on commodity programs and intervening in very important ways. Yet asset values continue to decline and farm incomes remain sluggish. The problem is that forces from the international economy are swamping the effects of domestic policies. The extent to which similar developments have occurred in other countries depends on the extent to which their economies has grown more open.

A second major change in the structure of the international economy is the emergence of an enormous, well-integrated international capital market. Although this integration is by no means complete or perfect, its extent is impressive, and has changed the way we must think about economic policy-making.

The principal steps in the emergence of this market included the development of a Eurodollar market, followed by a Eurocurrency market, and then capped off by the flood of petrodollars in the 1970's. From a situation in the immediate post-World War II period in which most international transfers of capital were from one government to another, we have reached a point at which international financial flows, largely sourced from private agencies and entities, swamp international trade flows. In 1984, for example, international financial flows were on the order of $42 trillion, while international trade flows amounted to only $2 trillion.

Financial flows obviously dominate foreign exchange markets. Moreover, countries are now linked together as much by their capital accounts as by their trade accounts. As we will see below, the capital markets are also an important link among national fiscal and monetary policies.

The role of this international capital market is influencing economic policy and economic conditions in individual countries and is not yet well appreciated or well understood. Most especially, there is a general failure to recognize the links between the capital accounts and the trade accounts in our external accounts. A deficit on the capital accounts has to be balanced by a deficit on the trade accounts. There is a further failure to recognize that if we borrow abroad to make up the deficit on our Federal budget, then we have to run a deficit on our trade account. We also fail to recognize that the rapid growth in our foreign debt - we are now the world's largest debtor - double that of Brazil - will eventually lead to a dramatic decline in our exchange rate as we have to shift from a deficit on our trade account to a surplus in order to service this foreign debt. All of this has enormous implications for agriculture.

A third major change in the structure of the international economy was the shift in 1973 from the Bretton-Woods fixed exchange rate system to a bloc-floating exchange rate system. When combined with the emergence of a well-integrated international capital market, this shift led to a dramatic change in how monetary and fiscal policies affect national economies. Changes in monetary policy, for example, are now reflected in international flows of capital, and these in turn affect real exchange rates. This means that the burden of adjustment to changes in monetary policy are borne by the trade sectors - the export and import-competing sectors. If monetary policy is held constant, there are similar effects from changes in fiscal policies.

Two significant consequences emerge from these changes. First, prior to the emergence of the international capital market and the shift to flexible exchange rates, agriculture was virtually isolated from the effects of changes in monetary and fiscal policies. After these developments,

agriculture became one of the sectors that has to bear the burden of adjustment. This has made agriculture a great deal more unstable.

A second consequence is that financial markets and commodity markets have now become closely inter-linked, far more than they were in the past. The linkage is through the foreign exchange market, with domestic terms of trade (the price of agricultural commodities relative to prices of other goods and services) shifting as capital flows surge back and forth. We are now in a situation in which one can hardly understand what is happening in commodity markets without understanding what is happening in financial markets. This has important implications for those doing outlook work.

Three other dimensions of these markets deserve some discussion. First, it is important to understand that the system is one of bloc-floating, not complete flexibility. The flexibility is primarily among the major reserve currencies. Most developing countries have their exchange rate pegged to one of the major currencies.

One should not be misled by the degree of "fixity" in the system, however, for as these major currencies move relative to each other, a great deal of implicit exchange rate realignment takes place. A consequence of this implicit flexibility is that some developing counties have been blindsided by what happens to the value of the major currency to which their currency is tied. Brazil and Mexico are important examples of countries that have suffered serious consequences from tying the value of their currencies to the value of the dollar at a time the dollar was experiencing large swings. The problem is perhaps even more severe in the case of monetary unions, such as the French franc zone in Africa and the common European monetary unit. Without common monetary and fiscal policies, these common monetary unions can create large distortions to trade in individual countries.

A second important dimension of these markets is that it is not just domestic fiscal and monetary policies that matter. The dollar became so strong in the first half of the 1980's not only because the United States was pursuing contradictory monetary and fiscal policies (a highly stimulative fiscal policy and a very tight monetary policy), but because Japan and Western European countries were pursuing policies that were the diametric opposite (conservative fiscal policies and easy monetary policies). The disparity in these policies led to large capital flows from the latter countries to the United States, thus driving up the value of the countries to the United States, thus driving up the value of the dollar. Thus to understand what is happening in domestic commodity markets, one has to understand what is happening with monetary and fiscal policies abroad as well as at home.

Finally, there are important linkages among monetary conditions, exchange rates, and domestic agricultural policies. For example, the 1981 farm bill, with its mandate for escalating price supports, would have been a serious problem in its own right. However, the large rise in the value of the dollar in the first half of the 1980's exacerbated that problem. As the dollar rose, market prices eventually settled on the support levels,

and as the dollar continued to rise, US producers were priced increasingly out of international markets. Given the relative importance of the United States in some of these commodity markets, the net effect was to push international prices higher than they otherwise would have been. This brought forth a surge in production elsewhere, especially in the developed countries, that is now helping to drive market prices to unprecedentedly low levels.

A somewhat similar linkage occurred in the developing countries in the 1970's. The flood of petrodollars in that decade made it easy for developing countries to take on debt from the international community. In fact, commercial banks were encouraged to recycle the petrodollars so as to avoid a collapse of the international economy, and they did so to a fault. This inflow of capital made it possible for the developing countries to sustain the value of their currencies at high levels, and to avoid devaluations that in the longer term were needed. These artificially strong currencies were a tax on their agriculture and an implicit import subsidy. The result was that imports by the developing countries of agricultural commodities surged in the decade of the 1970's. This sent false price signals to agricultural sectors in the developed countries and contributed to a significant over-commitment of resources to these sectors.

Today we reap the consequences of those false price signals. Moreover, when liquidity dried up in international capital markets, many developing countries faced draconian realignments in the value of their currencies to restore equilibrium in their external accounts, and the need for significant shifts of resources in their domestic economies. The political difficulties in bringing about such realignments and resource shifts is what has given us the international debt crisis.

The fourth major change in the structure of the international economy has been an increase in monetary instability, which dates back to about 1968. This increase in instability is not understood very well, but we can assess its consequences without understanding its causes. This instability takes on special significance in light of the other changes outlined above: increased dependence on trade, the emergence of a well-integrated international capital market, and the shift to a bloc-floating exchange rate system.

The increase in monetary instability has created two kinds of instability for agricultural commodity markets. The first is short-term instability, the kind that can be managed by futures markets in commodities and foreign exchange. Developing countries typically don't have such futures markets, however, and often impose limits on the ability of their producers and traders to take advantage of these markets in developed countries. This often leads to other forms of government intervention to provide the needed stability to markets.

The second form of instability is that reflected in the rather large swings in the values of national currencies. The value of the US dollar has now become somewhat of a classic case of such long swings. It experienced a long decline in the 1970's, then a long and large rise in the first half of

the 1980's, and it now appears to be in for another large and extended decline. As noted above, these large swings reflect in large part the configuration of monetary and fiscal policy here and abroad.

The problem with these long swings is that they can send misleading signals regarding underlying comparative advantage. For example, the long decline in the value of the dollar in the 1970's misled both US producers and producers in other countries about their longer-term ability to compete. The sustained rise in the value of the dollar in the first half of the 1980's sent similar misleading signals, although in the opposite directions. These misleading signals take on special significance when biological cycles and gestation periods are long. This is the case with livestock and tree crops. The net effect is for resource commitments often to be wrong in an ex post sense.

With this background on changes in the structure of the international economy, we now turn to some of the research needs. In turning to these these issues, I would like to emphasize the significance of the changes that have taken place, the persistent tendency of policy-makers and economists alike to still think about policy in the context of a closed economy model with no international capital markets, and the general lack of research designed to understand this new international order.

A modest research agenda on the above issues would consist of the following:

1. The design of domestic agricultural policies and programs that can be effective in the changed context of the international economy. There are two dimensions to this problem. The first has to do with income support programs designed to assist disadvantaged farmers and rural workers. In the past, most of these support programs have been tied to commodity prices. In the present international system this no longer seems feasible - because of the high costs of such programs - and the political rhetoric has already shifted to "decoupling." Politically acceptable programs that provide such decoupling are not yet at hand.

2. The second dimension of the problem has to do with how to provide more stable commodity markets, or the design of institutions that transfer the risk and uncertainty inherent in agricultural markets to other parts of the economy. One must recognize that many government interventions have increased stability as a goal, whether implicitly or explicitly, although their ultimate effect may be to increase instability. One must also recognize that the transactions costs of using futures markets can be relatively high. Ultimately the issue may need to be resolved at the international level through improvements in the international monetary system. We will take this issue up at a later point.

3. International capital markets are still poorly understood, as are foreign exchange markets. Predicting interest rates and values

of national currencies must be two of the riskiest tasks economists and others undertake. Yet both are critical in today's world for sound outlook work, for sound economic policy, and for sound expectations formations on the part of private decision-makers.

4. The linkages among financial markets, foreign exchange markets, and commodity markets are still poorly understood. There has been a considerable amount of work in assessing the impact of changes in exchange rates on the quantity demanded of imports. But most of this work has been done from a simple partial-equilibrium perspective and may be more misleading than helpful. The models needed to understand these various linkages are inherently complex and present formidable identification problems in an econometric sense. The political dimensions of international financial markets and foreign exchange markets are also poorly understood.

5. The linkages among policies in different countries are now very important in understanding trade flows, domestic terms of trade within national economies, and prices of agricultural commodities. Very little research on these linkages has been done. Such work should receive high priority, as should research designed to understand the political forces which drive trade interventions and which influence the rural and urban biases in food and agricultural policies.

6. The reasons for the instability in financial and foreign exchange markets needs to be better understood. Such research will have strong economic as well as strong political dimensions. Both factors need to be understood. A subset of these questions involves understanding more about why governments do what they do. The government sector is of major significance in all economies. It is only lack of perspicacity that economists have dedicated so little attention to understanding this part of the economy. Research in this area is growing rapidly, with important work by both economists and political scientists. Much more needs to be done.

7. The design of agricultural development strategies in a world with large and persistent swings in exchange rates is a difficult task. Research designed to produce more efficient long-term development strategies will have a high payoff.

Economic Development

Agricultural economists have probably contributed as much to understanding the processes of economic development as have any other class of economists. 1/ Growth models have been produced in abundance by general economists, but these models for the most part have little policy content of any significance and have limited value in understanding what actually takes place as an economy develops. Similarly, political scientists have

given little attention to understanding the forces that drive agricultural development, and social scientists in general have neglected this important problem of designing new institutional arrangements for an ever changing economy and society.

Unfortunately, we do not yet have a theory of economic development, or even of agricultural development. What we have is a general concensus that the production and distribution of new production technology is a cheap source of income streams and thus must be the engine of economic growth at early stages of political and economic development. When most of the resources in an economy are in agriculture, as they are in the case of low-income countries, then the process of technological change must start in agriculture.

Both elements of this proposition are primarily empirical in nature, however. They are not something that come as propositions of theory. A recent paper by Bob Lucas, however, casts the problem in the context of searching for high payoff information. 2/ This may yet give us a general theory of economic development.

A general theory of development would explain why and how particular nations grow and develop, both in their political and economic dimensions. It would also explain how and why the economies of other nations stagnate and fail to develop, or at best grow at very slow rates. In this respect it is interesting that development theories that emerge from developed countries tend to put the emphasis on the positive side, while those from the developing or low-income countries tend to concentrate on explaining stagnation or slow rates of growth.

Another dichotomy in these theories is that those from developed countries tend to be based on closed economy models and to ignore or give little emphasis to international trade issues, while those from the developing countries are rooted firmly in the international system. Generally described as dependency theories, these paradigms usually posit that the developed countries get that way by exploiting their under-developed brethren. The central mechanism by which this exploitation is supposed to take place is through changes in the external terms of trade, which are hypothesized to shift against the low-income countries and in favor of the developed countries. An important but very questionable implicit assumption in this perspective is that the total economic pie is fixed and thus that one country can grow only at the expense of others.

Four sets of empirical data have largely discredited these theories. First, during the 1970's the developing countries (the periphery) in the aggregate grew at a faster rate than the developed countries (the center). This was contrary to one of the main predictions of the theory. Second, countries that pursued import-substituting, inward-looking industrialization as the engine of development, an important policy prescription of the theory, generally obtained disappointing results. Third, countries that did the reverse, pursue outward-looking, export-driven development policies, have done unusually well. And fourth, the upper income industrialized countries of the West have rapidly become

the major exporters of agricultural commodities and important importers of manufactured products. The low-income countries, in contrast, have become exporters of manufactured products and importers of agricultural commodities. This is contrary to the main empirical assumption of the theories.

Economic development has produced enormous forces in the international economy these last ten to fifteen years and significantly changed the relations among national economies. Central to this process has been the emergence of the newly industrialized countries, seven nations that have pulled themselves up by their bootstraps in a dramatic fashion and in a fairly short period of time. These countries include Taiwan, Hong Kong, Singapore and South Korea in Asia, and Argentina, Brazil and Mexico in Latin America. Labor-intensive manufacturing sectors slipped rapidly from Japan to these countries as the level of general education in these countries rose. A new set of NIC's is emerging on the international scene, and includes countries such as India, China, and the Philippines. The consequences to the international economy of rapid growth in these economies will indeed be great.

Similar development experiences on the agricultural side are taking place among the developing countries, with new production technology being the driving force. The combined effects are shifting comparative advantage on the international scene in a dramatic fashion, and can be expected to change it even more rapidly in the future.

Before turning to these issues, I want to consider two relatedtopics. The first is what can perhaps best be described as the one iron law of economics. This is the tendency for agriculture's share of employment to decline as economic development proceeds. This tendency and the conditions which give rise to it was first noted by John R. Mills. T. W. Schultz later popularized the notion, and Colin Clark in the 1950's documented the trend. Bruce Johnston later pulled the evidence together again. 3/

This "law" is important because it creates a serious adjustment problem for agriculture that is rooted in the forces of economic development. The income elasticity of demand for food is less than the income elasticity of demand for non-agricultural goods and services. This in its own right would tend to cause labor to shift out of agriculture and to the nonfarm sector as per capita incomes rose. But the problem is exacerbated by two other sets of forces. The first is the tendency of rural population growth rates to be larger than urban population growth rates. This is because the costs of raising children are lower in rural areas than in urban areas, and because there is a strong demand for children as labor on farms. The second is the tendency for the introduction of technical change in agriculture to reduce the demand for labor, especially as output increases against a demand that is relatively inelastic to changes in relative prices.

In response to those economic forces, labor tends to migrate from agriculture to non-agricultural employment fairly early in the development process. At first this is reflected in lower growth rates in agricultural

employment than in non-agricultural employment, with the result that agriculture's share of employment tends to decline even though total agricultural employment continues to increase. Later in the development process, agricultural employment declines absolutely. Moreover, this process continues until late in the development process, as evidenced by the fact that agricultural employment in a highly developed economy such as the United States is still declining.

The significance of this tendency should not be under-estimated. It creates a chronic income problem in agriculture, and trade and other adjustment problems are on top of it. Paradoxically, those who argue that agriculture should be the employer of last resort don't seem to realize what a serious income problem they create in recommending such policies.

The second issue has to do with agricultural development per se. The closes thing we have to a theory of agricultural development is a theory of human capital formation. An important part of this general theory is a theory of technical change and a theory of institutional innovation, as articulated by Hayami and Ruttan. The starting point for this latter theory is the empirical proposition that investments in research that produce new innovations for agriculture tend to have high social rates of return. This is the same thing as saying that such investments are a cheap source of growth, or a cheap source of income streams.

The theory of induced innovation implies that these innovations will be focused on an efficient growth process in the sense that they will tend to ease the constraint implied by the most inelastic factor supply. As this process continues it produces an agricultural "surplus" in the Nicholi's 4/ sense, and this surplus can be used for the development of the rest of the economy. In addition to this product surplus, which can be used both to feed the nonfarm sector as well as for exports to earn foreign exchange, the process of technical change releases resources to the nonfarm sector, usually in the form of capital and labor.

As this process continues, backward and forward linkages emerge. The industrial sector becomes a source of inputs such as fertilizer and mechanical instruments for the further modernization of agriculture. And as agriculture becomes more commercialized, the need for processing and marketing services arises. Labor leaves agriculture in response to economic forces, agricultural output grows, but the sector makes up a relatively smaller part of the economy as the development process proceeds. These processes proceed as the dev[illegible]it process continues. And agriculture can be a source of economic g[illegible]ntil fairly late in the development process.

Investments improved nutrition and education complement the investments in producing new technology. As additional forms of human capital, nutrition, training and education raise resource productivity generally in agriculture. With this simplified model of the agricultural development process it is now appropriate to consider a number of developments that are emerging on the international scene. The first is the growing capacity for agricultural research in the developing countries, especially for food

crops. This has enormous implications for the international economy, for it provides the seeds for broad-based economic growth on a scale never experienced before.

As recently as the 1930's, grain yields in the developed countries were virtually the same as in the developing countries. As we moved into the post-World War II period, however, research programs that had had a long gestation finally began to pay off. Grain yields and other measures of resource productivity in the developed countries spurted ahead of those in the developing countries. (Labor productivity in countries such as the United States had begun to increase much earlier, driven by mechanical innovations produced by the private sector.) Although grain yields in the developing gradually begain to increase, they lagged significantly behind those in the developed countries.

The early 1960's witnessed one of the periodic Malthusian scares we seem destined to endure. This led to the establishment of an internationally sponsored Rice Research Institute in the Philippines dedicated to raising rice yields in Asia. The success of this Institute led to the establishment of a system of International Agricultural Research Centers. These Centers, which now number 13, are located strategically in the tropical South and are dedicated almost exclusively to food crops and livestock. The budget for these Centers is now approaching $200 million a year, and the youngest has now been established for about 10 years. The Centers are famous for having produced the miracle wheats and rices. Perhaps more importantly, they are now turning out a steady stream of modest but significant technological innovations on a sustained basis. This can be the basis of sustained and significant agricultural modernization in the low-income countries, the ultimate key to increases in per capital incomes.

In addition to the International Centers, individual countries are taking significant steps to develop their own agricultural research capacities. India, Brazil, and Indonesia are three important examples, but there are many others. The significance of these growing national agricultural research capabilities is in their ability to efficiently transfer production technology from the developed countries and the International Centers to the developing countries. The expectation is that the technological gap between the developed and developing countries will narrow significantly in the years ahead. Associated with that development will be significant shifts in international comparative advantage, reflecting developments in both the industrial and agricultural sectors.

Asia is now facing just such a shift in comparative advantage, with important implications for the United States. The success of the miracle rices has caused many countries in Asia to become self-sufficient in rice. Supply and demand conditions are such that rice is traded only on a minor scale. Consequently, its price elasticity of demand is quite low. Under these conditions, technological change in rice can result in immiserring growth for agriculture. The increases in output result in a more than proportionate decline in price, with the result that producers tend to be worse off after adopting the new technology rather than better off. This poses challenges for both political scientists and sociologists.

This problem is widely referred to as the need for diversification. A common view is that the diversification will take place at the farm level, with individual producers shifting out of rice and into oilseeds, fruits, vegetables, and livestock products. My Department in the World Bank is trying to better understand this problem and the challenges it poses. Our judgement from our preliminary work is that the diversification problem will be quite different than this popular view. In the first place, a major component of the diversification process, which is inherently an adjustment problem, will involve adjustment of resources out of agriculture, especially labor. Second, a great deal of the diversification process will involve regional specialization, with the diversification taking place on a global scale. This specialization will involve the introduction of and/or an expansion in the production of maize and other feedgrains, oilseed crops, fruits and vegetables, and livestock.

An important feature of this whole process will in our view be a significant growth in international trade. Much of that trade may involve within-region flows, but much of it may also take place with countries outside the region. It is difficult to say at this point how much of this trade will pose a threat to US producers. But understanding that threat should be high on our research agenda.

Another important issue is the impact that agricultural and economic development have on the distribution of income. This has been an important controversy in recent years in many developing countries. Superficial studies in countries such as Brazil and Colombia have suggested that the relative distribution of incomes has become more unequal as these countries experienced rapid economic development. More careful analyses, however, suggest that that is not the case, and that the broad masses of the poor tend to benefit significantly from economic growth.

A number of issues are important in understanding the income distribution consequences of agricultural development. First, most developing countries are characterized by massive low-level productivity, with the bulk of the low productivity concentrated in agriculture (where most of the poverty is concentrated as well). The key to reducing this poverty is to produce and distribute new production technology, and to invest in human capital, including formal schooling, improved nutrition, and improved health. The issue is in large part one of reducing or eliminating absolute poverty. This can be done in general only by raising resource productivity; trying to raise incomes of the masses by confiscating incomes and assets from the wealthy would have little impact on the poor since there isn't enough income or assets to go around.

Another issue is that under these conditions, doing something about poverty does not necessarily need to be at the expense of higher economic growth. To the contrary, if poverty alleviation measures focus on productivity-enhancing investments in human capital, the distribution of income can be improved at the same time the rate of economic development is improved.

A discussion of poverty alleviation leads naturally to a discussion of food security, perhaps one of the more poorly conceptualized issues on the international scene. Most of the proposals for dealing with the food security problem focuses on the supply side, with proposals either for food self-sufficiency or for the carrying of large stocks of grain. Unfortunately, neither of these really address the basic problem. India is an important example of a country that has technically now reached food self-sufficiency. Yet based on the data, India has hundreds of millions of people that are still malnourished.

Similar problems arise in carrying large stocks. The problem here is that stock-carrying is so very expensive. Low-income countries in general do not have the resources to carry stocks at the appropriate levels. Countries are better advised to use the international trading system to carry their stocks, exporting in years of plenty and importing in years of shortfall. There may be a need to carry somewhat larger reserves of foreign exchange. But in general these assets can earn interest, and the costs are minor compared to carrying stocks. The ability to manage stocks so that adequate supplies are available when needed is not without its own challenge.

The most important point about the food security issue, however, is that it is fundamentally an issue of poverty. 5/ The solution to the food security problem therefore lies in the reduction and alleviation of poverty. No amount of "fiddling" on the supply side can really address the problem in an effective way.

Finally, there is the problem of responding to the concerns of US farmers that the development of agriculture in low-income problems poses a threat to their markets. There are circumstances in which such development activities can reduce markets for US producers. In general, however, the relationship goes the other way. Future US markets for agricultural commodities are likely to be in the developing countries. The key to realizing these markets is for there be sustained increases in per capita income in those economies. The key to that will be modernization of the agricultural sector.

Brazil's experience illustrates this point very well. Its agricultural output expanded at a rate of five percent per year from 1960 through 1981. This was the highest rate of agricultural growth in the world, and significantly above the population growth rate. Yet imports of agricultural commodities grew at an annual rate of 15 percent a year in physical terms in this same period, and in value terms at an annual rate of 25 percent per year in value terms. What US farmers fail to recognize is that there is a demand effect as well as a supply effect when there is agricultural development. The demand effect may well outweigh the supply effect.

The research agenda which emerges from this discussion of development issues includes the following:

1. Basic research is needed to develop a more complete theory of agricultural development. What we have now is ad hoc and based on empirical propositions.

2. The mechanisms by which agricultural development is propagated needs to be better understood.

3. A great deal of work is needed on intersectoral labor markets. The speed with which labor is adjusted out of agriculture often plays an important role in determining how rapidly the development process proceeds. It also has a great deal to do with how equitably the benefits of agricultural development are distributed.

4. An important barrier to more rapid adjustment of agricultural labor is the fact that intersectoral labor adjustment often involves geographic migration of labor. Research is needed to determine how other economic activities can more efficiently be taken to the suppliers of agricultural labor. More effective decentralization of economic activities makes it possible to avoid the negative externalities associated with outmigration from rural areas.

5. A great deal of research is needed to understand the rapid shifts in comparative advantage that are taking place in the international economy. This cannot be a static analysis; it has to be done in such a way as to take account of changes in the base that determines comparative advantage.

6. A particular topic of considerable importance is what the new biotechnology will do to the competitive position of US agriculture. Will this technology be easily transferrable, or will it help give US producers a competitive edge in the future? Of equal importance is to understand the severity of the adjustment problem in developing countries.

7. Eliminating malnutrition in the international economy would be an important investment in human capital with a high payoff to the international economy at large. Research is needed to determine how this can be done in an efficient way.

8. Research is needed to clarify the extent to which development of agriculture in low-income countries benefits or harms US agricultural producers.

International Affairs

International affairs has to do with strategic issues in a foreign relations sense, and with the international rules needed for a more rational international economy. The issues here are very important, and deserve more attention than we can give in this paper. Perhaps a separate paper is needed to do justice to this topic. For present purposes I will try to identify the key issues.

On the strategic issues, the key question is how individual countries such as the United States sustain their political and economic power in the world. 6/ A critical issue is the extent to which international political power is rooted in economic power or in military power. The United States in the last eight years has acted as if military power were the key issue. Japan, on the other hand, has acted as if economic power were the key issue.

Investments in science and technology would appear to be an important source of power, independently of whether a nation chooses military or economic power. A more general issue is the extent to which investments in human capital can offset the effect of numbers of population, especially as we consider confrontations with countries like China.

Still another consideration is the extent to which making agriculture "small" in the developing countries is a source of political and economic power. This obviously depends on the policies used to make agriculture small. If it is brought about by investments in agriculture which raise its productivity so that the country can feed its population, supply industrial raw materials, and perhaps supply some exports with a minimum of labor in its agricultural sector, then the country obviously gains relative to other countries that cannot do so. A highly productive agriculture in this sense releases labor to work in other sectors of the economy, thereby giving the nation more economic and political clout. Similarly, if agriculture is made small by discriminatory policies which push labor out of agriculture prematurely, without at the same time raising productivity in agriculture, the benefits - if there are any - will be much less. Under these circumstances the country will most likely have to use its scarce foreign exchange to import its food and agricultural raw materials.

We now shift to the institutional issues so important in international affairs. One of the important problems we face on the international scene is that our economic integration has far outpaced our political and institutional integration. At the end of World War II there was a tremendously creative period in which an entire set of international institutions was created. Since then, however, many of our international institutions have broken down, and many of them have grown irrelevent. In other cases the right institutions were not created in the first place.

In thinking about international institutions it would appear that finding the institutional means to provide for more stable monetary conditions should have very high priority. Monetary instability now contributes importantly to price instability in commodity markets; in fact, far more so than do fluctuations in the weather. Short-term instability is as important as the longer-term swings, which probably reflect basic attitudes towards the relative importance of monetary and fiscal policy.

This instability, especially as it is reflected in real exchange rates and ultimately in commodity prices, creates strong pressures for protectionism, it makes long-term decision-making about investments at best cloudy, and it generates pressures for stock-carrying when in fact stable trading

relationships would probably make it not necessary to carry anything other than pipeline stocks.

More generally, the case for international monetary stability rests very much on considerations similar to those that determine the case for monetary stability in the domestic economy. The key issue, however, is how to bring it about.

In a little book I did on the United States and the developing countries, 7/ published by the National Planning Association, I argued that there were three possible routes the international community might elect: (1) since the United States is in effect central banker for the world and the world is effectively on a dollar standard, the United States could manage its monetary policy as if it were in fact central banker for the world (currently domestic considerations carry a heavy weight); (2) the United States and other industrialized countries could coordinate their monetary and fiscal policies; and (3) the IMF could be given a mandate to increase the stock of SDR's at a steady rate consistent with the growth in international trade and financial transactions, with provision for an interest rate on the SDR's comparable to the rate of return on other reserve assets. My perspective on these alternatives is that the US serving as central banker for the world imposes too many adjustment costs on the US economy, and that policy coordination among major countries is simply not feasible. Hence, the third alternative is the only viable choice.

The second large set of institutional arrangements needing reform is those pertaining to international trade. Bringing about reform in agricultural trade policies is very difficult, in part because domestic agricultural policies and trade policies tend to be inextricably bound. On the other hand, the benefits from trade liberalization in agricultural commodities promise to be very great. The externalities from trade liberalization appear to be large, since much of the world's agricultural output is being produced in the wrong place. If the gains realized by China from its domestic reforms are an indication - and certainly they should be - then the gains on a global scale could be quite great. In fact, obtaining reform of agricultural trade policies should have the highest priority on our international agenda.

The Uruguay Round of Multilateral Trade Negotiations is the proximate occasion for seeking such liberalization. Unfortunately, this round promise to concentrate most of its attention on export subsidies. Important as these are, they are only part of the story. Other issues include: (1) the policies used by the developing countries to discriminate against their own agriculture; (2) exchange rates as trade distortions; (3) rights in intellectual capital; (4) voluntary export agreements; (5) parastatals as barriers to trade; and (6) health and hygiene regulations as barriers to trade.

Multilateral trade negotiations are not the only way to go about lowering trade barriers. Access to the huge US market is a powerful attraction for countries seeking to expand their exports. There would seem to be great

potential in bilateral negotiations, such as the US is now engaged in with Canada. Once a breakthrough is made on a bilateral basis, the United States might want to consider using the multilateral principle, and give most favored nation privileges to other countries willing to make similar concessions.

Finally, we might want to take a leaf from our own history as the basis for obtaining more general trade liberalization. It is important to note that inter-state barriers to trade were prohibited by the US Constitution. Were it not for that prohibition in our most basic charter, the United States would doubtless have been Balkanized long ago. It may well be that such a charter at the international level is needed as theonly means to obtain truly sustainable trade liberalization.

The research agenda which emerges from this discussion includes the following:

1. What is the source of political power in an international economy? To what extent and in what way can agriculture contribute to that power?

2. To what extent do investments in human capital offset the effects of population numbers in determining international political power?

3. Research is needed to provide the basis for designing new international institutional arrangements. This includes international monetary arrangements, international trade rules, and codes for international investment.

4. Comprehensive analysis is needed of the gains to be had from liberalizing trade in agricultural commodities. This research should identify who will bear the costs and who will receive the benefits of such liberalization.

5. Research is needed that helps develop strategies for competing in a rapidly changing international economy. This research should incorporate economic, political, and technological considerations.

Concluding Comments

US agriculture, and the US economy as a whole, are now integral parts of a truly global economy. This has enormous implications for economic policy and for how we try to find our way in the world at large. The dimensions and character of that global economy are poorly understood, and we have thought even less about the strategic implications of this new situation.

Similarly, the global economy now finds itself in a period of sluggish growth, but the potential for widespread economic development is quite great. We know how to obtain faster economic development, and the NIC's have demonstrated that it can be done. Once the global economy recovers

from its present slump, these development processes will be unleashed in their full force. The forces for change that will be imposed on our own economy will indeed be great. We should be anticipating these changes and designing strategies for the future, rather than being like the proverbial general who fights the last war.

FOOTNOTES

1/ Surveys of the literature on agricultural development in Africa, Asia, and Latin, written by Carl Eicher, John Mellor, and G. Edward Schuh, respectively can be found in Volume IV of the American Agricultural Economic Associations Survey of the Postwar Literature in Agricultural Economics, forthcoming.

2/ Lucas, Jr., "On the Mechanics of Economic Development," prepared for the Marshall Lectures, Cambridge University, May, 1985 (mimeographed).

3/ Johnston, Bruce (1970): "Agriculture and Structural Transformation in Developing Countries: A Survey of Research," Journal of Economic Literature 8:369-404.

4/ Nicholls, William H. (1963): "An Agricultural 'Surplus" as a Factor in Economic Development," Journal of Political Economy, 71:1-29.

5/ See Sen, A.K. (1981): Poverty and Famine: An Essay on Entitlement and Deprivation. Oxford, Clarendon Press. For a policy perspective, see Reutlinger, S., and J. van H. Pelekaan (1986): Poverty and Hunger: Issues and Options for Food Security in Developing Countries, Washington, World Bank.

6/ See Schuh, G. Edward (1981): "Economics and International Relations: A Conceptual Framework," American Journal of Agricultural Economics 63:767-778.

7/ Schuh, G. Edward (1986): The United States and the Developing Countries: An Economic Perspective. Washington, DC, National Planning Association.

Chapter 10

AGRICULTURAL INSTITUTIONS AND ARRANGEMENTS UNDER FIRE

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Viewed from the outside there is one fact that dominates post World War II American agriculture. Agriculture has shrunk rapidly relative to the rest of the economy. From 1945 to 1986 net farm income fell from $78 billion dollars to $25 billion in 1982 dollars and agricultural employment fell from 8.6 million to 3.2 million.[1] Most of this decline occurred between 1945 and 1970 when 200,000 farmers per year were leaving farming.[2] In the end the number of workers forced to leave farming, 5.4 million, was much larger than the numbers left in farming, 3.2 million in 1986.

While the real farm GNP was expanding by $16 billion (from $57 billion to $73 billion in 1982 dollars) between 1945 and 1986, the total GNP was expanding by $2,323 billion.[3] Farming accounted for just seven tenths of one percent of America's growth over this period of time and by 1986 only accounted for two percent of the GNP. Where it had once been the largest of American industries, it was now one of the smallest. For a time in the 1970s agriculture was an important element in the balance of payments, but by the mid-1980s it had ceased to be an important net contributor to America's trade position. In 1986 agricultural exports exceeded agricultural imports by less than $3 billion and net exports were still declining.[4]

In 1986 it took one million American workers to produce $33 billion worth of GNP (1982 dollars).[5] As a consequence if one assumes that the 5.4 million people who left farming were average in terms of their abilities they added $178 billion to the national GNP when they went to work in alternative industries -- an addition to GNP far larger than that contributed by those that remained in farming. Farming's major contribution to the economy was not what it directly produced but the extra workers that it contributed to the urban economy. Economically those that left farming were far more important than those that stayed.

Given these facts it would be fair to ask whether America's agricultural institutions and arrangements had helped to plan for this decline and whether they had acted to make the transition from agriculture to alternative employment easier for millions of people. Not surprisingly the truthful answer to this question is of course that the system did essentially nothing to plan for decline or to help those leaving agriculture. Planning for decline and transition was Un-American. Seldom was it suggested, and if suggestions were occasionally made, they were ignored.

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At best it is only possible to argue that inadvertent aid was given to those leaving farming. Farm price supports kept some farmers in farming slightly longer than they otherwise would have been able to stay and as a consequence the movement out of farming was spread out over a longer period of time and was perhaps less painful than would have occurred if nothing had been being done.

One can of course point out that the food sector is much bigger than farming alone and that the rural population is far larger than the farm population, but if the food sector or the rural population is to be the focus of attention then one must judge colleges of agriculture on how much they have done to help the food sector or the rural population to be more successful. Only small amounts of attention have been focused on the non-farm rural population and aid to the food sector is spotty. The farther one gets away from the farm in the food chain the less attention has been paid. Looking forward one must also ask whether colleges of agriculture and the extension service have any unique comparative advantage in helping food businesses or the non-farm rural population vis-a-vis general schools of business.

In the past the focus of attention has been on those clients left in agriculture and this attention has focused almost exclusively on expanding farm production. This was an individually rational solution to a problem (how to stay in farming) for each individual farmer. If he could become the most productive farmer, he could survive in agriculture. But it was collectively a non-solution. The greater the expansion in production per farmer, the more farmers that would have to be squeezed out of farming.

This happens because farming confronted a situation where both the price and income elasticity of demand for farm products are substantially less than one. Thus if there is any well-known truth in farming it is that more productivity has to lead to fewer farmers. Increases in productivity due to the replacement of labor with alternative factors of production (chemicals, energy, capital) will lead to a faster reduction in the number of farmers than increases in productivity that use labor-intensive technologies, but both lead to the need for fewer farmers. While using labor intensive technologies leads to more farmers than capital intensive technologies, it also leads to lower incomes per farmer. Thus there is a direct trade-off between numbers and relative income.

The number of farmers can only stabilize if farm productivity grows at a rate that is substantially less than the rate at which real incomes are growing in the consuming sector. With output per hour of farm work growing at 5 percent per year in the 1980s and real personal income growing at less than 3 percent per year, simple arithmetic guarantees fewer farmers.[6] With large productivity gains from biotechnology looming on the horizon there is also little reason to believe that any slow down in the growth in farm productivity is about to occur.

Socially one can argue that the outcome has been optimal. More production led to lower prices for agricultural products and higher real urban incomes. The farmers forced to leave agriculture were used in industry to expand production above what would have been possible without them. Overall the benefits were substantial.

While focusing on raising productivity may have been a rational social strategy given desires for a higher material standards of living, it would seem to carry with it the social obligation, however, to plan for the decline of agriculture and to call for providing some farm aid on the millions of workers who would be forced to move from farm to other careers. They were the few forced to absorb the costs that would allow millions of others (those remaining on the farms and urban consumers) to make real income gains. Most of those that moved may have ended up with higher material standards of living than they would have had back on the farm but they were forced to bear the human costs of leaving a farm environment and often had to go through a transition phase where they had lower incomes. The failure to aid in this transition is the central failure of current agricultural institutions and arrangements.

If an outsider looked at the farm 'crisis' of the 1980s and were not allowed to look at the statistics for the 1970s, that outsider would wonder what the crying was all about. In the period from 1945 to 1970 when America was losing 5 million farm jobs, it generated 31 million non-farm jobs and farmers had to gain 16 percent of those jobs if they were to work in alternative employment. From 1980 to 1986 farm employment has fallen by only 200,000. The nonfarm economy has generated 10.5 million jobs over the same period of time. Farmers had to capture only 2 percent of these jobs to become employed in alternative employment.[7] Whatever the job transition problems of today's unemployed farmers they are minimal in comparison with the past.

It is true that nine million acres have been taken out of production since 1980, but sixty million acres were taken out of farm production between 1947 and 1966.[8] Here again the changes are minimal in comparison with the past.

The real farm GNP (1982 $) rose $4 billion from 1945 to 1970, rose another $3 billion from 1970 to 1980, and then jumped by $9 billion from 1980 to 1986.[9] The growth in farm output was actually much faster in the 1980s that it was in earlier decades. Even in the peak year of the 1970s output was only $4 billion higher than 1970 and $1 billion lower than 1980. Whatever was happening that made the 1980s a crisis is not to be found in output figures.

The feeling of crisis is of course produced by comparisons with the boom of the 1970s and financial obligations that were incurred because of this boom. If one ignores the 1970s, what was happening in the 1980s was merely a continuation of

a long-term trend toward shrinkage. Decline is once again occurring -- but in fact at a much slower rate than in the past.

In the 1970s farm employment did not decline as it had earlier. Real net farm income (1982 $) more than doubled from $34 billion in 1970 to a peak of $69 billion in 1973.[10] The 1970s were an exception to the rule that each decade would see a substantially smaller farm sector than the previous decade. Remember however that the real farm GNP grew very little in the 1970s. Incomes rose because prices were going up, not because farm outpout was going up.

Realistically given low income and price elasticities of demand for agricultural products and a high world-wide rate of growth of agricultural productivity (both widely known facts), there was no possibility that agricultural prices could forever remain at the levels of the 1970s. When prices began to fall, as they inevitably would, farm incomes would fall and farming would return to being a shrinking industry.

This is to get slightly ahead of the story, but the nature of the current crisis is an unwillingness of agricultural institutions and arrangements to face the reality of shrinkage or to be willing to convey clearly that reality to their clients -- those left in farming. Farmers in turn in all likelihood would not have listened even if they had been told that the decade of the 1970s was an exception.

The truth is that farming was and will be a shrinking industry. Real production will grow slowly. Given rapid rates of growth of total factor productivity fewer people, less land, and fewer units of other inputs will be necessary in the future than in the past. The industry has to plan for decline and help ease transition pains for those that will inevitably be forced out of farming. There is no solution within agriculture.

The good news is that the numbers that will now be leaving agriculture are very small in relation to the rest of the economy. The transition should be easier than it was in the past. More effort of the old fashioned sort (help in raising production), however, will merely increase the number of farmers that have to be transferred from farming to alternative uses. Since part-time farmers with off-farm income and large corporate farmers probably have more staying power than middle sized family farmers, the pressure to move is apt to be most acute on the full-time family farmer.

But the current feeling of crisis is not caused by the very small number of family farmers that have been forced to leave farming since 1980. It is caused by the false expectations about the future that were built into career plans, land prices, and bank loans by the 1970s. If one is faulting agricultural institutions and arrangements one then has to ask whether they did see, or should have foreseen, the abnormal nature of the 1970s and whether they did or could have conveyed this information to their clients so that these clients could have avoided building career plans, land prices, and bank loans on misleading beliefs about the future.

The current feeling of crisis is created by the fact that those in agriculture psychologically understand that decline is once again upon them. But the collapse of the boom was simply too rapid and too unforseen to notice that was seems like a 'bust' is merely a return to normal times. People are going to continue to leave. Land values are going to continue to fall. Some regions are going to go out of farming almost entirely. Agriculture is once again a shrinking industry. Humans not surprisingly are unwilling to confront this reality and plan for it. At the political level farmers and those that serve them want a magic cure that will change this long-standing reality, but they also know that there is no such cure.

Even more importantly this time some of the transition costs are being levied on those that remain in farming (their net worth is going down) whereas in the past all of the costs of the transition were levied on those that left farming and could as a consequence be ingnored by those left in agriculture (see below).

IT'S UNAMERICAN TO PLAN FOR DECLINE

While the facts about agriculture's decline are clear, Americans find it virtually impossible to face this reality and plan for it no matter what the industry. Part of the Ministry of International Trade and Industry in Japan is charged with planning 'strategic industrial retreats'. Recessionary cartels (group planning as to how an industry can collectively cope with long-run decline) are allowed by law when it becomes clear that an industry (aluminum is a current example) will inevitably decline. America has no analogous arrangements.

This partly happens because Americans believe that the market takes care of failure. In theory free markets drive the most inefficient producers out of business with no need for planning. In fact as the Japanese point out, markets drive those out of business with the least financial staying power. Those leaving an industry need not be the least efficient managers working with the least efficient productive resources. So too in farming today it is not the least efficient farmer that is being driven out of business but the farmer with the most debt and the least financial staying power. During the period when those with the least financial staying power are being driven out of business it is also usually necessary for those who will remain in the industry to incur losses. This deprives them of the resources that they need to compete more effectively in the future with foreign competitors.

The same effect is now working in farming. American farmers who remain in farming are falling behind farmers in Europe in buying the latest technology. European farmers have the money; American farmers do not. As a consequence European farmers are rapidly closing the productivity gap that once existed. Planning a strategic retreat often leaves a much stronger industry than simply letting the market rip.

It is certainly possible to charge that agricultural institutions and arrangements have been unwilling to plan for decline. But it is equally true that other declining sectors have not done so and that Americans do not want to plan for decline. Part of this comes from the political process where deliberately de-populating congressional districts doesn't seem quite right to incumbent congressmen, but part relates to deeper psychological resistances. To forecast that decline will occur or to plan for it is to be a pessimist and Americans are optimists. Pessimists are ignored, muzzled, or dismissed.

If one is willing to forecast decline and plan for it, the technical problems of how to do it are trivial. Everyone knows what must be done. Knowledge is first conveyed as to who and what is marginal and apt to be forced out of agricultural production. This applies to people, crops, and land. One accurately conveys information as to where marginal farm lands are located geographically and where land values are most likely to fall in the future so that the fewest mistakes will be made in current investments and plans. Government land retirements schemes are not spread evenly across the country but focused on those geographic areas that should retire from agricultural production.

One raises the sellable urban skills of those who are going to be forced to leave farming if one wants to ease the transition from farm to nonfarm employment. One provides geographic, occupational, and industrial information as to where former farmers should move and aid is given to help facilitate those moves.

Farm expenditures would be focused on those that leave farming rather than on those that remain. No one pretends that the current problems are temporary and if one just hangs on by their finger tips long enough there will be a return to the good old days of high incomes and rapidly rising land values. Farmers are advised to declare bankruptcy rather than to struggle if their situation really is hopeless. If those in trouble are really efficient producers and have simply made one bad mistake (taken on too much debt in the 1970s) debt write downs are negotiated.

Small rural towns are told that their agricultural base is going to disappear. One only talks about non-agricultural rural revitalization in areas where it is possible and in most areas it is not given the realities of inadequate transportation, inferior infrastructure, and low levels of skills among the local work force. In the past rural areas could compete for low skilled American industrial operations with low wages. This was the strategy of the rural American southeast. But with the development of a world economy, there will always be other places in the world where wages are lower. Rural communities in today's world economy can only compete if they can generate a labor force more skilled than those found in places such as Korea or if they have recreational potential.

Much of the decline in American manufacturing employment over the past six years has in fact been located in rural areas since their low human skill levels makes

them the most marginal manufacturing areas in the United States.

The problem is not what to do or what to say, but being willing to confront reality. On one level it is easy to castigate the agricultural intellectual establishment for not forecasting decline and developing plans as to how best to cope with it. On another level it is not. If they had planned for decline they would have been ignored at best, probably denounced, and possibly dismissed so that their pessimism could be replaced by optimism and by views more congenial to the traditional American spirit.

There is just enough individual truth in the doctrine that planning for expansion (more production) will save you to obscure the collective reality that in the aggregate precisely the reverse is true. More production will lead to the need to move more people and resources, not fewer people and resources, to other uses.

Planning for decline also confronts another harsh reality. Those who win the production wars will remain inside the industry and be available to help agricultural colleges in their future battles for resources. Those who lose the production wars will become outsiders. They may remember the aid given in their transition to non-farm activities fondly, but they will have dispersed across the economy, be difficult or impossible to mobilize in future political battles, and have little interests in devoting resources to those that remain in farming or its supporting activities such as agricultural colleges or the extension service. To aid those who must leave an industry is to spend one's time and resources undercutting one's own political base. It should be done, but it isn't often done.

THE TECHNOLOGICAL FIX

Since the Manhattan project in World II, Americans have had the belief that there is a technological fix to every problem. If we are simply willing to put enough money in, any problem can be solved. The equivalent of the atomic bomb can be found. The man-on-the-moon project of the 1960s firmly fixed that belief in the American mind. But the belief is basically false. Extra effort can only lead to results if the fundamentals are already present in the right configurations. President Johnson's 10 year 'Manhattan Project' effort to find a cure for cancer came to naught. Every problem is researchable, but every problem is not solvable.

In agriculture this belief is seen in the idea that the problems in agriculture are somehow caused by the fact that agricultural research has been focused on helping the big farmer and not the family farmer. According to this argument if the research had been properly focused in the first place the problems would not

have occurred and if research were now properly refocused the problems could be eliminated.

This argument makes a basic arithmetic mistake. Family farmers must go out of business even if all research if foused on family farmers as long as the supply of farm products is growing faster than the demand for farm products. As long as income and price elasticities of demand for farm products are less than one and productivity growth equals or exceeds the growth in real incomes, farm employment must decline even if all research is focused on family farmers. Family farmers end up driving family farmers out of business. Research and development on raising production cannot solve the problem of decline no matter how this research is directed.

One can argue inconclusively as to whether past research has in fact been too much focused on activities that were expected to yield more gains to large farmers than to small or medium sized farmers since it is not clear how one measures the extent to which research money is focused on the problems of different sized farmers. No researcher has ever been given the instructions 'Do whatever you want as long as it helps large farmers'. Researchers work on problems such as pest control and one has to decide before anything has been discovered whether pest control is intrinsically something that will aid big farmers more than it aids mid-sized farmers.

More importantly even if it could be shown that the agricultural research establishment had been given instructions to aid large farmers, those instructions would have been irrelevant. Research simply cannot be directed to come up with particular outcomes and there is a large economics literature that documents this result. What is called 'induced technical progress', a piece of technical progressed designed to use some particular input, simply does not occur.[11] A pest control research project designed with large farmers in mind may end up producing a pest control technique that helps small farmers much more than it helps large farmers. No workable research results have been surpressed simply because they ended up helping mid-sized farmers. Basically, the agricultural establishment has no ability to direct its research results so that these results come up with ideas that help the large farmers and not family farmers.

The current excitement about superconductivity, for example, was started by some European IBM scientists that happened upon superconductivity by accident as they were attempting to explore new ceramic materials. Superconductivity may well revolutionize the world but it current potential feasibility was not discovered by scientists that had been directed to work on superconductivity.

Ex-post there is also no evidence that the productivity of farms that require the labor of one or two workers has gone up more slowly than that of farms large enough to require the work of many laborers. Many large corporations have retreated from their farming investments of the 1970s since they could not in fact compete with family farmers.

If one wants to fault the direction of technology, the real faults lie in other directions. By being focused on raising the production of the large commodity crops such as corn, wheat, soybeans, or cotton, it left aside many of the man-made comparative advantages that might have been created. Cut flowers are probably the best example. Most of America's cut flowers are imported from Holland -- a very high wage country. Those flowers could have been grown in America, but they weren't. They weren't since the problem in cut flowers is not production, growing flowers, but the marketing and distribution systems that are necessary to deliver flowers fresh to the right place at the right time. Research on production could never make flowers an American industry. The research would have to have focused on management and distribution systems.

Many other examples can be given. There is a current proposal to make a large area of east-central Montana into what is called the 'Big Open', essentially an effort to recreate the orginal great plains with its teaming wildlife, where a farm collective would be organized to allow today's very marginal farmers to make a much better living serving and guiding tourists and hunters. The proposal did not come out of the state's agricultural college, however, since it does not envolve more farm production. It envolved turning farming into a recreation industry. It might also be said that local farmers are not enthusiastic about a proposal that essentially gives up on more production as a solution to their problems.

Similarly urban desires for food raised without chemicals opens up a high priced market for agricultural products that has been little investigated by agricultural colleges since the food has to be raised with techniques that lower production rather than raise production. It might also be argued that these demands were not catered too precisely because they cast aspersions on the technologies recommended by agricultural colleges in the past.

Creativity in thinking up man-made comparative advantages in rural areas has been low in the agricultural colleges of America precisely because they are colleges of agriculture and because these alternative proposals usually require a set of experts different from the plant or animal scientists who dominate the population of our colleges of agriculture and a mentality not dominated by the thought that the ultimate aim of research is to raise production. Economists are also to blame since they have stressed the god-given parts of comparative advantage and ignored the possibilities of man-made comparative advantage.

Unfortunately the biotechnology revolution that is now upon us is apt to bias our vision toward the tradition goals of increasing the production of our traditional products even more. It will be seen as the new miracle cure -- a chance to once again get ahead of the foreigners in productivity. It won't

happen. The rest of the world can keep pace with our agricultural research just as it now keeps pace with our industrial research. If biotechnology is in fact a big boost to productivity, then even more farmers will be forced to leave farming than would otherwise have been the case. What is needed in both biotechnology and older technologies is more imagination in creating new man-made comparative advantages. The falling dollar will uncover some of our old comparative advantages but in the modern world more comparative advantages depend upon human ingenuity than they do on the intrinsic gifts of mother nature.

THE FOREIGN SOLUTION

While Americans cannot eat what American farmers can grow, in the 1970s it became popular to believe that Americans could become farmers for the rest of the world. Agricultural incomes went up and the industry quit declining because it became much more of an export industry -- at the peak 60 percent of the wheat crop, 40 percent of the soybean, rice and cotton crops, and 25 percent of the corn crop was being exported. This trend was seen as permanent. It proved to be very temporary. By 1986 agricultural trade surpluses had essentially disappeared.

This raises a question as to whether that future decline could have been foreseen so as to stop those exports from becoming embedded in the plans of those envolved with agriculture (farmers, suppliers, bankers, land values, etc.) or whether something could have been done to prevent the decline in exports that did occur from occurring?

What happened in the rest of the world is clear. The green revolution worked if by the green revolution one means not just new varieties of plants, but a new awarness of the need to give peasants a financial incentive to produce, major investments in equipment such as wells and tractors, new investments in human capital, new institutions, and strong local research and development efforts. Agricultural productivity rose dramatically in many third world countries and for the first time in many generations they now feed themselves.

In addition the third world foreign debt crisis has leads to a situation where fewer middle income countries were going through that stage of development when per capita incomes reach a level where meat enters the diet in substantial amounts. Since humans who consumer their grain indirectly in the form of meat use much more grain than if they directly ate the grain themselves (animals can be thought of as machines that convert grain into more tasty forms but at the cost of using many more grain calories than if humans ate the grain themselves), a rapid rise in meat consumption usually makes a country into a grain importer for some period of time since the grain necessary to feed animals to satisfy meat demands grows faster than domestic grain production. As a result the debt crisis leads to less demand for American grain.

The growth of agricultural productivity in much of the developed world and among traditional food exporting nations has also reduced or sometimes even reversed America's traditional comparative advantages in agricultural production.
In the mid-1970s the Common Market imported 25 million tons of grain; in 1985 it

exported 16 million tons of grain.[12] To know such facts is to know that agricultural prices were going to decline even if we lived in a world of free trade in agricultural products -- which we don't.

The policies that lead to a high valued dollar and high domestic support prices for U.S. agricultural products speeded up the decline in exports but they did not cause it for it would have occurred without these policy 'mistakes'. The problem was caused by higher foreign productivity. Conversely better policies -- a lower valued dollar, a different price support system -- will not cure the problem.

American farmers live with the myth of American agricultural surpremacy. Their unit costs of producing almost anything are lower than those to be found in the rest of the world. Yet this belief in their supremacy is false. The current GATT round is supposed to be a set of negotiations that will lead to free trade in agricultural production. Yet how many American farmers know that free trade between Europe and the United States might lead to more wheat exports from Europe and the substantial demise of the U.S. dairy industry for anything other than fluid milk?[13] When Americans demand open access for rice in Japan how many farmers know that Thailand is the world's lowest cost producer of rice? How many farmers know that with the same technology and capital investments, Brazilian soybean producers may dominate American producers with higher yields per acre and per person?

To know the future of American farming one must have a realistic understanding of where Americans really do have a comparative advantage in agriculture and more importantly how that comparative advantage is apt to change over time as the rest of the world catches up with the United States in terms of agricultural technology and capital investments in farming and its supporting industries. Like the rest of the American economy the American farmer now lives in a world where he is better at some things, worse at other things, but on average he is average. He cannot compete based on the effortless technological superiority or higher capital investments that he had in the past. America does not have a comparative advantage in all of agriculture; it only has a comparative advantage in some parts of agriculture. An understanding of where we do and do not have a real comparative advantage or where we can make a real comparative advantage should be a central concern of agricultural economists.

Foreign productivity is also not now dependent upon the export of technology or capital equipment from the United States. Institutions to provide these factors of production now exist elsewhere in the developed world and foreign productivity growth is not dependent upon the U.S. research establishment. Increasingly new techniques are now in fact being imported into the U.S. When in comes to productivity enhancing innovations American farmers have much to learn from foreign practices yet our institutions for tapping these foreign

sources of expertise are limited. The problem is not to limit our existing institutions for exporting technology, but to expand our institutions for importing foreign technology and monitoring advances in foreign farm practices that might profitably be transferred back to the United States.

More importantly if the American farmer were able to become a food supplier for the world that ability would not solve the farm problem -- it would merely move the fact that agriculture must decline from the United States to the rest of the world. Farmers here would be forced to leave farming less rapidly, but farmers elsewhere in the world would be forced to leave farming more rapidly. On a world-wide basis the decline that must occur would remain the same. Foreign farmers who love to be farmers just as much as American farmers love to be farmers would be forced to leave farming.

At this point one can ask the degree to which the agricultural establishment was or is ignorant of what was and is occurring in the rest of the world, the extent to which it engaged in wishful thinking that somehow those foreign markets were permanent or can now be recaptured, the extent to which it knew and knows the truth and did and does not clearly convey that painful truth to its clients, or the extent to which the clients would not hear the truth even if it was and is clearly being stated. To some extent all of the above are probably true. Ignorance, wishful thinking, the desire not to be seen delivering bad news, and an unwillingness to confront reality all contributed to the present problems.

To eliminate the current crisis and to plan for the future, American agriculture has to have a clear understanding of what is happening in the rest of the world and what will happen dynamically over time as America's lead in technology and capital investment per farmer or per acre diminish and change. It then needs to convey this truth, whatever it is, to both farmers and policy makers.

There also needs to be a fair dose of political realism. If one looks at those income and price elasticities and one looks at the rate of growth of productivity in agriculture world-wide, farmers somewhere in the world are going to have to leave farming. Politically the rest of the world is not apt to agree that its farmers should be the ones to leave farming based upon hard economic evidence unless the United States would agree that its farmers should be the ones to leave farming if hard economic and agricultural science analysis were to show that American farmers did not have a comparative advantage in some specific product. Would America do so if the data showed, as it seems to show, that American dairy farming is inefficient relative to that of Europe? The answer is clearly no.

With government farm programs having disquised where real comparative advantage actually lies, there also is great uncertainty as to where different countries

have their real comparative advantages. Few countries know what parts of their farm sectors would disappear in a world with fewer trade restrictions on farm products. No one will dramatically lift trade restrictions with such uncertainties. The best that might be achieved is very small marginal reductions in trade restrictions to dip one's toe in the water to see how cold it really is for one's own farmers. It should be remembered that in the 1950s it was the U.S. Congress, not foreign countries, that kept agricultural products from being included in the original GATT agreements that lead to freer trade for manufactured products.

The chances that the current GATT round will lead to a substantial opening up of foreign agricultural markets is slight simply because no one wants their farmers to be the ones that have to go out of business and everyone will seek to preserve their domestic markets for their farmers. Their farmers love to be farmers as much as American farmers love to be farmers and their farmers have as much or more political influence than American farmers. To ask the probabilities for success one merely has to speculate on the probabilities that the United States would sign an agreement that would lead to the demise of many and perhaps most of its dairy farmers. The United States does not want free trade in agriculture any more than anyone else. We want free trade where we have a comparative advantage and the right to protect where we do not have a comparative advantage. But if we, and everyone else, wishes to maintain such protection there is no possibility of a movement to free trade in agriculture.

Just as importantly it is impossible to have free trade in agricultural trade internationally without having free trade in agricultural products domestically. Otherwise there is no way to know where real comparative advantage lies. But this means that a successful conclusion of that GATT round would essentially dictate U.S. domestic agricultural policies -- there could be no domestic agricultural support system or they would have to be identical with those adopted in other industrial countries. One could not even give transfer payments to farmers as an income support system since this would accurately be seen from abroad as a violation of free trade. With an income subsidy farmers would be encouraged to stay in farming longer than real comparative advantage dictates and hence America would be transferring some of the decline in farming that should be legitimately be borne by Americans to foreigners. The European Community already makes this argument. How many farmers if they knew the facts would trade free trade in agricultural products for the current $40 billion in public expenditures on farmers? I suspect very few.

Yet currently the opening up of foreign agricultural markets is held out as the salvation of the American farmer in the popular press. it won't happen and even if it did happen it would not change the nature of the problem. Fewer feed

grain farmers might go out of business and more dairy farmers might go out of business but it is doubtful that the shrinkage of U.S. agriculture would be noticeably affected in the aggregate with freer trade in agricultural products.

Wishful thinking and a refusal to confront reality are part of human nature, but the question here is the extent to which that natural human characteristic should be discouraged by the agriculture's intellectual establishment and the extent to which the political process will back up that 'reality treatment'.

EXPLORING ALTERNATIVE SYSTEMS

Capitalism is the doctrine that the efficient can, should, and will drive the inefficient out of businesses. It is precisely this process of creative destruction that generates higher standards of living for the average American although it can and does often lead to lower standards of living for specific Americans. A belief in capitalism does not stop anyone from receiving psychic income from a particular activity, such as farming, but it does say if a man loves to be a farmer he must pay for that love by being willing to work for less than those that do not have such a love and are willing to work whereever their income is highest. Those who are willing to incur the monetary and human costs of moving deserve to have a higher standard of living than those that are unwilling to move. What those that choose not to move cannot do under capitalism, however, is to demand that those who have been willing to make the sacrificies of moving be forced to give up some of their income to provide non-movers with parity in living standards.

This doctrine can be challenged -- it relies on a set of ethical propositions that do not have to command acceptance and in much of human history have not commanded majority acceptance (highly successful countries, such as the Roman empire, have not been built upon capitalistic principles) -- but the doctrine of capitalism cannot be selectively challenged. If it is to be challenged for farmers it must be challenged for everyone. There is nothing that sets farmers apart from others. Others may love to be copper miners; others may love to work in manufacturing. In the last six 6 years it is not just farmers who have been forced to switch. The decline in mining employment has been larger than the decline in farm employment; five workers have been forced to leave manufacturing for every one worker forced to leave farming.[14] Those people loved their workmates, neighborhoods, and occupations just as much as any farmer loves his.

Farmers also cannot argue that somehow they are differently treated in our capitalistic system -- i.e. they sell in competitive markets and buy in ologopolistic markets. Others are similarly treated. Anyone selling his labor is a little guy selling to a big guy. (Only 14 percent of the urban workforce had a union negotiating on their behalf in 1986.)

Thus the idea that a different system needs to be constructed for farmers must be buried in a more general argument that those who love their work should not be forced to endure much lower material standards of living if they express this love by not moving. Because of this general principle, whatever it is, it therefore becomes legitimate to tax those willing to move into urban areas to support the lifestyle of those not willing to move.

Before this argument can be made a lot of humanistic or social science work has to be done. What is there about farming that makes it different, unique, or better than other occupations. When someone says that farmers are 'nearer to nature', what does that mean? Farmers are certainly not natural ecologists. I am an avid mountain climber. In some senses I have been much nearer to nature than any farmer on his tractor. Once those characteristics, whatever they are, that make farming better and/or unique are clearly outlined and ennumerated, then, and only then, can we discussed the extent to which these characteristics are worth preserving and the alternative ways for doing so.

Since it is easier to understand arguments not directly affecting one's own lifestyle consider mining. Miners protest at being driven out of mining. Why? Let me give you my answer based upon growing up in a mining community. When the mines close miners are forced to leave their community and these communities are very close knit communities given their usual geographic isolation and the shared dangers of working underground. Miners don't love their job but they love their community and don't want to be forced to leave. If feelings of community are really at the heart of the issue, then one can then think of how communities might be maintained but this would not necessary lead to the conclusion that mining should be subsidized. There might in fact be much better techniques for keeping these communities alive.

I suspect that like mining the real issue is not farming but a feeling of community and having to move away from one's friends and relatives, but I am open to other arguments.

What are the limits of an economic market? What things should it not be allowed to decide? These are good questions. But they are not questions where the answers are of relevance only to farmers. If the decision is made that market forces could not be allowed to drive farmers and others who share in the same

characteristics out of business, then different systems for bringing such a result about could be explored and the costs and benefits of each could be ennumerated.

It is certainly true that that the agricultural establishment has not explored either the precise uniqueness of farming nor techniques for preserving this uniqueness, but it is equally true that if they had done so they would have been denounced by their farm clients as subversive. In the 1970s patriotic free enterprise speeches sold as well in farm America as they sold in urban America. Thus it is difficult to argue that the intellectual agricultural establisment did not do what it should have done.

ENVIRONMENTAL ISSUES

Valid charges can be made that issues of sustainability have not rated high in the agricultural agenda. Agriculture has been treated as if it were an extractive mining industry where one expects ultimately to have to go out of business since the natural resources will have been depleted and exhausted. Little efforts have been focused on preserving ground water availability or limiting toxic pollution of water or land. More efforts have been focused on soil conservation and proper management of irrigation projects (water logging or salinity), but perhaps not enough. Alternatives to the current dependence upon energy intensive forms of agriculture have been little explored despite the well-known uncertainties and expected variability in future energy prices. The central goal has been production rather than sustainability.[15]

One can argue that this blind spot is simply part of American culture and not specific to agriculture. This is certainly true. Externalities are not handled well anywhere. Witness our problems in coming to come to grips with acid rain. Environmental regulations are now far more stringent in developed foreign countries than they are here and as a consequence their water and air quality improvement have been greater than ours. Stewardship of our natural resources for the benefit of future generations is little preached and even less practiced in America. Visual pollution quickly mars almost all of our recreational areas.

Planning for the future is not an American trait. Our steel industry cannot roll steel to the tolerances or with the lack of impurities of its foreign competitors since no steel executive was willing to build the brand new mills that would have been necessary. Given the time to construct such mills each such mill would have hurt his profits and his bonuses while helping those of his successor. A gift to the future was required, but no one was willing to make such a gift. To say that others also error, however, is not to say that agriculture has not errored.

To correct these systematic errors requires an understanding of how our values and institutions lead to such practices. Social scientists have not led the way

to better understanding. Instead we have choosen up sides for an unproductive fight over envirnomentalism -- one is either for it or against it.

The lack of interest in sustainability spring from several factors. Many American institutions lead to short-term time horizons. The Deutsche Bank, for example, with its controlling interest in Mercedes Benz has a longer time horizon for Mercedes Benz than the legally required arms-length financiers bankers who bankroll Ford. The ease and availability of consumer credit in the United States leads to a world where instant consumer gratification is a way of life. Other nations demand larger down payments and faster repayment periods.

Problems with long time lags aren't taken seriously until the bad results actually begin to occur. The danger of asbestos has long been known but only recently acted upon.

Americans believe that a technical cure will always turn up. No matter how bad things may seem to be there is a technical solution that does not require changes in current practices. Someone will find a magic cure for falling ground water tables or ground water pollution.

Americans also believe that the free market behavior solves all problems. As a natural resources vanishes its price will gradually rise and American will smoothly move to alternative resources. The discontinuities of the oil shock are forgotten here -- all of our synthetic fuel projects have been discontinued as unnecessary. Abroad such projects contunue.

The adversarial nature of our institutions encourage us to argue without information. To be really useful environmental impact statements should be cheap and simple so that they can be used in the planning process before anyone is locked into some specific action. Instead environmental impact statements are complex and expensive. As a result they are never commissioned unless someone already knows what they want to do. Essentially they become advocate envirnomental impact statements useful in legal battles rather than social environmental impact statements useful in community decision making.

Intelligent pest control isn't practiced because it requires detailed knowledge to be effective, requires one to accept risks (the pests may get out of control) and uncertainty (too much pesticide may causes long run environmental problems but increases the certainty of short-run production results).[16] The technology essentially cannot be practiced unless some values are changed and perhaps some institutions (insurance?) are altered. Work on the supporting human values and institutional structures simply has not occurred.

The problem is not really better assessment of the consequences of new technologies but being willing to build the values and institutions that can make those new technologies useful and environmentally benign in the context of the long run sustainability of agriculture. Here there is a leadership role to be played both in agriculture and in the larger society.

THE CURRENT CRISIS

As a continuation of the trends of the 1950s and 1960s, the 1980s are not objectively a farm crisis. As has already been demonstrated the shrinkage of farming is occurring at a much slower rate in the 1980s than it has occurred in earlier periods of time. Farmers have left farming at a much faster pace in the past with no talk of 'crisis'.

The answer is found in farm wealth. Those left in farming are becoming poorer. Farm real estate values have been falling (per acre prices have fallen on average more than 30 percent from peak values in 1981 and much more in some states).[17] Because of a run up in farm debt in the 1970s proprietor equity has fallen even more (35 percent). Previous shrinkage did not lead to falling farm land values or reduced wealth for those left in farming. This time those who have stayed in farming have taken reductions in their wealth while in the past all of the costs of shrinkage had been carried by those that left farming. Yet at even today's depressed level the average farmer has more net equity than the average urban person and after correcting for inflation today's farm wealth is not much below that of 1970.[18,19]

The problem is obviously the 1970s. That decade was a temporary deviation from the long-run trend. It led to unrealistic expectations and unrealistic plans that then come back to haunt those that embarked on those unrealistic plans.[20] Could this situation have been prevented? Without the run up in land values, those debts would not have been taken on, and much of the current decline in farm wealth would not have occurred. The run down in wealth would not have occurred since the earlier run-up in farm wealth would not have occurred.

There is every reason to believe that this situation could not have been prevented. Similar speculative bubbles occurred in oil and office buildings. Recent declines in wealth have been just as rapid there as in farming.

It is also true that even at the height of the boom, land values could not be justified in terms of then current price for crops. The current value of land had to be justified on the fact that future value of land would rise and if anyone bothered to work out how high future crop prices would have to be to justify those expected future land values that calculations led to expected future crop prices so high that no one believed that they would occur. Most of the time the required calculation simply wasn't made, not out of ignorance, but because people simply did not want to know how much they were gambling. As an old aphorism puts it 'there is nothing like the prospect of a lot of money to fog the minds of otherwise intelligent people'.

Nothing the agricultural intellectual establishment could have done could have stemmed that run-up in paper wealth. Nothing that it could have done could have stemmed that subsequent run-down in that paper wealth. This does not mean,

however, that it should have been as quiet as it was. Not being listened to is not an excuse for not giving a warning.

CONCLUSION

Can Americans plan for decline? Those who cannot plan for decline suffer more when decline occurs than those that can smooth transitions to new activities but who are wise enough not to attempt to fight the inevitable tides of economic change. Agriculture has been marked by decline and in the future it will be characterized by decline. Those fundamental parameters of rapid productivity growth and low income and price elasticities of demand for agricultural products demand it. But planning for decline is difficult in the best of times and circumstances for Americans.

America's agricultural institutions and arrangements have almost exclusively focused on the insiders left in agriculture whatever the pace of decline. Attention and aid have never been given to those who were about to become outsiders. This is not strange -- labor unions worry about their current members and not their unemployed former member. How one corrects this outsider-insider bias, however, is not obvious. The insiders will be around to reward in the future those that helped them in the past. The outsiders are gone and not in a position to reward in the future those that helped them leave in the past.

If the current farm crisis were simply that another 200,000 farmers had been forced from insider to outsider status in the past six years there would be no farm crisis. The current farm crisis is produced by the fact that this time insiders have sufferred large reductions in their wealth. These insiders remain and are searching for either a magic cure (the agricultural establishment should be forced to produce one) or for a scape goat (the agricultural establishment should be punished for not stopped them from doing what they did in the 1970s). Returning to the old virtues, let's get production up, always feels good. In reality there are no magic cures, but reality never stopped anyone from going to Mexico for laetrile.

FOOTNOTES

The following consultants were helpful, but not to blame for any of the paper's arguments: Gary Comstock, Chester D. Black, Richard P. Haynes, William Lacey, Luther Tweeten.

1. Economic Report of the President, Jan. 1987, Council of Economic Advisers, pp. 280, 352.

2. IBID. pp. 280.

3. IBID. pp. 246, 255.

4. Survey of Current Business, March 1987, U.S. Department of Commerce, pp. 36

5. IBID., pp. 246, 280.

6. IBID., pp. 275, 353.

7. IBID., pp. 280.

8. IBID., pp. 354.

9. IBID., pp. 255.

10. IBID., pp. 252.

11. Paul Samuelson, "A Theory of Induced Innovation Along Kennedy-Weisacker Lines" The Review of Economics and Statistics, #47 Nov. 1965, pp 343-356. This is the last in a long series of articles.

12. Economic Report of the President, Op. Cit., pp. 149.

13. Agricultural Trade in Disarray, Council on Foreign Relations, 1986. pp. 21.

14. Economic Report of the President, Op. Cit., pp. 290.

15. Agriculture and the Environment, Resources for the Future, Washington, 1986.

16. IBID., pp. 149.

17. Economic Report of the President, Op. Cit., pp. 357.

18. "Survey of Consumer Finances, 1983", Feder Reserve Bulletin, Dec. 1984, pp. 863

19. Economic Report of the President, Op. Cit., p 357.

20. For a contrary view see: Luther Tweeten, "A Note on Explaining Farmland Price Changes in the Seventies and Eighties", Agricultural Economics Research, Fall 1986, pp. 25.

Chapter 11

PANEL DISCUSSIONS

Gary Comstock*

Since I am most interested in criticisms raised against the agricultural establishment, my response focuses on Mr. Thurow's paper. I was pleasantly surprised to learn that Mr. Thurow had agreed to give the talk called "Agricultural Institutions and Arrangements Under Fire." Like every other American, I knew of Professor Thurow's reputation as an economist, but I was not aware that he was also known as a critic of the "agricultural establishment."1/

After reading his paper, I am no more certain. His account of agricultural institutions under fire seems to show that Thurow is about as harsh a critic of agriculture as Tammy Faye Bakker is of husband Jim. Consider his argument. Agriculture has shrunk and will continue to shrink. If we really want to "confront reality," "if we really want to know the future of American farming," we'll have to face the fact that farmers "are going to have to leave farming." But, Thurow complains, the agricultural establishment has not faced this "reality," and has not led the way in retraining corn farmers to be computer programmers. Naughty agricultural establishment.

Never mind, for now, the very unrealistic assumption here that taking farmers out of agriculture is going to solve the problems of overproduction. If the reality of the last 30 years is to be believed, the fewer the farmers the greater the problems of overproduction. (A true "political realist" might well argue with Marty Strange, and against sacred agricultural orthodoxy, that what America really needs is more farmers.) But I am less concerned with specific failures to confront reality in Thurow's paper, and more concerned with the general implication of his single-minded focus.

Suppose that the only unkind word you had ever heard about the USDA, the land-grant universities, private colleges engaged in ag research, and agribusiness involved in the farm supply and food manufacturing industries was that they had not planned for decline. Suppose you had never heard of Jim Hightower and his book Hard Tomatoes, Hard Times, Wendell Berry and his book The Unsettling of America, Jack Doyle and his book Altered Harvest, or the U.S. Catholic Bishops and their pastoral letter Economic Justice for All.2/ If so, you might well wonder why this conference had devoted an entire session to this topic.

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Why indeed? The impression left by Mr. Thurow's criticism is that these other criticisms are out in left field and, apparently, should be left out there. I am not sure why the author chose not to bring these folk into our conversation. Perhaps he wanted to confine his remarks to matters pertaining to agricultural economics narrowly construed. Or perhaps he does not find the critics'arguments compelling. Whatever the motivation, I think a discussion of "Agricultural Institutions and Arrangements Under Fire" would be unobjective were it not to acknowledge that at least five important criticisms are still being pressed against modern agriculture. They relate to (1) the environment, (2) large farms, (3) developing countries, (4) economic power, and (5) spiritual identity.

1. The Environment: The agricultural establishment has encouraged research and products that are hazardous to the environment.

In my state, the groundwater of Northeastern Iowa shows alarming traces of pollutants from farm chemicals. Unacceptable amounts of nitrate-nitrogen and soluble phosphorus have been found in wells and surface water. The greatest source of these chemicals (in our state at least) is farmers using methods recommended by agricultural experts.

It is bad enough that modern agriculture is so heavily dependent on petroleum based products. But now biotechnology firms like Calgene of California are doing research not on plants that can withstand greater weeds around them, but greater doses of herbicides on them. At a recent conference, Bob Goodman of Calgene was asked by Jack Doyle why his company began this research direction. His answer was remarkably candid: "The technology was do-able and a market was there." Translated, this means: "We could make big profits for our company." Meanwhile, the people, plants, fish and animals in Northeastern Iowa continue to drink the water. I am just waiting for the biotech entrepreneur who first sees the market potential of herbicide-resistant people. Think of all the problems that would solve!

One might respond that this is a problem for the hard sciences, not the social sciences. But sociologists and anthropologists could help us answer questions like: Why have the land grant universities pushed monocultural and chemically-dependent farming methods so heavily? Why haven't we stressed sustainable agriculture? Economists might help us answer these questions: How can we internalize the externalities? How can we factor into our cost/benefit analyses the long term damage we are causing soils, plant, animal and human life? Incidentally, I noticed that some of these questions were not only not given high priority on Clarence Davan's list: they were not even on the list.

2. Large Farms: The ag establishment has encouraged farm research, products and techniques that favor large corporate farms.

Mr. Thurow acknowledges this criticism, only to say it is "probably untrue." Rather than guessing, perhaps we need a little research to find out. My very extensive sociological survey of all the farmers I know (about seven) reveals that farmers think universities have done nothing but research for the big guys. And they think this irrespective of whether they are large corporate

farmers or small part-time farmers. The only thing they disagree about is whether this research has helped them. Their answer here, as you might guess, depends on the scale of their operation.

If you don't think my farmers are "facing reality," you might consult the Superior Court judge in California who says he will soon find in favor of the small farmers who sued the University of California land-grant system for using Hatch Act funds for big farms and not for family farms. Specifically, the judge has said he will rule that the Hatch Act obligates Agricultural Experiment Stations to give "primary consideration" to the needs of "small or family farmers." The university has already offered a factual concession that it is not doing what the judge says it should be doing.

3. Developing Countries: The ag establishment has been more concerned with the profits of multinational agribusinesses than with the health of Third World countries.

The agriculture establishment has enthusiastically endorsed a particular foreign policy toward the world's developing countries: viz., the development of the private sector. It has unreflectively stressed the need to expand and diversify the export crops of, for example, Central America. "Measured by macroeconomic indicators," writes Robert G. Williams, this policy has been a success. "During the decade of the Alliance for Progress, the average annual growth rate of the Central American economy approximated 6 percent," a very healthy economy.3/ Macroeconomic indicators, however, are not the only ones we should use to evaluate our policies. One role for philosophers is to point this out. Measured by cultural, ethical and theological indicators, this policy has not been an unquestioned success. The case can be made, in fact, that it was a failure of tragic proportions, as social unrest, governmental repression and communist revolution have followed hard on the heels of rapid economic growth.

Why? Perhaps the leaders of multinational chemical and pharmaceutical companies could give some insight here. Firms such as Royal/Dutch Shell, Monsanto, ITT and Ciba-Geigy--along with the biotech and seed companies they have recently gobbled up--are making profits in the Third World that look like inverse curves of the suffering found there. As new markets open, these firms benefit most. They are the ones who stand to benefit most from continued adherence to the Reagan doctrine, pushing capital investment accompanied by vast military expenditures as the prescription for stability in the region. Yet we have every reason to think that this policy will only lead to continued instability for the peasants. The firms, on the other hand, can look forward to continued financial growth. Pushing export agriculture as the answer to the problems of the Third World is not our only option. And yet you would not know this from reading any of the papers in our conference's 200 page book.

Social scientists could be of help here, too. Economists could tell us what the major causes of the expert boom were. "To what extent was export success due to favorable market conditions and unusually low costs of production in Central America?" To what extent was it "the result of favorable government policies" and exploitation of labor?4/ Who were the real beneficiaries of the export boom? The cotton growers and cattle ranchers? The poor of

Honduras? Or Dow Chemical and American Cyanimid? "Who came to own the cotton gins and beef-export houses?" Mr. Thurow claims that "the Green Revolution worked." Did it work for everyone? Is there really such a thing as a free lunch in international agriculture? Critical historians and economists could help us figure out exactly for whom the Green Revolution worked.

Rural sociologists and political scientists, on the other hand, could help us understand the effects of our agricultural foreign policy on the material well-being of the peasants. "How did people use the land before it was turned into cottonfields and cattle ranches? How did each export drive influence opportunities for (the peasants) for making a living? How did it affect the environment (the rainforests, the plant and animal ecosystems)? How did it affect the relations between large landowners and the rural poor?"5/ More chemically based, export agriculture, combined with military aid, seems likely only to shore up existing regimes in Central America. "At a cost of billions of dollars and thousands of lives, the program promises to prolong the rule of the current governments of Guatemala and El Salvador. In Honduras and Costa Rica, the program will temporarily support individuals in the military and other sections of the government who will enthusiastically embrace U.S. policy."6/ Meanwhile, the agriculture establishment in this country treats the policy with an attitude of reverence that would put Jim and Tammy to shame.

4. Economic Power: The ag establishment has not opposed the increasing concentration of wealth and power in the farm supply, farmland ownership, and food manufacturing sectors of the economy.

There is evidence to suggest that medium-sized farmers are "caught in a competitive sector (namely, farming) sandwiched between sectors of extremely concentrated (and noncompetitive) economic power," and that high levels of concentration exist in the procurement of live cattle and the sale of boxed beef. In some sectors of the agricultural economy there are highly noncompetitive markets, which may be leading to an unfair price squeeze for producers.7/ Consider the concentration of companies in the farm input sector alone (a sector, by the way, not nearly as concentrated as food manufacturing). "The four largest companies selling tractor attachments accounted for 80 percent of sales in 1977. In the same year, the top four firms selling harvesting machinery (like combines and cotton pickers) had 79 percent of sales. The eight largest companies selling nitrogen and phosphate fertilizers had 64 percent of total agricultural chemical sales. And the pesticides industry was similarly dominated by a handful of companies: four firms had 60 percent market share (in 1976)."8/ I am not an economist, and I do not pretend to know whether entry barriers in these sectors are high, or whether shared monopolies are always a bad thing. I suspect they often are. What I do know is that when I listen to mainstream agricultural economists I rarely hear mention of this debate. What is going on here? Is there some professional mechanism of repression at work? If an interested academic like me has to dig around in the corners of a university library in order to learn that there is a live debate about the value of agribusiness monopolies, how will the average citizen ever learn? If they ever do learn, will they trust the economists in the future as they do now? We need greater openness and honesty about these research controversies.9/

May I suggest you also help us with the question of the increasing concentration of farmland ownership? It is true that most farmland is still being bought by neighboring farmers, but outside and foreign investors are more and more prominent in these transactions. More research, it seems to me, is needed here.

5. Spiritual Identity: The ag establishment has encouraged all of us to think of farming in purely technological and economical terms, ignoring (at best) or denying (at worst) its unique cultural, philosophical and spiritual qualities.

Consider these lines from Wendell Berry about the life of farming:

> The small family farm is one of the last places--they are getting rarer every day--where men and women, girls and boys, can answer (the) call to be an artist, to learn to give love to the work of their hands. It is one of the last places where the maker--and some farmers still do talk about "making" the crops--is responsible from start to finish for the thing made. This will perhaps be thought a spiritual value...In fact, from the exercise of this responsibility, this giving of love to the work of hands, the farmer, the farm, the consumer, and the nation stand to gain in the most practical ways: they gain the means of life; they gain the goodness of food; they gain longevity and dependability of the sources of food, both natural and cultural. The proper answer to the spiritual calling (of farming) becomes, in turn, the proper fulfillment of physical need.10/

Berry's eloquent defense of the cultural and spiritual value of farming, along with the actual labor of farmers who love their land, makes me wonder about Thurow's claim that "there is nothing that sets farmers apart from others." To say there is unique value in farming does not deny unique value in other forms of labor. This is a mistaken inference that critics of the agrarian tradition often ask us to draw. But it does not follow from the claim that farming has unique value that other forms of labor have inferior value. If anything, getting clear about the specific virtues and vices of farm labor helps us to see more clearly the specific virtues and vices of other forms of work. It is false to say there is nothing that sets farmers apart from others. It is true nothing sets them above others. The agrarianizers' claim that farmers are closer to nature, animals, and the rhythms of Creation is not a claim that farmers are better than others. They are just different. Instead of emphasizing this point, however, the agricultural establishment seems to be embarrassed by it, and responds by dogmatically training its young to insist that farming is a business. It is a business. But it is also a unique and specific way of life. Here, again, I recommend that the new agenda for social scientists emphasize the importance of making relevant discriminations such as this one, and trying to figure out how they might change our ordinary way of assessing agricultural "progress." As Fred Buttel correctly notes in his paper, not everything we value is convertible into quantifiable, economic terms.

This prejudice against farming as a way of life and the attempt to think of agriculture in purely technical terms in manifest in the rhetoric of agricultural experts like Clarence Davan. I was interested, too, in Lester

Thurow's confident assertion that "agriculture has been marked by decline and in the future it will be characterized by decline." Can an economist really extrapolate from past trends, boldly predicting "inevitable tides of economic change" if one is dealing with the realm Aristotle called praxis, i.e., the realm of human choices? Compare Willard Cochrane's assessment, quoted in footnote 21 of Richard Kirkendall's piece: "The current farm crisis could be relieved by two bad crop years in a row...Or...by the inception of a worldwide economic depression (a distinct possibility as of 1987). The only safe prediction is that the future of U.S. agriculture, economically speaking, is unpredictable." This seems to me a more scientific and objective claim in that, as David Hume taught us, it matches the strength of our beliefs to the relative certainty of our evidence.

I conclude by thanking Professor Thurow for his humanitarian concern. In drawing attention to the plight of displaced farmers, he has reminded us that we are all too prone to self-interested forgetfulness, concerned only with taking care of our own needs while ignoring the needs of outsiders. But I hope we can extend this particular criticism to other areas and take a hard look at our fundamental assumptions. As Mr. Hite's paper shows, there are real problems in farm country. I hope we will not confine ourselves to disciplinary business-as-usual as we try to design solutions.

ENDNOTES

1/ The phrase "agricultural establishment" is often used in a loose and ambiguous way: I follow standard practice in what follows. I also admit that the term is often used as a euphemism for whatever it is in agriculture that one does not like. Critics of the establishment need to be more specific. Helping critics to be clearer about the charges is one way social scientists could help.

2/ Jim Hightower, Hard Tomatoes, Hard Times, Cambridge, MA, Schenbman Publishing, 1973; Wendell Berry, The Unsettling of America: Culture and Agriculture, New York: Avon, 1977; Jack Doyle, Altered Harvest: Agriculture, Genetics, and the Fate of the World's Food Supply, New York: Viking Penguin, 1985; Economic Justice for All: Pastoral Letter on Catholic Social Teaching and the U.S. Economy, National Conference of Catholic Bishops, Washington, D.C.: U.S. Catholic Conference 1986.

3/ Robert G. Williams, Export Agriculture and the Crisis in Central America, Chapel Hill, NC: University of North Carolina Press, 1986, p. 8.

4/ Ibid.

5/ Ibid.

6/ Ibid., p. 190.

7/ Tony Smith, "Social Scientists are not Neutral Onlookers to Agriucltual Policy," in Gary Comstock, ed., Is There a Moral Obligation to Save the Family Farm? Ames: Iowa State University Press, 1987 (Forthcoming), p. 105 (galleys); quoting James Wessel, Trading the Future: Farm Exports and the Concnetration of Econmic Power in Our Food System, San Francisco: Institute for Food and Development Policy, 1983, p. 116; On noncompetitive markets, see Bruce W. Marion, The Organization and Performance of the U.S. Food System, Lexington, MA: Lexington Books, 1986, p. 134.

8/ Wessel, p. 116.

9/ Cf., Russell C. Parker and John M. Connor, "Estimates of Consumer Loss Due to Monopoly in the U.S. Food-Manufacturing Industries," American Journal of Agricultural Economics, 61 (1979): 629-39, and Marion (1986).

10/ Wendell Berry, "A Defense of the Family Far," in Comstock, ed. Moral Obligation, galleys, p. 183.

PANEL DISCUSSIONS

Billie R. DeWalt*

My sense of the strength of anthropology as a discipline is that it attempts to develop a holistic understanding of the relationship of people to the social environment and natural habitats within which they exist. While anthropologists have traditionally been weak in determining policy directions and making recommendations about what should be done (as Buttel points out in his paper), they often are able to present a much broader and useful view of the context within which such decisions can be made. Taken as a set, the papers presented during this workshop create a carefully-drawn background within which to develop an agenda for the social sciences in agriculture. My commentary will attempt to pull together what I have learned from this workshop and present what I believe to be the lessons that we should derive from it.

First, as Kirkendall so nicely develops in his paper, the history of American agriculture has been one of increasing labor productivity and decreasing involvement of people on the farm. Although we now hear more talk about the farm crisis, Thurow convincingly argues that the present situation is only the continuation of long-term trends. In fact, the current "crisis" is not as severe as past ones. At present, however, agriculture makes up a much smaller proportion of the GNP than it ever has before, farmers are a much smaller percentage of the population, and these trends are unlikely to change irrespective of what happens in terms of short-term government policy. There is still a substantial percentage of the population involved in the food system (about 20 percent) but most of these individuals are involved in the processing, marketing, and transportation of food. They are usually employed in large-scale, frequently multinational agribusiness corporations.

Put bluntly, the implications for colleges of agriculture and for social scientists whose concern is domestic agriculture are quite clear.

a) There will be less of a need for agricultural research to serve farmers. Many of their technical research needs are already being served by the corporations that sell them supplies and process their products. Biotechnology is done in corporations, and much of that occurring in public universities will not be done in colleges of agriculture. To be sure, there is still a role for public research to meet the needs of groups and individuals whose needs will not be met by the corporations. Many of these individuals will not be the traditional "family farmers" but part-time farmers,

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people who live in rural areas for aesthetic reasons, and people managing rural landscapes for nontraditional uses (e.g. hunting, fishing, green belts, etc.).

b) In the same way, social scientists doing research for and about farmers are also focusing on a diminishing clientele. Some researchers will be needed to look at the activities of the 17 or 18 percent of nonfarmers involved in the food industry and, as Hite points out in his paper, for economists and others who focus on the use of natural resources. We face the prospects of a declining need for commodity and production agricultural economists.

The second thing I have learned is that this does not mean that colleges of agriculture, agricultural experiment stations, and social scientists involved in the study of agriculture are or will become obsolete. Their perspective and mandates need to become much broader. As Schuh argues in his paper, we can no longer just think about domestic agriculture without also considering the international dimension. My view is that we are in the midst of a global reorganization of agriculture. The developed countries are increasingly going to only produce those crops that can be produced using highly mechanized means (mostly grains)--and perhaps a few crops that are too highly perishable to be transported very far. Labor-intensive fruits and vegetables are probably destined to be produced in the developing countries where labor costs are much lower. The message for those individuals in the United States who are concerned with agriculture is that there is a great need for their expertise--if they are willing and able to employ it within the context of the internationalization of agriculture.

The narrowness of perspective of some of the commodity interest groups will have to be overcome. Though Brazil may compete with the United States in soybeans and though Mexico may now be producing substantial amounts of sorghum, the overall level of imports in these countries has been stimulated by the modernization and development of their economies and agricultural sectors. Davan et al have presented an incredible paradox in their paper. They report that the highest priorities for research in agricultural economics were questions concerning what agricultural products foreign countries wanted from the United States and how competitive U.S. products are in world markets. Yet the lowest priority was assigned to questions of how to pursue policies that would raise the income of third-world countries. This indicates a real narrow-mindedness among the individuals interviewed in the Davan et al study; apparently they only are concerned with selling to developed markets rather than expanding the potential base of consumers by developing new markets.

U.S. development can no longer be based on the underdevelopment of significant parts of the rest of the world. It is becoming politically and economically indefensible (and on moral grounds has always been so). For this reason, international development should become the key to the future of the land grant system. All of those involved in colleges of agriculture and experiment stations will inevitably have to attempt to convince their traditional supporters (commodity interests) to accept their involvement in the

international arena. While in the short run this may be painful, my view is that long-term survival may hinge on the outcome of whether these hard decisions are made. The revitalization of the land grant system will require visionary, entrepreneurial and risk-taking administrators.

A third point that arises (if my first two points are accepted) is that there is a significant need for a reorientation and redirection of our educational system to allow us to more effectively participate in the newly internationalized context of agriculture. Our land grant system contains within it many disciplines that are relevant to the international context, yet few agricultural scientists or even agricultural social scientists have taken advantage of these educational opportunities. International marketing and production of agricultural products will require much more in the way of cross-cultural learning. It is also important to emphasize that there is a great need for more widely-trained people who focus on international dimensions of natural resource use. Issues like desertification, deforestation, and the like include both aspects related to the natural environment as well as a significant relationship with poverty. Anthropology, geography, ecology, philosophy, and the foreign languages are key elements here. Can we hope to understand our competitors and our customers if we can't communicate with them or understand their customs and behaviors? It is especially imperative that we recognize that a simple transference of American agricultural technology is not what is needed in most developing countries. The U.S. was able to absorb the many people displaced from agriculture by the new technology. Developing countries, with many more hundreds of millions of people involved in the agricultural sector, simply cannot generate the needed industrial and service sector jobs that would be needed if capital-intensive agriculture displaces the rural population.

My own perspective is that the agricultural social sciences have become overly specialized in their training and perspectives. This increasing specialization has diverted us from understanding many of the most important and significant questions that face world agriculture in the years ahead. How many individuals are focusing on the global reorganization of agriculture? Do we know what the effects of this will be? If we were unable to predict what occurred in our own agricultural sector, can we predict what will happen in the rest of the world? How can we prevent the vast majority of third world farmers from being displaced in the process of their agricultural development? What is appropriate technology for these farmers? If there is plenty of food in the world, then how do we solve the poverty problems of those who are too poor to get access to enough of it? We need many more synthesizers of research to answer such questions.

As many people have emphasized in this workshop, we need much more in the way of multidisciplinary research. It is more important to recognize, however, that in order to do more effective research in the social sciences, I think that we need many more interdisciplinary people--that is, people who are able to think beyond the strictures of their own disciplines. Just as we need to get away from the agricultural fundamentalism that makes us focus on the "family farm" and individual commodities, we also need to expand beyond disciplinary fundamentalism and chauvinism. No one discipline has all of the answers or even all of the right questions.

PANEL DISCUSSIONS

Don Paarlberg*

I pick up on a point made by Professor Hite:

"...there is good reason to believe that a combination of political, social, and technological developments are now in place that are as significant in their implications for rural America as the great historical transformations that accompanied other quantum changes in the dominant mode of production (e.g., during the Industrial Revolution)."

Rural America is part way through a profound transition. On that all four papers agree. Is it possible, as Professor Hite suggests, to improve our understanding of this change by examining its predecessor, the industrial revolution? I believe it is, and shall attempt to do so, finding in this undertaking a theme which is, to some degree, common to the papers under review.

The industrial revolution began about two centuries ago with the advent of the steam engine, and continues with today's robots and other forms of high technology. Mechanical power made possible the replacement of cottage industry by the factory system.

The initial change occurred in the technological area, where inhibitions to change were minimal. The technological changes disrupted conventional ways of thinking and doing and imposed great adjustment pains. In England the Luddites wrecked the printing press and in France the factory workers sabotaged the system by tossing their wooden shoes into the machinery.

Institutions, public and private, set up to serve cottage industry, came under stress. Received economic theory, which had assumed atomistic competition, was challenged by the advent of concentrated economic power. Utopian socialism came into being and Karl Marx developed his theory of dialectical materialism. Government sought to meet adjustment problems with the dole.

There was little understanding of the fundamental forces at work. Charges and countercharges were hurled back and forth. Financiers, factory owners, economic theorists, and politicians came under fire. There were avid supporters of the old order. The ancient rhetoric was voiced in the support of cottage industry, even amid the clatter of the new industrialized order.

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Meanwhile, the level of living gradually rose as the improved efficiency worked its way through the economy. But there remained some residue of the old system, islands of cottage industry that somehow survived the change.

How does the agricultural revolution compare with its predecessor, the industrial revolution?

The transformation of rural America began somewhat later than did the industrial revolution, the delay not easily explained. A commonly accepted date is the middle of the nineteenth century. The great names are Liebig, Pasteur, McCormick, and Mendel. The great institutions are the Land Grant Colleges and the U.S. Department of Agriculture. When the revolution began, half the American population was on farms; now the proportion is a little over 2 percent and falling. During the height of the transformation, more than 30 million people left farms, the greatest migration in history. The treasured institution, the family farm, came under stress.

There was limited understanding as to the cause of the transformation. Named villains were Wall Street, agribusiness, and the politicians. Prices fell, reflecting the new abundance, the competitive market was judged adversely; government stepped in to regulate prices and production. Contrary signals were called, the Land Grant Colleges working to increase production and the Department of Agriculture trying to reduce it.

Farmers increasingly borrowed money, rented land, and hired labor like other business people. Their wives gave up gardening and canning and began buying groceries at the supermarket like their city cousins. Agriculture, formerly considered different from the rest of the economy and worthily so, began to lose its distinctive character. Those sub-disciplines set up at the Land Grant Colleges to serve a unique clientele, namely agricultural economics, agricultural statistics, agricultural sociology, agricultural history, and agricultural engineering, began to wonder about their vehicle, their destination, their payload, and their fuel supply. There were efforts, public and private, to slow down the process of change but they were of little avail.

The technology changed first, and the institutions next, the rhetoric last. The traditional family farm, the old agrarian ethic, and the revered agricultural creed were voiced long after they had lost their meaning. The point of this is that if one listens to the rhetoric, he will be misled about what is going on.

True, in some isolated spots the old order has continued, islands within the flood.

While all this was happening, our capability to produce food increased, the real cost of food declined, hunger went into retreat, and the real level of living rose, farm and non-farm. Public attention focused not on the wonderful child being born but on the pangs that accompanied birth.

Change continues. We often speak of "the agricultural adjustment" as if it were a change from some fixed base to some new level of technology and

institutions at which things will again be settled. This is not so; the only constant in the picture is change itself.

Before the transformation began, technology, institutions, and rhetoric were rooted in the same soil. They were mutually supportive and controversy was limited. But once we embraced the new technology, they lost their compatability. Institutional lag and the rhetoric, with its retrograde character, failed to keep pace with technology. As long as technology advances, institutions and rhetoric will never catch up. Intellectually, politically, and philosophically, we shall continue to be in stress.

What can we learn about an agriculture in transition by examining the experience of the industrial revolution? At the risk of oversimplification, I offer these four points, which appear to me to be acceptable to the papers under review:

1. The agricultural transformation is underway and is irreversible.

2. Agriculture's uniqueness is being eroded and with it the disciplines and institutions that assumed continuing uniqueness.

3. It is possible by wise public policy to reduce the adjustment pains of those caught in the change process.

4. But it would be unwise to presume that we could, by advance planning, chart the precise course for the juggernaut that has been set in motion.

We can thank ourselves daily that the individual judgments of the persons most concerned were used in large measure both in the industrial revolution and thus far in the agricultural revolution in deciding what was best. Suppose the government had undertaken to decide which cottage industries should survive and which factories should be favored. Could government have decided, better than the 30 million people who left farms, what they should do and where they should live?

This Conference, intent upon "enhancing the quality and effectiveness of research," "developing a strategic agenda," and "clarifying the different roles of the social sciences" is an excellent undertaking. But let us recognize the transitory nature of the institutions, the fallibility of social planners, and the wrong signals of rhetoric. Let us remember the resourcefulness of individual persons and leave ample room for their decisionmaking in whatever comes from our Conference.

PART IV

SOCIAL SCIENCE INSTITUTIONS, KNOWLEDGE, AND TOOLS TO ADDRESS PROBLEMS AND ISSUES

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Chapter 12

FROM THE PERSPECTIVE OF BOTH THE RURAL AND BASIC SOCIAL SCIENCES

Larry J. Connor*

The perspectives of both rural social scientists and basic social science disciplines are important in analyzing problems pertaining to farming, agriculture, and rural areas. With this perspective in mind, the planners of this conference assigned the following objectives for this paper:

- To address this topic from the perspective of all the rural and basic social sciences rather than only from the author's own rural social science area and/or basic social science discipline.

- To place emphasis on

  1. the adequacy or inadequacy of theories, techniques and measurements in the basic social science disciplines relative to the problems and issues resolvable, in part, by the work of rural social scientists.

- To relate potential social science contributions to the improvement of

  1. institutions, policies and programs,
  2. technology,
  3. human development, and
  4. capital growth (biological and physical) and the conservation and development of natural resources

  needed in food and agriculture, natural and community resources, and the environment -- both in the U.S. and internationally.

- to relate potential social science contributions to the improved knowledge of monetary and nonmonetary values required to solve anticipated problems and resolve issues.

In order to accomplish such objectives, an author would have to have several alter egos or be extremely naive and foolish. At the risk of being both, this paper was undertaken by dividing it into two general areas:

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* Larry J. Connor is Chairperson and Professor in the Department of Agricultural Economics at Michigan State University. Comments and suggestions of the following individuals are gratefully acknowledged: Consultants -Peggy Bartlett, Sue S. Coates, Don Paarlberg, Glen Taggart and Thomas Wessell; Michigan State University colleagues--James T. Bonnen, Warren Cohen, Frank A. Fear, James R. Fischer, Carl Liedholm, Warren Samuels, Michael Schechter and Scott Whiteford.

1. Social Science Theory, Methods of Analysis and Tools, and

2. Capacities of Social Sciences to Address Rural Problems.

Social Science Theory, Methods of Analysis and Tools

The need for disciplinary contributions from the social sciences has been well summarized (Johnson, 9):

> "... Social sciences, like all disciplines, have special responsibilities with respect to disciplinary knowledge. Like the biological and physical sciences, social sciences generate the basic disciplinary advances which, in turn, provide the foundation for application in the form of improved policies, development of rural human resources and improved agricultural institutions (both public and private), policies and programs. As for the biological and physical sciences, not all disciplinary research in the social sciences is relevant for agriculture..."

In order to deal with varying problems related to agriculture and rural areas, social scientists fall back on their disciplinary underpinnings. These take the forms of basic theories, paradigms, analytical methods, and tools of analysis. The disciplinary underpinnings establish the capacity and set the limits of the social science disciplines to address rural and agricultural problems in an applied context and multidisciplinary efforts with other social sciences or applied agricultural fields.

Heterogeneity of Social Sciences

There is often a tendency to assume disciplines are relatively homogeneous, and that greater heterogeneity occurs between disciplines. This is hardly the case with the social sciences. In an analysis of variance context, there may be as much variation within some social science disciplines as there is between them. This has contributed to the views of physical and biological scientists that social sciences are basically "soft" -- that they lack vigor and powerful, generally accepted methodologies. Social scientists from a given discipline may give totally different responses to problems because of different philosophic and science orientations. Hence, generalizations about the social sciences need to be carefully made and understood.

Needs of Basic Social Sciences

To what extent do current problem demands related to agricultural and rural areas expose needs associated with basic social sciences? If the capacity of social sciences to deal with rural problems in an applied context (which often involves multidisciplinary interactions) is important, the items specified in Table 1 appear to be relevant. These needs are applicable in various degrees to social science disciplines, and are important in relating to agricultural biological and physical scientists (such as agronomists, agricultural engineers, etc.), as well as between rural social scientists. While maybe not applicable to all social sciences for all types of analysis, these needs are valid for social science research pertaining to agricultural and rural subject matter.

Table I

Needs of Basic Social Sciences
As Exposed by Agricultural and Rural Program Demands

1. Dominant or unifying paradigm(s) ?
2. Deductive analysis capability?
3. Empirical orientation?
4. Capacity to handle values?

First, are there dominant and unifying paradigms? This is an important need inasmuch as it lends credibility within and between disciplines and provides some accepted concepts/methods for problem solving. The social sciences have been vulnerable to attacks from the physical and biological scientists because they do not have established paradigms like some of the physical sciences (such as physics). A major danger of such paradigms is that they may produce "cloning" and discourage productive alternative paradigms for dealing with practical problems.

There is a considerable difference among the social sciences with respect to dominant paradigms. Economics probably has the strongest paradigm in its market-price mechanism-choice-marginalism emphasis. This is clearly the mainstream of American economic thought, although there are alternative schools of thought. Sociology also appears to have a dominant paradigm in structural-functionalism. The application of general systems theory in sociology has been within this paradigm. Anthropology has a dominant paradigm based on the concept of "culture:" an interdependent complex of behavior and beliefs that encompass economic, political, and idealogical realms of human life. The other social science disciplines appear to have less dominant or unifying paradigms.

Next, deductive analysis capability is important in applying or utilizing theoretical concepts. The ability to generalize with axiomatic reasoning is useful in dealing with certain types of problems. Deductive analysis depends not only on axiomatic logic, but also on inductive tests to validate its value in explaining various forms of behavior (to be able to predict). Of the applied agricultural fields, agricultural engineering often adeptly uses this approach. Of the various social sciences, mathematical economics probably has the most formal deductive analytical capabilities. Other social sciences also have this capacity in varying degrees, although in a more rhetorical base. A major limitation of deductive analysis is the tendency to concentrate on more disciplinary oriented research questions.

With their historical emphasis on experimental methods, laboratory sciences and the applied agricultural fields have long had a strong empirical orientation. This empirical orientation has been valuable in helping diagnose problems, and in evaluating alternative approaches to given problems. It is interesting that agricultural economics was created by plant and animal scientists with holistic concerns about public and farm decision making problems in agriculture. Their approach was strongly empirical.

Rural social scientists have made outstanding empirical contributions. The development of the agricultural data system is a prime example. On some campuses, the teaching of survey methods now appears to be shifting to the social sciences (particularly sociology) as many statistics departments have focused so exclusively on the theory of mathematical statistics that they have ceased to be interested in data, data analysis or applied statistics. It should be noted that there is a difference between empirical versus quantitative method orientations. University agricultural economists have increasingly become involved in the development and utilization of various quantitative analytical methods (econometrics, simulations, etc.) while decreasing their use of survey methods involving primary data collection. (This is less true with respect to USDA and for agricultural economists working in less developed countries.)

The last need relating to basic social sciences is the capacity of the disciplines to handle values (monetary and nonmonetary). The social sciences have always been faced with the problem of integrating positivistic information from the physical and biological sciences with social and humanistic values. Values are crucial from the standpoint of the social sciences, particularly in research on public policy or any kind of public/private decision making.

Social sciences handle values very differently. Colleges of education have long been dominated philosophically by American pragmatism which does not separate values and positivistic knowledge. Other social science disciplines have handled values on a conditional normative or normative basis (see Johnson 16). Social scientists within individual disciplines often handle values differently. The handling of values of rural social scientists has been a concern to individuals from applied agricultural fields and agricultural administrators. Objective analysis of values is not possible within the logical positivism framework of many of the applied agricultural fields. Hence, social scientists must carefully integrate values and knowledge in dealing with selected real world agricultural or rural problems. This is a challenging task, and one in which the social scientist must meet.

Capacities of Social Sciences to Address Rural Problems

In an applied context, what are the major capacities of the social sciences to address rural and agricultural problems? Alternatively, to what extent can the social sciences link problem sets with social science disciplinary and subject matter domains? The applied capacities of the rural social sciences are discussed in subsequent sections.

Types and Levels of Research

It is useful to identify three broad categories of research (Johnson, 10):

1. Disciplinary research-- to improve the theory, measurements, and techniques of one of the traditional disciplines of traditional universities.

2. Problem solving research--multidisciplinary research having as its objective the solution of a particular practical problem faced by a specific real world decision maker or set of decision makers in either the public or private sector.

3. Subject Matter Research--multidisciplinary research on a subject of interest to a rather well defined set of decision makers concerned with a rather well-defined set of problems.

Rural social scientists engage in all three kinds of research. Some research efforts may be a mixture of these types of research. This does not necessarily detract from the usefulness of the categories in thinking about research.

Agricultural research institutions are necessarily concerned with all three kinds of research. Typically, most departments in a college of agriculture or agricultural experiment station have a multidisciplinary orientation, although one discipline usually dominates. Varieties of research with respect to these three categories:

1. Subject matter research: examples include pest management, farming systems research, farm management, child development, community development, food safety, etc.

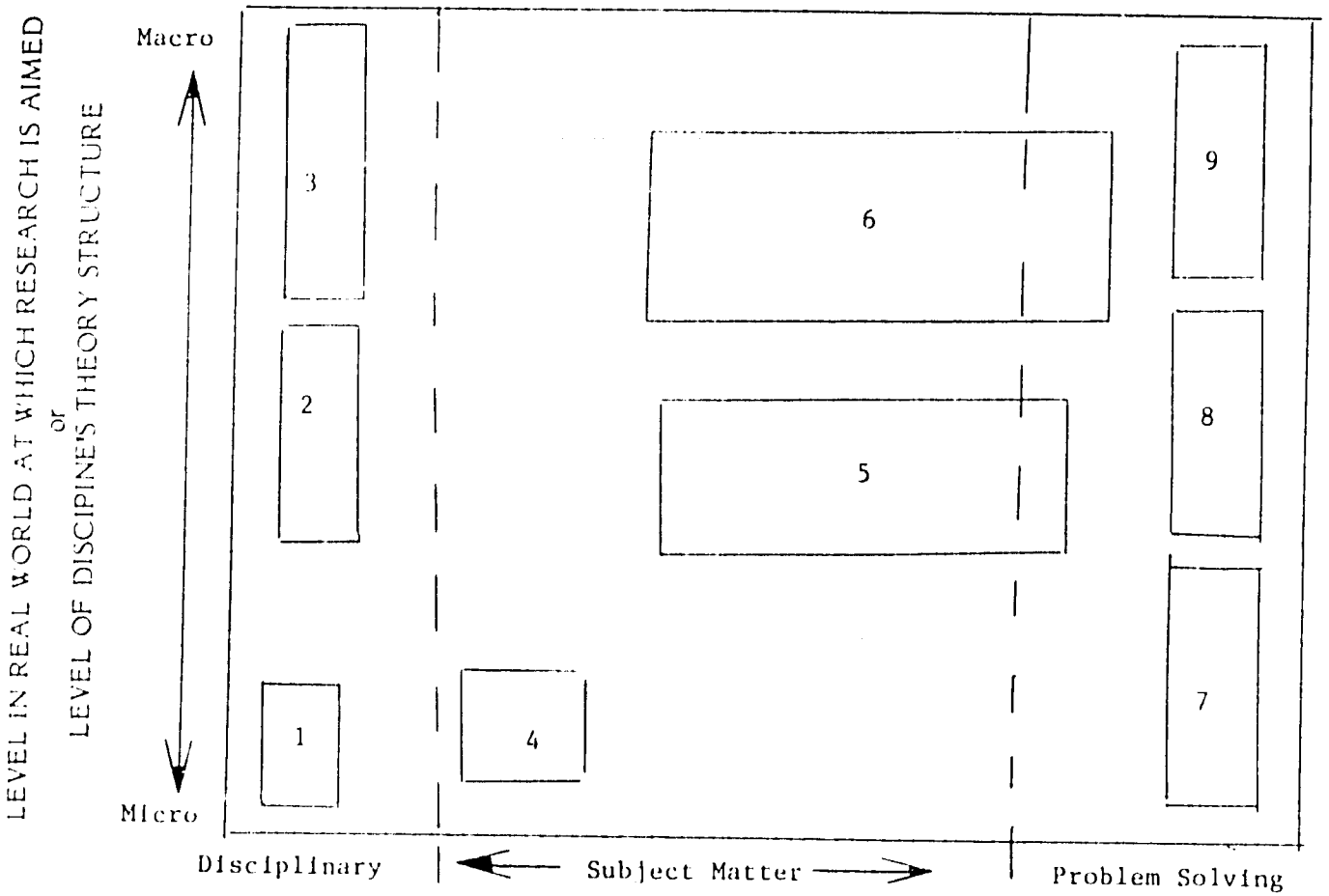
2. Problem solving research: examples include problems associated with the farm crisis, local community problems dealing with a declining tax base, management problems associated with a specific cattle feedlot,etc.

3. Disciplinary research: examples include the basic theories, measurements, techniques, and tools of the discipline such as techniques for economic modeling, organizational, behavior, etc.

In Figure 1, examples of these three categories of research are illustrated with examples from agricultural economics. The diagram demonstrates how the level of research relates to disciplinary, subject matter, or problem solving efforts. As indicated, some research (farming systems, agricultural policy analysis) may contain a descriptive, subject matter, and problem solving mixture.

The level of aggregation or structural level of discipline theory can be a major impediment to multidisciplinary research. This is particularly true with respect to working with agricultural scientists. Entomologists often start with a bug on a particular leaf, soil scientists may be concerned with a cubic yard of soil, and animal scientists may be concerned with only the rumen of an animal. In order for the social scientist to relate to agricultural scientists, the level of aggregation must be on a similar plane. Usually this is at the farmer decision making level. In some cases, social scientists may find it impossible to interact with biological scientists because of the social scientist's inability to deal with the very micro level of analyses at which the biological scientists works and thinks. Biological and physical scientists, in turn often be frustrated in working with social scientists because of their concern with the "big picture," or the long term consequences of technological change.

A major problem in putting together multidisciplinary teams is the matching of individuals with respect to both disciplinary and applied skills on the one hand and their micro or macro skills on the other hand. Few social scientists (or other scientists) have the capacity to work across both continuums. Thus, multidisciplinary research is most successful when directed to a very specific problem or subject matter area. Multidisciplinary research does not mean that outstanding disciplinary skills are not required. Department chairs have a tendency to "volunteer" their less disciplinary oriented faculty for multidisciplinary projects in colleges of agriculture. Indeed, outstanding skills may be needed to provide adequate problem identification and system structure to analyses.



TYPES OF RESEARCH

Figure 1.
Schematic Example of Various Research in Agricultural Economics[1]

[1] Numbers in boxes refer to examples of research:

1. Expected utility analysis
2. Demand analysis models
3. Macroeconomic models
4. Soil carbon dynamics
5. Farming systems
6. Agricultural policy analysis
7. Integrated decision support systems
8. Community development
9. Agricultural sector stimulation

Multidisciplinary research involving only the social sciences has probably been most pronounced in the area of community development or with the family where economists, sociologists and human ecology have interacted. Agricultural economists have had the most extensive experience in working with the physical and biological scientists in agricultural institutions. Other social scientists have had less frequent interaction in multidisciplinary research efforts relating to agriculture and rural areas.

Types of Information and Major Sources of Change

The types of information generated by social science researchers have value to private and/or public decision makers. According to traditional informational theory, information is data that has been evaluated in the context of a specific problem situation. The true value of the information is related to the decisions that private or public managers have to make. The relationships between major types of information and prime sources of change in societal capacity are shown in Table 2.

Table 2

Capacity of Rural Social Sciences to Provide Selected Types of Information Relative to Major Sources of Change in Rural Areas

Types of Information	Prime Sources of Change in Societal Capacity			
	Technology	Human Capability	Institutions	Biological/Physical Capital
Descriptive	+[1]	+ to ++	+ to ++	+
Diagnostic	+	+ to ++	+ to ++	+
Predictive	0 to +	+	+	0 to +
Prescriptive	0 to +	+	+	0 to +

[1] Relative Strengths:
++ Strong
+ Moderate
0 Negligible

Information can be classified as descriptive, diagnostic, predictive, and prescriptive. Descriptive information portrays the "what is" condition. It describes the state of some physical, biological, sociological or economic aspect of a given entity at a specified point in time. Diagnostic information protrays the "what is wrong" condition. It is utilized for problem identification. Diagnostic inforation is measured as the disparity between "what is" and "what ought to be." Prediction information portrays the "what if...?" condition. It is concerned with possible outcomes of alternative courses of action. Finally, prescriptive information is directed to decision making and the "what should be done" question.

In dealing with selected types of information, social scientists are most skillful in providing descriptive and diagnostic analyses. Because of the large number of exogenous variables which cannot be controlled in social/economic/political systems, it is often difficult to predict with precision. (A prime example deals with the difficulties associated with macro economic forecasting models). Although social scientists have difficulty in predicting, many of the physical and biological scientists working in agriculture also have problems in this respect (as evidenced by difficulties in predicting crop yields, livestock production, etc.). Nevertheless, rural social scientists must do predictive analyses in such forms as impact, benefit/cost, policy and political analyses.

Social scientists do not always provide prescriptive solutions for private/public decision makers by themselves. In this respect they encounter the same problems as the biological and physical scientists. As previously indicated, rural social scientists must be careful in how they handle values. Good social science extension specialists have typically handled values through careful conditional normative prescriptions.

Despite the capabilities of social scientists in providing descriptive and diagnostic information, research relating to the provision of this information has been somewhat lacking (Bonnen,1). As a prime example, the Agricultural Data System in existence still largely reflects the problems of the 1930s. As another example, the efforts of various agricultural experiment stations in generating data pertaining to the recent farm crisis and rural families should also be noted. Surveys of farms, farm families, and other primary collection activities had to be conducted on a crash basis to provide needed information for state legislators, governors, etc. Finally, universities have been happy to leave much of the work on data collection to the U.S Department of Agriculture, and do less primary data collection today than several decades ago. Primary and systematic data collection is labor intensive and has grown more expensive to be undertaken or sustained easily. Unfortunaly, some data has been discontinued by the USDA in recent years because of budget constraints, and increasing pressure to focus only on national level policy issues, and this in a very short run context.

The four prime sources of change in societal capacity are: technology, human capabilities, institutions and biological/physical capital. The social sciences have greater relative strengths in dealing with human capabilities and institutions than with technology and biological/physical capital. This is not to say that social scientists cannot make contributions with respect to the latter two areas. Indeed, they can and should. Unfortunately, social science interactions with agricultural biological and physical sciences in analyzing questions pertaining to technology and biophysical capital have been much too limited.

Impacts of Alternative Institutional Models on Rural Social Sciences

Rural social sciences have had varying degrees of success in surviving and prospering over time in academic settings. Agricultural economics has clearly been the most successful. Departments are located in every college of agriculture in the U.S., and the Economic Research Service is a large component of the U.S. Department of Agriculture. Family relations and child development departments have developed in colleges of home economics (ecology), although they have not enjoyed the same level of funding support as departments of agricultural economics. This may be partially attributed to being in separate colleges. Rural sociology has had mixed success. Some departments of rural sociology have survived, while others evolved within or have been combined with departments of agricultural economics or with sociology departments in liberal arts or social science colleges. A scattering of lawyers, usually located in departments of agricultural economics, is also present around the country. Other relevant disciplines -- history, political science, anthropology, psychology, etc. -- have either not developed or not survived in colleges of agriculture. However, there are individuals in basic social science departments who specialize in such areas as agricultural history, rural development, the politics of agriculture, etc.

Why have some rural social sciences developed successfully and obtained funding support from agricultural administrations? There is probably no single general answer to this question. Agricultural economics has probably prospered because of its work on incomes, which ranks high among human concerns, and its close relationship to colleges of agriculture and the other agricultural disciplines. This has been particularly crucial inasmuch as most agricultural college administrators come from the biological and physical sciences. With the emphasis on home economics (human ecology), family relations and child development has also survived, although not prospering like agricultural economics. Rural sociology's lesser degree of success can probably be attributed to its rural orientation as opposed to an agricultural orientation. As a consequence, it has had less identification and support from agricultural administrators. The major focus of agricultural colleges has been on technological change, biological/physical capital, and human capability as it relates to these two forces of change. Institutional change and human development have received much less emphasis from Experiment Stations than from Cooperative Extension Services.

A variety of institutional models can be used by the rural social sciences[1] Rural social science departments may be set up separately from basic social science departments. Rural social scientists may be grouped together in varying types of arrangements. Rural social scientists may also be independently distributed among the physical and biological departments. Does it really make any difference? Is there any rationale for having separate rural social science departments? Do social science organizational models influence the type of rural social science research conducted?

Various social science organizational models for relating to agricultural and rural problems and the hypothetical impacts on various types of research are identified in Table 3. The range of organizational models include: private/public universities such as Harvard, Chicago, and Texas; land grant universities with various organizational forms; governmental social science agencies; and independent institutes such as Resources for the Future, American Enterprise Institute, and the International Agricultural Policy

[1] See Ruttan (17) for another discussion.

Table 3.

Social Science Organizational Models for Relating to Agricultural and Rural Problems: Relative Impacts on Various Types of Research[1]

Organizational Model	Characteristics	Relative Impacts On:[2] Disciplinary Research	Subject Matter Research	Problem Solving Research
1. Private/public University	Basic Disciplines Only	++	0 to +	0
2. Land-Grant University				
A. University Disciplinary	Basic and Rural Disciplines in same department: All applied economics in Economics Department, etc.	+ to ++	+	0 to +
B. College Disciplinary	Rural social science disciplines in College of Agriculture: Ag. History, Rural Sociology, Agricultural Economics, etc.	+	+	+
C. School of Rural Social Science	Rural social science disciplines grouped within a school in College of Agriculture: Rural Sociology, Ag. Law, Agricultural Economics, etc.	0	+	+
D. College Disciplinary with salaried Joint Appointments	Same as 2B above except some faculty would have salaried joint appointments in other departments: Agr. Economist located in Animal Science with half his salary appointed in Agr. Economics, etc.	0 to +	+	+
E. College Disciplinary with independent Appointments	Same as 2B except some faculty would have independent appointments in other departments: Ag. Economist appointed in Fisheries & Wildlife with no appointment in Ag. Econ.	- to +	0 to +	+ to ++
F. Center or Institute	Organization independent of departments, with specific charge (tenure, rural development, etc.)	0 to -	+	+
3. Government	Publicly Supported (ERS/USDA, etc.)	0 to +	+ to ++	0 to +
4. Institutes	Private Organizations (RFF, AEI, IAPRI, etc.)	0 to +	+ to ++	0 to +

[1] There are obviously various combinations of these models

[2] Relative impacts:

++ Strong
+ Moderate
0 Negligible
- Negative
-- Very negative

Research Institute. In interpreting the results of Table 3, it should be emphasized that these are generalizations. Certainly, any organization may have a mixture of professional social scientists with different capabilities. Availability of money to conduct social science research can also influence any organization as to the nature of its research. Nevertheless, there does appear to be some evidence of differences in performance with respect to types of research and organizational models.

The private/public universities clearly have a comparative advantage in conducting disciplinary research. Faculty are recruited on this basis, research funds for this type of research are more readily available internally and from external funding agencies, and faculty generally have less contact with food system and rural decision makers. The land grant universities have a comparative advantage in doing problem solving research, and to a lesser extent, subject matter research. Government and institutes appear to have an advantage in doing subject matter research, although organizations such as the Economic Research Service periodically do some problem solving research for executive and legislative government purposes.

Various land grant organizational models have been broken down further because of the large number of rural social scientists within the land grants. The most disciplinary orientation within a land grant structure is probably where the basic and rural disciplines are in the same department in the university (sociology or economics department). The most applied problem solving approach is probably where social scientists are separately appointed and located in other departments (such as in the animal sciences and plant sciences). Where extension specialists are located in departments, their relationship to research specialists and possible joint extension/research appointments also influence the nature of research in universities.

Is there an optimal organization model for land grant universities? The answer to this question depends on what individual colleges of agriculture wish to accomplish. Colleges of agriculture have a tendency to encounter difficulties when they either over-emphasize the disciplinary basis or the more applied subject matter and problem solving basis. They also have problems in balancing the capability to address the technology, human capital, institutional and biophysical dimensions of any problem of subject matter of relevance to agriculture and rural areas. Maintaining a balance is important for long-term survival (both in the context of relating to state level and disciplinary clientele).

Are the social sciences properly organized to do effective agricultural and rural research? The answer to this question depends on one's views of the following:

1. What kind of research is important? (Disciplinary, subject matter, or problem solving? Descriptive, diagnostic, predictive, or prescriptive? Technology, human capital, institutional or biophysical?)

2. What are the potential relative contributions of the individual social sciences to agricultural and rural research? The resources available to rural social scientists from various disciplines vary considerably.

Prioritization of Rural Social Science Problem Areas

During the 1970s and 80s, applied agricultural and rural fields increasingly attempted to prioritize research needs. This was in response to shortages of research funds, inflation impacts, the development of a competitive grant program in the USDA, responding to new pressures such as biotechnology and the farm financial crisis, protecting the market

share of the agricultural research dollar,etc. Two major conferences were held in the crop sciences, one in the animal sciences, and various fields have periodically revised and updated priorities.

Examples of recent research priorities for agricultural economics and rural sociology professional associations are shown in Tables 4 and 5. In Table 6, the ranking of research initiatives is shown for the NCT-146 group. This committee is composed of North Central administrative representatives from home economics, agricultural economics, rural sociology, and agricultural education. The 13 research initiatives shown in Table 6 were drawn from 21 research areas in the 1986 CSRS report on "Research Initiatives: A Research Agenda for the State Agricultural Experiment Stations." In examining these initiatives it should be emphasized that the ranking was done by individuals in the North Central states with their state needs in the region in mind.

Table 4

Critical Issues Facing Agricultural America for the 21st Century--A Statement of Economic Research and Education Issues Identified by Agricultural Economists

Item	Critical Issues
1.	Increasing the profitability of agriculture
2.	Organizing to compete in world markets
3.	Developing policies to reflect the changing pattern of ownership and control of agricultural and rural resources
4.	Improving the linkage between food and environmental concerns and agricultural programs
5.	Developing policies for stressed communities and for the future needs of rural people

Source: Critical Issues Facing Agricultural America for the 21st Century, a Statement of Economic Research and Education Issues Identified by Agricultural Economists, the American Agricultural Economics Association, 1986.

The prioritization process conducted by NCT-146 was rather interesting. Thirteen areas were selected from the 21 research areas originally identified by the CSRS report as being most relevant to rural social sciences. The committee then proceeded to identify two priority areas and two secondary areas for further research. The highest priorities were: agricultural policy in a global setting, and rural family and community well being. Secondary priorities were: market penetration and efficient marketing of agricultural and forest products, and integrating agricultural technology. The group dynamics were interesting. Agricultural economists argued for agricultural policy as the

Table 5

1986-87 National Priorities for Rural Sociology Research

Number	Research Area
1.	Consequences of technological and economic changes in vital rural industries
2.	Improved methods for predicting the social effects of proposed developments in rural areas
3.	Strategies for enabling people in rural areas to enhance their well-being through increased access to resources of the larger society

Source: Klonglan, Gerald E., National Priorities for Rural Sociology Research, The Rural Sociologist, Volume 6, Number 6.

major priority. Home economists and rural sociologists argued for rural family and community well being as the major priority. This formed the basis for specifying these two initiatives as the foremost priorities. At a subsequent meeting of NCT 146, the committee agreed further to recommend to the North Central Experiment Station Directors that the initial research initiative be concerned with developing a comprehensive data base that was comparable across the region and which described the state of well being of agriculture and rural communities. The development of comparable, good descriptive data bases would involve cooperative efforts among the rural social sciences specified.

The NCT 146 experience illustrates several interesting conclusions. First, agricultural economics clearly has had the greatest interaction with other agricultural disciplines, and is most concerned with this linkage. This reflects the location of agricultural economics in the college of agriculture, and its historical relationship with other applied agricultural fields. Next, the rural social sciences have had few group collaborative efforts. Rural sociologists have worked some with the agricultural economists, the agricultural economists have worked some with the home economists, the home economists have worked some with the rural sociologists, etc. However, there have been few comprehensive research efforts that attempted to pull the rural social sciences together. Finally, in prioritizing the initial research initiatives, the development of a good descriptive data base was the initial priority. Obviously, most states felt a strong need for more and better descriptive information.

The extent of influence this prioritization might have on the region's experiment station directors remains to be seen. Of the 21 research areas identified in the 1986 CSRS report, few of the areas in which the social sciences dominate have been ranked very high by the North Central Experiment Station Directors. The financial situation of farms, agribusiness, local communities and families has had little impact on most table 6

Table 6

Research Interest in 13 Research Initiatives by NCT-146 Committee (North Central Regions Technical Committee) September 1986[1]

	Research Initiative	Ranking by Representatives of:[2] NCA-5 Home Econ.	NCA-12 Agr. Econ.	NCA-13 Rural Sociol.	NCA-24 Agr. Educa[4]
1	Sustaining Soil Productivity	N	M	H	N-M
2	Maintaining & Protecting Water Quality & Quantity	M	M	H	N-M
3	Rangelands & Pasturelands	N	M	M	N
4	Animal Health & Disease	N-M	N	N	N
5	Improved Management of Crop Pests & Diseases	N	N-M	N	N-M
6	Short-term Adjustments for Enhancing Economics of Agr.[3]	M	H	H	M-H
7	Agr. Policy in Global Setting[3]	N	H	H	M-H
8	Market Penetration & Efficient Mktg. of Ag & Forest Products[4]	N-M	H	M	M
9	Rural Family & Community Well-being[3]	H	M	H	H
10	Interrelationships of Food & Nutritional & Health Status of People	H	N	H	N-M
11	Computer Technology for Ag Management	M	M	M	M-H
12	Processing & Quality Enhancement	M-H	N	N	N
13	Integrating Agr. Technology[4]	M	H	H	H

1 Drawn from 21 research areas deemed to have a significant social science component in 1986 CSRS Report on "Research Initiatives: A Reserch Agenda for the State Agricultural Experiment Stations

2 H-High, M-Moderate, N-negligible

3 Top 2 priority research initiatives

4 Next 2 priority research initiatives

5 NCA-24 ranking done in 1987

experiment station priorities despite the increasing importance to agriculture and rural areas of researchable problems that fall primarily in the domain of the social sciences or in which the social sciences are (or should be) critical multidisciplinary participants. Response from cooperative extension services to the farm and rural family crisis has been much greater.

Research Areas of Opportunity

While the preceding section indicates some of the major research priorities of rural social science disciplines, it does not necessarily indicate major research areas of opportunity. The possible long-term nature of major problems and likelihood of funding must be considered along with specific contemporary research needs pertaining to agriculture and rural areas. In Table 7, major research areas of opportunity for rural social scientists are advanced. These are broad areas which the author believes contain numerous researchable problems.

Table 7

Major Research Areas of Opportunity for Rural Social Scientists [1]

Research Area	
1.	Agricultural Competitiveness
2.	Rural Communities
3.	Natural Resources
4.	Technology Assessment

[1] Based on research needs pertaining to agriculture and rural areas, continuing nature of problems, and likelihood of funding. Each area contains various researchable problems.

Agricultural competitiveness is increasingly a greater concern in the U.S. because:

1. Expansion of international markets probably provides the major opportunity for enhancing agricultural incomes,

2. The U.S. is experiencing increasing competition in international agricultural markets (wheat from Canada, France and Argentina, soybeans and citrus from Brazil, dairy products from Europe, etc.),

3. National macroeconomic policies have a strong impact upon the competitiveness of U.S. agriculture, and

4. Individual states are increasingly attempting to maintain/expand their agriculture, food processing, etc. at the expense of other states and to find niches in U.S. and international trade.

Researchable competitiveness topics cover agricultural production, input supply industries, food processing, marketing and distribution firms, government infrastructure, etc. Of particular importance is research on national agricultural and rural policies which: (1) provide adequate and stable prices for agricultural commodities, (2) do not disadvantage U. S. products in world markets, (3) do not make unreasonable demands on the U.S. treasury, and (4) do not have degrading environmental and social impacts. While economists have a primary role to play among the rural social scientists in this area, there is a demand for other types of social science research (such as the changing structure of U.S. agriculture). This is particularly true relative to institutions and human capability developments. Because of pressures from state legislators, agricultural commodity groups, and state economic development groups, agricultural experiment station directors will increasingly be concerned with the competitiveness of the agricultural industries in their individual states. But without leadership from the social sciences, institutional and human development is likely to be under emphasized or even ignored.

The impacts of the farm financial crisis on the health of rural communities are by now somewhat documented. Additional pressure and change will be forthcoming when biotechnology impacts begin to be felt. The continuing decline in farm numbers and corresponding decreases in numbers of input supply firms will continue to impact small towns, counties and townships. Changes in nonfarm industries will also impact rural areas. A good example is the decrease in automobile part suppliers in Michigan and Ohio and the resulting loss of jobs for rural people. Researchable topics relating to rural communities cover a variety of topics including the family, quality of life, development processes, local governmental financing, community development, provision of local services (schools, roads, etc.), leadership development, etc. Leadership for this research area must come from the rural social sciences.

A third general area relates to the natural resources: sustaining soil productivity, maintaining and protecting water quality and quantity, reducing acid rain, minimizing livestock waste pollution, etc. With the passage of the recent water act and override of the President's veto, attention is once again being focused on environmental quality issues. Public opinion polls show strong and growing public concern for the quality of the environment. In addition, some states are beginning to experience increasing problems involving such issues as ground water pollution from fertilizers, hog hotels, soil erosion, etc. Social scientists have already done good work in this area. Much remains to be done. Some of this research will have to be conducted jointly with agricultural scientists.

The last area of opportunity for social scientists may seem surprising: technology assessment. To understand its importance, a review of history may be useful. The period prior to World War I up to the late 1940s was basically the mechanical power era in American agriculture. The period from the late 1940s through the middle 1980s has been the chemical power era (fertilizer, chemicals, etc.) Current advances in biotechnology now suggest that the forthcoming several decades will be known as the biological era in American agriculture.

Preliminary analyses indicate substantial adjustments occurring as the result of adopting biotechnology. For example, adoption of the dairy bovine growth hormone will result in a great reduction of cow numbers and some corresponding reduction in feed grain use. Various producer groups are already expressing concerns relative to this technological advance, particulary after the recent dairy herd termination program (Rauch, 16).

Attempts to do preliminary testing of the growth hormone has resulted in some negative consumer reaction to the milk produced. As a consequence, the potential biotechnology may not be fully adopted without adequate social science analyses prior to the release of the technologies. An analogy can be drawn to nuclear power. Nuclear power has not been adopted to the same extent in the United States as in Europe because of social concerns and constraints. Social science analyses were never conducted as part of the feasibility research relating to the adoption of nuclear power in the U.S. and the major final restraints turned out to be a lack of social acceptance of this technology.

While biotechnology will strongly impact American agriculture, it also will reinforce other existing concerns about technology. These include food additives and dietary impacts on human health, environmental impacts relating to water and soils, and issues raised by animal rights and other activists groups.

To date, there have been limited research opportunities for rural social scientists in this area. Social scientists have been excluded from the Department of Agriculture's special funding of biotechnology. Cornell appears to be one of the few universities that has to date specifically attempted to incorporate the social sciences into analysis of biotechnology impacts. Yet, there is little doubt that agricultural technology will come under increasing scrutiny. As it does, agricultural administrators from the biological and physical sciences will increasingly be forced to request social impact analyses of technological adoptions. (One must remember that technology is especially endearing to them.) This may well place some rural social scientists in difficult situations as they are forced to deal with conflicting views on the value of new technological advances in agriculture.

Finally, the area of information systems should perhaps be mentioned, although it has been implicitly included in the others areas identified under Table 7. The continuing computer/communication revolution (microcomputers, cable t.v., satellite discs, etc.) will have major impacts on public and private decision makers. Social scientists will be involved in developing expert systems, integrated decision support systems and management information systems. They will also have to deal with ethical and public policy issues concerning their use.

Summary

Major needs of basic social sciences as exposed by current rural problem demands were identified and discussed. These included: dominant or unifying paradigms, deductive analysis capacity, empirical orientation, and capacity to handle values. Various considerations relating to the capacities of social sciences to address rural problems were elaborated. Types and levels of research, types of information relative to major sources of societal change, impacts of alternative institutional models on rural social sciences, and prioritized research areas were identified. The question was raised, but not answered, as to whether social sciences are organized to do effective research for agriculture and rural communities.

Both the rural and basic social sciences have much to contribute to the solution of problems confronting agriculture and rural areas in America. Rural social science contributions to developing appropriate policies, institutions, programs and human capacities have not been fully utilized by agricultural research establishments.

The increased need and responsibility for better communications on the part of social scientists should be obvious. Social scientists clearly need to do a better job of

articulating and prioritizing research needs with agricultural administrators. However, social scientists also need to a much better job of communicating with the agricultural scientists and within the social sciences. Surprisingly, the rural social sciences have done far too little in the way of joint initiatives to build better relationships among themselves. This situation must change on campuses, government agencies and within various institutes.

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Chapter 13

FROM THE PERSPECTIVE OF RESEARCH ADMINISTRATION

H.O. Kunkel*

Introduction

The perspective of the research administration should not differ much from that of the social scientist. Yet administrations are more subject to encounters with the constraints of funding agencies, expressions of the clientele who support the institution in the legislatures and the Congress, the hopes and expectations of commodity and other groups who take proprietary views of the research institution, the aspirations of the scientists, the understandings of administrators who stand above the research administration -- presidents, chancellors, regents -- and of advisory councils, and the visions of research administrations themselves. There are also short-term crises and questions of "what have you done for us today." These all impinge upon the administrative perspective.

The research administration is given the responsibility for development of the long-term vision, that is, the strategic perspective, and its articulation in persuasive terms. To be sure, the administration should provide the context in which the short-term crises and the external constraints can be handled. But the agricultural research administrator has to lead toward a strategic plan, which must somehow hang on some relevant "nails" that funders can understand, relevant points that administrators of the institution can understand, and relevant objectives for the internal guidance for the research staff. Administration, thus, has to deal with the awkward position of having to filter the priorities of legislators, clientele and others, priorities that may be different from the priorities of the staff. The administrator has to reconcile the differences and bring to consensus the concepts and commitments of the research staff and the requests of the public support. He/she has to try to fit tools, knowledge base and skills into the strategy. And therein obviously lies the genesis of divergent viewpoints that must be accommodated.

Of course, research administration is generally not a single person; administration today is likely to be corporate or plural. Staff advices and disciplinary instincts of various kinds play into administration. But the general concerns stated in this paper will surely color the perspective whatever its form.

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Performance of Social Sciences

It is clear that the basic scientific quality of social sciences has improved dramatically in the past decade. Evidence of significant amounts of excellent scholarship has accumulated. There is a growing, general recognition that economics and economists, sociology and sociologists, and home economics and human ecologists can contribute even more significantly to the knowledge base and to the solution of important problems.

But the scientific sophistication of the social sciences is nowhere near its limits. Self-evaluations by social scientists have raised fundamental questions: What are the adequacies of the basic science and theoretical foundations? What additional aspects of the basic social sciences, particularly economics, sociology, and psychology, require assessment and use in the rural social sciences? What is the fundamental theory to solve the problem? And what can be the contributions of philosophy, ethics, political science, history and anthropology to the agricultural settings?

Sociology, for example, has had an excellent record of doing useful things in group and individual development, community development, and the like which may seem less important today. The challenges for tomorrow are broad and unbounded There are now questions on the social impacts of technologies in agriculture, food processing and the marketplace, the structure of agriculture and further decisions regarding biotechnology, and even the differences in the goals and values held by scientists in the agricultural research institution. A central issue is the industrialization of agriculture. A sociology of agriculture requires construction. Similarly, the interaction between society and the environment provides issues that have become relevant. Research and scholarly debate should touch the ideologies, the agendas, and the roles in agriculture but now are critically needed to go beyond conventional boundaries.

Born on the need to provide guidance and put sense into the complexities of agricultural production and marketing, agricultural economics has contributed to policy and innovations in human institutions. Agricultural economists have conceived and described the elements of inputs in a production process: technology, institutional improvements, human capital and biological and physical inputs and their interrelationships (Ruttan, 1984). They built a strong profession around an empirical tradition.

Today, we see the need to turn again to the descriptive, empirical base of agricultural economics, drawing, of course, on the basic science of economics. Technology may be outstripping human institutions. International settings, the market, environmental quality, utility and human well-being, racial and sexual inequality, and other quality issues place new imperatives on economics. The tractor used today, the system of plant protection used today, the management used today, and the cuts of meat and the kinds of breads appearing in the marketplace today are not the same as they were ten years ago. These are issues that require description beyond quantitative techniques. They require the kind of attention that among economists only agricultural economists can likely provide.

Home economics has captured both the elements of natural science (nutrition, textile science, etc.) and the social sciences, including psychology, sociology, and economics as well as human development and family economics. But it has done so with particular sensitivities to problems in consumer economics, family welfare, human health, rural life, and the human response to technological development (see Deacon and Huffman, 1986).

Colleges of home economics, more so than colleges of agriculture, have been forced to deal with the implications of technological development. Through their work with individuals and families they have encountered directly the problems and crises of community life and rural America. They have had to relate to the cultural and social aspects of eating and how that links to nutrition. Home economists, more than the rest of us, have visualized how consumers enter the marketplace. Colleges of home economics have positioned themselves to deal with the complexities of rural issues by building multidisciplinary faculties. But home economists, too, must look to even wider horizons and seek improvement of their scientific quality, all the while that the required social science base is still developing.

The definition or redefinition of problems, particularly the nagging problems, are particular issues of concern to research administrations:

--- What, for example, is rural America? What are the significant elements of rural America for the future? If we had truly known the significant issues in the past, would rural America have suffered as much in recent years?

--- Many still look at the decentralized market as the economic model for agriculture. But now there are all sorts of institutional arrangements, "deals cut," international agreements and the like that deny the decentralized market to agriculture. The agricultural market is a structured system, a nonhomogeneous process, the kinetics of which require redefinition.

--- Social sciences in recent years appear to focus on those problems in which quantitative techniques are dominant. The values of these efforts are unquestioned. The trend has been useful at the micro-level, but the need today is to be useful in the broader policy issues. Description of utility values -- why do people farm, why do people live in rural areas where the services are less than they could gain elsewhere, what are the human effects of food technology -- may be the larger issues in the future effort to measure maximum utility. It is not that quantitative methods are not important to the discipline. But for questions that worry the research administration, another balance may be required.

--- The agricultural research establishment is in the business of creating technological opportunities. No one can evaluate better the possibilities and probabilities in the creation of new technology and inherent product quality than the scientists and the administrators concerned. No one else really has that capacity. But such scientists may be the least capable of evaluating the human values -- the impacts on people and the environment including the global sense.

Social sciences, thus, have unique implications in agricultural research institutions. They are particularly important in the Land-Grant universities. Technological advance is the mirror of research in all research institutions, but the universities have special responsibilities for consideration of the direction, management and implications of technological advance. The social sciences thus have a range of roles for which only they may have the conceptual bases and frameworks to do. But many of these roles are yet to be fully undertaken. Obviously, the need for social sciences grows.

Administrative Issues

There may be, on the surface, distinctive problems in managing the work of social sciences in an agricultural agenda. There may be problems of integrating their work with the work in other areas. There appear to be problems of acceptance of the social sciences. There seem to be differences in perspective. There are problems of mutual understandings.

There are differences also in expectations of what the social sciences can do. The predictabilities and the coefficients of variation in social sciences are incredibly loose. But so are the predictabilities of meteorology and climatic studies, the windblown migrations of plant disease organisms, the movements of living marine resources, the responses of insects to controls as resistance to insecticides grows, or the relationship of diet to cancer, all of which have resonance in food and agriculture and agricultural research institutions.

Are then the social sciences truly different from the hard sciences? Are they more sensitive, more political, more subject to bias, more controversial or what? My guess is that they are not, even though they may have been so a few decades ago. Through years of experience as a research and academic administrator, I have seen as much need for sensitivity and as many controversies surrounding the results of the experimental and natural sciences as I have experienced with the social sciences. If there are differences, they likely have more to do with the individuals and the problem of the moment than the nature of the science.

Boulding (1980) has reminded us that technology can best be applied when there is fundamental understanding. When understanding is less defined, attempts to create a meaningful application or technology are a struggle. Without caution, confusion and illusions and disillusionment can be created.

Experimental or observational sciences are intellectually more satisfying when they can be carried out with precision. One can be fairly "secure" in the results of chemistry, physics and, perhaps, even molecular genetics. But our knowledge of individual human behavior is "insecure" because of the great complexity of the human brain and body and the great difficulties in sampling it. Agricultural sciences, dealing with rapidly adapting biological systems, the human physiology (we cannot experiment on humans) and climate may be no more "secure" than those which deal with social systems, national and global economies, and political processes. Yet each kind, the continuum from "secure" to "less secure" science, is essential in agricultural research. Well placed, the social sciences are a critical part of the continuum of agricultural research.

But the administrative management of social sciences may yet have distinctive features, some of which derive from the special insights and skills that social sciences bring to research and some of which relate to what might be termed the "sociology" of the social sciences.

There are issues in the reward system for research scientists. The current research institutional arrangements, and the administrators of them as well, have created a market for the positivistic. There has been far less concern with the need to create a market for considerations of values and morals. As a result, quite understandably, social scientists have often tried to emulate the physical scientists. They have seen that it is the more positivistic "stuff" that gets rewarded. Some rural social scientists have been captured by the tools of positivism. They seek larger computers, produce more "squigglies," build more models.

There are problems also in the reward system for engaging in interdisciplinary work. Almost two decades ago, Castle (1970) noted that society has permitted and encouraged universities and other social research institutions to engage in "basic" or "pure" research, as one of their traditional and autonomous functions. Castle argued that administrators will ignore this at their peril. The definition of important problems which are researchable calls for first-rate minds who will rebel at inappropriate formulation of the problem. But the issue remains that multidisciplinary researches -- subject matter and problem-solving research -- make important uses of the social sciences. The traditional peer driven reward system, which has emerged in a logical outflow from the very effectiveness of disciplinary research of the past, is not given to encourage multidisciplinary research. The administrator is thus confronted with a constraint which he/she may not really control.

But new divisions of the faculty to work on "lines" of research (subject matter and problem-solving research) as well as disciplinary problems are absolutes for the future. That will require groups of scientists from different disciplines working together. But, also there are necessities for accelerating the research process; teams of scientists which hold allegiance to the same discipline but provide different skills or interests may be needed to speed the work. Teams are common for work in the physical sciences and are increasingly seen in the biological sciences. It has not been easy to bring together research teams in the social sciences in part because such operational modes seem alien to those scientists who still tend to work in individualistic settings.

Administrators, too, have a responsibility for facilitating the access that social scientists need to those outside the colleges of home economics, agriculture and natural resources or the agricultural research institution without casting aside the traditional staff of the college. The linkages to other disciplines, including the mother disciplines of statistics, economics, sociology, history and philosophy is essential for vitality of institutions and the agenda of the relevant social sciences.

Those administrators who are not social scientists, and perhaps some who are, often regard the goals of the social scientists and of the physico-biological scientists in agriculture as coincident, or at least, that they ought to be. For most of the history of agricultural sciences, reaching back to the early

days of agricultural chemistry, the theories of agricultural science have been structured by preconceived and changing human goals and objectives (Krohn and Schafer, 1976). Agricultural chemistry and biology are most often carried out not to provide insight into why agriculture functions but rather consists of a design of how it ought to function. The data base of most agricultural sciences has been preselected by normative judgments. Thus, agricultural chemistry and biology become a social science operating with the methods of natural science. The instinctive expectations in such an operative mode is that social sciences per se should serve the same purpose. This view sees the natural science model and the social science model as but analogs of each other, both creative of new methods and insight.

But analyses -- be they of social institutions and organizations, of resources, of impacts of technology and of human implications -- tend to be critical. Thus, there is a tendency to label all social scientists as critics. This is particularly true of the image of those scientists generally tangential to the usual agricultural research establishment -- anthropologists, political scientists, historians, ethicists -- but economists and sociologists may also view themselves or be regarded as mainly critics as they analyze the effects of policy, technology, and the political economy. The question is how can critical investigations be legitimized in colleges of agriculture when such colleges have always, generally provided new things for clientele. But it must be done.

Work of the Social Sciences

Research institutions and administrations are having to grapple with issues that a decade ago were largely ignored. Not only are there deepening concerns about the vitality of rural America and the viabilities of agriculture and its structure, but also there are the looming aspects of international trade, this "business" of externalities, the changing boundaries of the research properly assigned to the private and public sectors, the marketplace, as well as public policy in agriculture. And research institutions are having to grapple with these issues with old sets of institutions and perhaps old sets of tools.

Bonnen (1986) writes a now generally accepted perception: The agenda of issues in agriculture today strongly suggests that more social sciences are needed. Needs are growing for new institutions or modifications of the old, the development and transfer of technologies, for resolutions of ethical problems, and in the creation of new capital.

Considerable discussion has occurred during the past few years relative to future needs in social science research. Such discussion has occurred among the leadership of the relevant social sciences, directors and deans, and the Joint Council on Food and Agricultural Sciences, and at hearings of the Congress and has set priority thrusts as the several groups see them (see Connor, 1987).

In the specific, the stated needs for research include efforts to strengthen the rural family and the community economic base. They include analyses of family stress factors, identification and expansion of economic alternatives and opportunities, developments in small-scale agriculture, and management of the new technologies. They include research designed to deal with the

problems of the increasing number of rural and agricultural families facing economic and social crises. They emphasize future needs of human capital for rural America, the development of jobs. They are concerned with population demographics. They look to strengthening the international competitiveness of rural industries, sources of rural capital, organization and finance of rural governments, and development of community leadership.

Priorities are stated for technology assessment -- new knowledge on the impact of technological and economic transitions in agriculture, development of the necessary data bases, assessment of strategies for coping and monitoring the important changes in rural life. They would focus on the interdependence of farms, of agricultural and nonagricultural systems, and of community organization and the larger society. The issues of individual well-being -- emotional distress, decision-making, integrity of the family, health and aspirations of families -- as related to economic policy are matters of special concern to home economics administrators.

These concerns are surely the basic grist for the mills of social science. But society's support of the social sciences research and education hinges on their contributions to the well-being. Serious questions arise with the enormous success of agricultural production, the expanded matrix of society's value systems, the linkages of issues of science, technology and society -- such as farm profitability, information technology, the global market system -- and how they affect the well-being of individuals and communities. Desired is fundamental research on the linkages, on how the effects can be mitigated, and how crises are solved. The ultimate defense for support hangs on our abilities to understand the linkages and deploy the necessary tools.

It is compelling to set priorities for a national agenda for the social sciences. To do so has major values in telling supporters of social science -- administrators, funders, legislatures and the Congress -- what is needed, what is missing in the current effort, and what should have added or priority support.

But from the perspective of a research administration, we must see that everybody's institution is different. The system is not monolithic. Priorities differ for each institution. In that, lie special values of the multiplicity of institutions conducting research.

It seems to me also that the priorities listed, though comprehensive, are not all inclusive. The lack of attention of social scientists other than home economists to certain issues relating to the selections by people of the foods they consume and to nonuse issues (e.g., nutrient labeling) in food marketing is surprising. One senses, for example, that the desire to consume certain animal products and preparations from them is suppressed in the population, or is forced into latency, in the overriding flood of "nutritional" information.

We use policy principally in the context of agricultural production and the marketing of commodities. The agricultural establishment thinks in terms of science; how commerce fits in is often ignored. But the use of policy through the marketplace and its attendant advertising also poses a powerful mechanism for agriculture and agricultural science, for the nutrition and welfare of the people, and for stability of the family and economic base of the community.

The marketplace is a harsh, inhuman institutional form. Yet, with appropriate attention, we can co-opt it, cooperate with it, give it grist for its mill, or provide consumers with the ways to interpret it. But we can no longer ignore it.

Almost every state agricultural experiment station is now working on the possibilities of value added aspects of agriculture. Clearly, much of the success of such research will reside in technological research. But, like research on biotechnology, value adding studies are researches that can soon get ahead of themselves unless we know more of the institutions in which the system is operative. Greater attention to the marketplace can provide dividends. It is easier to modify the product than to reset the production operation. Bringing in communication with the consumer is better than not, because one can see what works and what doesn't. If the product design-production-processing-marketing-consumption can be seen as a feedback loop, many stresses on agriculture can be reduced.

Moreover, we have deep roots in our culture that allows the American people to be experimental. We are a pluralistic nation. Unlike in other cultures where the household has an enormous power in setting values, the family influence on values appears to be waning or, at least, taking on differing forms. We are increasingly impacted by other elements in our environment and the marketplace is one of them.

In the 1990s, how to guide and limit the market may well be the biggest stage that we will play on. But the research institution will not limit the marketplace with the stroke of a pen. They will run into lobbies, groups with vested interests, entrepreneurs who are convinced their products will promote greater health, critics and zealots. The 1990s may be more activistic, a replay of the 1960s. A certain courage and a lot of objectivity will be required.

The marketplace is an arena in which all the social sciences -- agricultural and food economics, home economics, sociology, political science, ethics and anthropology -- will play important roles.

We noted earlier that the working environment of the social sciences may see change that will be of a great interest to research administrations. Bonner (1986) stated an issue as follows: To practice at the cutting edge of almost any discipline today, requires not only a command of the discipline but also of major components of knowledge from related disciplines well beyond mathematics and statistics. As science grows more interactive, a growing proportion of disciplinary research takes us through multiple disciplines and techniques. To practice a discipline today one must increasingly collaborate with other disciplines. Even as biochemistry has penetrated the ranges of agricultural biology, one or more aspects of the social sciences may become the cohesive factor in a lot of agricultural research.

The center of gravity of research related to agriculture, be it in the social sciences or in the physical and biological, will move toward a more integrative scholarship. Call it the systems approach to solving problems, systemics, or whatever, the move may be embodied as much in the curricula and courses of

the academic arena and the influences of that on thought on research, as in the research institutions per se.

The requirements will be that education of human capital be directed to future needs, which may not be met if only graduate programs and research dominant the academic agenda. Ph.D. production still tends to follow research trends and, thus, some areas of academic need remain unattended. The substance of our undergraduate and professional academic programs in the past grew very much out of what was happening in research. Now research programs may develop a multidisciplinary stance out of the perceptions required for new, progressive elements in the upper-year undergraduate and professional academic programs. (This presumes, of course, that the undergraduate programs are indeed progressive.)

Academic programs in colleges of agriculture were, for decades, culturally oriented. We took students whose experiences and perceptions were largely conditioned by life on the farm and the rural home. Now the situation has changed. Students with those special integrative abilities, honed by agricultural and rural environment during their precollege days, have greatly diminished nationally and have disappeared in many areas. The colleges of agriculture and home economics now find themselves dealing with students of other demographic origins.

Moreover, the research institution will need not only a renewal of its corps of scientists, but also placements in those bands of professionals who can translate science and technology coming out of the research institution into productive action. Academic programs in colleges of agriculture likely cannot survive in a continued cultural orientation, but must become market oriented to the student population that is not instinctively oriented to traditional agriculture. That is an element that research administration must not ignore.

Two words of caution may be in order: First, the agricultural establishment has generally moved on the signal of science that derives from the notion that science is impervious to politics. But the truth is complicated. Science can be co-opted by any group. It is an instrument and it can be the voice of anybody. It follows that all who set the course of science -- scientists and critics -- have significant responsibilities to society. This may have to be the ultimate perception of research administration. And that, of course, will bother many of us.

Finally, the struggle that social sciences will wage with a research administration may not be just one for greater understanding of the social sciences by the administration, but that very understanding may create greater expectations of the social sciences, which they may not be prepared to deliver. The demands for application of the works of social scientists have an immediacy that can be disquieting to the scholar.

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Chapter 14

FROM THE PERSPECTIVE OF USERS AND AFFECTED PERSONS

Richard J. Sauer*

Introduction

There are problems in agriculture today--problems almost unparalleled in the history of U.S. agriculture. A global recession and the rising value of the dollar during the early 1980's dampened the demand for U.S. farm commodities abroad and high interest rates imposed severe financial burdens on farmers and their suppliers. These have combined to force a severe deflation in land values and a financial crisis for many farmers.

Many statistics could be cited about the financial woes of farmers, their debt to asset ratios, the proportion that have gone out of business with more to follow, the impact this is already having on rural communities and so forth. But it is not necessary. Everyone has been exposed to it, day in and day out, in newspapers and magazines and on radio and television and, perhaps in some instances, through personal experiences--as farmer, landowner, lender or supplier.

And there is lots of finger pointing. Everyone is quick to blame someone else for the cause of the problems.

- Farmers for taking unnecessary risks
- Lenders for extending easy credit
- Machinery manufacturers and dealers for promoting new and larger equipment
- Earl Butz
- President Reagan, the Secretary of Agriculture and Congress for failing to come to grips with the real issues in the 1985 Farm Bill
- State legislators
- Land-grant universities and USDA and our public research and education programs in agriculture

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If there had not been a strong public investment in agricultural research and education over the years, there wouldn't be talk about a farm problem today, or there would be talk but of a different problem--lack of sufficient food of adequate quality. However, the problems actually faced by farmers and rural communities today stem partly from abundance and success. Yes, land-grant universities plead "guilty" to being successful and contributing to the abundance of high-quality food and fiber products.

Land-grant universities have a mandate to lead their state's and this nation's efforts in higher education and research in agriculture--a mandate we have had for 100 years--but perhaps we need to be reminded that the mandate has changed. We must now determine how we can lead constructively while agriculture is in chaos and rural communities disintegrating.

There is no doubt that there is a rapidly changing public perception about land-grant universities and agricultural science, their programs and their value to society. The biggest danger is for the agricultural science system to become defensive and not listen to the growing voices of critics. To understand the changing perception about our programs, leading to ways in which we can improve the perception, we need to hear what our critics say about us.

Various groups have criticized the agricultural science/land-grant university establishment in recent years. An open and serious consideration of these criticisms is essential in reaching objective recommendations on agricultural science policies, the introduction and impact of new technologies, and decisions on priorities for social science as well as physical and biological science agricultural research and education projects.

What's Right About Us

Over 100 years ago land grant universities and their state agricultural experiment stations were charged with developing new scientifically based technologies to improve the productivity of U.S. agriculture. This in turn would allow a labor force to be freed up for the development of the industrial capacity of the country. The results have been impressive. These institutions can largely take credit for laying the foundation for the tremendous improvement in U.S. agricultural production, literally making two blades of grass grow where one grew before. They enabled the U.S. to be the world's largest food and fiber exporter, as well as being the major supplier of world food aid, literally keeping alive millions in the world today. Techniques borrowed from here have fueled the green revolution in third-world countries, staving off hunger and starvation.

When we--the agricultural science establishment--look at these accomplishments, we like what we see through the rose-colored light of success: A productive U.S. where 2% can now produce the food and fiber for the other 98%, with that 98% producing other things of value for an affluent nation. U.S. citizens are getting the greatest variety of safe and healthful foods for the smallest part of disposable income anywhere in the world.

At the beginning of this decade, just seven short years ago, we saw an abundance of published reports on projections for food production and agriculture. Among them were the Final Report of the Presidential Commission on World Hunger; the Global 2000 Report; Resources, Society and the Future; the World Food and Nutrition Study; the Bonn Conference; the Brandt Commission Report; the Report of the Food and Agriculture Organization of the United Nations; the proceedings of the Conservation Foundation Symposium on the Future of American Agriculture as a Strategic Resource; and the Agricultural-Food Policy Review of the U.S. Department of Agriculture. The general tone was one of pessimism. All raised questions about the future productive capacity of U.S. agriculture, the environmental consequences, resource availability, and technological capabilities.

One hears less concern today about the world food production issue. Perhaps it is masked partly by the burgeoning surpluses of food and feed grains in the U.S., and by transferring our technology to other countries. Developing countries have also made enormous gain in their own food producing capability. And new technologies, including the new biotechnologies, offer the potential for significant increases in productivity, assuming an adequate sustained level of public support for agricultural research and education programs.

Cracks in the System

Despite the successes of the past, our incomparably productive agricultural system has developed cracks. The list would keep you awake at night: gutted soils; heavy silting; increased flooding; an alarming depletion of aquifers; a disturbing pervasiveness of chemicals; run-off pollution; destruction of forests; wholesale resistance to chemicals by insects and weeds; scarce water used for producing costly agricultural surpluses for which there is no market or commercial use; farm policies that favor production for production's sake; farm exports down and farmers struggling awash in their own production; and the U.S. may no longer be the world's most economical producer of grains and oilseeds.

There is no doubt that there is a rapidly changing public perception about us and our programs, and our value to society. Public attitude in general towards agricultural science has shifted from unqualified support to a questioning ambivalence and even fear of its consequences.

To understand that changing perception, leading to ways in which we can improve the perception, we need to hear and understand what our critics say about us. Various groups have criticized the agricultural research establishment in recent years. Consideration of these criticisms is essential in reaching objective recommendations on agricultural science policies, the introduction of new technologies, and decisions on priorities for research projects.

One group of critics are the biological and physical scientists outside the land-grant system. They suggest that agricultural science lacks a basic science foundation and is a third-rate enterprise, using too many of its resources on applied research. Not everyone agrees. Farm lenders, farmers and farm-oriented legislators argue that transferring these resources to more

basic disciplinary research would lead to the neglect of problem-solving research and to the expansion of academic bureaucracies. Thus, we see line item earmarking in state and federal agricultural research appropriations to ensure that certain kinds of problem-solving and commodity research will be done.

There are also critics who are dissatisfied with the way technological advance sometimes restructures agriculture and society. They argue that the present economic woes in agriculture are the result of too much research, too much information, too much capability. They argue that the new technologies exacerbate the problem and, in effect, say that agriculture would be better off if it were less efficient. Some go so far as to promote a return to less intensive/low input/small farm agriculture of 50 years ago.

Next consider the criticisms of humanists, social scientists and religious leaders. They maintain that the agricultural research establishment pays inadequate attention to the values involved in rural poverty, human nutrition and malnutrition, endangered species, environmental pollution, energy, water and the structure of rural society.

Then there are a broad group of critics called "activists." As advocates, activists often sacrifice objectivity to promote solutions that they put beyond research.

Two major groups of activists concerned with agricultural research establishment researc' are the anti-agricultural research establishment and the pro agricultural research establishment activists. The anti-establishment activists include some religious, hunger and poverty workers, environmentalists, some concerned with the preservation of non-farm rural values, people worried about mistreatment of migrant and small farmers, some concerned with the so-called demise of the "family farm," some with fears about the exhaustion of non-renewable resources, some who promote their own political futures, and some nutritionists and other academicians promoting their disciplines or fields and, for that matter, themselves. Despite lapses in objectivity, the anti-establishment activists have often placed important problems and issues on the agenda, and we should not forget that. However, some of them have proven poorly informed about the technology and institutions of agriculture; others have lacked knowledge about the nature of farm people. Some see almost innumerable "conspiracies" among the agricultural research establishment, agribusinesses and large farmers to exploit small farmers, farm laborers and consumers.

Pro-establishment activists who unobjectively defend the agricultural research establishment come from the establishment itself, from agricultural businesses and various groups of agricultural fundamentalists, both inside and outside of government. Not all defenders of the establishment are unobjective. The defenders also include those who try objectively to listen to the anti-establishment activists and to provide them with objective knowledge about agricultural institutions, technologies, people and capital accumulation. Others, of course, react emotionally, in uninformed, unobjective ways, in defending the agricultural research establishment against the anti-establishment activists.

Among important issues placed on the agricultural research establishment's research agenda, in part by activists, is the need for agricultural technologies that are less exploitive of our resources and more sustainable during the decades ahead. A variety of alternatives are promoted under such descriptive and attractive names as regenerative agriculture, sustainable agriculture, closed-system agriculture and organic farming. Activists often view pesticides and fertilizers as threats to the environment of human health. This concern has promoted research on possible adverse impacts.

Though the complaints of all groups are sometimes in conflict, they are all primarily ethical in the sense that they assert that the agricultural research establishment has made and is making wrong decisions, often on the basis of incorrect values, on agricultural science policies and research priorities, goals and objectives. Do their criticisms have validity? I suggest they do, without making a judgment as to what extent. For too long our scientists and research administrators have assumed that all externalities of their research would be positive. That only good would accrue from newly introduced technological change, such as a new pesticide or harvesting machine. That is not the case, and it never was, but for too long we've blindly moved ahead with that assumption. It can no longer be. Society will demand that we ask all the questions about potential impact, negative as well as positive, while we are conducting research and perhaps before the technology is ever introduced into commercial use. A classic situation now exists with regard to genetically engineered micro-organisms and the lawsuit filed by Jeremy Rifkin.

Society should insist, in fact is insisting, that agricultural research be concerned with the effects of agricultural technology upon the health and safety of agricultural producers, with the nutrition and health of consumers, with the impacts of agricultural practices on the aesthetic and productive qualities of natural and modified environments, and with the quality of life in rural communities.

There is a substantial element of validity in each of the other criticisms I have mentioned as well. The agricultural research system has been less than adequately responsive to the needs of many elements of its potential constituency. The agricultural research establishment has at times devoted excessive resources to applied research that has little application--or application for only a limited clientele. The appropriate allocation of responsibility for research between the public and private sector is an issue that must be continuously reexamined in response to institutional, scientific and technological change. Each of the criticisms, though perhaps excessive and sometimes not well informed, has generated response and the beginning of reform in the agricultural research establishment.

In addition to the criticisms of agricultural research from outside of the establishment, there has been a rising level of criticisms of agricultural research and of the productivity growth generated by research by the traditional agricultural research clientele--by those who have traditionally benefited from agricultural research or by their representatives. During 1980-85 a global recession and the rising value of the dollar combined to dampen the demand for U.S. agricultural commodities abroad. High interest rates, associated first with inflation and later with massive federal

borrowing, imposed severe financial burdens on farmers and their suppliers. These combined to enforce the decline in farm commodity prices, severe deflation in land values, and a financial crisis for many farmers. Confronted by the build-up of commodity stocks, the federal government engaged in increasingly expensive programs designed to slow the growth in agricultural production.

These difficulties have prompted some critics to suggest a moratorium on agricultural research and technology development. They say the present economic woes in agriculture are the result of too much research, too much information and too much capability. They feel that we should slow down our research until society has had a chance to catch up and assimulate the gains we have made. They suggest a moratorium would result in slower economic growth in agricultural production and permit domestic and international markets to absorb surplus production capacity at no real cost to consumers or producers.

While the agricultural research establishment is being criticized for generating too much new technology, there are also critics who maintain that both the agricultural research establishment and the state cooperative extension service system are too slow, too conservative and too unresponsive. We are too slow in releasing the results of research to benefit farmers. We are too conservative, testing the same production systems and technologies over and over, and do not take enough risk with radical new alternatives. We lack responsiveness to changing needs. We're dinosaurs, having outlived our usefulness and unable to adapt fast enough to a changing world.

In addition, we no longer have a monopoly on the technology development and the marketing of information. The private sector has developed an increased interest in agricultural technology, especially through the new bio-technologies and the use of computers. Farmers can seek reliable advice on production, marketing and financing from other sources. This has caused us no small degree of concern. We even find our own employees wondering whether we have a future. It's effected our recruitment of high-quality staff and our securing of additional resources to continue to serve the public well.

What do we do about all of these criticisms? If they are not valid, do we simply ignore them? I do not think we can afford to ignore them, even if they are unfounded. However, I do find some amount of validity in most of these criticisms. That should bring us even greater concern.

Some Other Observations

I am not a social scientist who has studied agriculture or the agricultural science and education system from that perspective. Rather, I am an agricultural research and education administrator with experience at three land-grant universities. I have interacted with numerous clientele, legislators, other public officials and a broad range of people both within the academic community and throughout the agricultural community, during one of the most stressful times in midwest agriculture. Based on these experiences I'd like to offer a collection of additional observations, most of which I do not claim to be original.

Agriculture's Complexity

The word agriculture conveys different meanings to different people, from a farmer on a tractor plowing his fields to frenzied activity on the floor of the Chicago Board of Trade. Others might think of agriculture in terms of foreign trade, crop research, heavy equipment industries, herds of cattle grazing, aisles of groceries in a supermarket, or a rural community. We all have different images of agriculture. Although each of us sees a part of the picture, few see the whole picture. Comprehending the connections and relationships among the many disparate elements of American agriculture is exceedingly difficult. Thus, we often are not even able to start from the same point in initiating a dialogue with one other person let alone reach agreement on the ideal structure of rural America of the future.

Lack of Comprehensive Agricultural Policy

Likewise, no single law exists that defines an agricultural policy. Congress periodically adopts an omnibus farm bill. But these bills, by themselves, have never constituted a complete, self-contained "agricultural policy." Frequently, Congress, the courts, foreign governments and agribusinesses make decisions that have extensive ramifications on the farm economy. Commodity price supports, for example, have reduced the competitiveness of American crops on international markets that public investments in increased productivity have been trying to achieve. Fiscal, monetary and credit policies have run counter to programs to save the family farm and encourage rural economic development.

In recent years, the state of agriculture has been in an upheaval due to a changing economy, fluctuating policies, technological developments, and new consumer habits. Farming has always been risky. Historically, much of our government's policy has been aimed at stabilizing agriculture, insulating private landowners from the consequences of change. Public policies, however, have failed to maintain the status quo and protect farmers from risk; some policies have even exacerbated the problems. It is no wonder that current discussions of farm policy are fraught with frustration, anger and confusion.

Agricultural Research is Underfunded

Annual rates of return on public investments in agricultural research are high, often 30 to 50% or more. This suggests that agricultural research and development is substantially underfunded by standard investment criteria. And yet today we face the counter argument that the world's markets are awash with the products of excess agricultural capacity because of research. This is pure hogwash. This excess capacity was caused by bad investment decisions by farmers based on excessively optimistic expectations, induced in part by subsidies and foolish national policies.

A related issue is that from the local (state) perspective that public investment in agricultural research and development looks adequate. A large part of the benefits of research funded by one state spills over into other states. An excellent example is the recent spillover of wild rice production technology from Minnesota to California. Such losses of state level benefits

inhibit state investment in agricultural science. The spillover argues for a greater federal investment, and yet in real terms growth in such federal funding essentially stopped 20 years ago. Without compensating federal funding, the states, acting alone and rationally, will never achieve an optimum level of national investment in agricultural research.

Interdisciplinary Team Science

We still unduly organize, fund and practice science, especially basic science, in this country around a 19th century tradition of an individual scientist in his or her laboratory surrounded by a few laboratory technicians or graduate assistants. However, not all technology arises out of basic disciplinary research. Further, many of today's problems in science, including agricultural science, can be solved only by a team of scientists from several disciplines--each contributing their unique expertise toward the solution of the problem, at least in a multidisciplinary fashion if not in a systems approach.

While the numbers of interdisciplinary centers and multiuniversity consortia have grown, and linkages between university and industry R & D are more common, the efforts are still inadequate. The majority of state agricultural experiment station research is still organized by disciplinary or subject matter projects with a single principal investigator. And most regional research projects are not interdisciplinary. Even those that are generally lack an adequate level of funding to really tackle the task at hand.

Land-grant Universities as Predictors of Change

With the severe problems in agriculture in recent years, one of the most often heard criticisms of state agricultural experiment stations is that we failed to predict the changes and warn farmers. My own experience is that many of our faculty, including several prominent agricultural economists and rural sociologists, did predict the financial problems and warned farmers not to expand, not to purchase land at inflated prices, not to incur more debt. However, relatively few farmers listened and now, after some have lost their farms, they are looking for someone else to blame.

Recently our Department of Agricultural and Applied Economics released a publication which contains the principal conclusion that now is a good time to enter farming. It points out that the opportunities for beginning or reentering farmers to succeed in the agricultural industry have improved significantly in the last few years, especially if a crop share rental arrangement is utilized rather than the ownership option of land acquisition. However, I have received criticism from both farmers and legislators for the release of this study. Of course, these critics include those who have lost their farms and feel taken advantage of, especially if someone else will now acquire and farm their land for a lower cost and make a profit.

Land-grant Universities As Change Agents

While land-grant universities have predicted change with some success, particularly on the financial side of agriculture, we have been much less successful in leading the way for major change in agricultural production

systems. Our biological and physical scientists have been slow to redirect research to alternative crops, reduced or low input systems, non-chemical pest control or other major changes that might improve profitability and/or sustainability of our agricultural production systems.

And our social scientists have been hesitant to depart radically from their studies and analyses of the traditional production systems. Their research should be providing some of the economic and social rationale for giving alternative approaches to food production a legitimate test. On the contrary, in defense of the social scientists, we have not organized our SAES research projects with sufficient interdisciplinary linkages between the social and biological/physical scientists, nor have we allocated adequate resources to our social scientists.

Land-grant Universities and Agricultural Policy Development

It has become increasingly obvious that the U.S. needs the development of sane, constructive, complementary agricultural, natural resource and rural development policies. The new configuration of the international economy, the problems in rural America and the increasing numbers of critics throughout society heighten this need. These policies must be based on our science and technology knowledge and data bases, using the skilled professionals in our land-grant universities and other public and private institutions. All too often, however, our agricultural, natural resource and rural development policies have been formulated by amateurs and politicians in response to the intense pressures from and vested interests of many special interest groups. Land-grant universities have the people resources to provide informed recommendations and analyses of the potential impacts of draft legislation. These resources, heretofore, have gone largely underutilized.

Challenges for the Future

Land-grant universities have a mandate to lead their state's and this nation's effort in higher education and research in agriculture and in turn chart a course for the future of U.S. agriculture and rural communities--a mandate we've had for 100 years--but the mandate has changed. We must now determine how we can constructively lead while agriculture is in chaos. Several challenges lie ahead, and social scientists must play a key, if not pivotal, role in our successful response to them.

Agriculture and the Environment

We know surprisingly little about the long-term impacts of agricultural practices and land use on the environment. The questions must be addressed in terms of ethics and values as well as in terms of technical impact. And as more is known about agriculture's impact on the quality of the environment, fundamental policy changes should emerge. Agricultural and natural resource policies in the future will not be formulated so much by examining the impact of resource quality, quantity and price on farm income and production; rather, policies will be formulated by examining the impact of farm practices on resource quality and quantity and on our quality of life.

There will be more interest in farming systems that reduce chemical usage, use less energy, and reduce soil erosion. Some farmers may return to more rotations. More farmers will need and want to adopt integrated pest management practices that substitute biological control and crop monitoring for traditional pesticide use, lowering costs for the farmer and improving the aquatic and wildlife environment. Much research, biological, economic and sociological, remains to be done to make the above a reality.

Public Opinion and Agriculture

Public opinion about agriculture and its use of resources is changing. At one time most Americans either lived on a farm or were only one generation removed from a farm. They saw a link between the farmer's welfare and the nation's welfare. They saw the farmer as the steward of the environment, and they had faith that science and technology would bring social benefits. As citizens have become further removed from farming enterprises, farmers are losing their special place in society. Increasingly, they are finding their traditional programs and practices questioned. And the same questions are being directed to the agricultural scientists who developed the current technologies.

While these changing views can be threatening to the agricultural community, they can also be challenging. This is the time for farmers and those with interests in agricultural policies to search for compromises with the environmental community and to forge alliances that are sensitive to both agriculture's unique constraints and the public goals of an improved environment. Land grant university scientists can play the lead role in forging the changes.

Economic Development and Rural Communities

It is clear that governments and educational institutions must promote economic diversity in rural areas that are suffering as a consequence of their heavy dependence on agriculture. Rural economic development may be the most effective and realistic way to help many of these communities. Among other things, the availability of off-farm jobs in rural areas may make it possible for existing farms to stabilize their incomes and for more Americans to be involved in agriculture via part time operations.

Land-grant universities have the knowledge base to assist rural entrepreneurs and thus stimulate economic development and job creation. Cooperative extension services should provide the leadership; to do so they will have to break out of their traditional mold and draw upon people resources within the university with which their programs have not been strongly linked in the past--such as faculty in law, management, and high technology.

A New Agricultural Research Agenda: More Social Science Research

The new agricultural research agenda that is emerging is beginning to look at productivity in terms other than yield per acre or yield per animal. Lower operating costs, the preservation of natural resources, and sustained yield have become as important as simple yield. Biotechnology can be a powerful tool, but if the goal is poorly defined, inefficiency may result. We have to

learn that we must first ask, "Where do we want to go?" before we ask "How do we get there?"

The agenda of issues in agriculture today strongly suggest that more social science and humanities knowledge is needed. This is due to growing needs of the modification of old institutions or development of new institutions, the adaptation and transfer of technologies, for the resolution of numerous ethical problems as well as the sustained input of ethics into research decision-making and priority-setting, and in the creation of new human capital. The mix of relevant disciplines varies with the problems addressed. Implementing the right mix is imperative to future public support for agricultural research. The growing complexity of the agricultural industry, and thus the chance of error, as well as the fact that science is increasingly expected to minimize deleterious impacts on society, means that we may not ignore current criticisms and expect continued and adequate public funding. The need for social science and humanistic research on agriculture and rural life is growing.

However, the mix of disciplines in most state agricultural experiment stations, due to tenure and relatively little turnover during the past decade, is generally appropriate to serve a pre-1980's agriculture. That is, the faculty are dominated by scientists in the hard (biological and physical sciences) with a production/maximum yield orientation.

In most SAES's, the social sciences became institutionalized at a latter stage and generally have not received an adequate allocation of resources. There were many reasons for this, including the domination of the production departments, the fact that most station directors came from a biological or physical science discipline and that there has existed a misperception that it costs much less to support a social scientist than a biological or physical scientist.

Today many SAES's have static or even declining resources. Thus, increased support of social science research will have to come from internal reallocation. Do station directors recognize the need? And if they do, do they have the courage to reallocate? I have some reservations.

Conclusions

The problems of the future in agriculture and rural America cannot be solved by the research programs of the past. Major changes in the research agenda and priorities, the organization and funding of research projects, and in the mix of scientists will be necessary.

Research must be driven by a new set of concerns and priorities, including sustainability, environmental quality, human health, consumer desires, and what's best for rural communities. We must confront many criticisms of an ethical nature. Societal values will be incorporated into research decision-making and technology development and transfer. Productivity will still be a priority, but profitability not yield will be the focus.

The mix of disciplines and relative research investments in state agricultural experiment stations will change. Social scientists will play a more pivotal role in developing the research agenda and helping us answer the question "Where do we want to go?"

Land-grant universities and their state agricultural experiment stations face major challenges. By reorganizing the challenges and the changes necessary to successfully address them, these institutions can play a key leadership role in determining what U.S. agriculture and rural communities become in the 21st century. But they must be willing to make major, even radical, changes in the way they do business and must have adequate resources to back their convictions.

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Chapter 15

PANEL DISCUSSIONS

Glenn L. Nelson*

I agree with Richard Sauer "that we must first ask, 'Where do we want to go?' before we ask 'How do we get there?'" I also agree with Harry Kunkel that

> Science can be co-opted by any group. It is an instrument and it can be the voice of anybody. It follows that all who set the course of science--scientists and critics--have significant responsibilities to society.

While the papers by Sauer and Kunkel, as well as others in this conference, raise these questions and issues, the conference has paid too little attention to the values implicit in our goals and in our science. The papers all too often quickly move to a discussion which implicitly or explicitly assumes that those with economic or political influence offer legitimate information on desirable priorities for rural social scientists.

This paper explores the role of paradigms in determining priorities and argues that we should be more conscious of the assumptions with regard to values in our paradigms. The paper concludes that rural social scientists are too accepting of current distributions of economic and political power in formulating their research, teaching, and public education agenda. The paper draws most heavily on agricultural economics for its applications because this is the field most familiar to the author.

Critical Role of Paradigms

Paradigms have a major influence on the definition of problems, including what is and is not a "scientific problem" (Conner, Kuhn). The framework used to define research problems should lead to productive work. Productive work implies defining problems which have a reasonable probability of being solved, problems which are important to society, problems dealing with relationships perceived only dimly or not at all, and many problems rather than fewer problems. Kuhn argues pursuasively that having a paradigm which guides research is a clear criterion proclaiming a field as a science (Kuhn, p. 22).

The choice of a paradigm reflects the values of those people influencing the choice. Alternative paradigms emphasize different problems. A personal preference among paradigms reflects values as to what problems are important.

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This question of values can be answered only in terms of criteria that lie outside the dominant paradigm.

Cooter and Rappoport emphasize the changing nature of problem definitions in their discussion of the evolution of economics. The "Hicksian" or "ordinalist revolution" in the 1930s displaced the "material welfare school." The latter included a willingness to compare the well-being of groups while the former placed great emphasis upon explaining prices and quantities in free exchange. They argue, "... ordinalists offered different questions, not better answers. Thus, the ordinalist revolution represented a change, not progress in economics" (p. 508). They conclude by agreeing with Lindley Fraser (1937, p. 36) that the choice between the two schools of thought "would have to rest largely on the individual temperaments of the persons concerned" (p. 528).

Criteria other than the worth of the problems generated by a paradigm affect choices among paradigms. These criteria include characteristics such as predictability, simplicity, logical, and clarity. The existence of multiple criteria implies that the choice of a preferred paradigm is a value laden choice in the sense that values determine the weights on the criteria (McCloskey).

Our paradigms include value-laden assumptions about what is important. We should recognize this in our work. Furthermore, we should subject these assumptions to critical review from both a societal and individual viewpoint.

The Example of Neoclassical Economics

Utility theory underlies the paradigm of neoclassical economics. While impossible to summarize in a few words, utilitarianism emphasizes that situations are good insofar as they produce such things as pleasure, happiness, and satisfaction. Rights of people are not inherent characteristics but are assigned so as to produce the most good, that is, rights are instruments rather than fundamental goals.

As noted above, problems of explaining the prices and quantities resulting from free exchange among individuals have come to dominate the concerns of many economists. Theoretical treatments typically begin by assuming an endowment for each individual and then proceed to derive descriptive price theory results and also normative prescriptions which will lead to an efficient outcome conditional on the initial endowment. The initial endowment receives little or no attention. Applied analyses of prices, quantities, and efficiency typically begin with current endowments as the starting point and proceed to prescribe rights and procedures to attain efficiency in this context. The applied results depend crucially on the assumed endowments.

The resulting work is rigorous in its internal logic and increasingly irrelevant to the pressing problems of society. Many important problems, if not most, entail disputes as to rights and tradeoffs between winners and losers. Neither controversy is handled particularly well in current economic practice. Abstract thinking may, of course, have considerable long run value as a basic contribution to knowledge even when it is not immediately applicable to current problems.

Economists should understand whether they are attempting to solve societal problems as applied social scientists or to contribute to a system of abstract thinking akin to applied mathematics. The regrettable widespread confusion exists at least in part because self-identified applied economists are using a disciplinary tool, neoclassical economics, to define problems as well to solve problems. The result is that too many complex social problems, such as food and agricultural policy, are reduced to problems of price analysis and efficiency.

The Need for Political Philosophy

Applied economists should give explicit attention to how we identify problems and, especially, to the values underlying these definitions. We should do this at the outset of our individual and joint discussions of research priorities. The framework for problem identification should focus on the welfare of people and should not shrink from, but relish in, problems of interpersonal comparisons. This will provide a basis for defining a multitude of questions and problems relevant to society. The initial attention to problem identification will not replace the neoclassical paradigm but place it in perspective as one set of ideas of possible usefulness in solving applied problems.

Fortunately, we do not have to create this framework. It exists in political philosophy. We do have to become familiar with this body of information and with the experts in this area (for example, Rawls, Nozick).

A tighter linkage between political philosophy and economics would be a return to normalcy. The history of economics is dominated by individuals with joint interests in economics and political philosophy. The separation of the most recent decades is the exception rather than the rule.

A Personal View of the Consequences

I suggest the following as reasonable hypotheses if we take seriously our study of problem definitions in the context of political philosophy.

We would conclude that the problems of poorer and more disadvantaged people are more compelling than those of richer and more favored people, all other things being equal.

We would conclude, along with Fried (ch. 4, "Rights--The Economic Analysis," pp. 81-107), that economists should take seriously the fact that people have rights to the qualities needed to participate in a system of free exchange. These rights must be granted prior to the determination of instrumental rights for the latter to have a justifiable foundation. These rights include information on frameworks for thinking and on the data for operational decisions.

Finally, we would conclude that our research agenda is not consistent with the above set of high priority problems and issues. In searching for the reasons, we might first turn to our common practice of taking current endowments as the starting point for analyses of efficiency. This procedure gives more weight to the wealthy than the poor and is thus directly contrary to our more basic values. We might also turn to the workings of our political system. Although Olson has discussed in convincing fashion the reasons that the wealthy and organized are

better represented than the poor and the disorganized, some researchers may cling to naive notions of the legitimacy of the political process. Also within the political context, we might ask ourselves whether the writing of Niskanen on the budget maximizing bureaucrat serving current political power describes us better than a more socially responsible model.

Conclusions

I will stress four points in conclusion. First, we should recognize the values in our paradigms and in our recommendations from this conference. These values should be an explicit part of our discussion and writing. Second and more personally, we should conclude that in the past we have paid too much attention to the economically and politically powerful at the expense of the poor, the disadvantaged, and the disenfranchised.

Kenneth Farrell also stressed the remaining two points in his remarks at this conference. Third, we need more public policy analysis and especially the analysis of institutions. We need to design, create, and implement institutional forms which better realize the goals of citizens--especially those who are currently disproportionately ignored. Finally, we need a better understanding of the role of science and technology in stimulating and managing social change.

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PANEL DISCUSSIONS

Erwin Johnson*

Introduction

You have me on an emotional roller coaster at this conference. First, my ego is swelled by all the attention we research user clientele are afforded. Then, I hear that we farmers are on an endangered species list. On the second hill up I hear what a fantastic job we are doing to help feed America. On the way down I hear that we farmer-producers are or will not be competitive with foreign producers in such basic commodities as corn, soybeans, and wheat.

Reaction to Papers

My first reaction to the three presentations and conference thus far reminds me of a heart patient. I, a research user-farmer, am laying on the operating table in the middle of an open heart surgery operation. My chest is split open and exposed for all to see. The lights are centered on me. My blood is flowing too freely. The three doctors are not looking at me but at each other while discussing medical theories. If I were not under the influence of anesthesia and my arms strapped down, I would cry out or reach for attention. I need immediate help to get my heart functioning correctly and my blood flow stopped. I also need a long term solution or explanation after recovery to get my body and life back together. Maybe that is asking too much of you social scientists but I have what most patients have and that is the will to survive or live.

Questions

I have many more questions than answers. Do social scientists need to not only listen more to critics of social science establishment but also users of your research? Are social scientists in an era of sub-specialties? You are all studying parts of the body of agriculture and rural people but not the life of the same people and entities. Can or should the reward system within the social science community be altered so that more attention could be placed on the application of research to users and less on the academia? Should social scientists lead, follow explain, advise, or educate? I am confused by the conflicting thoughts expressed in the papers and discussion at this conference. My own bias is that explanation and education are the paramount roles. I do not see leadership as the primary role.

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Future Direction

Sauer asks "Where do we want to go?" I fully realize that I am but one user of research. If I felt typical or spoke for all users, my opinions could be expressed freely. Rural people and consumers are not a homogeneous group. We have many different and sometimes conflicting ways of living, philosophies, politics, needs, and values. We are competitors as well as concerned neighbors. In our individual lives as farmers many have the difficulty of reconciling the differences between the farming way of life and the forces of the market or business needs. There is often the hard choice each of us has to make between these two realities and the ultimate or dominating choice may not be palatable.

Changes in Rural America

There is change taking place in rural America. In our local area our excellent school is losing student enrollment forcing budget and personnel adjustments. A bank in a near by town has gone broke. Farmer-neighbors are quitting the production of food and fiber involuntarily either by finances or health. Our country church is struggling to maintain its membership and vitality. Three local and one regional supply and grain cooperatives have discontinued business or merged with other cooperatives in the past two years. We must now drive 11 to 25 miles just to buy repair parts for our machinery and equipment. I no longer feel comfortable or in control of my own destiny. Forces outside my control seem to influence my life and business more than those things that I can control. Can I accept change? Yes, but I need understanding and knowledge. Yes, but I need a breather occasionally to look back and ahead to where I've been or am going. Yes, but I need the tools and person to person assistance to sort out the changes and knowledge to decide what I want to include in my life and business.

Decision Makers in Research Funding

Kunkel discussed the difficulties he faces as a research administrator in balancing all the players and forces at work in establishing research plans and funding of that research. We face at this conference a similiar dilema in beginning the process of setting an agenda and priorities for social science research. Perhaps it is healthy in a democratic environment to have third party people such as legislators or other decision makers have a greater say in the funding and establishment of research priorities.

Concentration of Power

Is it desireable to concentrate the decision making process in research or have more control over the funding or type of research? Perhaps-Not! As a farmer, I have become much more of a "contrarian". When everyone is singing the same tune about market trends, land values, etc., I tend to take the opposite action or opinion. There is power in knowledge. The concentration of this knowledge or power can be undesireable depending on who holds the knowledge. If you consider this opinion pessimistic, I plead guilty. People in agriculture who have allowed their destiny to be totally determined by others have generally been hurt.

Agricultural Research-Knowledge Dissemination

I would like to add one thought to the papers and our discussion today. There has been no discussion given to the dissemination of the research or knowledge to users. Is it sufficient to just worry about what research we are going to conduct without thinking about how we can get this knowledge to those people who need it most? Publication in a journal will not be sufficient. One of the greatest challenges of a local county extension director is to get the opportunity to relate with local clientele who can use his help most. They just don't walk into his office.

Values

I applaud the time and thought given to values by Kunkel, Conner, and participants at this conference. Integrating values and knowledge has to require a great amount of special effort.

Conclusion

I will end with a gentle reminder. As our thoughts whirl around issues, institutions, empirical studies, etc., I feel you need to recall that we research users and consumers are not just statistics but real people. We need love and to be touched. We have fears and need comfort. Apparently, you have chosen careers to help us through our life's journeys.

It is indeed a pleasure to have the opportunity to see and touch the human side of you professionals at this conference.

PANEL DISCUSSIONS (Con't)

Alan Randall*

These three papers by Larry Connor, Harry Kunkel and Dick Sauer are wide-ranging and wise. In addition, Sauer's is innovative, and Connor's is clearly the result of a rather considerable research effort. I commend these papers for your careful reading.

In the ten minutes allotted to me, it would be absurd to attempt a serious and balanced discussion of the many important issues these three authors have raised for us. At this stage in the Workshop, perhaps I can be most useful by making a single point, a point that was little noted by the speakers yesterday and this morning. In so doing, I will make no attempt to offer a balanced perspective; but, by introducing this point into the discussion, I may make a contribution to the overall balance of our subsequent deliberations.

There is a gap between the institutional rhetoric of the agricultural research establishment and the day-to-day working life of researchers in the rural social sciences. The institutional rhetoric emphasizes a particular methodology, presumes a particular institutional framework, and arrives at a particular prognosis as to the outlook for the rural social sciences. The official methodology is pragmatic: the emphasis is all upon "research needs," i.e., the demand for results, while little attention is paid to the supply side. Yet, the relationship between the level of research effort and the expected value of substantive results - the supply side - is quite different for different kinds of research undertakings; and that ought to be considered when allocating research resources.

The institutional rhetoric visualizes an institutional framework that is collective and permanent: a research establishment with a budget supported largely by regular and reliable appropriations from government, a tenured faculty of researchers, and an administrative structure that directs research toward client needs in order to generate the political support that keeps the appropriations coming. With regard to outlook, the institutional rhetoric tends to be depressing. Appropriations are stagnant at best and there is little hope for improvement, and the social sciences share of those appropriations is diminishing under the onslaught of glamour fields such as biotechnology.

It is my impression that the workaday existence of researchers in the rural social sciences is not at all consistent with this institutional rhetoric. Forgive me if I talk a little about my working life, but it is the life that I know best. While the details of your lives will differ from mine, I expect that many of you will have analogous experiences and impressions.

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My research gets funded. Much of those funds come from research grants and contracts and, at the level of the individual researcher, these funds are notoriously volatile: at times one is awash in research monies while at other times there are summer salaries and student stipends to pay but the treasury is empty. My part-time appointment with my state's Agricultural Experiment Station provides something of a safety-net, and I am grateful for that. My university appointment (the so-called teaching appointment) is also a part of the safety-net. The point is that much of my research is funded independently of the agricultural research establishment and much of it is basically piece-work. One receives a research grant or contract to perform specified tasks and deliver specified products within a specified time frame.

I do disciplinary, subject-matter and problem-solving research. If one gets lucky, a single contract or project will call for all three kinds of contributions; otherwise, a portfolio of different projects and contracts will serve that purpose. I make no apology for doing disciplinary research - even at a conference where the rhetoric of clientele needs is dominant - because I believe that, even where problem solving is the ultimate goal, disciplinary capital is a necessary pre condition for success. Value added may sometimes be greatest at the disciplinary and subject-matter stages.

The graduate students keep coming (yes, I am one of those Ph.D.s who produce Ph.D.s). What is more, some of my Ph.D.s have already produced Ph.D.s; one does not need to be very old to be a grandfather or great-grandfather in the Ph.D. producing business. I make no apology for producing Ph.D.s; every one of them is well employed. I teach and I publish; and I feel quite comfortable telling the public at large that I do those things. The public demand for excellence in traditional professoring seems stronger now than it has been for some time.

I do not claim to know what our collective priorities should be, but I do not need a lot of institutional help in figuring out my own priorities, and I believe I have some useful suggestions about priorities for my small cadre of present and former graduate students. This sense of priorities is distilled from signals and feedback from a wide variety of sources: the agricultural research establishment and one's own colleagues and administrators, for sure; but also various sponsors and funding agencies, clientele groups, the disciplinary and subject-matter journals, one's network of friends (and competitors) in the research community, and the peer reviewers that one encounters in the publication and funding processes. These are some of the sources of demand-side signals. On the supply side, one gets a sense from one's own research experience, and from interaction with one's advanced graduate studen[illegible] one's peers in the profession as to where the promising prospects for [illegible]earch successes might lie.

By saying that I [illegible]ot need much institutional help in defining my own priorities, I am not taking a position of academic arrogance: "I know what I am doing, and all the public needs do is to [illegible]ind its own business and send plenty of money." To the contrary, I am making what should be a non-controversial claim; i.e., that the broad base of continuing contacts that one must maintain with one's colleagues, competitors, funding agents, and clientele groups serves to provide considerable information about priorities, and to provide much of it independently of the agricultural research establishment.

Finally, whereas the official prognosis for support for the rural social sciences is depressing (and has been, for as long as I have been paying attention to such things), my own career and those of my former graduate students have been going reasonably well. Disaster could be just around the corner, but the signals that I am registering are not at all foreboding.

Again, I have been speaking personally only because I know better the details of my own workaday life than yours. Many of you will have analogous experiences. Perhaps this kind of experience is more wide-spread among those working in natural resources issues, regional development, and community-level concerns, than it is among those dealing with more directly agricultural concerns. Perhaps we have reacted to the agricultural research establishment's rather tentative commitment to us by developing networks that range far beyond that establishment. Nevertheless, I suspect that most researchers in the audience have had work life experiences and have received signals that are at least analogous to those that I have reported for myself.

It is noticeable that, in the rural social sciences, there are frequent conferences about priorities. On the other hand, our disciplinary brethren in economics, sociology, and the like do not appear to have so many such conferences. It seems that we worry about priorities at the organizational/institutional level because we are a cartel of research suppliers that seeks to be funded, regularly and reliably, at the organizational level. Our approach seems to be to convince the tax-paying public to fund us, as they do many other kinds of researchers, but not on the piece-work basis upon which most other researchers are funded. This has some appeal to the individual researcher, if it provides not only adequate and less volatile funding but also some insulation from ephemeral shifts in the priorities of those who fund contract research. But there may be a down-side: the advantages of stable institutional funding are less obvious if they come with the price-tag of institution-wide priorities set by a clientele that represents only a part of the broader society and demands immediate results with little appreciation of the disciplinary capital that makes results possible.

Fred Buttel has noted that rural development work remains important in terms of need, but has had some problems in developing clientele support. Jim Hite has observed that the agricultural research establishment has been limited in its support of research concerning natural resources, and regional and community development, but that the individuals who do this kind of work all seem fully employed and optimistic about their personal futures. They find support, but not always under the agricultural research establishment's umbrella. I tend to discount the notion that traditional agricultural researcher administrators have simply preferred to work on agricultural matters, and that explains their modest support of the rural social sciences. Rather, I believe that they are honest brokers and would willing encourage this kind of work if they could visualize it generating client support. Their problem is in visualizing and actualizing that support. This is the difficulty that leads agricultural research administrators back to agricultural, rather than rural, research.

But support for more traditional research related to the production and marketing of agricultural commodities is likely also to be declining. The

clientele for that kind of work is narrowing as farmers continue to exit agriculture, and as the large and successful agricultural and agribusiness enterprises continue to demand more information that is individualized and private rather than public and available to all including their competitors.

The leaders of the agricultural research establishment are in a bind. They are faced with the diminishing ability of traditional clientele to deliver appropriations. Expansion of the clientele to include more people concerned with natural resources, and regional and community development seems an obvious step, but these potential clients seem unwilling to provide much in the way of stable appropriations to the agricultural research establishment. First, they are not convinced that the agricultural research establishment will deliver what they need and, second, they seem to prefer to provide funding for specific activities and tasks rather than no-strings appropriations. Perhaps, the agricultural research establishment is simply not the institutional form best-adapted to tapping this potential clientele and serving its needs.

All of this is by way of background. Now I come to my single point. For quite a few of the researchers in the land-grant university Colleges of Agriculture, the agricultural research establishment is no longer the dominant influence on research priorities and opportunities. I predict that future developments will exacerbate this trend. I see a future in which professors at the Colleges of Agriculture will find that university teaching, special-purpose centers and institutes, and direct personal contacts with research funding agencies will play increasingly important parts in their lives, while the role of the established Agricultural Experiment Stations will be gradually but surely diminished.

Several of our speakers have emphasized that agriculture is losing its uniqueness: farmers are becoming more like people. I am suggesting that, in addition, faculty in the Colleges of Agriculture are becoming and will continue to become more like professors. Institutional priorities for the agricultural research establishment will continue to be serious business, but their importance will be diminished ultimately as the agricultural research establishment itself accepts a diminished role. We have to accept the inevitable emergence of new ways for getting rural social science research done. Among our highest priorities should be some serious thinking with a view to having some influence on the kinds of research institutions that emerge.

PANEL DISCUSSIONS

William B. Lacy*

The structures of our food and fiber system and the agricultural research system are undergoing major changes which have important implications for the future role of rural social sciences. The four authors (Buttel, Connor, Kunkel and Sauer), in reviewing the rural social sciences, provide diverse and complementary insights into the past, present and future roles. My remarks will not attempt to summarize these well written papers but instead will focus selectively on some of the challenges and opportunities facing these social sciences.

While the dramatic changes in the structure of agriculture have been well documented in the papers of this conference, the equally important changes in the role of agricultural science should not be overlooked. These changes are likely to have a significant impact on the rural social sciences as well as other agricultural science disciplines. The following are just some of those changes:

Decreasing federal support. Over the past several decades, agricultural research as a percent of federal research has declined from over 25% to less than 2%. Today, of the $64 billion in federal research only one billion is devoted to agricultural research. Furthermore, agricultural research as a percentage of the USDA budget has declined significantly to less than 2%. Moreover federal funding, particularly of state experiment stations, has stagnated in the last two decades. rom 1966 to 1982, federal funds (in constant dollars) grew at a rate of only 1.2% while state appropriations increased 2.8% annually (White, 1986). The rural social sciences appear to be particularly hard hit by the lack of growth of federal funds. For example, between 1977 and 1983 the percentage of federal formula funds allocated to experiment stations for agricultural economics dropped from 12.8% to 8.2%.
From institutional to project funding. As formula funds have diminished, many state experiment stations have applied substantial pressure to increase federal competitive grants to individual scientists. While these new competitive grants programs may offer new opportunities for the rural social sciences, early evidence suggests the contrary. For example, the agricultural biotechnology competitive grants program excludes the rural social sciences.

Increasing private sector research. The private sector has played a role in agricultural research for over a century particularly in agricultural engineering and agricultural chemicals. However, most of the agricultural research during the later part of the 19th century and the first half of the 20th century has been conducted by the public sector. In the last twenty years, new patent laws and decisions (e.g., the Plant Variety Protection Act of 1970 which afforded patent-like protection for seeds; Diamond vs. Chakrabarty 1980 Supreme Court decision which permitted patenting of novel life forms), tax laws and new biotechnologies have been major forces for increased private sector involvement in agricultural research. At the same time the structure of the private sector has changed from one characterized as

a set of small regional and national independent, single-product firms to a concentrated and integrated industry with a few large multinational, multiproduct firms. Research funded by the private sector has increased dramatically to approximately $2.1 billion (Lee, 1986) and constitutes nearly two-thirds of all agriculture research today (Ruttan, 1986). The research is oriented toward proprietary products and product packages. Consequently the rural social sciences have had no role in the growth of this research.

Public-private collaboration. The increased involvement of the private sector in biological research has caused a shift in public-private relations. Whereas previously corporate grants to public universities were directed to individual scientists, and were seldom more than a few thousand dollars each, they now are often earmarked for centers and institutes and may be in the multimillion-dollar range. While total corporate support for public research in the past rarely exceeded 3-5% of an experiment station's research budget, they now approach 15% in some states. In some fields of science, such as plant and animal biotechnology, corporate support of public research at some particular universities has approached 50%. Furthermore, some have documented that even small sums of agribusiness funds can often redirect the efforts of scientists supported primarily by public funds to serve rather narrow and specific industry goals. At a time of stagnating federal funds and increasing corporate funds, problems of no interest to the corporate community may simply be underresearched or ignored entirely. These trends are not promising for the rural social sciences whose research generally is of little direct interest to corporations.

Disciplinary research. As noted by the previous papers, agricultural research particularly in the public sector has become increasingly fragmented along specialized disciplinary and subdisciplinary lines. Scientists typically receive all or most of their education within the same discipline with little exposure even to fields allied to their own (Lacy & Busch, 1984. In addition, most of the scientists receive their disciplinary training at a dozen institutions. Moreover, agricultural scientists rarely subscribe or publi outside disciplinary boundaries (Busch & Lacy, 1983). This insularity may have important scientific significance as well as consequences for the rural social sciences. By focusing on only those aspects of the world that are deemed relevant by a particular discipline, scientists and research administrators may ignore, undervalue or be unaware of important problems or perspectives that lie outside their competence. Since most directors and deans are not from the rural social sciences, they may tend to undervalue the contributions of these disciplines.

Despite these widespread changes in agricultural research, the rural social sciences have the opportunity and potential to maintain and expand their contributions to the public sector research agenda. The problems facing the food and fiber system require both complex short-term and long-term interdisciplinary approaches. This will require greater knowledge on the part of rural social scientists of the substantive issues confronting the system. Future research agendas must also address the role and impact of science and technology to include both social and environment impact. Here rural social scientists need to be involved throughout the process from conception of new technology, through development and diffusion. Furthermore, an ongoing research program in policy formulation and analysis needs to be established. This should include the capacity to examine the consistency of agricultural research agendas and policy with a range of societal goals such as an adequate

and nutritious food supply, sustainability, stewardship, social equity and community. The rural social sciences may be particularly well suited to contributing to this broader research agenda. To increase the capacity of the current system to adhere effectively to this agenda, however, may require not only changes in the training of rural social scientists but modifications of research strategies and methodologies as well as organizational structures.

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PANEL DISCUSSIONS

W. Burt Sundquist*

The papers by Drs. Connor, Kunkel and Sauer are all very interesting and informative and all three authors give social scientists concerned with rural agendas a good deal of moral support for an expanded mission. Not surprisingly, they do not lay out a suggested blue print for either an expanded social science program agenda or for an organizational format from which to launch a major future program thrust. All three papers do, however, show a good deal of insight into both the subject matter areas needing the attention of rural social sciences and the issues which they face vis-a-vis organization, linkages and communication. As an augementation to these three papers, I commend for reading the brief section on the social sciences in agriculture from Bonnen (1986 pp. 1077-1079).

Dr. Connor correctly concludes that there are different priorities and different paradigms within the several rural social sciences. Although this highlights the necessity for increased communication across disciplinary lines, it also suggests that, given the appropriate incentives and operating environment, social scientists can work across a broad spectrum of topics vis-a-vis agricultural, environmental, community, human resource and international issues. Moreover, different levels of aggregation for a number of topics do not have to be dealt with by the same individuals. Thus, for example, multidisciplinary teams can involve different individuals when addressing micro as compared to macro dimensions of a social science research agenda.

Connor's comments regarding the three categories of research are well made and stand up even if one operates with a modified set of research categories. Moreover, I believe that as important as multidisciplinary efforts are, sometimes major gains can be made in subject matter and problem solving inquiry only after effective disciplinary research has developed both an acceptable theoretical framework and the required analytical mechanisms for measurement and analysis.

The question of "values" comes into play at several stages in social science research. But at no point are values more important than in the area which Connor calls "prescriptive" knowledge. My conclusion, reinforced by some widely differing values voiced by participants in this conference, is that there will be some important areas in which value differences cannot be resolved prior to the conduct of evaluative analysis. Even here, however, the basis for rationality in decision making can be improved by identifying relevant decision alternatives and measuring the trade-offs among multiple criteria for valuation. I am in fact less enthusiastic about the ability of social scientists to develop "prescriptive knowledge" than I am about their ability to measure multiple criteria for valuation and to provide

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"trade-off" analyses for informed decision making. And, I am convinced that future decision making and policy will involve the consideration of multiple goals and values. Although economic profitability remains a value that cannot be ignored in decision making and policy it is no longer an adequate sole criterion for most policy decisions.

Next, with regard to Connor's paper, I find his set of four "research areas of opportunity" a very reasonable set. I am inclined to suggest, and I believe Connor would likely agree, that some redirection of existing public sector social science research resources will be warranted even if new research funding is acquired. But, with or without additional funding, "public interests" and "public goods" should be important considerations in the development of future research priorities. In this regard, I find Farrell's list of three priority areas somewhat more oriented, than Connor's, toward the public interest. Farrell's list includes:

1) Public Policy Analysis (including institutions and institutional reform)

2) Multiple Uses of Resources (including natural and environmental resources)

3) Science and Technology (including evaluation of the distribution of benefits and costs).

But the two lists of priorities have a lot in common and certainly at some juncture agricultural competitiveness is a critical public interest issue as well as an interest of the private firms involved.

Despite the importance of the research area, the mounting of any major research effort on Connor's "Technology Assessment" or Farrell's "Science and Technology Impact Assessment" topics will probably require some substantial organizational innovation. If done extensively, this work can become rather repetitive and routine. As a consequence, it is not the type of research well suited for the University setting. It is probably not well suited either for the development of Ph.D. dissertation projects or for the research agenda of young University faculty members establishing their credentials for tenure. Thus some type of regional public research institutes may be a better suited type of organizational format for the conduct of broad-based technology assessments.

Finally, in response to several of Connor's explicit and implicit questions, I would suggest that the rural social sciences now have available the theoretical frameworks and analytical capabilities for a broad range of important public sector research and information generation. As I see it, the large looming problems are two:

1) The acquisition of relevant and reliable data of the type and volume needed, and

2) An organizational and incentive structure from which to tackle important multidisciplinary and interdisciplinary work.

Despite the frequent and repeated cries to undertake important interdisciplinary research over the past couple of decades or more, little has happened. This suggests the need for some new incentives and organizational structures. And, despite the broad-based recognition of key data needs, our public data system continues to deteriorate and to become less relevant for much applied social science research. One needs different data to address the set of priority research issues identified by Connor, Farrell and others here, for example, than is needed to estimate the size of the national corn crop. But, there is no agency currently servicing the data needs of the Connor-Farrell research agenda.

I interpret Dean Kunkel to suggest that, among other things, we need a new round of production function and input-output analysis for current and emerging agricultural technologies, some of which should be low-input technologies. But in the process we need also to estimate relationships for a substantial set of environmental, nutritional and social externalities. I agree, and again, I don't think analytical methods or evaluative criteria are nearly as much of a problem here as is the inability to acquire relevant quality data to analyze and a lack of adequate funding for the work.

I concur with Kunkel's general propositions that the state-of-sciences in the social sciences has improved substantially of late and that the social sciences are not truly different from the hard sciences in terms of their vulnerability to bias or controversy. Machlup (1978) captures the essence of this issue as being a difference between predicting the outcome of controlled laboratory experiments and predicting future events in the social world which can be observed but not controlled. As the following quotation suggests, it is mainly the propensity of social scientists to make future social predictions which results in their achieving a lower grade as scientists.

> "Experts in the natural sciences usually do not try to do what they know they cannot do; and nobody expects them to do it. They would never undertake to predict the number of fatalities in a train wreck that might happen under certain conditions during the next year. They do not even predict next year's explosions and epidemics, floods and mountain slides, earthquakes and water pollution. Social Scientists, for some strange reason, are expected to foretell the future and they feel badly if they fail." (Machlup, 1978, p 361)

I personally favor a continuation of future social predictions but the outcome of these predictions should not be evaluated against the expected accuracy of results from controlled laboratory experiments.

Finally, with respect to Kunkel's paper, I agree with his contention that "positivism" has for some time wielded an undue amount of influence in the work of many rural social scientists. This is not to suggest a dramatic swing to the other extreme. But, if social scientists are to address most of the important issues in rural America, they must be willing to move beyond the confines of a narrow positivistic framework of analysis.

Dr. Sauer rightfully points to incomplete, unstable and inconsistent agricultural, fiscal, monetary and credit policies as contributors to the social problems of rural America. I agree that we probably could do a lot better job of evaluating alternative policy options if existing policies had some consistency and stability. But that's a fact of life and our complaints are not likely to change the situation.

I agree that we need to ask "Where we want to go?" before we ask "how do we get there?" But the question of where we want to go quickly becomes a complex one. And, I'm not so optimistic as to believe we can get unanimous concurrence on where we want to go. But, we do seem to have some pretty broad based agreements about what we should do in rural social science research in the future compared to what we have done in the past. And, that is a place from which to start.

I am pleased to see Sauer's willingness to support a research program with expanded inputs from the social sciences and humanities. But, I do think we need in return (or preferably in advance) to provide a clearer road map of research priorities and at least some increased perspective of how we can best organize to carry out an expanded research mission.

And, I do think, in accord with Thurow's position, that in outlining a set of research priorities for rural social scientists, we need to recognize farmers and food production as shrinking portions of the total population and total national economy. This means to me that in laying out a research agenda for the future, we need to look for an agenda which is relevant not only to farmers and agribusinesses but also to other participants in our rural society and economy as well as to environmentalists and consumers. Moreover, we need to utilize evaluative criteria and measure the trade-offs that affect all of these groups.

As an example of the kind of trade-off analysis which I have in mind (and admittedly, in this case, the evaluative criteria are almost exclusively those of economics) I commend the recent report put out by Resources for the Future (1987) for comparing alternative midcourse corrections in the Food Security Act of 1985.

Finally, by way of personal suggestions relative to future social science research, I have the following perspective for improving our contribution from an expanded effort:

1) A somewhat dualistic research system could be developed consisting of (a) rather individualistic and entrepreneurial research efforts heavily directed at disciplinary and problem solving research (this is probably what we have in the main now) and (b) a priority research agenda centering heavily on public interest issues and with some well planned division of labor with targeted financial support. The latter research configuration would require some critical mass of research personnel and funding support. This is a different configuration than the typical existing research project with a small portion of the time of a faculty member, a part-time

graduate research assistant funded with a $12,000 to $15,000 annual budget most of which goes for a stipend for the graduate assistant.

2) A serious effort to identify and acquire the key data needed to support the high priority social science research agenda thrust. In most cases this probably needs to be national in scope. In other cases, well designed regional research centers or projects might constitute a satisfactory institutional set-up for data acquisition and processing and a big improvement over the currently deteriorating national data system.

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PART V

SPECIAL AFTER-DINNER PAPERS

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Chapter 16

SOCIAL SCIENCES IN A GLOBAL CONTEXT

Jimmye S. Hillman*

Introduction

I'm glad to be at this conference; also delighted to have this opportunity to visit with you albeit a "sub" on both counts! Glenn Johnson called me a month ago saying that the leader of the International Trade Discussion Group had cancelled out and would I substitute. Yes. After mutual trips to Africa, he called again a week ago and asked would I be so kind as to fill in tonight. Yes. Therefore, he bears double indemnity - both for my presence and this, what I shall call a "visit" and personalization of some views rather than a speech. Blame Glenn for both my presence and these remarks. The ingredient most lacking from the following remarks are data to support the many insertions. While I am now holding two full-time jobs, and with such short notice, an elaborate, scientific documentation is difficult. The topic "Social Sciences in a Global Context" is a title broad enough, however, to give one liberty to say almost anything. I shall not purposefully court controversy, but am sure that observation as well as suggestion and error in fact will provoke plenty.

As many of you know my origins are deep South. Born in Mississippi on what in current development jargon would be called a peasant farm, I often am amazed when I look back at the direction and progress (?) of one farmboy--from then plowing one mule and a Georgia stock, to now operating modern, high-powered, 16-row equipment; from then living in local provincialism--having never been more than 30 miles from home till I went off to college--to now dealing with multifaceted international phenomena; from a local economy in depression and without communciation (I never talked on a telephone, never saw an airplane, nor visited a dentist until WW-II) to a dynamic economy such as those of California and Arizona in which I've dwelt for the past 40 years. One thing was clear early on, however: I wanted to escape that mule!

My differentiation of experience over time is quite comparable with the current differentiation of the world experience of others over space. There's an advantage in this. I see few primitive physical situations in Africa, which I visit frequently, that are really all that much worse than conditions of some rural Mississippi situations in 1932-38. One can therefore

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understand. My experience has been rather unique in that I've been able to work with developing countries in a technical assistance sense for 30 years while at the same time to research the complex problems of international trade policy amongst developed economies. From that backdrop, and from the international perspective and platform which I've been lucky to have attained by 1987, a few phenomena are obvious to me; at least I shall be audacious and first make some observations followed by some suggestions.

Observations

First, in 1987 we exist in a world of contrasting phenomena. Examples: 1) Centripetal technical forces such as communications and transportation permitting us to establish centralizing functions, but, at the same time centrifugal tendencies, many of which are institutional, which deliberately destroy these moves toward central control, e.g., the breakup of AT&T, deregulation policies, etc.; 2) The potential for economically efficient administrative decision making, made possible by the computer age, is being dissipated by a tendency to fragment as a result of such things as commutative justice, affirmative action (in the U.S.), and so on, in which laws, rules and regulations, dictate quotas, institutes and nontraditional, nondisciplinary forms, irrespective of economically efficient or distributive processes; 3) I sense a "scarcity amidst plenty" condition which pervades Western societies and perhaps all developed economies (perhaps this has always been the case, I don't know) in which there is an increasing pressure on a small number of intellectual, industrial elite and where large populations of other human resources are redundant, or they are being reduced to automatons; and 4) there is the nuclear phenomenon where the alternatives are full speed ahead, or a non-nuclear state of affairs, which some would like. These are but a few and are not all-inclusive observations.

Into this philosophical context I introduce some other more specific observations which infringe on the state of world, economic development, international trade and political economy.

1) Forty plus years without a major war among the great powers has resulted in an aggregate material welfare situation in the world far superior to that which existed in, say, 1945. Whether or not the world is, in the aggregate, better fed--a position which I hold rather strongly--the potential to produce food and to physically distribute food to hungry people is much greater, and amongst the developed world the problem has become what to do with surpluses. It is obvious to me that the problem is distributive in nature: have and have not conditions are exacerbated more by decisions in public policy rather than by forces governed by physical potential. This material richness pervades all phenomena from morality to the physical--more population possible, etc.

2) Instabilities and imbalances in the world economy in food production and in international trade are also exacerbated by national and supranational policies and decisions particularly at the macroeconomic level which would induce change and/or alter a given economic condition. Ed Schuh, Gale Johnson and many others have spoken repeatedly on this theme. The prime

example of this was the period 1972-75 when country after country intervened in production and trade mechanisms which resulted in the fallout which we have witnessed since 1981--overproduction, trade wars, protection and further threats. Instability galore.

3) Environmental considerations, including the psychic burden of overcrowding, are more serious factors in the human condition than just more "bread". Recent concern in USAID relative to the deterioration of the resource base in Africa bears out this observation. Substantiating the overcrowding thesis are many sociological and anthropological studies plus the thesis that serious wars and revolutions between nations are perpetuated more by peoples living well above the margin than just at the margin of life; e.g., Japan in the 1920s and '30s, Germany of the 1930s, Cuba in Latin America (which had the highest per capita income there in the late 1950s), and now Iran and Iraq.

4) Ideology and a lack of personal ability or willingness of scientists to work together on common problems presents a peculiar problem. Despite study after study by reputable scientists showing that many problems in the developing (as well as the developed) world stem from social considerations, project managers of aid agencies--United States as well as others--continue to ignore economics, anthropology and culture as important factors as to success or failure of their missions. I've had a specific, recent experience in this regard.

5) A major factor in United States ineffectiveness on the dispensation of aid, as well as in leadership in trade negotiation, is our insistence on transferring our own institutional patterns and ideas in the case of aid, and our blindness to our own protectionist "sins" in the case of trade. In the case of aid, for example, early on the "holy trinity", American style, of teaching, research and extension was promulgated regardless of the context and the country in which we operated. As to trade, from the beginning after World War II we lost credibility by vetoing the International Trade Organization (ITO) and by maintaining exceptions in the GATT for our Section 22 activities. We have never really regained credibility, despite all our fulminations, principally because of our continued farm policy legislation, which violates the spirit of free trade, and which we advocate but don't practice.

6) The United States continues to underestimate the power and efficiency of other agricultures, particularly of European agriculture. The agricultural sector of the EEC is in many ways very efficient. Even without the Variable Levy it would be a formidable competitor. At the same time we have overestimated the real absorptive capacity of world markets for U.S. agricultural exports. Since at least 1977 we have built up inordinate expectations amongst U.S. farmers as to the export market for our products. We have refused to countenance agricultural policy tools that are not part of supply side economic "nonsense".

Suggestions:

It might appear absurd for a lowly public servant in a relatively minor state in the United States to render prescriptive ideas for social science action in a global context. Nevertheless, when I look at the world as it is I think the suggestions which I proffer--if adopted--would make neither the world worse off from a welfare standpoint nor the United States position worse off politically or economically than both are currently.

1) First, no effort should be spared by the developed nations to increase real productivity in the developing world. Aside from agricultural employment this is a difficult task. Essays in a book by Schuh and Johnson (1983) describe the role of markets in the world food economy. The accelerated growth of income was the basic source of divergence in growth in demand and supply of food in the 1970s-early 1980s period, though trade distortions had a lot to do with that divergence as well. The level of income, the employment content of growth and the rate of income growth itself all are strategic factors as demand determinants. As Mellor (1982) has pointed out, demand will be driven rapidly when income is initally low, when growth has a high employment content, and when the income growth rate is rapid. Large net capital inflows and enhanced terms of international trade favor the latter. Because of strong multiplier effects of agriculture growth, heavy investment in agriculture may not shift supply of food more rapidly than demand.

2) With respect to agricultural development, the world in 1987 is clearly in a different phase than in the 1950s and 1960s and particularly at variance with the 1930s. Self-sufficiency in the basic food components has become the battle cry of most countries and a justification for all types of aid, and for research assistance to the developing world. Contrary to Mellor's thesis (ibid), I am not so anxious about the pressures which will be put on the food exporting countries to deliver an adequate supply of food at real prices at or below prices of other goods and services. Nevertheless, the developed world will render its most beneficial service to the Third World by supporting research and training efforts which will increase the real output of food. My prognosis is more in line with that of Ruttan (1986) who predicts a long term continuing decline in the real prices of agricultural commodities and favorable terms of access to those commodities, despite periodic short term upward price movements.

3) Macroeconomic policies have, increasingly, had a profound effect on development and trade policies of all countries. So much has been written on this in the past five years or so that I shan't go into detail here. Suffice to repeat a proposal I made at AAEA meetings at Cornell in 1982 (Hillman): If the agricultural policy and the trade situations (and, I would add, the economic development situation) are as disastrous as we are claiming that they are, then the respective subject matter ministers from the OECD countries had better be brought to the annual Summit Meetings for direct interaction with the chiefs of state, the finance ministers, the backers of the IMF, IBRD, FAO and others. The problem with separate subject matter sessions as they are now held (e.g., OECD agricultural

ministers meet periodically) is that the narrow context limits the power to bargain and to decide complex issues.

Most everyone agrees that much mischief has come about to aid and trade through inappropriate macroeconomic policies. Much of the price instability in the agricultural sector, for example, has resulted from inefficient or perverse macroeconomic policy. Specifically, the tendency for U.S. agricultural prices and commodity prices in developing countries to "overshoot" is an excessive response to monetary, fiscal and other exogenous shocks. One appropriate suggestion to remedy this evil is some type of stabilizing monetary arrangement which might derive from a new Bretton Woods.

What is important for us here is to deal with the fallout from the declining relevancy of the Bretton Woods principles to the conduct of international relations in general and, specifically, to the free flow of agricultural trade. After the early 1970s deterioration, subsequent events generated a dangerous void in conceptual thinking, and a large vacuum still exists. Difficulties have been compounded by developments which have changed the basic context of international economy but which are yet imperfectly understood. Space will permit the listing of but a few such developments:

A. We are now approaching the limits of domestic policy. The external consequences of evolving domestic policies, which are designed to achieve the optimum internal balance between inflation and resource utilization, have not been well thought out;

B. The impact of multinational enterprises, natural-resource depletion and environmental controls have far reaching effects;

C. The significance of the apparent broadening economic relations between the centrally planned communist countries and the market-oriented economies of the West will undoubtedly increase (despite the Reagan Administration!);

D. And, more specifically, the international food system which appears to be increasingly linked with political decisions, as well as to humanitarian needs, cannot be left to the uncertainties of irrational politics.

The cumulative effect of these and many other related developments has been to change the economic framework in which the world is operating. Agricultural trade and domestic agricultural policies are no exception. We cannot simply wish for a return to those conditions and institutions which provided certainty and growth for a generation prior to 1971. In the words of Robert Muldoon, who until early July, 1984, was New Zealand's Prime Minister and Minister of Finance, when something big is developing, comprehend it correctly from the start. The present situation facing the trade and payments system, which results from the complex and rapidly evolving interdependent world economy, necessitates a comprehensive examination along the lines of the process that led to the original Bretton Woods Conference in 1944 (Muldoon).

A fundamental examination of monetary and trade problems might first focus on how to deal with international interdependence. We have known for years that

economic integration has outrun our ability to fashion political institutions to deal with it. Also, that the linkages between trade and finance, between economic growth and structural adjustment, and between agricultural and nonagricultural trade are growing. The main point is, however, that the practical significance of these linkages has attained such importance and intensity that in terms of public policy it warrants being treated as a substantially new phenomenon. Dealing with this "new phenomenon", i.e., the new plateau of interdependence via linkages, will require not only the highest intellectual and political commitment, it will also require resistance to the idea of rewarming old remedies the excuse for which is "now is not the time to reshuffle the deck because to do so would produce too much uncertainty and endanger world economic recovery."

4) A new form of reality in political economic negotiation must be put in place to deal with the new forms of protectionism which have arisen in the past 50 years. Nontariff barriers have arisen in the rapidly industrializing, densely populated countries where agriculture is losing its comparative advantage.

A number of recent studies, e.g., Anderson and Hayami (1986) suggest that as economies grow they tend to change from a condition where agriculture bears the burden of growth to a condition where agriculture is protected. This has been the case in Japan, Korea and Taiwan, and the implication for other developing countries is clear: as developing countries enter into a period of rapid industrial growth they are likely to adopt increasingly protectionist policies. Food security is often used as an excuse for such protectionism.

Real protectionism in agriculture is likely to grow rather than to abate over the next decade and we must be ready to measure it with other means than mathematical economic models. The GATT Round begun in Montevideo in 1986 is likely to be long and bitter before it concludes!

Protectionism did not abate during the prosperous post-World War II period and in the decade of relatively high agricultural and raw material prices beginning in 1972. Instead, protectionism has metamorphosed from traditional trade restriction activity into more complciated, yet still-effective, forms of restrictions, epitomized by nontariff barriers. Also, that agricultural trade barrier problems residual to the Kennedy and Tokyo Rounds of trade negotiations, buttressed by the nature of their uniqueness, are likely to become more important in the future. The possibility of international trade breakdown will increase proportionately to the unwillingness of the major producing and trading nations to reduce the adverse impact of their domestic farm policies upon international trade. This is especially the case in developed industrial countries such as Japan, the European Community and the United States. But, it is also true of Australia, Canada and New Zealand; and holds for developing countries, and wherever state trading predominates. Domestic farm policies, buttressed by regulatory, sanitary and technical barriers, in sum, are the root cause of major restrictions in international commerce of farm products. Section 22 of the United States Agricultural Adjustment Act, the Common Agricultural Policy's variable levy, Japanese quotas and technical barriers in livestock and meat trade all amply demonstrate this.

One must take issue with the observation that the instruments of protection of today are about the same as they always have been in that they are all barriers to efficient production, comparative advantage and reduce international gross economic product. Philosophically and in economic principle, this is true; but, technically, what my research on nontariff barriers has demonstrated is: technology, technical problems and administrative bureaucracies have made many commercial problems unique since the nineteen twenties.

Examples supporting this thesis are not difficult to discover: market-differentiating factors such as grades, standards and labeling; health, sanitary and phytosanitary regulations, supported by vigorous border inspections; rapid mass transport; and near-instantaneous communicative devices--all these, and many other technical changes, reinforced by the powers of administrative bureaucracies clearly produce methods of trade restriction which necessitate different techniques and modalities for trade negotiation. Moreover, in this sense the large scale public employment is essentially a twentieth-century phenomenon because, perhaps for the first time since the fifteenth century, many trade barriers are used in part to justify the existence of the bureaucracies which erected the barriers to begin with. Another way of putting it is that vast areas of commerce have been slowed by the regulators which were employed to facilitate, not impede, trade.

Thus, while it is correct to say that there is little difference in terms of results historically between various methods of agricultural protection--the main consequence is to raise agricultural rents--there is a vast difference between traditional tariffs and modern nontariff and technical barrier procedures.

5) Regarding GATT negotiations as well as other economic and political phenomena, the United States must take a longer term view of its problems and policies. Government as well as business nowadays often looks no further than the quarterly report! As a result, look at what has happened to the long term capital (bonds) market. I refer back to monetary and financial stability.

One of the saddest illustrations of short-range and uncertain vision relates to Congressional action with respect to AID budgeting and finance. The entire process of technical assistance is flawed and needs a revolutionary overhaul. Nothing short of this will do. More studies and piecemeal reform are not sufficient. I quote from a recent essay in the New Yorker by William Pfaff (1987, pp. 44-56).

"American policymakers dealt with these (Iran and other such) problems, as they continue to do with those of Central America, in almost complete innocence of the history involved or the cultural stakes in play, as if each problem were a discrete conflict of ideology and national power, winnable by coercion and money or, when these fail, by the application of military power. The forces at work are, to Washington's surprise, repeatedly discovered to be unamenable to these methods: 'unreasonable'--or reasonable only by a different calibration of reason. The result is failure, repeated failure, caused by a pedestrian American belief in nearby cause and immediate

effect, and a willful indifference to the long look, '"The backward look behind the assurance. Of recorded history the backward half-look ... towards the primitive terror,"' to quote Eliot."

6) The United States should reassess its attitude toward international political and economic cooperation. I attach herewith a calendar of meetings of some of the important agencies. We have been highly critical of many of the agencies and are loathe to enter the fray of bureaucratic argument and infighting with patience and preparedness in order to carry the battle. Often we just make threats such as those against European agricultural interests. Probably we missed a golden opportunity during the halcyon days of 1945-65 to place our stamp on international institutions.

7) Finally, many of us who have grown up in the postwar milieu of United States dominance in a variety of sectors (including the dollar), and who have been accustomed to our institutions being accepted unquestioned must adjust to a new reality. Especially must we adapt our institutions to the new reality. One good example: the Land Grant University System. In order to serve the needs of the United States and the world in Century 21 the system must be systematically altered all the way down to, but especially including, graduate education. We are training far too many of the wrong type of people for tomorrow. How to change ourselves in all these ways? QUITE A CHALLENGE!

INTERNATIONAL MEETINGS CALENDAR

December: GENERAL AGREEMENT ON TARIFFS AND TRADE*
International Meat and Dairy Councils

ORGANISATION FOR ECONOMIC COOPERATION AND DEVELOPMENT
Committee for Agriculture

OTHER
Meeting of Second Committee of UN General Assembly

USDA
Outlook Conference

January: GENERAL AGREEMENT ON TARIFFS AND TRADE
Multilateral Trade Negotiations commence

ORGANIZATION FOR ECONOMIC COOPERATION AND DEVELOPMENT
Joint Working Party, Agriculture and Trade Committees

February: GATT Council

ORGANISATION FOR ECONOMIC COOPERATION AND DEVELOPMENT
Trade Committee

INTERNATIONAL MONETARY FUND
Article IV Consultations--Canada

OTHER
Wheat Exporters Meeting
European Outlook Conference

March: GENERAL AGREEMENT ON TARIFFS AND TRADE
Trade Ministers Meeting
International Dairy Council

ORGANISATION FOR ECONOMIC COOPERATION AND DEVELOPMENT
Working Pary I of Economic Policy Committee
Trade Committee

UNITED NATIONS FOOD AND AGRICULTURE AGENCIES
FAO Committee for Agriculture

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* The timetable for meetings of Uruguay Round negotiating groups is currently the subject of consideration in Geneva. A deadline of 16 December (1987) has been set for the resolution of detailed negotiating plans for subject groups.

March, continued:

INTERNATIONAL MONETARY FUND
Article IV Consultations--Japan, UK

OTHER
UNCTAD, Trade and Development Board, special session

April: GATT Council

UNITED NATIONS FOOD AND AGRICULTURE AGENCIES
FAO Committee on World Food Security

WORLD BANK
Development Committee

INTERNATIONAL MONETARY FUND
Interim Committee

May: GATT Council

ORGANISATION FOR ECONOMIC COOPERATION AND DEVELOPMENT
Ministerial Council meeting

UNITED NATIONS FOOD AND AGRICULTURE AGENCIES
FAO Committee for Agriculture

June: GENERAL AGREEMENT ON TARRIFFS AND TRADE
International Dairy Council

ORGANISATION FOR ECONOMIC COOPERATION AND DEVELOPMENT
Trade Committee
Agriculture Committee

UNITED NATIONS FOOD AND AGRICULTURE AGENCIES
World Food Council

OTHER:
Western Economic Summit

July: UNITED NATIONS FOOD AND AGRICULTURE AGENCIES
FAO Committee on Commodity Problems

OTHER
UNCTAD VII

August: GATT Council

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Chapter 17

PHILOSOPHY OF SOCIAL SCIENCE AND ETHICS

Paul B. Thompson*

Observers of agriculture and its institutions in the 1980's may have witnessed a number of events that would lead them to expect a new role for philosophy in the coming years. Many agricultural universities, including Iowa State, Wyoming, Cal Poly-San Luis Obispo, Rutgers, and Kentucky, have offered courses on agricultural ethics in conjunction with liberal arts faculty. Cornell, Texas A&M, Florida, and Washington State have appointed trained ethicists to teaching positions within the College of Agriculture. Conferences have been held at many of these institutions where authors trained in religion and philosophy have shared research on contemporary agricultural problems. The National Agricultural and Natural Resources Curriculum Project, sponsored by the USDA, NASULGC, and ASCAAR, identified ethical aspects of agriculture and natural resource policy as a top priority for development and implementation. The first faculty training workshop in that area was held June 14 to June 26, 1987. Research and teaching on issues such as animal welfare, environmental policy, or world hunger and development have become widespread among philosophers the world over.

These events evidence a new interest in what philosophy might contribute to understanding of agriculture's issues and problems, as well as a new willingness on the part of philosophers and the religious community to think seriously about agriculture. The particulars of this contribution, however, remain vague. The lack of clarity on what philosophers might do for agriculture has led to unrealistic expectations on the part of some, and undue skepticism on the part of others.

The task for this paper is to prepare the basis for clarifying the role of philosophy in agriculture and natural resource issues, and in particular to indicate how philosophical inquiry might function in disciplinary, subject matter, and problem solving research in the rural social sciences. The strategy that will be followed is to first offer a brief, definitional clarification of philosophical inquiry itself, followed by a similarly brief discussion of why, in the 1980's, agricultural institutions should come to demonstrate a hitherto unprecedented interest in philosophy. Disciplinary, subject matter, and problem solving research will, then, each be discussed in turn. The key thesis will be that disciplinary models of philosophical analysis must be supplanted with approaches more amenable to subject matter and problem solving research. An emphasis upon making philosophy

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relevant to subject matter and problem solving research can help avoid unrealistic expectations, and will ultimately be more responsive to the concerns that have generated interest in philosophy during the past ten years.

Philosophy: A Definition

In the remarks that follow, the term 'philosophy' will be broadly construed to include not only research conducted under the disciplinary aegis of philosophy departments and by philosophy Ph.D.s, but also research on values, argumentation, and interpretation that might be conducted by humanities professionals in fields such as rhetoric, composition, communication, language arts, religious studies, and history. In its contemporary setting, philosophy is generally distinguished from research that is empirical or descriptive not in the sense that it is divorced from experience, but to the extent that it stresses conceptual clarity, consistency, and applicability, as opposed to measurement and prediction of events or phenomena in the physical and social world.

Certain aspects of the social sciences, notably in anthropology and sociology, also stress interpretive understanding of cultural and conceptual systems for organizing knowledge, political life, and moral or religious beliefs. For the purposes of this paper, social science research that aims not at quantification and measurement, but at interpretive or structural elucidation of culture and behavior may also be considered philosophical. Although practitioners of such research would rightfully make distinctions between their work and that of academic philosophers, most would acknowledge that their methods owe as much to the intellectual traditions of the humanities as to the experimental methods of the natural sciences [Turner].

Similarly, academic philosophy is frequently distinguished from research on metaphysics and ethics done by theologians or scholars in religious studies. This distinction is generally based on the presumption that religious philosophy accepts a body of doctrine on faith or scriptural authority, while philosophy *per se* accords privileged status to no claims, save those of logical consistency [Eldridge]. Although this distinction can be important in contexts relevant to the rural social sciences, it will largely be ignored in the following discussion. Discussion of philosophical research will be construed to include work done from an explicitly religious perspective. Many of the values and beliefs most crucial to an understanding of agricultural issues cannot be adequately interpreted apart from the religious traditions in which they have arisen [Meeks; Johnson 1982a].

Finally, certain intellectual themes drawn from general systems analysis ought to be included under this definition of philosophy.[1] To the extent that systems analysts are concerned with the general configuration of reality, and of how the various discip-

lines are related to one another in attempting to describe reality, they are just the latest in a long line of philosophers who have undertaken this task. Philosophers and theologians have called it "metaphysics," but this would never do in a society where mention of metaphysics is less likely to be associated with Aristotle than with Shirley MacLaine. Systems analysis that stresses quantitative modeling of physical systems frequently becomes quite disciplinary, but "soft systems," the attempt to address problems or models from a broad, interdisciplinary perspective, is philosophical in a very traditional sense.

Problems and Issues That Give Rise to Philosophy

New interest in philosophy among scholars and practitioners of agriculture and natural resource policy is almost certainly linked closely to current events, and the recent history of American agriculture. These topics have been discussed by other authors in this project, and need not be recounted at length. Issues raised by critics of agriculture might be thought to call for philosophy for three reasons. Philosophy can be seen as constructive self-criticism, as an interpretive guide to alternate perspectives, or as a method of defense against attack. Each of these potential contributions can be analyzed in terms of events that buffeted agriculture during the past decade.

Agricultural colleges, research institutions, and the USDA were generally the beneficiaries of staunch political support and general goodwill well into the decade of the 1970's. Political support was largely the result of commodity groups that had reversed a long history of discord and disorganization among farmers nationwide. Commodity lobbies occasionally squabble, to be sure; but the relative political strength of farm groups has, ironically, increased, at least to the early seventies, as farm population has declined. In addition to political organization, American farmers through the sixties and seventies enjoyed broad public support, in part as a holdover of agriculture fundamentalism, but also because, in contrast to defense and smokestack industries, agriculture appeared rather benign [Fite].

The seeds for change in this positive position for agriculture had already been sown, of course. As the large users of pesticide chemicals, farmers were, by 1970, already coming under attack (if indirectly) from environmental groups. Criticism of agricultural institutions began with the 1962 publication of Silent Spring and mounted throughout the seventies with Jim Hightower's Hard Tomatoes, Hard Times, Wendell Berry's The Unsettling of America, and an anthology of critical essays titled Food For People, Not Profit. Agricultural universities (and USDA offices) also came under indirect criticism as a result of publications aimed primarily to support organic foods, animal welfare [Singer], and world development [Lappe]. As criticisms of agricultural technologies mounted throughout the seventies [Schell; Jackson], leaders in agriculture and natural resource fields closed the decade with the wagons circled, having fallen

from the height of power and prestige to what must have seemed like low ebb.

A handful of administrators began to perceive a trio of needs that had arisen in the wake of these attacks. First, there was a need for professionals to internalize some of the criticism. Although critics were frequently portrayed as self-seeking and poorly informed, a few also recognised that agriculture's leaders had failed to perform the introspective self criticism that would have given them full confidence in their own position. Second, there was a need to understand the arguments of the critics in order to determine the basis of criticism and to evaluate the merit of their claims. Arguments that seemed opaque to leaders in agriculture were nevertheless capable of engendering public support, sometimes on a large scale. This was nowhere more evident than with animal welfare, where a failure to understand the critics' position led to a series of inept responses [March]. Finally, there was a need to defend the goals and values of the people and institutions that had come under attack. The technical arguments of the natural and social sciences were woefully inadequate to the task of direct and explicit defense of normative, ethically grounded goals and policies [Kunkel]. Indeed, professional standards in the agricultural sciences precluded advocacy of values.

Philosophy, broadly conceived to include religious ethics, rhetoric, and the more humanities-oriented social sciences, was (and is) in a strong position to meet those needs. The triumvirate of self-criticism, interpretive empathy, and argumentation represents the set of skills that underlie virtually all styles and branches of the otherwise disparate discipline of philosophy. Though philosophers may have been in a poor position to apply these skills to agriculture in 1980 [Thompson 1984], there is little doubt that they, as a group, were more solidly in possession of them than any other segment of the research and teaching community.

It was, and remains, a minority of research and teaching administrators who perceived these needs. Nevertheless, the interest in philosophy's potential contribution to agricultural research and teaching is growing. Philosophers can analyze broad background beliefs about agriculture, the environment, and human nature, and can examine the conceptual, logical, and experiential links that give these beliefs coherence and applicability. Such connections are tenuous, even nebulous, and their analysis is often subtle and open to revision. Philosophy cannot elucidate or evaluate background beliefs with scientific precision, but it can lay this area of thought, so important to controversy of all sorts, open to examination and public discussion. This is not, however,a task for ivory tower philosophy. Agricultural professionals must be encouraged to participate actively in the discussion. They will reap the benefits of self-criticism, interpretive empathy, and logical clarity for themselves, and they will perform a valuable public service by adding their

informed perspective to the debate.

Philosophy, Methodology and Disciplinary Research

Within the context of the Social Science Agricultural Agenda Project, it is appropriate to examine all aspects of philosophy's relation to the rural social science. Philosophy has been interwoven in the scope and definition of the social sciences since their inception. Philosophical considerations have played a far more decisive role in the development of social science methodology than in the experimental and quantitative models of the physical sciences. The longstanding interpenetration of philosophy and the social sciences should be expected to continue for some time to come. It would be pointless (and more than a bit arbitrary) to selectively review the general literature in the philosophy of social science for present purposes.[2] There are, however, two themes within that literature that are particularly relevant to the issue at hand.

The Philosophy and Methodology of Social Research.

The first theme is the emphasis on epistemology that has pervaded the philosophy of social science, while the second is the negative tone that philosophy of social science has adopted. In his Treatise on Human Nature, David Hume set out to lay the foundations for a science of human nature that would encompass much of the research now done by contemporary social scientists. Hume thought that this could be done by first completing an analysis of how knowledge is possible, and upon what experiential grounds it can be secured. Social or moral inquiries could then be restricted to those subjects that can be known, if not with certainty, then at least with the same confidence that undergirds our knowledge in the natural sciences. Although the psychological associationism that was at the root of Hume's substantive claims has been superceded, his philosophical strategy of epistemological elimination has prospered.

Many of the most important twentieth century developments in the philosophy of social science have consisted in demonstrations of what cannot be known. Watson's behaviorism was founded largely on his belief in the psychologists lack of observational access to the mental life of their subjects. Arrow's famous work on collective choice demonstrated the impossibility of defining social welfare in terms of individual preference functions. Popper's attack on historicism involved an argument (later revived by rational expectations) demonstrating the inherent inability of social theory to anticipate human knowledge. Each of these contributions determine social science methodology by stipulating its epistemological limitations. The list of similarly negative tenets includes restrictions on intersubjective comparisons of utility [Hicks], limits on translation of culturally dependent terms [Quine; Winch], and strategies for reducing social mores to ecological functions [Harris].

Positivism and the Agricultrural Sciences.

In both biological and social sciences for agriculture, Hume's legacy is most notable in the persistence of beliefs and dicta classified under the heading of logical positivism.[3] Logical positivism became a somewhat subtle and far reaching philosophical movement in the first half of the twentieth century. As a philosophers of science, logical positivists proposed a methodological rule for theoretical claims that stressed verifiability. In its pure form, the movement foundered when it was discovered that some fundamental axioms of logic and science (including the verifiability principle itself) could not be verified by logical positivist standards. As a broader philosophical movement in the social sciences, logical positivism came to embrace the behaviorists' reluctance to study cognitive states, on the one hand, and emotivist and prescriptivist theories in metaethics,[4] on the other. When Milton Friedman published his well-known methodology paper in the early 1950's, he associated the term positivism with his view that neo-classical economic theory could profitably be understood as the attempt to predict exchange behavior. both at the individual and the aggregate level, and he distinguished this positivist economics from the attempt to describe or justify rational standards for exchanging or balancing different types of value [Friedman].[5]

The philosophical views advocated by the logical positivists, the behaviorists, mid-century metaethics, and post-war neo-classical economists hardly cohere into a consistent philosophy of science, but they do share one trait that has been crucial for the direction of the rural social sciences in the last four decades. Each of these philosophies provide a rationale for neglecting value theory. Each of them provide some reason for concluding that knowledge about what really is good or bad, or what one ought to do as a matter of moral duty, is, if not utterly meaningless, then at least beyond the scope of well founded scientific enquiry. As such, this general collection of views, now frequently lumped together under the logical positivist banner, provided a rationale for focusing research on technical questions in agriculture, questions such as expanding production and product options, maximizing yield against land or labor inputs, and constructing crop and economic models that would improve performance predictions for cultural and policy options. As answers to technical questions became available, the course of recent agricultural history has been determined by market forces operating within constraints set by the initial distribution of resources and by national trade, tax, and commodity policies.

Perhaps this has been a good thing; perhaps market forces should be allowed to determine these changes, while scientists within the academies concentrate on offering disciplinary services. The irony is that the disciplinary constraints imposed by the positivist tradition prohibit any attempt to find out. There can be no enquiry or argument that would justify or criticize the

strategy and practices of agriculture's research philosophy since World War II, precisely because any attempt to justify the philosophy would be a violation of it. Agricultural research is condemned to the open ended pursuit of truth, with no basis for selecting among the myriad forms of truth that might be sought, and no prospect for setting goals that research might be structured to attain.

The Disciplinary Orientation of Traditional Methodology.

This picture, of course, substantially overstates the situation. Only a few years after Friedman's essay, Kenneth Boulding countered Friedman's sharp distinction of positive and normative economics by suggesting that our methods for obtaining knowledge of fact and of value are far more similar than they are different. [Boulding] Friedman himself never suggested an abrogation of research on values, merely a separation of this philosophically oriented form of economics from narrow disciplinary enquiry [Hausman] Institutionalist and then resource economists, as well as some rural sociologists, continued to conduct value oriented research, teaching, and extension in agricultural institutions. The purpose of these remarks is not to condemn the adoption of positivist ideology among disciplinary researchers, in any case. In large measure, these methodological views have prospered precisely because they do, in fact, enhance the scientist's ability to identify researchable disciplinary topics. One would expect philosophy of social science to help disciplinary research most by replacing some of the less plausible positivist notions with new ones that nevertheless maintain the focus of disciplinary attention along traditional lines.

The problem is that while positivist views, despite their deficiencies, may have been well enough suited to guide disciplinary research in the natural and social sciences, they are poorly suited to the non-disciplinary forms of research and leadership that have, since the Morrill Act in 1837, and particularly since the Hatch act 100 years ago, been the mandate and charge of the American college of agriculture. Agricultural research, teaching, and extension are expected to provide the knowledge base that will lead American agriculture through policy, technology, and institutional changes. The notion of leadership implies an ability to grasp and articulate goals, but the positivist philosophies of the past four decades exclude the study of goals and values from the research program, and therein lies the rub.

In addition, there is the fact that disciplinary research is only a minority component of agricultural research, anyway; the question of whether the positivist tradition is appropriate for subject matter and problem solving research is also relevant. Before leaving the discussion of disciplinary issues, however, it is worth noting how the disciplinary tradition of philosophy of social science affects the reception that philosophical research is likely to receive in the rural social sciences.

Unrealistic Expectations.

The philosophical tradition of setting epistemological constraints defines expectations in oddly contradictory ways. Pessimists and skeptics among the rural social sciences have deeply internalized positivist assumptions, and probably see little hope of overcoming them. They would see the rural social sciences continuing to operate within current philosophical parameters. Under these assumptions, the application of social theory to policy or problem solving is restricted to a fairly narrow set of predictive exercises. Advocacy of values and goals violates the methodological restrictions of "objective" science, since values and ideology are, by definition, idiosyncratic, personal, and arbitrary from the perspective of social theory. Given these attitudes, there can be little ground for anything more than skepticism and suspicion of non-epistemological attempts to play a more positive role in problem solving and policy research.

Optimists, on the other hand, may see these constraints on social theory as philosophical in origin, and reason that who would therefore be better to help conquer them than philosophers. It is true that the epistemological limitations of social theory can be superceded (if at all) only by philosophical revision or analysis, and it is entirely possible that one or more of the currently accepted constraints will be overcome at any time. Optimism about philosophy's role in this regard places a severe burden upon philosophical research, however. By this standard, participation by philosophers is welcome, but, ironically, may place a greater burden on philosophy than skepticism. Any meaningful philosophical contribution at this level is probably worthy of a Nobel prize, and there seems to be little opportunity for more modest efforts. As such, emphasis upon methodological constraints probably creates expectations that are unwarranted, whether they welcome or condemn philosophical work.

These conflicting expectations confront those who attempt philosophical work in rural social science departments or disciplinary contexts. Furthermore, like anyone, rural social scientists can be relied upon to bring disciplinary prejudices into subject matter and problem solving research. Although it will be argued below that the largest potential contribution for philosophers in agricultural research is in the multidisciplinary context of subject matter and problem solving research, attention to disciplinary issues and to the traditional problems of the social sciences is needed at least to help revise unreasonable expectations of both pessimists and optimists.

Subject Matter Research

Subject matter research brings several disciplines to bear on a particular topic, such as technological change, or farm manage-

ment. Subject matter research may take up issues over which there is a considerable controversy, such as farm animal welfare, or environmental quality. Philosophical analysis contributes to subject matter research in a broad way by examining the rationale for defining topics in one way, rather than another, and, in so doing, by indicating the relative domains and interactions of contributing disciplines. With regard to issues, philosophical analysis has a more prominent role to play in interpreting, and sometimes adjudicating, points in dispute.

Subject Matter Research: The Metaphysics of Farm Management.

Subject matter research is defined around a set of topics that determine the subject matter area [Johnson 1987, p. 13]. Farm management, for example, has traditionally involved some mix of financial planning or accounting with agronomic and livestock skills. Agronomic skills, in turn, devolve into disciplinary components that include soil chemistry, hydraulics, and plant physiology; the same sort of disciplinary division can be applied to other areas of farm management subject matter.

With respect to farm management, the mix of disciplinary components has changed throughout time, while the relative importance of biological and financial skills has been realigned. Hedging and insurance have emerged as risk management strategies, for example, while the broad framework for farm management has probably shifted from an agronomy-based framework for managing cultural practices to an economics-based framework for achieving profitability. Changes like these represent shifts in the philosophy that underlies the general subject matter of farm management. One can imagine an argument in which one party asserts that what makes farming distinctive as farming is cultivation of the earth, while another party insists that it was profit that was really important, all along. Such a dispute serves as an example of disciplinary imperialism, in which the categories of one discipline are taken to give the definitive answer to the metaphysical question, "What is reality?" Effective subject matter research requires that the subject matter itself dictate the terms for what is really real.

Philosophical Definitions of Subject Matter.

The philosophies of traditional subject matter research in agriculture have evolved well enough without the help of professional philosophers, but the researchers that have led these changes have applied insight that was philosophical in character, nonetheless. In practice, these changes may be subtle and spread over a long period of time; practitioners may not even be aware of them as they happen. Direct philosophical research on the definition of subject matter areas would, in most cases, do little more than specify the relations among the disciplines within a conceptual framework that is explicit, and of which researchers are consciously aware.

There are some subject matter areas, however, in which just this sort of research would be an important contribution. The arrival of recombinant DNA techniques, for example, has thrown the subject matter of variety improvement into chaos. In some institutions, plant breeders have become an endangered species. This is, in part, because one role they had played in variety improvement research, the introduction of new genetic material, has clearly been superceded by the new techniques. Yet plant breeders have also monitored crop level and multigenerational traits that may not be obvious at the level of the individual genome, and there is no reason to think that these contributions will not continue to be important to variety improvement research. [Hansen, et.al.] Strategic planning for subject matter research can, sometimes, profit from a careful consideration of subject matter definition, and individual disciplinary contribution.[6]

Disciplinary frameworks in the social sciences are extremely comprehensive; they must be capable of incorporating a wide variety of social and behavioral data in order to achieve any explanatory power. As such, the potential for organizing subject matter research under the conceptual framework of disciplinary economics or sociology is particularly problematic.[7] Any reasonably consistent set of stimulus-response interactions might be rationalized under a preference function, for example [Sagoff]. The comprehensiveness of social science frameworks surely creates temptation for social scientists working in problem solving areas. When a variety of social and biological phenomena can be translated into one's own disciplinary perspective, there will be a strong tendency to colonize other disciplines, rather than attempting to understand or relate to them on their own terms. When this happens, some self-criticism is called for, and, lacking that, some aggressive argument from others to open the subject area to genuine multi-disciplinary inquiry. On both counts, this is essentially a philosophical form of research activity, whether it be conducted by philosophically trained researchers or not.

Subject Matter Research on Controversial Issues.

It is when subject matter becomes contentious and controversial, however, that philosophy has its most obvious role to play. Agricultural biotechnology risk analysis, for example, includes a complex mixture of technical, social, and philosophical issues. One disagreement concerns the standards for acceptable risk. Some authors have suggested that genetic transfers at the cellular level really do not constitute anything different from transfers through breeding, at least as far as environmental, health, and safety consequences are concerned. They argue that traditional procedures for plant science research, and for dissemination of new products, are adequate in light of society's history of accepting the risks from variety improvement [Brill, Davis]. Others argue that field testing and commercial release should be allowed only after risks have been quantified by

scientific studies, and acceptability weighed against some standard of social benefit [Alexander, Sharples]. Although this battle is being waged by scientists, the matter in dispute concerns the philosophical interpretation of acceptable risk.

Philosophical values become even more apparent when social impacts of specific biotechnologies are at issue. Robert J. Kalter's work on the impact of synthesized bovine growth hormone on the American dairy industry has raised questions about technology policy that have clearly philosophical components. Increasing dairy productivity will throw current U.S. price policy into an even deeper crisis. Should market forces be allowed to operate unfettered? Should public institutions have contributed to the research that made this development possible? Answers to these questions depend upon philosophical views of market economy, and of the family farm [Madden & Thompson].

When the more radical views espoused by Jeremy Rifkin are brought into the dialogue, philosophical analysis is required even to interpret the basic thrust of the critical claims. While he is willing to seize upon safety concerns or social consequences if they will help build a political coalition against all forms of recombinant biotechnology, Rifkin's primary opposition to agricultural biotechnology is based upon his philosophy of history. His book Algeny describes a multi-century deterioration of morality in Western civilization. It is tied to a growing tendency of human beings to understand themselves in purely materialistic terms. In Declaration of a Heretic, Rifkin links this to the modern ethic that evaluates actions in terms of their consequences, rather than in terms of duty and loyalty. He finds ice minus bacteria and mutually assured destruction to be two sides of the same ideological coin. When Rifkin's philosophical vision of the human soul is tossed into the subject matter stew of biotechnology policy along with safety, environmental, and social concerns, the result is a complication of issues and alliances. The complexity of these relations has, to date, prevented institutional agriculture from addressing biotechnology support and regulation with anything resembling a unified and informed vision [Crawford; Jaroff]. Arguably, philosophy could help; it could hardly make things worse [Thompson, 1986a].

Subject Matter Research and the USDA/Land-Grant Mission.

It may be that agricultural universities concern themselves more properly with subject matter research than with disciplinary research. Certainly, the traditional conception of the land-grant mission has stressed organization of knowledge around the needs of the practically employed citizen, rather than disciplinary purity. As farmers and business executives, people face a set of concerns that seldom divide themselves along the disciplinary divisions of the arts and sciences. If this mission is still legitimate, a philosophical question in and of itself, then it becomes particularly important that disciplinary dogma is not allowed to control the research and teaching agenda in the

future. Resisting the disciplines, however, presupposes an understanding of how disciplinary philosophies, most notably in the form of positivist assumptions, have influenced research choices in the past. As such, a certain amount of philosophical critique may be needed merely to assure the future of subject matter research, itself.

Problem Solving Research

If subject matter research requires philosophical defense in order to resist disciplinary assumptions, the case for problem solving research is even more extreme. One component of land-grant philosophy was the goal of bringing the best science to bear on specific problems faced by the mass of citizens who would not be able to command the resources for research and development without public support. Times have changed in the past one hundred years, and no segment of the land-grant mission needs more rethinking than the commitment to problem solving research. Faculty and administrators justifiably resist the pressure to provide public subsidies to various kinds of contract research that can be fully supported by the private sector, and agriculture is increasingly dominated by firms that can well afford to buy solutions to their problems. Nevertheless, there are still those who lack the financial resources, and sometimes the political power to solve their problems. Are their problems as important as those of the wealthy? Should our public universities use public funds to subsidize their solution? Questions like these illustrate the way that philosophical questions of equity and justice enter into the fundamental administrative question of how and whether problem solving research should be funded.

The Role of Values in Problem Definition.

Problem solving research starts with a problem, and this implies that the strategy of research is to work systematically toward a resolution of the problem. When problems involve conflict among different parties, the solution to the problem will be measured, in part, by the values of these parties. It will also be measured by the fairness, thoroughness, and sensitivity to outcomes or constraints embodied in problem solving research itself [Johnson 1987, pp. 14-20]. Philosophy plays one role in interpreting the values of parties to the problem situation, and another in eliciting standards of ethical and logical adequacy for the research activity itself.

Problem solving begins by collecting information about the situation at hand. Unlike disciplinary research, where past research traditions set the agenda, or subject matter research, where the agenda is set by shared perceptions of what is at issue, problem solving research must begin with a survey of circumstances that may be entirely unique to the particular situation. The first stages, therefore, involve description of

circumstances, including description of values held by parties to the situation. Description of values is largely a task for traditional social science research, but it can be enhanced by a sensitivity to philosophical value positions, and to their patterns of conflict and harmony.

In order to recommend a solution to a problem, however, problem solving research must adopt standards that determine what is to count as alleviating the problem, as opposed to worsening it. In short, the notion of solving problems, or helping, in general, involves values in direct application [Dundon]. If problem solvers ignore this fact, they will apply values that have been implicitly adopted, perhaps by habit, without any direct inquiry as to the larger goals or responsibilities of the problem solving process. To the extent that problem solving research hopes to be truly objective in the sense of eliminating undue bias, researchers must undertake direct investigation of what is good, what is beneficial, what is bad, what is harmful, with regard to the specific problem situation [Johnson, 1982a].

Research On Values In Problem Solving.

Problem solving research has traditionally performed normative inquiry in an eclectic fashion, if at all. Researchers have brought values such as honesty, fairness, beneficence, and loyalty to their work, even if they have not always been willing to recognize this fact publicly for fear of appearing unobjective. Values are learned and refined throughout the process of living more surely than they are learned from mere philosophizing, so researchers have learned values in the process of solving problems. Nevertheless, the possibility of making the process of learning and assimilating crucial values into the problem solving process needs to be more than a haphazard affair depending solely on the wisdom and good will of a particular investigator. One of the key needs in a joint social science and philosophy effort is thus to be found in developing models and procedures that will make value oriented research a more integral and systematic part of the problem solving process. Recent efforts have begun to make contributions in that direction.[5]

Problem solving must recommend a solution; it must move from information about what would be good to a prescription as to what ought to be done. This is a second level of ethical or normative type of information, employing a decision rule [Johnson 1987, p. 18]. Decision theory, of course, has offered a number of strategies for analyzing the consequences of applying particular decision rules in a given context, and has offered help in being able to define rules that maximize the probability of achieving certain definite goals [McClennon].

But how are decision rules themselves justified? Are they to be rationalized solely on the basis of the means they help achieve. Are there constraints on how a responsible party may manipulate others? Are there duties that force decision makers to ignore

the benefits or harms that might accrue to third parties? On what authority, moral or political, is a given decision made to stand? These are philosophical questions that go to the root of political economy, understood in the grand tradition as a mixture of economics, political science, geography, and philosophy. In order to become applicable in the problem solving situation, the grand tradition must be particularized to the single case.

One philosophical issue that can be expected to recur in many problem solving instances is that of uncertainty. Although philosophers and decision theorists have devoted substantial research effort to uncertainty in recent decades,[9] uncertainty problems can become highly particularized to a specific policy decision. A recent review of the decision to ban saccharin on food safety grounds, for example, notes that it was uncertainty about affected groups, rather than the more familiar types of uncertainty about probabilities, that was most crucial to decision makers [Caplan]. Some environmental disputes have turned not upon uncertainty in data, but upon uncertainty about the moral character of parties to the dispute [Thompson, 1986b]. Although subject matter and disciplinary research on uncertainty in decision may contribute to problem solving, one can expect the unique circumstances of uncertainty to require a degree of philosophical analysis in the problem solving effort itself.

Despite the possibility that philosophers might contribute to the analysis of specific problems such as uncertainty, the largest reservoir for problem solving research clearly resides among rural social scientists, including extension specialists. Strategies for assessing and applying values have undoubtedly been effected by individual researchers in this group, but they are not widely disseminated. As with problem solving research generally, glamor and rewards would not favor application of philosophical skills and concepts to this area as much as it would to disciplinary or subject matter research [Johnson, 1984]. The barriers to progress are considerable, but the needs are great.

Conclusions

The structural constraints on this paper afford little opportunity to discuss specific philosophical problems. Only a few agriculture and natural resource issues with ethical and philosophical dimensions have been mentioned. Among the topics that have been slighted are agrarianism and family farms,[10] moral obligations to the world's hungry,[11] and the moral imperatives of sustainability and stewardship.[12] The real flavor of philosophical writing on agriculture and natural resource topics, its strengths and weaknesses, is captured better in any of the substantive papers that have been cited than in the survey that has been given here.

Constraints.

Yet, though there is a surfeit of issues and a ready supply of philosophically inclined researchers[13], there are barriers to the use of philosophical thought in the rural social science agenda. A principle barrier is the poorly understood conceptual relationship between humanities research and the disciplinary, subject matter, and problem solving research conducted on agriculture and natural resources. This barrier leads to a second, in that a poor understanding of this relation can lead to unfortunate expectations on the part of agriculture and natural resource scientists and administrators. These are the barriers that have been attacked in the preceding remarks. The general conclusion is that these special barriers to philosophical reflection are closely related to the rise of the disciplines, and to the relative decline of subject matter and problem solving research. Part of the reason to call for philosophical studies is simply to give this component of interdisciplinary research a disciplinary identity, and a group of spokespersons in the academic world.

In identifying philosophy, broadly conceived, as the discipline that will accept responsibility for self-criticism, interpretation, and logical argument within agriculture and natural resource research, however, one runs the risk that this proposition will be taken seriously, not only by scientists and administrators, but by philosophers, as well. This is not a disciplinary task, and it cannot be assigned to one department or faculty, nor can it be discharged by adding a few courses and positions. In its disciplinary context, philosophy has its own problems and issues. Philosophical ethics is no more relevant (in its disciplinary form) to the ethics of agricultural issues and problems than is literary criticism. Disciplinary philosophy is best at the negative epistemology found in traditional philosophy of social science; philosophers are not trained in problem solving and subject matter research.

Two Goals and a Qualification.

If this assessment is correct, then the role of philosophical thought ought to figure prominently in the objectives of the Social Science Agricultural Agenda Project. There are two goals. First, the project must find a way to rehabilitate the philosophical aspect of subject matter and problem solving. The idea that agricultural institutions labor under a sense of duty to the public good is not new. The ability to reflect upon and then fulfill this duty must be reconstructed, and then protected from the academic's drive to know only the truth that can be written in stone. If SSAAP is steadfast in its commitment to a research agenda in which disciplinary studies are balanced against interdisciplinary needs, philosophy and ethics will emerge surely enough of their own accord.

The second goal is to find a way for the research skills of the humanities, skills shared by professionals in many academic departments, to play a more direct role in the organized research

of the coming decades. It can only do this if the first goal, a rejection of disciplinary chauvinism, is achieved; but while that is a necessary condition, it is not sufficient. Philosophers, broadly conceived, must be brought out of their own disciplinary shells, too. The types of research and teaching that are rewarded by deans and departments in the liberal arts are not necessarily those that are needed for the rural social science research agenda. There are limits to what someone working within the research institutions of agriculture can do to affect this situation, but two suggestions can be made to avoid getting caught between a disciplinary agricluture rock and a disciplinary humanities hard place.

Research proposals can be structured to include ethics professionals, and research administrators can support such a strategy. As agriculture moves into an era of program and competitive funding, it becomes possible to reward proposals that have found a way to explicitly include ethics, and that have shown promise of competently completing ethics research. This strategy must, however, be supported by a process of human capital formation for ethics and philosophical expertise. Institutes, workshops, and individual study grants should be instituted that 1) provide opportunities and rewards for agriculture professionals to upgrade philosophical knowledge and skills; 2) provide opportunities and rewards for humanities professionals that want to work on agricultural issues; 3) bring these two groups of people together. In short, research administrators must give attention to the learning process that all participants will inevitably endure before the promise of applied ethics and philosophy can be realized.

To these goals must be appended the note that incorporating ethics into rural social science research is not equivalent to discharging ethical responsibilities in the management of agricultural policies and institutions. Farmers, administrators, businessmen, and teachers have duties to act morally. Pointing out these duties and attempting to clarify them does not relieve the actors themselves of that onus upon their action; only they can discharge the duties. Only the actors can make agricultural research and agricultural practice more ethical. Perhaps this point goes without saying, but there must be no illusion that philosophy itself, rather than the character and motives of the actors and decision makers, can carry the responsibility to make agriculture moral.

The prospects for philosophically-oriented contributions to the rural social sciences are far better today than only five years ago, when I attended one of the early W.K. Kellogg Foundation conferences on agriculture and the liberal arts. The agriculture group huddled in one corner of the University of Florida student center and the liberal arts group huddled in the opposite. The number of recent references cited below is testimony to the growth of interest in agricultural ethics (and only a fraction of available references are cited). But part of what we have

learned is just how little we knew about each other then. The prospects for philosophy and ethics studies in agriculture and natural resources are still emerging. The tone that must be set for the future is one of openness and flexibility, as the possibilities of genuinely interdisciplinary values research are gradually explored.

June 12, 1987

FOOTNOTES

1. Kenneth Boulding and Victor Pavlenko both noted that the discussions of subject matter and problem solving research that follow both imply a general systems analysis perspective. I am indebted to them in including systems thinking under my broad definition of philosophy.

2. A sample of recent books that include such a review include Braybrooke, Philosophy of Social Science; Deising, Science and Ideology in the Policy Sciences; Johnson, Research Methodology For Economists; and Blaug, The Methodology of Economics or How Economists Explain.

3. These observations on logical positivism in agricultural sciences are largely the result of Dr. Bobby Eddleman's comments on an earlier draft of this paper. I would like to thank Dr. Eddleman for his thoughtful criticisms.

4. Emotivism was proposed by A.J. Ayer in Language, Truth and Logic, sometimes taken to be the definitive statement of logical positivist philosophy. Ayer interpreted moral language and "ought" statements to be roughly equivalent to statements such as "I feel pain" or "I am happy." Statements of moral belief are, on the emotivist view, statements about the speakers' feelings, rather than statements about the world; as such they are beyond the scope of scientific enquiry. Prescriptivism, often associated with philosopher C. L. Stevenson, interpreted statements of moral belief as predictors of how the speaker will act in a given situation or as attempts to control the behavior of others, thus paving the way for a behaviorist analysis of moral language.

Strictly speaking, both emotivism and prescriptivism take moral language too seriously to be consistent with the narrow logical positivist view that moral language was without meaning altogether. Both share the result, however, of directing attention away from the substantive attempt to understand what is good or bad, or what a person in a given situation is morally obliged to do (though it is not clear that Stevenson ever intended prescriptivism to imply the impossibility of substantive ethics). As such, these and similar trends in metaethics (e.g. the study of ethical language and the structure of moral situations) may have tended to reinforce the general turn away from value inquiry that was endorsed by the logical positivist ideology.

5. For the record, Friedman's positivism owes more to Dewey's instrumentalism and to Popper's falsifiabilism than to the verifiability criterion that was the heart of Vienna circle logical positivism. Friedman's rejection of testing by the realism of assumptions is tantamount to a rejection of verifiability. In this respect, Friedman adopts a methodological strategy that is very anti-positivist in its implications.

6. It must be granted that it will take philosophically sensitive scholars who are also unusually well trained in technical issues to fruitfully analyze subject matter such as the plant breeding, variety improvement case. It is when social science disciplines are fundamentally involved in subject matter that philosophical reflection is more likely to play a role.

7. A particularly cogent example of this phenomenon is Richard Posner's effort to reformulate the general question of justice within his particular understanding of welfare economics. Readers may evaluate the success of Posner's attempt to bring the subject matter of social justice into a disciplinary framework for themselves.

8. Glenn Johnson's Research Methodology for Economics is the most sustained effort, but see also William Aiken's contribution for an insightful view on the way that ethical values are conceptualized in the decision process.

9. Among the standard sources frequently cited are Arrow and Hurwicz, and Luce and Raiffa. Recent empirical studies of uncertainty have added a new element to the discussion [Tversky and Kahnemann], while philosophical work on uncertainty has stressed policy applications [Goodin, Elster].

10. Perhaps no other subject has had as long a history of philosophical reflection. In addition to Jefferson's celebrated musings, certifiably philosophical discussions of this issue can be found in Emerson's essay "Farming," from Society and Solitude, as well as in the too frequently neglected works of John Brewster, especially the essay "The Relevance of the Jeffersonian Dream Today." [Brewster, pp. 174-207] Philosophical work on this topic continues throughout the current farm difficulties - [Montmarquet].

11. The literature by philosophers on this topic is extensive and not generally known among agriculture professionals. For a representative introduction, see Aiken and LaFollete, and also O'Neal. Articles on world hunger are nearly standard in introductory ethics textbooks, yet there is an almost complete lack of dialogue between the disciplinary communities of philosophy and of agriculture on this issue.

12. Among the recent contributions are the articles by Sara Ebenreck, Baird Callicott, and Phillip Shepard.

13. My consultant Victor Pavlenko cautions that I am optimistic in my assessment of the supply of researchers. Certainly he is correct to object that most philosophically trained researchers within academia have demonstrated little interest in the background research needed to become competent in agricultural issues. Two points should be made in response, however.

First, although the professional training and rewards

situation in academic philosophy still does not favor the researcher who wishes to apply philosophical skills to agriculture, it is nevertheless fair to say that the situation has been undergoing steady improvement for nearly two decades. Academic philosophy reached a height of detachment in the 1960's. Since 1967, however, philosophy departments have shown a renewed interest in the research and teaching of substantive ethical issues, including several (such as world hunger and animal welfare) that are of direct relevance to agriculture. It has only been in the last eight to ten years, however, that philosophers have reaped any professional rewards for becomming competant in the empirical subject matter of the substantive issues they research. Although the situation is still lamentable, it is nonetheless improving.

Second, there should be no presumption that one needs a Ph.D. level scholar of philosophy or religion to undertake meaningful study of the ethical, logical, or other broadly philosophical issues discussed herein. I do intend to suggest that direct training in the humanities will be an asset to the researchers who undertake philosophical tasks, but there is no reason why professional rural social scientists cannot develop these skills. The constraint is, again, the training and rewards system within the discipline.

PART VI

REPORTS FROM
CONCURRENT WORKGROUPS

Chapter 18

REPORT FROM CONCURRENT WORKGROUP 1

ON

FARMERS, AGRIBUSINESS AND CONSUMERS

LEADER: Fred Buttel
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MEMBERS: William Cromarty
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REPORT FROM CONCURRENT WORKGROUP 1

ON

FARMERS, AGRIBUSINESS AND CONSUMERS

Under the leadership of Fred Buttel, this group had a lively, wide-ranging debate on the scope and content of its assigned area; the relative emphasis that should be put on problem-solving versus subject matter and discipline-oriented subareas; and the appropriate balance between more aggregate or macro issues versus micro issues and providing help to individuals and families.

The subareas chosen for further development of priorities tend to reflect problem areas and subject matter concerns. Nevertheless, there were strong views expressed that the setting of a social science agenda for the years ahead should not ignore the urgent need to improve the capacity of the relevant professions to do problem-solving research and education. Capacity-enhancing needs include improvements in theory and methodology, interdisciplinary and multidisciplinary work, enhancement of data bases and improvements in educational techniques.

Concern was expressed that the social sciences not lose sight of their ultimate responsibility to help individuals and families. Even when the problem area to be addressed is of a broad policy nature, it was agreed that it will be improtant to consider carefully the distributive aspects (income, age, race, rural/urban, regional, etc.) of the problem.

There was considerable discussion of the issue of information. The discussion resulted in two subareas for future priorities: information and information technology as research and education resources; and information as a product for constituent use.

Most of the subareas include important work to be done by a broad range of social sciences. No attempt was made to spell out the prospective challenges for each of the social sciences for each of the subareas. It is a fair observation that the language in which the subareas are cast was heavily shaped by agricultural economists.

Important Subareas Within Which Priorities Should be Set

1. Competitiveness of U.S. Agriculture in Global Markets

   This topic is deemed urgent because it has implications not only for trade and aggregate economics of U.S. agriculture, but also for the adjustments that regions and rural communities have to face and the well-being of farm and rural people. This is a broad and complex subarea that includes work for most

rural social sciences. It includes analysis of where U.S. agriculture shakes out in the world market under alternative policy and technology scenarios, forces affecting the status and dynamics of U.S. comparative advantages, how competitiveness can be enhanced, how our competitive prospects differ by commodities and products, and the implied adjustment pressures for producers of specific commodities, regional resource use, rural people and communities and agribusiness infrastructure. This subarea would also include the development of improved national marketing and trade strategies and analyses of the consequences of trade liberalization. Both the global and domestic spatial aspects of competitive adjustments require analysis and understanding of the geopolitics of those adjustments.

2. Agricultural and Food Policy in a Global Economy

Topic includes analysis of the origins and consequences of present and alternative farm commodity, food, resource and trade policies, including distributive aspects of these policies. Requires conduct of studies useful to formulating policies that achieve stated societal objectives, while minimizing undesirable consequences. Also includes analysis of regulations affecting food supply and costs, demand and trade.

3. Performance and Consequences of the Food and Fiber System

Performance relates to the degree of achievement of a broad array of societal and constituent objectives, including, as examples, efficiency of resource use, distributive equity, environmental enhancement, systemwide resiliency and innovativeness, assurance of safe and high quality food at reasonable costs to consumers, and consistency with other national policy objectives. This subarea includes evaluation (transparency) of current performance status, and evaluation of alternative approaches to improving performance. Since performance is measured against other than purely economic criteria, input from most of the social sciences is required.

4. Structure of Agriculture and Agribusiness

Structure may be a performance criteria for the food and fiber system, but is viewed as important enough to break out separately to assure it gets proper attention. This subarea includes understanding the existing and emerging structure, organization and control of the entire agricultural sector, the consequences, and for whom. It also includes understanding what drives structure and structural change, and how those driving forces, and structure, might be changed to improve system performance. This topic includes resource ownership and control, tenure and access to resource services.

5. Science and Technology Policy, Technology Assessment, and Productivity

This is another broad category involving everything from economics to philosophy and values. It includes understanding what drives technological development and change, economic and social consequences of present, emerging and prospective technologies (including information technologies), linkages of technology and productivity changes to competitiveness, implications for organization, location, and control of production and marketing and for consequent pressures on institutions, and identification of winners and losers. Is science and technology policy always structure neutral?

6. Food Consumption: Demand, Sociocultural Influences, and Nutrition and Health Consequences

This subarea includes understanding of food consumption patterns, habits and preferences as well as food quality, safety and human nutrition. The former includes determination of all economic, cultural and other factors affecting food consumption and demand, and the dynamics of those factors. The latter (food quality, safety and nutrition) includes understanding food/health relationships, regulatory assessments and linkages back to food demand. The subarea also includes implications of how changes in demand and consumption patterns affect demand for farm commodities and agribusiness services and ultimately jobs and resource use.

7. Effective Information/Knowledge Delivery and Utilization

This topic includes education and enhancement of all constituent groups' abilities to determine their information needs, acquire information and process it to make decisions more consistent with their enlightened self-interests. Includes public policy education and new, innovative information/intelligence delivery systems in addition to improved traditional systems. May require research to better understand information use and decisionmaking processes. Includes providing information/understanding to those who set the rules that govern performance as well as to those who are the actual performers (farmers, businesses, households, etc.). The topic also includes more effective identification of users and their information needs.

8. Information Systems, Improved Data Bases, and Information Property Rights

Includes improved statistics on agriculture, the food and fiber system, and farm and rural households; design and use of modern information systems; understanding of impacts of modern information systems on rural and social science institutions, and property rights in information and software.

9. Agriculture, Natural Resources and the Environment

The subarea includes development of farming systems, technology, policies and institutions that assure protection of land and water resources and environmental quality for assuring health and safety, higher quality of life, and preservation of future production capacity. Includes water quality water use, soil erosion, land use, protection of open space, air quality, and wildlife preservation, as examples. Natural resource preservation includes preservation of genetic resources, wildlife species, and the spatial openness and integrity of farmland.

10. Quality of Farm and Rural Family Life

This subarea focuses on rural households and their needs. The topic includes, at the aggregate level, more basic data on what is happening to farm and rural families including data on stress, satisfaction, time expenditures, access to social services, social indicators, etc. For individuals and families, needs include family counseling and adjustment assistance (sometimes financial, but often counseling).

Recommendations for the Second Conference

The group felt that it was important that each broad area have a coordinator to: keep progress going for all the subareas; assure comprehensive covereage while minimizing overlap within the area; assure development of adequate materials; and assure adequate communication among all the scientists involved prior to and during the second conference. Those present also debated alternative ways to group the subject matter into broad areas and concluded that the present four areas were as good as any we could suggest. The area descriptions might be enhanced to point out that "Farmers, Agribusiness and Consumers" is a sectoral approach, while "Natural and Rural Community Resources and the Environment, and Their Uses" deals primarily with the spatial or territorial dimensions of our overall problem universe. It was agreed that international issues probably deserved special attention but would require close coordination with the sectoral and spatial groups to assure proper coverage of the integration of domestic and global economic/social/political system while avoiding duplication. Again, this concern supports having strong area coordinators.

Finally, while the group did not spend much time on the question of whether additional "think" papers should be commissioned, the following suggestions were offered as possibilities:

- Science and technology policy and assessment
- Information
- Competitiveness of regions and nations as an area of research and education
- Human ecology

Chapter 19

REPORT FROM CONCURRENT WORKGROUP 2

ON

NATURAL AND RURAL COMMUNITY RESOURCES

AND THE ENVIRONMENT AND THEIR USERS

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Gene Wunderlich

REPORT FROM CONCURRENT WORKGROUP 2

ON

NATURAL AND RURAL COMMUNITY RESOURCES

AND THE ENVIRONMENT AND THEIR USERS

We have developed eight subareas, described below. The workgroup initially developed a list of 48 individual subjects and problems which we then collected into eight categories of relative homogeneity. The scope and complexity of the different subareas differ greatly. There was no effort to assign relative priorities to the subareas.

Subarea 1 -- Conservation and Use of Land and Water Resources

A. Land use: preservation and development decisions

- o Origins of attitudes toward rural land use (zoning, development, property rights)
- o Effectiveness of voluntary versus regulatory land use policies
- o Unanticipated effects of voluntary versus regulatory land use policies
- o Role of market and nonmarket forces
- o Planning and decision making processes

B. Soil conservation

- o Voluntary versus regulatory policies
- o Marketing strategies for conservation
- o Attitude-behavior linkages and the role of stewardship
- o Social and economic impacts of off-site erosion
- o Behavior and attitudes regarding conservation tillage (e.g. use of pesticides)
- o Role of market and nonmarket forces

C. Water quality and quantity

- o Social definition of the resource
- o Social and economic impacts of changes in water quality and use
- o Evolving institutions, shaping the pattern of water use
- o Role of market and nonmarket forces

Subarea 2 -- Development Strategies for Rural Communities and Areas

A. Economic development and local resources

- o Human capital formation
- o Manufacturing
- o Amenities, tourists, retirees
- o Rural entrepreneuralship
- o Disadvantaged groups, transfer payments
- o Rural labor markets

B. Relationships among local, area, national and global economies

- o Regional impacts of fiscal and monetary policy
- o Financial deregulation
- o Changes in health programs, income assistance and related programs
- o Systems of places -- urban/rural

C. Local government administration and infrastructure

- o Rural tax base and local government
- o Adjusting to a declining base
- o New rural elites -- voluntarism
- o Local environmental management
- o Civic participation

Subarea 3 -- Valuation of Natural Resource Systems

A. Role of and validity of benefit/cost analysis in public decisions on natural resource use

- o Benefit/cost as conceptual paradigm for choice, organizing information, extension of logical positivism
- o Benefit/cost as technique, rules for use. Its role in incremental policy process, non-rational world of government decisionmaking.
- o Ethical implications of using B/C in public choice. Some impacts better measured, get priority.

B. Technical measurement questions

- o Nonmarket valuation of natural systems
- o Hedonic pricing, contingent valuation, inferential techniques

C. Risk that technical "progress" may permanently destroy natural systems (bio-diversity, co-evolution, optimum demand)

Subarea 4 -- Institutional Design and Analysis

A. Alternative means for organizing response to conflicts.

B. Alternative rules for information generation and presentation.

C. Various incentives to affect public and private behavior.

Subarea 5 -- Natural Resource Commodities

This subarea involves traditional questions of production,management, marketing of saleable, off-site commodities from natural resource systems. In this area questions are raised about tradeoffs and behavior in extractive, saleable commodities, and other resource sources, such as wildlife habitat, aesthetics, and clean air in rural areas.

A. Forestry: forest products, timber on public and private lands.

B. Fisheries

C. Mining/Minerals

Subarea 6 -- Resource Information Systems: Design, Development, Management, and Evaluation

Resource information is a basis for decisions on land and water use, environmental protection, taxation ownership and transfer. The need for timely, accurate, consistent information is increasing. The technical capacity to generate data is also increasing as are problems of consistency, quality, distribution of cost, access and control. Information technology is affecting persons, communities, institutions,and jurisdictions.

Social scientists working with engineers, lawyers, systems, analysts and officials can assess impacts and recommend solutions to problems of design, management, and policy. In the longer run social scientists can foster interdisciplinary relations and create subdisciplines to conduct research, develop curricula, and extend knowledge to users, commercial enterprise, and governments.

Research may include effects of resource information systems on local government decisions, social structures, distribution of benefits and costs,

privacy, welfare of specific groups, location of rural industry, structure of local and state government.

A. Impact of computerized land data base on local government decision processes (political science).

B. Does the resource data base enhance community cohesiveness, change status of individuals, or separate into castes? (sociology)

C. Is it possible to identify a demand (supply) function for information? (economics)

D. Can we identify a benefit/cost relationship for specific information products? (economics)

E. Privacy (political science, sociology, psychology)

F. Marketing information (sociology, economics)

Subarea 7 -- Structuring Effective Research

A. Linking other actors into the agricultural research system: The 1980 land grant colleges/non land grant universities-public and private/private sector industrial research

B. Achieving a user oriented delivery system

C. Organizing an effective research structure of social science research

D. Financing and coordinating research

E. Getting social scientists to cooperate

F. Evaluation of disciplinary, subject matter, problem solving research

Subarea 8 -- Risk and Regulatory Policy

A. Risk assessment and criteria

B. Regulatory rule making

C. Regulatory policy

Chapter 20

REPORT FROM CONCURRENT WORKGROUP 3

ON

INTERNATIONAL AFFAIRS

LEADER: Jimmye Hillman
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MEMBERS: Tom Carroll
Billie DeWalt
Gary Hansen
Don Paarlberg
Margaret Sarles
Bud Stanton
Paul Thompson

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REPORT FROM CONCURRENT WORKGROUP 3

ON

INTERNATIONAL AFFAIRS

Participants

The discussion group on international affairs consisted of Jimmye Hillman, Chairman; Tom Carroll; Billy DeWalt; Gary Hansen; Don Paarlberg; Margaret Sarles; Bud Stanton; Paul Thompson; and Ed Rossmiller, rapporteur.

Perspective

Discussion of the scope and perspective necessary to establish the broad categories of research needed in the international arena led to dropping development from the title of this discussion group. The title thus went from international development and affairs to simply international affairs. The original title placed undue emphasis on the development aspects of international activity relative to the other important dimensions including trade and international finance.

A second issue related to the need for addressing not only the research dimension but also the teaching or curriculum dimension and the extension or public affairs dimension of international affairs to develop a broad and balanced approach. The main reason this became important was the view that international is no longer, if it ever was, a separate and distinct area that can be juxtaposed against teaching, research, and extension.

The rationale for this position is as follows. Particularly during the 1970s an irreversible internationalization of agriculture took place. The U.S. agricultural sector came to rely heavily on the international market for a significant portion of its income. Moreover, rural communities throughout both the capital and goods markets in which they participate have become part of an integrated open economy. This subjects them to forces exerted by events and policy shifts at national and global political economy levels.

Social science research teaching and extension programs throughout the land-grant university system must adapt to this new and continuing reality. The international political and economic dimensions and linkages need to be accounted and included as an integral part of the research agenda, the curriculum and the extension program, particularly the public policy education dimension of the latter.

This imperative has major implications for the organizational structure in land-grant universities, especially for colleges of agriculture. The question must be raised as to the present and future adequacy of the solution taken in the past of appending an international program to stand in forced parallel to the tradition research teaching and extension components of agricultural colleges in the land-grant university system.

Given the impossibility of separating the domestic and international dimensions of problems and issues particularly in the policy area, and given the large proportion of foreign graduate students in many social science programs, particularly agricultural economics, the international

dimension must be integrated into all aspects of the university's program when and where appropriate.

This suggests that the international dimension is more important than is indicated by an international programs dimension in the College of Agriculture paralleling the research, teaching and extension functions. This is not to say that the international program function should be done away with entirely. Rather it should be redefined along with the integration of the international dimension into the ongoing programs. The redefinition of the role of international programs should include facilitating the spread of the international component within the other programs and to provide a catalytic role in helping to incorporate course work and other experiences in the curriculum that develops a cultural and substantive sensitivity to a changing international environment within which U.S. agriculture performs, and of which U.S. rural communities are a part.

The group considering the international affairs research agenda therefore recommends that those participants concerned with administrative and funding strategies in the second phase of the SSAAP work specifically address the issue of integration of the international component into the research, teaching, and extension program of the land-grant universities, with particular emphasis on the Colleges of Agriculture.

The International Affairs Research Agenda

The issues agenda for research needs and approaches under the SSAAP conference taxonomy for the component entitled international affairs includes the following general categories and subheadings.

The two major areas of emphasis in international affairs are trade and economic development, thus the two major headings--The Political Economy of Agricultural Trade and Development Processes and Economic Assistance. A third heading, Multi-Level Food and Agricultural Data Systems highlights the fact that data and information deficiencies are severe enough in the international affairs arena that special consideration needs to be given to their improvement as a specific and separable topic.

The first level sub-headings (A, B, C, etc.) under the three major headings indicate the broad areas of research emphasis that in the view of the International Affairs discussion group represent the most pressing set of issues. The second level subheadings (1, 2, 3, etc.) are illustrative examples of more specific topics of research of importance given the present and likely future state of international agricultural trade and global economic development affecting agricultural sectors and rural communities.

I. The Political Economy of Agricultural Trade

A. Competitiveness and comparative advantage.
Factors affecting the global supply and demand for agricultural commodities, including the international market

1. Production, supply and excess supply elasticities
2. Demand and excess demand elasticities (RDW and US)
3. Price transmission elasticities
4. Domestic agricultural and trade policies
5. Institutions - Parastatal, state trading
6. Technology

Elasticity of trade with respect to growth.

B. Incidence, causes and impacts of trade protection and trade liberalization

1. Political factors (flexibilities, rigidities, social objectives)
2. Measurement and monitoring instruments
3. Welfare gains and losses
4. Mechanisms
5. Negotiation strategies and packages

C. Macroeconomic and international finance linkages

1. Monetary and fiscal policies
2. Exchange rates
3. International capital flows and debt
4. International institutions: role, rules and adequacy

a. GATT - trade
b. IMF - finance
c. IBRD - development

II. Development Processes and Economic Assistance

A. Agriculture under Alternative Political Philosophies

1. The Geo-politics of Economic Assistance
2. International and cross-cultural social accounting methodologies and philosophies

B. Plant and Animal Genetic Resources and Protection

1. Intellectual property rights - patent rights
2. Development of alternative crops
3. Multinational ethics and involvement in international agricultural development
4. Protection, regulation, productivity and human health.

C. People Resources, Environment and Development

1. Labor/land ratios
2. Resources management (fragile lands, water, desertification. tropical forests, pastoralism.
3. Land use patterns - causes and consequences
4. Labor mobility and migration
5. Food, Nutrition and Health - Adequacy and Regulation
6. Rural - urban links

a. employment
b. resource use
c. population, family planning, rural development

d. nutrition, health, productivity, agricultural production
e. energy sources and uses

D. Social Impacts of Food Aid and Technology Transfer

1. Impacts of economic assistance, including in agriculture, on economic development and growth
2. Self-sufficiency, Food Security, Self-Reliance
3. Benefits and Costs of Food Aid

E. Institutions

1. Farmer organizations
2. Research-Education-Extension links and organization
3. Diffusion and innovation of technology
4. International organizations
5. Land tenure patterns

III. Multi-level Food and Agricultural Data Systems

A. Data needs
B. Measurement statistics, concepts, techniques

Chapter 21

REPORT FROM CONCURRENT WORKGROUP 4

ON

ADMINISTRATIVE AND FUNDING STRATEGIES

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REPORT FROM CONCURRENT WORKGROUP 4

ON

ADMINISTRATIVE AND FUNDING STRATEGIES

Under the leadership of G. E. Klonglan, Chairman of the Department of Sociology and Anthropology at Iowa State University, the group quickly recognized that they were concerned with both (1) administrative and funding strategies for the rural social sciences and basic social science disciplines with respect to agriculture and (2) needed research on administrative arrangements and strategies and funding for the rural social sciences and the basic social sciences. Consequently, this report is broken into two parts, the first of which deals with administrative and funding strategies and the second with the research needed on the administration and funding of the rural social sciences and of basic social science disciplinarians working on agriculturally related topics.

The future of rural social science will depend in large part on the future administrative structures of universities.

Because of funding constraints over the past several years, most colleges of agriculture, agricultural experiment stations and extension services are undergoing downsizing exercises (frequently called strategic planning exercises). University and college level administrators are seeking ways to optimize program effectiveness with fewer resources. This involves such considerations as eliminating or merging programs, departments or colleges.

It was also recognized that the general subject of administrative and funding strategies would increase in relative importance for SSAAP as we proceed from the first to the second and third conferences, the last of which will focus on administrators and funders of agricultural research.

I. Administrative and Funding Strategies

Each of the following major topics (designated with capital letters) should be considered as a separate topic to be considered by discussion groups at the second SSAAP conference -- sub-topics are indicated with Arabic numerals. The group recognized, of course, that as the second conference is designed and implemented, the Executive Committee and Advisory Board will have to consolidate, coordinate, even eliminate and, in some instances, add sections to those suggested by this group as the program.

A. Alternative models for organizing rural social science research and knowledge distribution and utilization at university, experiment station, center, governmental agency and institute levels. Many universities are considering new ways to organize their academic/research/extension programs. Many different ideas are being discussed and implemented. We believe it is important to identify and describe the various organizational arrangements that are being considered. This would include explicit statements of the rationale for alternative administrative structures to

facilitate discipline, problem solving and subject matter research.

1. Future rural social science departmental structures.

There are currently many different organizational structures for rural social sciences in colleges of agriculture. These include separate departments of agricultural economics and rural sociology; combined agricultural economics and rural sociology, combined agricultural economics and economics departments (and similarly combined rural sociology and sociology departments), as well as other combinations. There are some interdisciplinary social science departments.

The future academic homes of rural social scientists needs thorough analysis. Should the separate rural social science departments be merged with their basic discipline department (agricultural economics to economics, rural sociology to sociology, etc.)? Should all rural social scientists be in one (expanded) department to include agricultural economists, rural sociologists, political scientists, agricultural historians, rural geographers, socio-cultural anthropologists, etc.

We need to assess the advantages and disadvantages of alternative administrative structures to effectively carry out future teaching, research and extension functions.

2. Should social scientists in colleges of agriculture be structurally related with social scientists in colleges of human ecology/home economics? Should social science programs in agriculture/home economics be merged? Should new colleges with new names be created for rural social scientists?
3. How should rural social scientists structurally relate to social scientists in business schools? Many business schools are focusing on the same problems as agricultural economists and rural sociologists. Are there separate domains or duplication?
4. What organizational structures are needed to integrate rural social scientists with technical agriculture faculty? Should centers and institutes play a more prominent role in fostering interdisciplinary research teams? Should station directors exercise more control over research projects in order to foster interdisciplinary research?
5. Should agricultural experiment stations become university-wide research units no longer administered as the primary domain of agricultural and home economics colleges?
6. To what extent should there be new interstate programs involving the rural social scientists? If downsizing occurs, do we need more multistate or regional centers of expertise? What should the criteria be for establishing new multistate centers or institutes? What division of

labor strategies are most workable and need to be given priority attention?

B. Managing Public/Private Research Linkages for Rural Social Scientists

The ramifications of increased linkages between universities and private companies especially as they relate to biotechnology and other technical fields, need to be assessed for social scientists.

Are there opportunities for rural social scientists to participate on interdisciplinary teams that are joint public/private ventures? Are potential social/economic/legal problems so important as to warrant increased involvement of social scientists in future activities?

C. Obtaining Administrative Capacity and Flexibility

Universities are faced with many new challenges, but have little if any flexibility in budgets to initiate new program thrusts. Universities are considering many different ideas as to how to initiate new programs. It is important that rural social scientists think through the ramifications of several university-wide policy options on rural social science programming. These include:

1. Changing the tenure appointment base of faculty from 12 months to 9 months.

2. Hiring a certain portion of faculty on term contracts to work on a specific problem or subject matter. (Perhaps tenure, in its current sense, should be eliminated, especially given elimination of retirement age limits for faculty in seven years)?
3. Encouraging the development of research entrepreneurs to establish special programs either inside or outside the university expanding soft money resources.
4. Encouraging faculty to do more special interest consulting.
5. Creation of endowed chairs. How many will be for rural social scientists? Will these chairs be fore disciplinary, subject matter and problem solving purposes?

D. Evaluation and Recognition for Problem Solving and Subject Matter Excellence. Special administrative problems are associated with evaluating and awarding problem solving and subject matter research by social scientists and defining what constitutes excellence for social scientists in doing this kind of research. The group was concerned with the need to widen the range of participation of social scientists in problem solving and subject matter research and of doing this in such a way as to promote career development while maintaining the academic freedom so essential for effective research, teaching, extension, advising, consulting and administering.

Obtaining promotion and tenure for faculty who do primarily problem solving or subject matter research or work in extension is a problem at many universities. Many rural social scientists work on problem solving and subject matter projects.

Efforts are needed to clearly articulate the role of subject matter and problem solving functions in universities. When subject matter and problem solving activities are truly an explicit mission of a university as they now are in land grant colleges of agriculture, faculty evaluations for promotion and tenure should recognize excellence in carrying out these functions. This includes these types of work in both domestic and international settings.

1. Specific considerations: widening the range of social science participation in agricultural colleges.
2. The need for increased participation from agricultural historians, political scientists, anthropologists, human ecologists, geographers, philosophers, and others, generates a number of key issues:
   (a) Can we persuade top-of-the-line professionals in the field to participate with us on agriculture issues?
   (b) Can we persuade university administrators (and state and federal funding sources) that these fields have something useful to offer agriculture and rural life?

(c) Can these individuals be guaranteed that they can function according to professional standards (and be free from possible external pressures)?

(d) Can they be guaranteed access to records they need to see to study key issues? An example here would be the study of the relationship between colleges of agriculture and its clients. These could potentially be very controversial. The historian or anthropologist must be able to report what they find, even if it may be somewhat embarrassing to the university.

E. Human Capital Strategies

1. Restructuring Graduate Education in Rural Social Sciences

Given the increasing need to create multidisciplinary teams to focus on the complex problems of today, we believe that rural social science graduate programs should be reviewed for adequacy and appropriateness. Considerations should be given to the breadth of social science training, perhaps to requiring different rural sociologists to include the other social sciences and philosophy in their programs of study. Similar expectations would be created for students in the basic social science disciplines expecting to apply their expertise in agriculture.

Given the likelihood of significant technological, institutional and human capacity advances, there will be increased demand for social and economic impact assessment of new technologies, institutional changes and human capital development. Graduate educators need to address how the Master's and Ph.D. programs prepare rural social scientists to be effective members of interdisciplinary teams of biological, physical and social scientists. (Perhaps biological and physical science graduate programs will also need to incorporate social science knowledge and perspectives in their graduate programs.)

Special attention needs to be given to types of social science graduate education different universities will provide in the future. There may need to be a greater division of labor among graduate schools in the future. A few may educate (train) primarily discipline oriented scientists, whereas more may need to emphasize multidisciplinary efforts. Regional (and national) efforts are needed to assess whether or not all universities with Ph.D. programs need them. Perhaps some departments can be known for excellence in broad applied research and service and/or undergraduate programs, whereas others may stress more narrow disciplinary excellence in education. An effort to establish a new division of labor based on excellence may actually improve the overall quality of higher education compared

to the present situation where most schools try to emulate each other.

2. Restructuring the Rural Social Science Mix in Colleges of Agricultural Through Teaching Assignments.

Undergraduate education in college of agriculture is undergoing a thorough review at most universities. Declining enrollments, changing occupational opportunities, the internationalization of agriculture, changing technology and other factors have stimulated an assessment of what should be modern undergraduate curricula in colleges of agriculture.

Much attention should be given to the role of an undergraduate agricultural degree. Should it provide more of a broader-based "liberal arts" education and less of a (narrow) technical degree? Should the master's degree become the accepted specialization degree in technical arenas?

At the undergraduate level, should colleges of agriculture hire philosophers, geographers, political scientists, agricultural historians, anthropologists and others to broaden the understanding of agriculture and rural life as we prepare to enter the 21st Century. Staffing innovations that some universities have experimented with should be evaluated and considered by other schools.

F. Building Political Power Bases for Rural Social Sciences: Bachelor's graduates, professional master's, leadership training, public service, extension. etc.

There is a need for the rural social sciences to build a more effective power base at state and national levels. The rural social scientists have not historically had the natural constituencies that animal and plant scientists have had with commodity and other farm organizations.

Generally, rural social scientists have not devoted much time to develop meaningful linkages with important rural and non-farm rural groups. Historically, agricultural economist have developed clientele groups among farm record keepers, cooperative organizations, commodity groups (dairy, cotton, tobacco, horticulture, etc.) governmental officials (federal, state, local, international), farm credit agencies (public, private and parastatal), and land grant administrators. More recently, rural sociologists have been successful in developing clientele relationships with land grant extension service and experiment station groups. Internationally, agricultural economists and, to a lesser extent, rural sociologists and anthropologists have been successful in developing meaningful clientele relationships.

By meaningful we mean constituencies who understand the role that rural social sciences can play in solving the problems of agriculture, rural America (and the world). Some members of these constituencies should understand the concepts, models and methods of rural social scientists.

Most of the contemporary problems of agriculture and rural areas have major political, social, geographic, and economics and will therefore be solved in part by utilizing the knowledge base of rural social scientists. Often (too often) we hear that the solution is to be a "technological fix," e.g., developing a new biotech or electronic (physical) innovation will solve the problem. too often such new technologies have failed to solve problems for many people and communities.

Rural social scientists need to identify relevant constituencies and build links with them. We believe there are many possible individuals and organizations that could help speak on our behalf. Thee include our former undergraduate students who have taken our classes or majored in our fields and who are now in key positions. Similarly, graduates of our professional master's programs are often in key business, government and education positions. Participants in our many special short courses (on leadership, finance, marketing, policy, etc.) at state and local levels have benefitted from our research and knowledge base and should be supportive of our programs. There are many public service groups who have utilized our work extensively. These include the National Governors Association, Council on State Governments, National Conference of State Legislatures, National Industry - State Agricultural Research Committee, Council of State Policy and Planning agencies, National Association of State Development

Agencies, National Association of Counties, and the National Association of Towns and Townships.

Rural social scientists also need to take a more active role in state and national legislative processes. We need to better understand how these processes work and how we can provide timely information to both authorizing and appropriations committees. We need to present our own rural social science needs in these same forums.

G. Summary

Rural social scientists need to give increased attention to alternative human capital strategies for the beginning of the 21st Century. We need to reassess our undergraduate and graduate curriculum and program and communicate our needs to relevant constituencies.

H. Funding Strategies

It was felt that special groups at the second conference should address the following topics having to do with funding of rural social science and agriculturally related basic social science research.

1. Attention should be given to Federal funding strategies and levels for problem solving, subject matter and disciplinary research in the ERS, CSRS and the CSES. In this connection, consideration should be given to the roles of ESCOP, ECOP, NASULGC, NASCARR, the Joint

Council, Congressional offices and their staffs as well as COSSA.

2. Attention should be given to the special support, facilities and services needs for social science research in universities and agricultural experiment stations. By way of elaboration, it is noted that the support service and facilities needed in the social sciences are substantially different than those needed by the biological and physical agricultural sciences and that, further, the majority of agricultural experiment station directors are not experienced in using or providing such support, facilities and services.

3. The problems associated with state funding of the rural social sciences and agriculturally related research of the basic social sciences should be specifically addressed. Increasingly, agricultural research support comes from state governments. Often such support is most readily available and most easily earned by addressing specific problems of specific interest to state legislators and governors.

4. Private sector funding of social science research relevant for agriculture. By and large, the social sciences do not receive substantial support from private sector agencies. However, there are opportunities in this area which should be explored at the second SSAAP conference.

II. Needed Research on the Administration, Funding and Conduct of Rural Social Science and Agriculturally Relevant Basic Social Science, Education, Research Structures and Information Delivery Systems

The concurrent group felt that needed research could be organized under the following headings:

A. Education. This group can very well be combined with the above mentioned groups having to do with the formation of social science human capital. It was thought that attention should be given to educational goals and philosophy, the history of social science education, the organization and administration of social science, education, funding, curriculum problems at both graduate and undergraduate levels, clientele groups and finally, its impact.

B. Research on the administration, conduct and funding of social science research. Under this heading, goals and priorities, history and philosophy, techniques, the organization of sociological, economic and political agricultural research, research management and organization vis-a-vis disciplinary, subject matter and problems solving research, research processes and dynamics, and impacts and consequences of social science research relevant for agriculture.

C. Information or knowledge delivery and utilization. By way of elaboration, the group felt that attention should be given to

theories concerning these processes, intra-organizational problems involving the administration of knowledge, delivery and utilization systems, inter-organizational issues involving clients and the structural relationships among different organizations, techniques and data bases used and finally, impacts and consequences.

APPENDIX

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Appendix

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