NONFORMAL EDUCATION DELIVERY SYSTEMS TO REACH LIMITED RESOURCE FARMERS IN MICHIGAN

By

Thomas M. Olson

A DISSERTATION

Submitted to
Michigan State University
in partial fulfillment of the requirements
for the degree of

DOCTOR OF PHILOSOPHY

Department of Agricultural Economics

1978

ABSTRACT

NONFORMAL EDUCATION DELIVERY SYSTEMS
TO REACH LIMITED RESOURCE FARMERS
IN MICHIGAN

By

Thomas M. Olson

Small farms have been basic to the structure of American agriculture. They represent some of the values which this nation was founded upon. However, technological developments over the past several decades have resulted in great increases in agricultural productivity which have not been shared by small farmers. This has resulted in a changing structure of agriculture to fewer, larger and more commercially oriented farms.

In recent years there has been an increased concern for the future of small farms. The 1977 Farm Bill reflected these concerns by providing for research programs on small farm problems, and for small farm extension programs. The primary purpose of this study was to examine the information gathering process of small farmers in relation to the education and information delivery systems of the Cooperative Extension Service in Michigan.

The first objective of this research was to examine

the sources of information used by small farmers in Michigan. The second objective was to examine the importance of various types of information as perceived by small farmers and as perceived by County Extension Agents. The third objective was to examine alternative informational delivery systems or nonformal educational delivery systems that the Cooperative Extension Service could utilize in reaching small farm operators. The fourth objective was to try to identify some high priority areas for resource allocation alternatives for the Michigan Cooperative Extension Service if additional funds are made available to operate special educational programs for small farm operators.

Three conceptual models of the diffusion of information were examined and used in this study. These were the problem-solving model, the research and development model and the diffusion of innovations model.

A mail questionnaire was developed and mailed to 800 persons whose names were obtained from the Agricultural Stabilization and Conservation Service in six Michigan counties. The counties were chosen by a random process, as were the names. In addition, each of the County Directors for the six survey counties was interviewed.

The survey respondents closely represented the 1974 Census of Agriculture in percentage breakdown by occupation, age of the operator and farm size. Farms were categorized based on the gross farm income categories of

the 1974 Census of Agriculture.

The survey results showed that all farmers use a wide variety of sources of information and that there is a relationship between size of farm and the frequency of citing particular sources. There is a relationship between size of farm and contact with Extension with the $20,000 to $39,999 farm income category having the highest contact.

The results also showed a relationship between size of farm and perceived importance of types of information. Small farmers tended to place less importance on technical or institutional information than did larger farmers.

In terms of informational delivery systems, one conclusion was that small farmers need basic "how to" types of information. The small farm respondents expressed a willingness to attend meetings and suggested several topics for discussion. These topics included several "how to" subjects and also general areas of interest for small farmers.

Suggestions were made concerning the use of various channels for reaching small farmers. Mass media channels can be used in creating awareness and in presenting some fundamental agricultural practices. Interpersonal channels can be used to involve small farmers in "how to" types of programs.

Several high priority areas for resource allocation were suggested. These areas included research on small farm subjects, development of bulletins for small farmers,

county level small farm programs, and regional and state-level back-stopping and coordination activities. In addition, several suggestions for further research were presented.

To Poonsin and our daughter Tatana

ACKNOWLEDGMENTS

> Practically all works we usually call our own represent only a few scoops of originality added on top of a mountain of knowledge received from others.
>
> Nicholas Georgescu-Roegen

This work would not have been possible without the guidance and advice of many people. Special thanks and appreciation go to Dr. Ralph E. Hepp, my Research Supervisor, for his assistance, support, and encouragement and to Dr. Warren H. Vincent, my Guidance Committee Chairman, for his help in this research and in seeing me through my program of study. One could not have better members of a Research Committee than Drs. Harold Riley, George Axinn, Cole Brembeck, and George Stachwick. Their criticisms, comments, and suggestions were always valuable.

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

CHAPTER I

INTRODUCTION

Early Beginnings of Small Farms in America

The American agricultural economy was originally based on a structure which consisted of a large number of small farms. The right to own land was one of the driving forces for millions of immigrants who came to this country to settle vacant land and establish farms. These farms were nearly always small due to the realities of the hazards and sacrifices of pioneer life and due to the Puritan convictions regarding proper forms for civil and religious governance. Various Ordinances issued by the Continental Congress in the 1780's established procedures for surveying new territories and dividing them into lots of 320 acres, and subsequent acts provided for division into even smaller lots until in 1832 the federal surveyor was authorized to lay out quarter-quarter sections, or 40 acres tracts, for sale.[1] At the then prevailing price of $1.25 per acre, the public lands were thus brought within the price range of virtually all prospective settlers.[2]

The societal goals and values which resulted in a structure of small farms were articulated by Thomas

Jefferson, John Adams and other early leaders in American history. These values included freedom, independence, self-reliance, ability to resist oppressors, the right to own property and the right to occupy and thus acquire vacant land. In those early days the right to own and occupy land was also the right to a job. "Freedom of entry to land and thus to employment was therefore a cornerstone of historic American policy toward the small or family farm."[3]

The importance of agriculture in the American economy led to the passage of the Morrill Land-Grant Act in 1862 which set up educational institutions in each state "where the leading object shall be, without excluding other scientific and classical studies and including military tactics, to teach such branches of learning as are related to agriculture and mechanic arts in such manner as the legislatures of the states may respectively prescribe in order to promote the liberal and practical education of the industrial classes in the several pursuits and professions in life."[4] In 1887 the Hatch Act was passed by Congress to provide federal assistance in setting up and maintaining agricultural experiment stations at each of the land-grant colleges. By 1914 the Smith-Lever Act was passed which provided that extension work in agriculture and home economics should be carried on by the land-grant colleges in cooperation with the United States Department of Agriculture. The result of these acts was

the establishment of a land-grant system of teaching, research and extension that has been unparalleled in the rest of the world. This system has helped to develop new technology in the form of labor-saving machines, pesticides, and high-yielding varieties of crops. The agricultural workforce is now much more productive both in terms of yield per acre and yield per worker than earlier generations. The United States Department of Agriculture can now boast that one farmer can feed 45 Americans, and that the U.S. is the "bread-basket" of the world.[5]

Effects of Productivity Growth on Farm Structure

The growth in productivity of American agriculture, particularly in the last fifty years, has resulted in changing the structure of the American system in terms of the number and size of farms. Agricultural statistics show that the number of farms in the United States has steadily declined since 1935, and between 1950 and 1975 they declined by 50 percent.[6] In 1975 the top 16 percent of farms contributed 70 percent of the sales of farm products while the bottom 43 percent of the farms had gross sales of less than $5,000 and contributed only 5 percent of farm product sales.[7] Generally, the farms with the least amount of farm sales have gone out of business. Between 1960 and 1973 the number of farms in the U.S. with gross annual sales under $20,000 decreased by about 1.8 million, or nearly fifty percent. Although about one

third of these moved into categories with gross annual sales over $20,000, the other two-thirds went out of business.[8] The trend has been toward more capital intensive, commercially oriented types of farms while the smallest farms have not been able to survive.

Responses to Changing Farm Size and Structure

This changing structure of American agriculture to fewer farms of larger size has resulted in increased concern for the small farmer by individuals, various groups and by state and federal governments. In 1967 the Extension Committee on Organization and Policy (ECOP) issued a report entitled "Extension's Responsibility to Farmers and Ranchers With Gross Farm Income Less Than $10,000." At that time this included nearly three-fourths of the farms in the United States.[9] The report concludes:

> Extension has a very definite responsibility to serve these farmers and their families and has been serving many of them effectively within the limitations of available resources. Continued pressures for use of these limited resources for other high priority programs prevent their full utilization in developing the concentrated programs required to make more significant progress.[10]

In 1972 the publication of Hard Tomatoes, Hard Times by Jim Hightower of the Agribusiness Accountability Project called attention to the small farmer. "The message of the report is that the tax-paid, land grant complex has come to serve an elite of private, corporate interests in rural America, while ignoring those who have the most urgent needs and the most legitimate claims for assistance.[11]

Hightower charged that the large scale commercialization of agriculture has left a large segment of the farm population with low incomes, has exacerbated the unequal income distribution between rural and urban populations and between small and large farmers, and has resulted in rural to urban migration which has increased problems of urban unemployment and unrest.

The Rural Development Act of 1972 included an amendment which would have required the establishment of a program for small farmers who desired to "upgrade" their operations through Cooperative Extension programs.[12] This would have involved research on innovative approaches to small farm management and technology, training, and technical assistance to small farms. Unfortunately the Administration never implemented the small farm section of The Rural Development Act, but the substance of this section has reemerged in later legislation which may have more of a chance for implementation given the favorable attitude of the new Administration.

In 1975 the General Accounting Office made a report to the Congress entitled Some Problems Impeding Economic Improvement of Small-Farm Operations: What the Department of Agriculture Could Do. The report was critical of the U.S.D.A. and the land grant system for not meeting the needs of the small farmers. The report states:

> Although some publicly supported extension and research projects have related to the needs of small-farm operators, USDA and the land-grant

> colleges have not made a concerted effort to solve problems impeding the economic improvement of small farm operations. USDA and the land-grant colleges have not, to a great extent, 1) evaluated the economic and social impacts of production-efficiency research nor 2) determined the assistance that small-farm operators need to plan for and adjust to changes brought about by such research.[13]

The report concluded that the USDA and the land-grant colleges are the logical developers of research and extension information for small farms and recommended that the United States Department of Agriculture:

> Identify small-farm operators in their productive years who depend on the farm as their primary source of income and categorize them according to their resources, abilities, educational experiences, and willingness to improve their operations by using available technology and efficient management practices.
>
> Estimate the costs and benefits of programs needed to extend training and technical assistance to small-farm operators having the potential for improvement and present the information to the Congress for its consideration.
>
> Examine the potential for research uniquely designed to improve the economic position of small-farm operators and, if such potential exists, consider the priority of such research in relation to other federally funded agricultural research.
>
> Establish procedures for 1) evaluating the economic and social impacts of future research that could greatly change the productivity, structure, and/or size of existing farms, and 2) determining the assistance small-farm operators would need to plan for and adjust to the resulting changes.[14]

These recommendations were quoted in full in a report to the Senate from the Committee on Agriculture and Forestry. This report recommended ammending the Rural Development Act of 1972 to require the Secretary of Agriculture to carry out small farm extension, research and development

programs which "shall consist of extension and research programs with respect to new approaches for small farms in management, agricultural production techniques, farm machinery technology, new products, cooperative agricultural marketing, and distribution suitable to the economic development of family size farm operations."[15]

The 1977 Farm Bill again dealt with the issues and concerns of small farmers and a special section of the bill addressed small farm research and extension programs. This section amended the Rural Development Act of 1972 to read as follows:

> SMALL FARM RESEARCH PROGRAMS - Small farm research programs shall consist of programs of research to develop new approaches for initiating and upgrading small farmer operations through management techniques, agricultural production techniques, farm machinery technology, new products, new marketing techniques, and small farm finance, and
>
> SMALL FARM EXTENSION PROGRAMS - Small farm extension programs shall consist of extension programs to improve operations of small farmers using, to the maximum extent practicable, paraprofessional personnel to work with small farmers on an intensive basis to initiate and improve management techniques, agricultural production techniques, farm machinery technology, marketing techniques, and small farm finance, and to increase utilization by small farmers of existing services offered by the United State Department of Agriculture and other public and private agencies and organizations.[16]

In order to carry out the above programs the bill also authorized a budget "not to exceed $20,000,000 for each of the fiscal years ending September 30, 1978 and September 30, 1979."[17]

The above legislation may have been influenced in

part by a number of publications dealing with American agriculture and small farms in general which appeared in the mid-1970's. These books raised questions about the appropriate size of farms, the food production and distribution system, chemical additives, food price inflation, corporate influence in farming and many many more.[18] In general these books have increased public awareness of these problems which has resulted in action by various agencies and governmental bodies at the local, state and federal levels. Currently the U.S. Department of Agriculture and the Community Services Administration are co-sponsoring a series of regional small farms conferences throughout the nation designed to:

> Provide small farm operators an opportunity to identify problems that are important to their farm operations and families.
>
> Develop priority needs and suggest programs that will benefit small farm operators and their families.
>
> Identify what small farm operators need, as contrasted with what other farmers need.[19]

A Changing Philosophy

Many factors have affected the size of farms and structure of American agriculture, but underlying these has been a philosophy based on the principles of competition and free enterprise. One of these principles is self-gratification, which includes the concept that bigger is better and more of something is more desirable than less of that seme thing. The emphasis is upon efficiency, and

those units which are less efficient and cannot compete, naturally, are forced out of the business. For years the migration from the farms to urban centers was seen as a natural consequence of the competitive system, and the benefits accrued to society in terms of increased productivity of food and fiber at lower costs. Bigness was part of the American way of life.

Along with the increased concern for the small farmer shown by the publications and legislation of the past several years, however, there is also emerging an alternative philosophy regarding size. This has become increasingly popular since the publishing of Small is Beautiful, Economics os if People Mattered by E.F. Schumaker in 1973.[20] This philosophy can be traced back to Ghandi and other eastern sages whose main concerns were for quality of life and spiritual well-being, and who had a deep respect for nature and the environment.[21] The current thinking of Schumaker and others reflect "some deep-seated and recurring concerns about size and scale in many of the activities undertaken in the name of modern production systems."[22] It requires an examination of smallness and an understanding of why we are where we are today. The present research will hopefully contribute to the growing knowledge base concerning small farms and, more practically, will offer suggestions to alleviate some of the problems of small farmers.

Response by Cooperative Extension Service

Flexibility and change have been major attributes of the Cooperative Extension Service over the years.

> Much of the successful achievement of the Cooperative Extension Service in the United States may be attributed to its willingness and ability to change as the needs and interests of its clientele change. The goals and objectives of the entire system have been restated almost every decade and have shifted dramatically.[23]

The Cooperative Extension Service has responded in a number of ways to the changes cited above. At the national level the U.S.D.A. and Community Services Administration are sponsoring a series of regional workshops on the problems of small farmers, as mentioned earlier. Various states have developed small farmer programs using paraprofessionals and program aids to work with small farmers. In Michigan various County Agents have programs for small farmers using program aids and volunteers. Others have conducted group meetings for small farmers. In December of 1977 there was a workshop on programming from small/part-time farmers for County Agents. The state has also begun publishing a series of bulletins designed for use by small farmers which are being made available through the usual channels of the Cooperative Extension Service.

Importance of Small Farms in Michigan

Although farm numbers are still declining (after a slight reversal in the early 1970s) and the average size

of farm operation is increasing, small farms still hold an important position in American agriculture, and particularly in Michigan. In terms of numbers, figures cited by Hepp[23] from the 1974 Census of Agriculture show that 85 percent of Michigan's farms are small, 11 percent are medium sized and 4 percent are large.[24] Full-time farms comprise 54 percent of the farm operations and over two-thirds of these full-time farmers operate small farms. Nearly 98 percent of the part-time farmers operate small farms.

It is true that average farm size is increasing, but the large farm operators farm almost two-thirds of the agricultural land in Michigan and they rent about 44 percent of the rented land. Small farms average 123 acres per farm versus 342 acres for medium sized farms and 631 for large farms.

It is in terms of gross (and net) agricultural income that the small farms fall short. Hepp estimates that small farms receive only 33 percent of the gross revenue from the sale of agricultural products while medium size farms receive 28 percent and large farms receive 39 percent. Although small farms comprise 85 percent of the farms by number, they sell only one third of the agricultural products.

One reason for this is low productivity. Hepp estimates crop yields of corn for grain at 59 bushels per acre for small farmers versus 62 for medium and 68 for

large farmers. Likewise small farmers had lower yields for wheat, soybeans and hay. In an earlier study Thompson and Hepp estimated that crop yields on small farms are 12 percent to 30 percent lower than yields on large farms and livestock productivity is also low compared to large farms.[25] Also Hepp and Thompson conclude that small farms have a higher percentage of tillable land in low-return crops while the larger farms raise crops which have a relatively high rate of return.

Motivation for This Research

This research is a response to many of the same concerns which prompted the various publications and acts of legislation described earlier, but primarily it is a response to the changing structure of agriculture and the questionable future of small farms in America. It is motivated in part by the author's background which includes being raised on a small farm, and by a concern for change and development which was fostered during three years in the Peace Corps. It is also motivated by the fact that the majority of farms in Michigan, as well as in developing nations, are small (although the criteria for "small" varies tremendously between the United States and other nations), and that small farms contribute to the well-being of society. This is applied, problem solving research which hopefully will

benefit the small farmers in the state of Michigan and elsewhere.

Purpose and Objectives

Given the task ahead for researchers of small farm problems, it seems obvious that the subject must be narrowed down to researchable units. The problems are all interconnected and related, but individual problems need to be analyzed separately in hopes of gaining further insight into the whole. In their report, Description and Analysis of Michigan Small Farms, Thompson and Hepp concluded that increases in net cash income on small farms are possible and emphasized the necessity for improvements in farm management practices.[26] They suggested that further research was needed in farm management relative to small farms in Michigan. They also suggested that the Cooperative Extension Service could play an important role in attacking the problems of small farms by tailoring some of their programs to the needs of the small farmers. It is the purpose of this study to examine one aspect of the farm management process relevant to small farmers in relation to the education and information distribution systems of the Cooperative Extension Service. More specifically, this study will examine that part of the decision making process of

farm management which involves observation, or information gathering, and the role of the Cooperative Extension Service in distributing information, providing educational programs and initiating change among farmers.

The first objective of this research is to examine the sources of information used by small farmers in Michigan.

The second objective is to examine the importance of various types of information as perceived by small farmers and as perceived by County Extension Agents.

The third objective is to examine alternative informational delivery systems or nonformal educational delivery systems that the Cooperative Extension service could utilize in reaching small farm operators.

The fourth objective is to try to identify some high priority areas for resource allocation alternatives for the Michigan Cooperative Extension Service if additional funds are made available to operate special educational programs for small farm operators.

Some Hypotheses

The above stated objectives led to the development of some specific objectives which could be tested by

various statistical measures. The statistical procedures used were the Chi Square, the Kendall Correlation Coefficient and tests of binomial parameters. The hypotheses included:

1. Ho: There is no relationship between farm size category and sources of information used.
   Ha: There is a relationship between farm size category and sources of information used (i.e., small farmers use some sources more frequently than large farmers, and vice versa).

2. Ho: There is no relationship between farm size category and contact with Cooperative Extension.
   Ha: Larger farms have more contact with Cooperative Extension than do smaller farms.

3. Ho: There is no relationship between farm size category and perceived importance of various types of information.
   Ha: There is a relationship between farm size category and perceived importance of various types of information.

4. Ho: There is no relationship between farm size category and their ranking of specific problems by importance.
   Ha: There is a relationship between farm size category and their ranking of specific problems by importance.

5. Ho: There is no relationship between size of farm and rationality of decision making as measured by scores on a test instrument.
   Ha: There is a relationship between size of farm and rationality of decision making as measured by scores on a test instrument.

6. Ho: There is no relationship between size of farm category and information gathering activities as measured by scores on a test instrument.
   Ha: There is a relationship between size of farm category and information gathering activities as measured by scores on a test instrument.

Scope and Limitations of the Study

This research is primarily concerned with the informational flows to small farmers in Michigan. The function of gathering information is just one part of the decision making process of farm management, but as Dr. Glenn Johnson wrote with reference to the Interstate Managerial Study, "The vastness of management as an area of research precluded complete coverage of all the managerial functions."[27] Mention will necessarily be made of the other functions of management, but this research will not analyze these other important areas.

Definition of Terms

So far the terms small, medium and large in reference to farms have been used rather vaguely. These adjectives are, of course, relative and there is no consensus regarding the definition of a small farm. This is due in part to the diversity of crops and livestock in agricultural production, the various physical constraints on agricultural land in different areas of the country and the intermix of farm and off-farm employment of rural people. The definition also depends upon the measurement variable that is used, which may be in physical units such as number of acres or livestock or the amount of labor employed, production units such as bushels of apples or pounds of milk produced, or dollar figures such as gross or net income (which may or may not include off-farm figures).

According to the Economic Research Service of the United States Department of Agriculture gross farm income and total family income are the most important factors to use in defining a small-farm operator.[28] In the study cited earlier by Thompson and Hepp a small farm was defined as one with over ten acres of farmland which had gross agricultural sales of between $50 and $20,000 at 1969 agricultural price levels.[29] Hepp recently updated the definition using information from the 1974 Census of Agriculture to define small farms as those grossing under $40,000 from agricultural products, medium farms as those grossing between $40,000 and $100,000 and large farms as those grossing over $100,000 per year.[30] The present research will use this latest definition based on gross annual sales, although in some analyses the small farm category will be broken down into smaller categories in conformance with the categories of the 1974 Census of Agriculture.

For census purposes the minimum criteria for the definition of a farm has been changed nine times since the census was first taken. The most recent change deletes the criterion for number of acres (previous minimum was ten) and changes the criterion for minimum value of agricultural products sold (either actually or potentially) to $1,000.[31] For purposes of this research there was no minimum gross farm income determined. The respondents were asked whether or not they operated a farm before being asked to complete the questionnaire.[32]

The term information as used in this research will be defined as "The communication or reception of knowledge or intelligence . . . knowledge communicated by others or obtained from investigation, study or instruction."[33] This will include all types of knowledge and process skills relevant to agricultural production and farm management as well as knowledge of nonagricultural subjec areas. It does not include information in the statistical sense of sequential analysis or measurement of the uncertainty of an experiment to be performed. Information theory in this sense is left to the statisticians.[34] Also, it does not refer to data or agricultural facts such as those found in Michigan Agricultural Statistics.[35] Data are collected to measure some empirical phenomena, but do not become information until they have been analyzed, interpreted and put into a purposeful decision-making context.[36] For purposes of this study the same is true of research reports and the development of new technology. It is largely the role of the Cooperative Extension Service to interpret the research results of the land-grant universities and adapt them to the needs of farmers so that they can be used to solve problems in a decision-making process at the farm level.

Information is tied closely to education, and both distribution of information and education are major functions of the Cooperative Extension Service. For purposes of this research education is equated with learning, and

thus "education is obviously a continuing process, spanning the years from earliest infancy through adulthood and necessarily involving a great variety of methods and sources."[37] Formal education is the highly institutionalized, chronologically graded and highly structured system which is characterized by rigidity, rules and regulations, paid faculty and a set curriculum. Nonformal education, on the other hand, "is any organized, systematic educational activity carried on outside the framework of the formal system to provide selected types of learning to particular subgroups in the population, adults as well as children."[38] The bulk of Cooperative Extension Service activity is in the nonformal education category.

Another distinction which needs to be made is between source of information and channel of information. In communication theory, as will be discussed in Chapter II, the source of information is the person or institution which developes the information or new knowledge. In agriculture the source of much of the agricultural information which is available, particularly with regard to new technology, is typically the land grant universities and agricultural experiment stations. The channel, on the other hand, is the "means through which the source conveys a message to the receiver."[39] In agriculture the means are typically through the Cooperative Extension Service, which in turn uses other means such as mass media, publications, or group

meetings to get the message to the farmers. The present research is concerned primarily with the channels of communication of agricultural information, but since the average layman makes no distinction between sources of information and channels of information, and more commonly uses the term sources of information, the term sources will be used interchangably with channels of information in this report.

Organization of the Report

This introduction has presented some of the history of American agriculture, the role of the small farm, and various changes in the size and structure of farms in America. It has discussed some public and private concerns for small farms which has resulted from these changes, and also a changing philosophy toward small farms and smallness in general. These concerns have motivated the present research. The importance of small farms in Michigan was discussed, as well as the purpose and objectives of this research, its scope and limitations, and some basic definitions.

Chapter two is devoted to reviewing the relevant literature and explaining some of the conceptual models used in this research. It reviews past research on the diffusion of information, decision making and cooperative extension.

Chapter three explains the survey design and the

mechanics of data collection.

Chapter four is an analysis of the survey data. It includes analyses of the general representativeness of the data, types of farm and home decisions made by farmers, the sources most often cited, rationality of decision making as measured by a test instrument, and contact with Cooperative Extension.

Chapter five reviews and analyzes the interviews with County Agents of the Cooperative Extension Service, looking particularly at the types of farmer who demand the most of their time and their assessments of the informational needs and problem situations of small farmers.

Chapter six is a synthesis of the previous chapters, and particularly of chapters four and five. This chapter pulls together the results of the mail survey and the County Agent interviews to make suggestions for extension educational programs for small farm operators.

Chapter seven contains the summary and conclusions, and suggestions for further research on small farms.

Footnotes

[1]Philip M. Raup, "Societal Goals in Farm Size," in Size, Structure and Future of Farms, ed. by A. Gordon Ball and Earl O. Heady (Ames, Iowa: The Iowa State University Press, 1972), p. 4.

[2]Ibid., p. 4.

[3]Ibid., p. 5.

[4]The Morill Land-Grant Act of 1862, quoted in Edmund deS. Brunner and E. Hsin Pao Yang, Rural America and the Extension Service: A History and Critique of the Cooperative Agricultural and Home Economics Extension Service, (New York: Bureau of Publications, Teachers College, Columbia University, 1949), pp. 4-5.

[5]U.S. Department of Agriculture, Economic Research Service, The American Farmer (Washington, D.C.: U.S. Government Printing Office, 1976), p. 3.

[6]U.S. General Accounting Office, Comptroller General, Report to the Congress; Some Problems Impeding Economic Improvement of Small-Farm Operations: What the Department of Agriculture Could Do, RED-76-2, August 15, 1975, p. 2.

[7]U.S.D.A., E.R.S., The American Farmer, p. 4.

[8]U.S.G.A.O., Report to the Congress, p. 2.

[9]Extension Committee of Organization and Policy, "Extension's Responsibility to Farmers and Ranchers with Gross Farm Income Less than $10,000," Report of Project III Committee, May 4, 1967, p. 5.

[10]Ibid.

[11]Jim Hightower, Hard Tomatoes, Hard Times, A Report of the Agribusiness Accountability Project on the Failure of America's Land Grant College Complex, with a Foreward by Senator James Abourezk (Cambridge, Massachusetts: Schenkman Publishing Company, 1972), p. xvii.

[12]U.S. Congress, House, Committee on the Judiciary, Antitrust Subcommittee, Family Farm Act, Report, 94th Congress, September, 1976.

[13]U.S.G.A.O., Report to the Congress, p. 8.

[14]Ibid., p. 26.

[15]U.S. Congress, Senate, Committee on Agriculture and Forestry, Assistance to Small Farmers in Upgrading Their Farming Operations, S. Report 94-1234, 94th Congress, September, 1976.

[16]National Agricultural Research, Extension, and Teaching Policy Act of 1977, Public Law 95-113, September 29, 1977, 7 USC 3101, Subtitle F--Small Farm Research and Extension, Sec. 1404.

[17]Ibid.

[18]See for example A. Gordon Ball and Earl O. Heady, eds., Size, Structure and Future of Farms (Ames, Iowa: The Iowa State University Press, 1972); Catherine Lerza and Michael Jacobson, eds., Food for People, Not for Profit, A Sourcebook on the Food Crisis with a preface by Ralph Nader (New York: Ballatine Books, 1975); Jim Hightower, Eat Your Heart Out, How Food Profiteers Victimize the Consumer (New York: Vintage Books, 1976); Richard Merrill, ed., Radical Agriculture (New York: Harper Colophon Books, 1976).

[19]U.S. Department of Agriculture and Community Services Administration, "Regional Small Farms Conference, Results of Work Group Sessions August 16-17, 1978, Des Moins, Iowa," p. 1.

[20]E.F. Schumaker, Small is Beautiful, Economics as if People Mattered (New York: Harper & Row, 1973).

[21]For a good discussion of an Indian philosopher whose ideas addressed the problems of the rural poor and smallness see George H. Axinn, New Strategies for Rural Development, Chapter 1, "Introduction--An Inspiration from the Past," (DeWitt, Michigan: Rural Life Associates, 1978), pp. 5-10.

[22]Otto C. Doering III, "Introductory Comments," American Journal of Agricultural Economics 60 (May 1978): p. 293.

[23]George H. Axinn and Sudhakar Thorat, Modernizing World Agriculture. A Comparative Study of Agricultural Extension Systems (New York: Praeger Publishers, 1972) p. 103.

[24]Definitions used in this study will be discussed later in this chapter. Hepp defines small farms as those with gross agricultural sales less than $40,000, medium farms as those between $40,000 and $100,000, and large farms as those grossing over $100,000. See Ralph E. Hepp, "Characteristics of Michigan's Small Frams," Staff Paper No. 77-73, Department of Agricultural Economics, Michigan State University, 1977.

[25]Ronald L. Thompson and Ralph E. Hepp, "Description and Analysis of Michigan Small Farms," Research Report 296, Michigan State University Agricultural Experiment Station, East Lansing, Michigan, March, 1976, p. 19.

[26]Ibid., p. 3.

[27]Glenn L. Johnson, Chapter 8, "Action Taking and Responsibility Bearing," in A Study of Managerial Processes of Midwestern Farmers, ed. by Glenn L. Johnson, Albert N. Halter, Harold R. Jensen and D. Woods Thomas (Ames, Iowa: The Iowa State University Press, 1961), p. 140.

[28]U.S.G.A.O., Report to the Congress, p. 4.

[29]Thompson and Hepp, "Description," p. 4.

[30]Hepp, "Characteristics," p. 1.

[31]U.S. Department of Commerce, Bureau of the Census, 1974 Census of Agriculture, Michigan State and County Data, Volume 1, Part 22, pp. IX-X.

[32]Several people responded that they had "hobby farms" or a few acres, but that they did not really "operate a farm."

[33]Websters Third New International Dictionary of the English Language Unabridged, 1964.

[34]See for example Henri Theil, Economics and Information Theory (Amsterdam: North-Holland Publishing Company, 1967) or Abram Wald, Sequential Analysis (New York: John Wiley and Sons, 1947).

[35]U.S. Department of Agriculture; Economics, Statistics and Cooperatives Service with Michigan Department of Agriculture, Marketing Division, Michigan Agricultural Statistics, (Lansing, Michigan: Michigan Crop Reporting Service, published yearly).

[36]James T. Bonnen, "Assessment of the Current Agricultural Data Base: An Information System Approach," in A Survey of Agricultural Economics Literature, 2 vols., ed. by Lee R. Martin (Minneapolis, Minnesota: The University of Minnesota Press, 1977), 2:397.

[37]Philip H. Coombs with Manzoor Ahmed, Attacking Rural Poverty, How Nonformal Education Can Help (Baltimore: The John Hopkins University Press, 1974), p. 8.

[38]Ibid.

[39]Everett M. Rogers in association with Lynne Svenning, Modernization Among Peasants, The Impact of Communications (New York: Holt, Rinehart and Winston, Inc., 1969), p. 124.

CHAPTER II

REVIEW OF RELATED LITERATURE

Overview

There is a growing volume of literature related to the problems of small farms. Much of this concerns the problems of rural poverty which often require special programs in unemployment, housing and health.[1] This literature is informative and interesting, but not directly related to the present research so it will not be reviewed formally.

The subject of dissemination of information or the diffusion of innovations has "traditionally been the domain of rural sociology or geography."[2] Thus, literature from these disciplines will be reviewed for background and conceptual models. Research in farm management and agricultural economics has been concerned less with the diffusion of information than with the decision making process of farmers. This literature will be reviewed for its contributions. Some research concerning Cooperative Extension will also be reviewed.

Diffusion of Innovations Models

The diffusion of innovations is a particular type of communication which attempts to explain the spread, or diffusion, of innovations, new ideas or new technologies from a relatively advanced sector of an economy to a lagging or traditional sector. One of the early studies which has become a classic was on the diffusion of hybrid seed corn in the 1930's and early 1940's in the midwest.[3] This study showed first a very slow rate of adoption of the new hybrid followed by a period of very rapid adoption which then slowed as the last few adopters made their decisions. In general these studies used adoption of an innovation as the dependent variable and looked at characteristics of the independent variables of early versus late adopters, the rate of adoption over time, perceived attributes of innovations, opinion leadership, communication channel usage and other processes in the diffusion of new technology.

By the early 1960's several hundred such studies had been conducted by independent researchers at various universities throughout the United States. Foremost among these were Charles Loomis, George Beal, Joe Bohlen, Eugene Wilkening, Herbert Lionberger and Everett Rogers, to name a few.[4] These researchers had developed variations of a theoretical model, but it was not until Everett Rogers published his book Diffusion of Innovations in 1962 that these research reports were compiled and synthesized into

a general theoretical model with a manageable number of generalizations.[5] Rogers pulled together some 405 research reports in writing this book, but by the early 1970's there were some 1,500 research reports concerning the diffusion of innovations, many of which involved research in countries other than the United States. In 1971 Rogers updated his earlier book, reinforcing the theory and assumptions, with Communication of Innovations: A Cross Cultural Approach.[6]

According to the various diffusion studies of the 1950's which were summarized by Rogers there are four crucial elements in the diffusion of new ideas. These are 1) the innovation, 2) which is communicated through certain channels 3) over time 4) among the members of a social system.[7] These elements and other main concepts of the diffusion model will be described next.

The Innovation

> The Innovation is an idea, practice or object perceived as new by an individual. It matters little, so far as human behavior is concerned, whether or not an idea is "objectively" new as measured by the lapse of time since its first use or discovery.[8]

Rogers discussed two components of an innovation, an idea component and an object component, or physical product of an innovation. Most of the research reports he analyzed consisted of material innovations such as hybrid seed corn, fertilizer or machinery, but innovations may consist of an idea, skill or process. Thus, the

definition of information used for the present research conforms to the idea of an innovation in the diffusion model.

There are several characteristics which innovations may posses by varying degrees which have been shown to contribute to their rate of adoption. Briefly these are:

1. Relative Advantage is the degree to which an innovation is perceived as being better than the idea it supersedes. The degree of relative advantage is often expressed in economic profitability, but the relative advantage dimension may be measured in other ways.[9]

2. Compatability is the degree to which an innovation is perceived as consistent with existing values, past experiences, and needs of the receivers. An idea that is not compatible with the salient characteristics of a social system will not be adopted so readily as an idea that is compatible.[10]

3. Complexity is the degree to which an innovation is perceived as relatively difficult to understand and use. . . . Although the research evidence is far from conclusive, we suggest . . . The complexity of an innovation, as perceived by members of a social system, is negatively related to its rate of adoption.[11]

4. Trialibility is the degree to which an innovation may be experimented with on a limited basis. New ideas that can be tried on the installment plan will generally be adopted more rapidly than innovations that are not divisible.[12]

5. Observability is the degree to which the results of an innovation are visible to others. The easier it is for an individual to see the results of an innovation, the more likely he is to adopt.[13]

There are, of course, additional characteristics of innovations which may help to explain their adoption, and generally the importance attributed to any characteristic

varies with the discipline in which the research is being conducted. Economists generally look at the relative advantage in terms of economic variables such as profitability of an innovation, asset position of the firm or rates of return over a period of time. Sociologists are generally more concerned with compatibility with existing values of the society.

Communication

Rogers calls diffusion research a subject of communication research that is concerned with new ideas. Probably the oldest model of communications is that of Laswell who described all communication as dealing with "Who says what, through what channels of communication to whom with what . . . results."[14] The model most often used in modern communication research is the S-M-C-R-E model which consists of 1) source, 2) message, 3) channel, 4) receiver and 5) the effects of the communication.[15]

It was noted earlier that in communications research there is a distinction between a source of information and a channel of information. These are two distinct stages in the S-M-C-R-E model. The message is developed by a source and is communicated through various channels. This distinction is not commonly made by the average person, however, and the terms sources and channels are used interchangeably in this study, and particularly in the questionnaire.

Early communication researchers divided the types of

communication channels into two kinds--mass media and interpersonal. The mass media channels are most effective in simply informing an audiance about a new idea, while interpersonal channels may be necessary to persuade an audience or receivers to accept new ideas.

Time

Time enters into the diffusion of innovations model in three ways:

> (1) in the innovation-decision process by which an individual passes from first knowledge of the innovation through its adoption or rejection,
>
> (2) in the innovativeness of the individual, that is, the relative earliness-lateness with which an individual adopts an innovation when compared with other members of his social system, and
>
> (3) in the innovation's rate of adoption in a social system, usually measured as the number of members of the system that adopt the innovation in a given time period.[16]

The innovation-decision process has been conceptualized as a cumulative series of four steps by Rogers. These are (1) knowledge, or awareness of the innovations, (2) persuasion, or the formation of a favorable or unfavorable attitude toward the innovation, (3) decision, or the choice to adopt or reject and (4) confirmation, which may lead to reinforcement or rejection of the decision.[17] This model will be contrasted later with the problem solving models of Johnson and the IMS.

Much of the earlier diffusion research looked at the

innovativeness of individuals and the characteristics of adopters based on the relative time of adoption. These researchers identified five categories of adopters: 1) innovators, 2) early adopters, 3) early majority, 4) late majority and 5) laggards. These categories can be shown graphically in figure 1.

These category names tend to reflect society's normative bias toward early as "good" and late or laggard as "bad." This would tend to bias any research on decision making based on this model. However, the model has resulted in describing many characteristics of the various classes of adopters which have been useful in designing educational programs in agricultural extension and other change agencies.

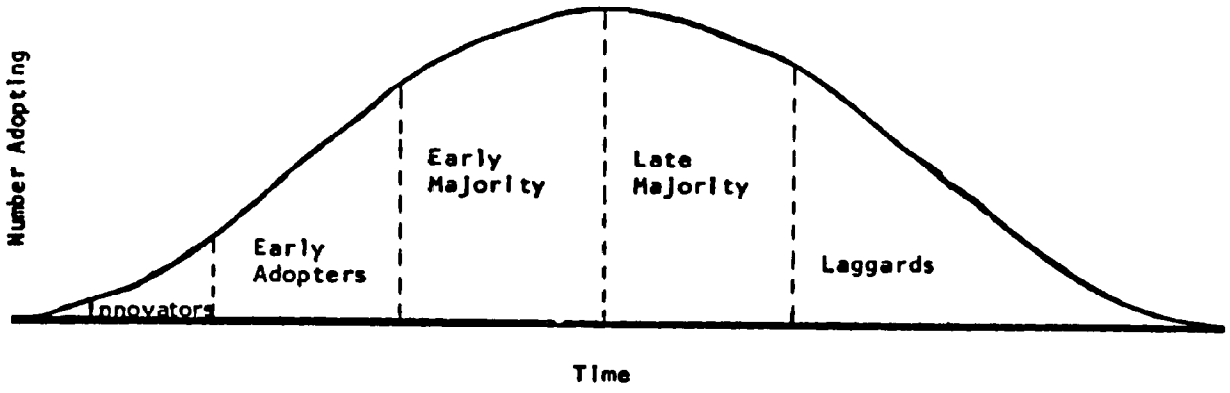

Figure 1. Categories of Adopters on the Basis of Relative Time of Adoption of Innovation[a]

[a]Rogers, Diffusion of Innovations, p. 162.

The third way in which time enters the diffusion of innovations is in the rate of adoption. The rate of

adoption is the relative speed with which an innovation is adopted by members of a social system, and it varies for each innovation and social system. Generally, if the percentage of adoption is plotted against time the result is an "S" shaped curve but the exact shape of this curve varies greatly with the actual rate of adoption. Much of diffusion research has been focused on the rate of adoption and methods to influence (generally increase) the rate of adoption. Some characteristics of the innovation which affect the rate of adoption were presented earlier. Other variables include the nature of the communication channels used, the nature of the social system and the extent of a change agent's promotion efforts.

Social System

The last crucial element of the diffusion model is the social system, which is defined as a collectivity of units which are functionally differentiated and engaged in joint problem solving with respect to a common goal.[18] The social system affects diffusion through norms, attitudes, religion, group pressure and in many other ways.

One of the major assumptions of diffusion research is that social systems are divided into two ideal types or "polar types" which are called the modern and the traditional types. The modern type is "innovative, progressive, developed, scientific, rational, and so on.[19] Traditional social systems are less favorable to change,

have lower levels of literacy, education and understanding of the scientific method. New ideas, naturally, originate in the modern sector and flow towards the traditional sector, eventually reaching the "laggards."

Much of the communication methodology of the Cooperative Extension Service and other change agencies has been based on certain assumptions which rural sociologists and communication researchers have labeled the multi-step flow model or the "trickle-down" model.[20] In this model much of the Extension Agent's attention is focused on the "early adopter." These people are generally better educated, more upwardly mobile, more open to change and suggestion by others, have larger farms and greater capital investment and are commercially oriented. The assumption was that the later adopters would be more likely to adopt an innovation after opinion leaders had adopted it and shown it to be successful. However, the result seems to be that the gulf between the small farmers (the late majority and the laggards) and the larger farmers has widened leaving the problems of small farmers as discussed in Chapter I. This model was never really addressed to the needs of the small farmer.

CRUSK

Rogers' work was considered by many to be the most significant effort in the general area of dissemination and utilization of knowledge of the 1960's.[21] In the late

1960's the United States Department of Health, Education and Welfare made a grant to the Center for Research on Utilization of Scientific Knowledge (CRUSK) of the Institute for Social Research at the University of Michigan. The objective was to do a study of the process of innovation, dissemination and utilization of knowledge. Everett Rogers was a member of the CRUSK team which included representatives from a number of disciplines. The study was to be comprehensive using an interdisciplinary comparative approach.

The CRUSK study was a response to the "knowledge explosion" and to the expectation on the part of government and business leaders that knowledge should be useful to man.[22] This latter is one of the reasons for establishing agricultural extension, and the failure to make knowledge useful to a certain segment of man, namely the small farmer, has prompted the present research. Unlike the diffusion research which dealt mainly with material innovations but included new ideas and processes, the CRUSK study dealt with knowledge in general and included the fields of medicine, social welfare, education and many more.

The CRUSK study cites four levels of knowledge utilization which should be noted. The first is the intrapsychic level, or single-person level, and really forms the basis for the other three. This level requires some psychological assumptions that humans experience various

needs (problems, pain, arousal, etc.) which must be satisfied. Knowledge is useful only in terms of these needs, wants or aspirations. At the intrapsychic level a person may find solutions to a problem internally, or the person may be forced to turn to the outside world. If the person turns to the outside world and seeks help from another person, then knowledge utilization is at a second level, the interpersonal level. This level involves communication between senders and receivers. If the person with the problem must go to several other persons for information, and these people are, in turn, dependent upon still others, then a third level is reached and that is the social system level. At this level there are many things which affect the dissemination and utilization of knowledge, including norms, traditions, roles, organizational structures and institutions. The fourth level which logically follows the first three is the intersystem level. This level involves two or more peoples or cultures. The first level clearly belongs to another discipline for research purposes. The CRUSK study and the diffusion studies, as well as the present study, examine the interpersonal or social system levels but recognize that individual human needs at the intrapsychic level are the basic reason for knowledge utilization and define the usefulness of any information.

It should be noted that there are several methods of information gathering at the intrapsychic level which

this research does not deal with. This includes past experience, limited experimentation, observing others, reasoning from information known to be true and keeping written records. These are all valuable learning tools, but are not the subject of this research.

Much of the CRUSK study involved an extensive review of the literature and the concepts involved in communication. In the course of this review three relatively distinct conceptual models of the diffusion of knowledge were identified which formed the basis for much of the research which had been reported. These three models are shown graphically in figure 2. Within each model there are variations, but each recognizes the existance of various stages in the adoption, dissemination or utilization of knowledge. They differ significantly in their assumptions and in the perspectives taken.

The Social Interaction Model

The first of these conceptual models has already been discussed since the diffusion model is its most prominent member. The CRUSK study called this type the social interaction model because the key to adoption as viewed by the researchers is the social interaction among members of the adopting group.[23] Of the three conceptual models the social interaction model is the richest with regard to empirical data and useful generalizations. The unit of analysis is the indivudal receiver and it is assumed

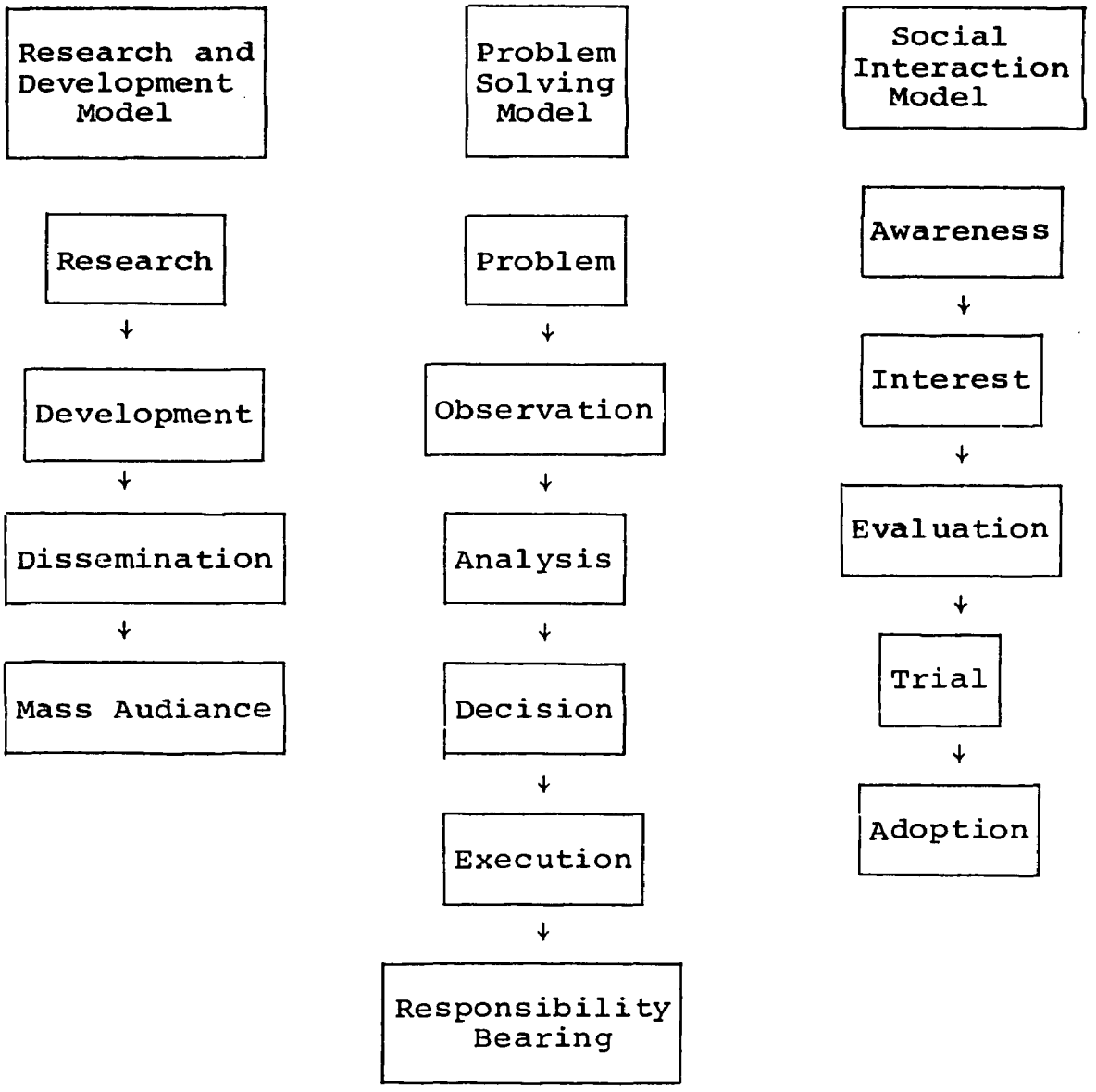

Figure 2. Conceptual Models of the Diffusion and Utilization of Knowledge.[a]

[a]Havelock, p. 2:40.

that an innovation or new idea is available to the receiver in developed form, suitable for use and readily available. (It has been argued that this is not the case for the small farmer,[24] but this will be discussed later.) This innovation is presented to the receiver by the sender, or change agent, and in effect the receiver and the receiver's needs are defined and determined exclusively by the change agent.[25] If the receiver reacts favorably to the innovation a five stage decision making process follows.[26] The first stage is awareness, in which a passive receiver is made aware of something by an outsider. This seems to violate the psychological assumption that knowledge utilization begins with an individual need. Instead, the change agent creates a need for the innovation.[27] The second stage is interest, which involves information seeking and is the stage most connected with the present research. Third is evaluation, perhaps the most difficult to explain or gather information about. The fourth stage is trial, or testing on a small scale. Finally there is adoption, although Rogers has reformulated this so that it includes rejection. Most of the diffusion research has as a dependent variable the adoption of an innovation. Rejection can occur at any stage (including after adoption), and is much more difficult to assess with empirical evidence.

Research and Development Model

The second general conceptual model identified by the CRUSK study team is the research and development model which depicts the process of change as an orderly sequence beginning with research and progressing through stages of development, diffusion and adoption. The research does not necessarily begin with the needs of the consumers, but rather with problems as perceived by the researchers on the assumption that "if the knowledge is there, a use will be found for it."[28] This assumption has provided the basis for much of our national investment in basic research in medicine and science, and has resulted in much useful knowledge. The emphasis, however, has been on the research with little regard for the other three stages except in agriculture.

> The one field which appears to exemplify the transformation process in a very clear way is that of agriculture. Agricultural research, development and dissemination in the United States seems to follow an orderly process which most clearly exemplifies the R, D & D model. There is a transformation of knowledge from basic research to applied research and development which goes on the agriculture-related departments of the land-grant colleges and universities. This R & D process is systematically linked to the Cooperative Extension Service, an elaborate mechanism which diffuses the developed knowledge to the farmer. This system taken as a whole, thus seems to exemplify the orderly transition of knowledge from the research to development to diffusion and finally to adoption by the consumer.[29]

Even in agriculture, however, the diffusion stage is dominated by communication theory, and particularly by the diffusion model described by Rogers.

Problem Solving Model

The third conceptual model of knowledge utilization is called the problem-solving model. This model places emphasis on the recipient or ultimate consumer of the knowledge as both the starting point and ending point in a problem-solving information-gathering process. The process may be initiated either by the receiver or by a change agent, but in either case the receiver must desire to change and must participate fully in bringing about the change. Once cognizant of a problem, the receiver will search for information. The receiver must then analyze the information in the context of the present problem, examine the alternatives and decide on one, proceed with the execution or implementation of the alternative chosen and finally accept responsibility for the action taken.[30] This model most closely conforms to the intrapsychic level needs mentioned earlier, but is criticized as placing too much emphasis on the recipient. As such it is not a diffusion model, but a model of the various functions of farm management or decision making.

The Interstate Managerial Study (IMS)

The problem solving model was used in a rather extensive and ambitious study of the entire managerial process of farmers who deal with imperfect knowledge which provides a backdrop for the current research. This study was initiated in the 1950s by the North Central Farm Management

Research Committee by an interdisciplinary team of professionals including Glenn Johnson, Albert Halter, Harold Jensen, D. Woods Thomas and others in hopes that "a better understanding of managerial processes should lead to improved resident and extension teaching and better agricultural policy formulation."[31] The study was conducted among 1,075 farm managers in seven states, Indiana, Iowa, Kansas, Kentucky, Michigan, North Dakota and Ohio. Some sixty-six questions were asked in seven functional categories; 1) information, 2) analysis as a function of management, 3) expectation models, 4) strategies and insurance, 5) knowledge situations, 6) willingness to insure against losses and the chances of gains and 7) characteristics of farmers interviewed.[32]

After completing their study the IMS researchers identified six interdependent managerial functions which make up the problem-solving model. Later Johnson added two "data banks," one with positive and one with normative information, along with a pragmatic interdependency loop and interconnecting arrows which indicate an interconnectedness and interdependency throughout the model. These additions are based upon the philosophical foundations of the model which require that both normative and positive information be included, and that both are necessary in dealing with any real-life problem.

Since one of the functional categories of questions concerned information sources, this study is relevant to

the present research in three ways; in terms of the model used, the methodology and some of the results and conclusions. However, the population of the IMS "consisted of non-urban commercial farms (census definition) with a gross income of $2,500 or more."[33] This no doubt included many small farms but the emphasis of the study was on commercial farms as opposed to the emphasis on small farms in this study. The results will not be directly comparable, but certain relationships will be discussed where relevant.

North Carolina Study

A more recent study of decision-making and communication patterns was conducted in North Carolina by the Department of Adult and Community College Education.[34] Although dealing with much different populations (the North Carolina study looked specifically at disadvantaged farm families--DFF--as defined by eligibility for the North Carolina Social Service Food Stamp Program while the present study looks at small farms in general), the North Carolina study is relevant here in that it uses the conceptual problem-solving model and the communications model of Rogers discussed earlier. It is much broader in scope (having already provided material for four doctoral dissertations) but it addressed many of the same kinds of questions that this research is concerned with. The North Carolina study specifically looked at six research

questions:

1. Who are North Carolina's DFF and what are their characteristics?

2. What kinds of major farm and home decisions are DFF making?

3. How rational are the decision-making processes utilized by DFF in making these decisions?

4. What communication media are available to DFF? What are the major sources of information utilized by DFF in making farm and home decisions? What credibility do DFF assign to their information sources?

5. What is the degree of linkage between interpersonal information sources used by DFF in making farm and home decisions and research-based information sources?

6. What is the relationship between selected socio-psychological variables and the: (a) degree of rationality in decision-making; (b) availability, usage, and credibility of media (i.e., interpersonal, mass publications) and the information sources within those media; and (c) degree of linkage between interpersonal information sources used by DFF and research-based information sources?[35]

In looking at communications channels three categories were identified--interpersonal, mass and publications. The interpersonal category was the most frequently used and perceived as the most credible while publication media was ranked low and appeared to be an unimportant channel for communication with the DFF.[36] Some analysis was done comparing various communication channels within these categories, but no comparisons were made between categories.

In looking at rationality in decision making the problem-solving model was used to define rationality. A survey instrument was developed and refined to test the

degree of conformity of the respondents to a process of (1) orientation (problem definition), (2) observation (information gathering), (3) analysis (weighing alternatives), (4) implementation and (5) feedback and adjustment. A scale was developed and the scores grouped into categories of low, medium and high. The conclusion was that the DFF respondents exhibited rationality in decision-making and so educational programs should be designed accordingly. However, the question of the validity of the test was not resolved. The scores were skewed to the high end and one could assume that the instrument was not sufficiently sensitive to distinguish variations among the population. The researchers contended that, because the population studied was homogeneous, this homogeneity would be reflected in the lack of variation in the rationality score.[37] Since knowledge of the rationality of the respondents would help indicate the types of educational programs to be developed, and since this was the first test of rationality this researcher had seen, it was decided to reproduce this test in the current study. In the process some disagreement arose regarding certain matters which will be discussed later.

Research in Agricultural Economics and Extension

The Interstate Managerial Study in which agricultural economists were members of an interdisciplinary team is probably the closest that agricultural economics has come

to dealing with the diffusion of technology or the information gathering process of farmers. "The main focus of economists in their approach to the diffusion of technology has been on how economic variables such as profitability of innovation and the asset position of firms influence the rate of diffusion."[38] In the 1950's, however, there was a five year experiment in extension which involved some analysis by agricultural economists. Experienced extension agents worked intensively with farm families in five Michigan townships for a period of five years. The objectives of the experiment were 1) to increase agricultural output, 2) to increase farm earnings, 3) to speed up application of improved agricultural practices, 4) to bring about 'higher levels of living for farm families' and 5) improve rural communities.[39] Comparison was made with a control group using 1959 bench-mark data, a 1956 intermediate survey and a 1959 terminal survey. Attempts were made to reach all the farmers in the townships involved, but it is notable that "all of the agents considered it their major responsibility to work with farm operators who carried on substantial farming operations."[40] Thus the emphasis was not on helping the smaller farmer. The conclusions were that the more intensive extension efforts at the township level were effective with a benefit-cost ratio of 2.5. The agents agreed that it took one and one-half to two years to establish the program, but by the end of five years they had reached eighty-one percent

of the farmers in their townships.[41]

More recent studies on the role of education in agricultural decision making conclude among other things that (1) an increase in the availability of information (agricultural extension) eases the gathering and processing of information, (2) that scale economies exist in using information, (3) that education and agricultural extension are substitutes and (4) that expenditures on state and federal extension staff time in the U.S. are providing a good although not spectacular social rate of return.[42] Petzel recently concluded that education of the decision maker plays a major role in determining the rate of adjustment to economic disequilibria.[43] This reinforces the conclusions of T.W. Schultz and others concerning investment in human capital.

Current Research Information System (CRIS)

In an attempt to determine what relevant research was currently being undertaken concerning small farm problems and extension programs for limited resource farms the Current Research Information System (CRIS) was consulted. CRIS is a computerized information network search which has a data base of approximately 24,000 research resumes. Coverage includes active and recently completed projects (terminated less than two years ago) from fifty-six State Agricultural Experiment Stations, thirty Forestry Schools and six U.S.D.A. research agencies. Several

key words were used, including adult education, diffusion, dissemination of information, extension programs and others. Ninety-eight research projects were retrieved, of which four were of direct use.

Footnotes

[1]See for example The People Left Behind, A Report by the President's National Advisory Commission on Rural Poverty (Washington, D.C.: U.S. Government Printing Office, September, 1967); Willard W. Cochrane, The City Man's Guide to Farm Problems (Minneapolis: University of Minnesota Press, 1965); Jeanette Goodstein, ed., The Rural Poor Unseen by Policymakers, (Phoenix, Arizona: Center for Public Affairs, Arizona State University, March, 1977); Estelle E. White and Edgar T. Boone, "Decision-Making and Communication Patterns of Disadvantaged Farm Families in the North Carolina Coastal Plains Area," Technical Bulletin No. 245, North Carolina Agricultural Experiment Station, December, 1976.

[2]Willis Peterson and Yujiro Hayami, "Technical Change in Agriculture," in Lee R. Martin, ed., A Survey of Agricultural Economics Literature, 2 vols. (Minneapolis, Minnesota: The University of Minnesota Press, 1977), 1:524.

[3]Bryce Ryan and Neal C. Gross, "The Diffusion of Hybrid Seed Corn in Two Iowa Communities," Rural Sociology 8 (1943):16-24.

[4]For a good bibliography which cites these and other researchers see W. Arden Colette and Gail Easley, Small Farm Operations, Rural Development Bibliography Series No. 4 (Mississippi: Southern Rural Development Center, September, 1977).

[5]Everett M. Rogers, Diffusion of Innovations (New York: The Free Press, 1962).

[6]Everett M. Rogers, Communication of Innovations: A Cultural Approach (New York: The Free Press, 1971).

[7]Ibid., p. 18.

[8]Ibid., p. 19.

[9]Ibid., p. 138.

[10]Ibid., p. 145.

[11]Ibid., p. 154.

[12]Ibid., p. 155.

[13]Ibid., p. 157.

[14]Bruce L. Smith et al., Propaganda, Communication and Public Opinion (Princeton, N.J.: Princeton University Press), 1946.

[15]Rogers, Communication of Innovations, p. 18. See also D.K. Berlo, The Process of Communication (New York: Holt Rinehart and Winston, 1960) and Claude E. Shannon and Warren Weaver, The Mathematical Theory of Communication (Urbana: The University of Illinois Press, 1949) for some forerunners to this model.

[16]Rogers, Communication of Innovations, pp. 24-25.

[17]This replaces a five-step process used by Rogers in his earlier works. These steps were 1) awareness, 2) interest, 3) evaluation, 4) trial and 5) adoption. A reason given for this change was that this makes provision for rejection as well as adoption decisions. See Rogers, Communication of Innovations, p. 25.

[18]Ibid., p. 29.

[19]Ibid., p. 33.

[20]See for example Elihu Katz and Pual Lazarsfield, Personal Influence (Glencoe: The Free Press, 1955).

[21]Ronald G. Havelock et al., "Planning for Innovation Through Dissemination and Utilization of Knowledge," Center for Research on Utilization of Scientific Knowledge, Institute for Social Research, The University of Michigan, Ann Arbor, Michigan,. 1971, p. 1:2.

[22]Ibid., p. 1:1.

[23]Ibid., p. 10:30.

[24]Jim Hightower, "The Case for the Family Farmer," in Catherine Lerza and Michael Jackson, eds., Food for People, Not For Profit, A Source Book on the Food Crisis with a preface by Ralph Nader (New York: Ballantine Books, 1975), p. 41.

[25]Havelock, Planning for Innovation, p. 10:29.

[26]Rogers discusses these five stages in his earlier works, but in Communication of Innovations he criticized some of these stages and regrouped them into four stages (see above, p. 29 and n. 17).

[27]Havelock, Planning for Innovation, p. 10:42.

[28]Ibid., p. 2:41.

[29]Ibid., p. 2:42.

[30]The CRUSK study was more general in discussing this model and included as examples models which had from three to eleven steps. The particular steps listed here are taken from Glenn L. Johnson, "Some Lessons from the IMS," Staff Paper No. 76-5, Department of Agricultural Economics, Michigan State University, April 15, 1976 (also presented at the Agricultural Development Council, Inc. Conference on Risk and Uncertainty in Agricultural Development, at CIMMYT, Mexico).

[31]Glenn L. Johnson and Albert N. Halter, Chapter I, "Introduction," in Glenn L. Johnson, Albert N. Halter, Harold R. Jensen and D. Woods Thomas, eds., A Study of Managerial Processes of Midwestern Farmers (Ames, Iowa: The Iowa State University Press, 1961), p. 7.

[32]Interstate Managerial Project Committee, "Summary Data from the Interstate Managerial Survey," Bulletin 669, Kentucky Agricultural Experiment Station, University of Kentucky, June, 1959, p. 7.

[33]Ibid., p. 6.

[34]Estelle E. White and Edgar J. Boone, "Decision Making and Communication Patterns of Disadvantaged Farm Families in the North Carolina Coastal Plains Area," Technical Bulletin No. 245, North Carolina Agricultural Experiment Station, December, 1976.

[35]Ibid., p. 1.

[36]Ibid., p. 8.

[37]Ibid., p. 3.

[38]Peterson and Hayami, "Technical Change," in Martin, ed., Agricultural Economics Literature 1:524.

[39]James Nielson, "The Change Agent and the Process of Change," Research Bulletin No. 17, Michigan State University Agricultural Experiment Station, East Lansing, Michigan 1967, p. 1.

[40]Ibid., p. 5.

[41]Ibid., p. 64.

[42]Wallace E. Huffman, "Decision Making: The Role of Education," American Journal of Agricultural Economics 56 (February 1974): p. 96.

[43]Todd E. Petzel, "The Role of Education in the Dynamics of Supply," American Journal of Agricultural Economics 60 (August 1978): p. 451.

CHAPTER III

SURVEY DESIGN AND DATA COLLECTION

The Questionnaire

In view of the objectives of this research and the lack of available secondary data, it was decided to develop a questionnarie (see Appendix A) and sample a portion of farmers through a mail survey technique. This would be complemented with personal interviews with a number of county Cooperative Extension Directors. Since nonresponse bias is a potential problem in any sample survey and particularly mail surveys, a telephone follow-up of a subsample of the nonrespondents would be conducted after three follow-up letters were mailed to nonrespondents, allowing two to three weeks between mailings for additional responses.

The questionnaire for the mail survey was designed with the objectives of this research in mind. It was divided into sections by type of question and arranged so the responses could be easily coded for keypunching. Section A consists of control questions for categorization purposes and for comparisons with census data for representativeness. These questions were designed to be answered with a simple check mark in a box. These are the easiest and

quickest questions for the respondents to answer in order to encourage them to continue with the rest of the questionnaire.

Section B was perhaps the most difficult part of the questionnaire because it asked the respondents to write out answers to two open-ended questions.

These questions were designed to find out about the most important decisions which the respondents felt they had made in the past two years and the places where they had looked for information.

The open-ended questions were necessary in section B because they had to precede section C in order to give focus to the questions in the latter section. Section C is the rationality of decision making test which was borrowed with permission from the North Carolina study. It is based on the problem-solving model and the work of Johnson and the IMS study. Rationality of decision making is first defined as the degree of conformity to a process of decision-making; the more rational the decision making, the more closely the steps of the problem-solving model are followed. The hypothesis was that small farm operators would have lower scores on this test than the larger farmers.

Section D also consists of control questions but was placed in the center because of the more sensitive nature of the questions which concern gross farm income and nonfarm income.

Section E consists of a series of forty-four questions designed to reveal the respondents perceived importance of various problems and, by implication, the importance of the information required for these problems and the sources where they looked for more information. One of the important lessons of the IMS, according to Johnson, was that the IMS researchers had ignored the normative information necessary to define and solve problems.[1] Here normative information, as measured by perceived importance, is explicitly recognized to see if a difference exists between different types of farmers.

The questions in section E were asked in terms of specific problems which farm operators may encounter based on responses to the IMS study, the North Carolina study, readings and personal experience. The problems listed are such that they can be classified as technical, human or institutional so that comparisons can be made between different categories of farmers and their perceived importance of these types of problems. Analysis can also be conducted regarding the sources of information used.

The last section, F, is concerned with the amount of contact the farmers have with Cooperative Extension.

The questionnaire was reviewed by various members of the guidance committee and other faculty and pretested with local farmers before being finalized.

Population

The population of interest consisted of small farm operators in Michigan as defined earlier. Because of the lack of a frame or list of small farmers in the state, and because some comparisons were to be made with larger categories of farms, the target population is all farm operators in Michigan. The most complete listing of this population is maintained by the Agricultural Conservation and Stabilization Service of the United States Department of Agriculture, but only at the county level. Special permission had to be obtained at both the state and federal levels before the county ASCS offices would release their lists of farmers.

Sample Design

Since there was no listing on a statewide basis, a stratified two-stage random sample was chosen. This method requires listing of the population only at the second stage, or in this case, at the county level. First the state was stratified into six regions based on the current supervisory regions of the Cooperative Extension Service. This was done for several reasons. First, a statewide representation was desired which would include the Upper Peninsula and parts of the northern lower peninsula. Second, the trend in recent years in Cooperative Extension has been to more regional planning. It was assumed that some regional differences exist which would affect the

suggestions for Extension educational programs as the result of this research. Third, the Cooperative Extension Service had taken many things into consideration when delimiting the regions which would be useful in assuring representativeness, such as types of farms, marketing arrangements, natural geographical boundaries, etc. Although six counties were chosen for the sample, the purpose of this research was not to compare counties, nor to compare the County Agents of the different counties, but rather to make implications on a regional basis. Then the counties in each region were listed along with the total number of farms per county and the cumulative total (see Appendix B). The number of farms per county was based on the 1974 Census of Agriculture but included the smallest farms (less than $1000 in gross agricultural income) which were excluded by the new census definition. These small farms are part of the survey population of this study. In order to insure equal probability of selection, a random number was generated for each region using a programmable hand calculator with a range from 0 to the cumulative total per region. The counties whose cumulative total corresponded to the random number was selected for inclusion in the survey. (For example, number 1752 was generated for the Upper Peninsula Supervisory Region. This number lies between 1436 and 1769, and therefore corresponds with Delta County. Thus, each farm has an equal probability of selection.)[2]

Survey Frame

Once the counties were selected, permission was requested to use the county ASCS list of farms. A sample size of eight hundred was decided upon based on financial resources available and by the types of statistical tests to be used (mainly chi squares), and an estimated return rate of forty percent. Also, ASCS indicated that perhaps ten to fifteen percent of the names on their lists may be obsolete or out of date. After the lists were received each name was numbered and the random number generator used to determine the mailing list. The number of farms chosen per county was based on the percentage of farms in the region.

Mailing

An attempt was made to try to get a high rate of response. The 800 questionnaires were mailed out in hand-stamped envelopes with personalized cover letters which were hand signed by the co-researchers (See Appendix C). Self-addressed hand-stamped return envelopes were enclosed, along with a post card offering a copy of a summary of the research results. The first mailing was early enough to precede spring planting activities (and a late spring was also helpful). Three follow-ups were mailed out to the nonrespondents and the second one included another copy of the questionnaire. Because postal prices had increased since the original mailing, additional postage was included

for the return mailing.

Confidentiality

In order to comply with university rules concerning confidentiality with regard to research on human subjects the questionnaires could not be identifiable by respondent in any way. However, in order to separate the respondents from the nonrespondents the return envelopes were coded by county and respondent. Thus, as the responses arrived the questionnaires were separated from their envelopes and placed in a box so they could no longer be associated with a code number. The respondent's numbers were then checked off from the mailing list so that follow-up letters were not sent to people who had already responded. The questionnaires were then numbered sequentially for purposes of analysis.

Response

Of the 800 questionnaires mailed, 468 were returned, or 58.5%. However 238 of these were from people who did not operate a farm, had recently retired, rented out the farm, had sold the farm or were widows or widowers. Thus instead of ten to fifteen percent of the names being obsolete or out of date as indicated by ASCS, thirty percent were obsolete. Since these were not farm operators and not part of the target population their numbers were subtracted from the original sample size for a reduced sample size of 562 (800 less 238). Of the remaining responses

twelve were not usable (2%) and 218 were usable for a response rate of 39 percent.

Phone Survey of Nonrespondents

In order to check for nonrespondent bias a sub-sample of nonrespondents were contacted by phone. A sub-sample size of 29 was selected using the same percentages per county as the original sample with at least one respondent per county.

A questionnaire was designed for the phone survey based on the original questionnaire (see Appendix D). It was, of necessity, much shorter than the original and consisted mainly of control questions to see if the nonrespondents differed significantly from the respondents by various classifications.

Personal Interview of County Agents

The final step in data collection was to interview the county agents in the six counties selected earlier. A list of questions was developed (see Appendix E) which formed the basis of the interview, but an informality was maintained to encourage more unstructured responses and to allow discussion of other areas which the agents felt were important.

Footnotes

[1]Johnson, "Some Lessons from the IMS," p. 23.

[2]Much of this chapter is based on Sir Claus Moser and G. Kalton, Survey Methods in Social Investigation (New York: Basic Books, Inc., 1972).

CHAPTER IV

ANALYSIS OF THE DATA

> Here and there, some tribes come to realize, first that knowledge gives controlling power over the environment (unfortunately, over others as well) and consequently makes life easier for him who possesses it; and second, that learning what others already know is far more economical than acquiring this knowledge by one's own experience.
>
> Nicholas Georgescu-Roegen

General Characteristics of the Survey Respondents

Several control questions were included in the questionnaire for purposes of grouping and analysis of the responses. Figure 3 shows a comparison of the survey respondents with the 1974 Census of Agriculture and indicates that the survey closely represents the census in percentage breakdown by occupation and age of the operator and farm size. It is only in the breakdown of full-time farms by size that some discrepancies appear with the medium and large farms being overrepresented. This would tend to suggest that the larger farmers were more likely to respond than the smaller farmers.

The breakdown by occupation was determined both in the Census and in the survey by the percentage of work time spent in farming or in other occupations. If fifty percent or more of the operator's working time was spent in farming, that person was considered a full time farmer. This included fifty-six percent of the respondents. Of the remainder,

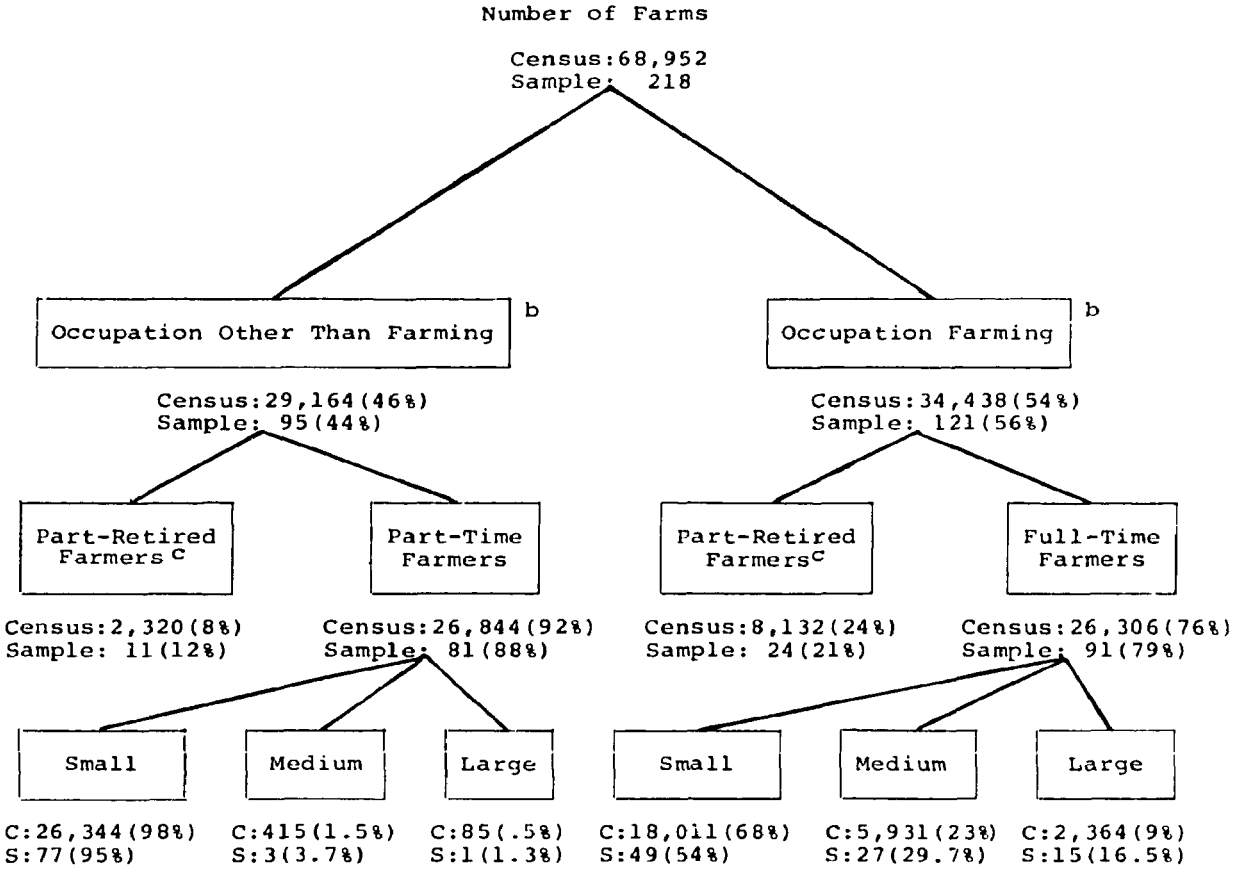

Figure 3. Comparison of Research Sample with 1974 Census of Agriculture by Occupation of the Operator, Age of the Operator and Farm Size[a]

[a]Based on Ralph E. Hepp, "Characteristics of Michigan's Small Farms," with data from 1974 Census of Agriculture.

[b]Census did not include farms which grossed less than $1000. Two respondents did not answer this question (#A-3).

[c]Census breaks down farmers by age groups and Hepp based retirement on age 65. The sample questionnaire used age 60 and receipt of social security or retirement to define part-retired (question A-5). Nine respondents did not answer this question (see text).

eighty-three respondents identified twenty-two occupational categories, with factory work being the most common (eighteen respondents). Twelve respondents indicated they were retired, ten worked in sales, eight worked in shops and six were teachers. The remaining occupations ranged from government work (4) to truck driver (4) to university professor (1)(see table 1).

The criteria for dividing farm operators into part-time and full-time differed somewhat between the sample and the Census. The Census did not identify retired farmers per se, but only by age categories. Hepp based retirement on age sixty-five or over for his 1977 study,[1] and the same basis was used in figure 3. The present survey, however, specifically asked about receipt of social security or retirement benefits to define part-retired farmers. Even with these differences the sample closely resembled the census and tests of significance for a binomial parameter indicate that there was no significant difference between the two at a five percent confidence level.

The basis for dividing farms into large, medium or small categories in figure 3 was gross agricultural sales. Both the census and the survey further divided the small farm category by income groups as reported in table 2. Again the survey closely represented the census in breakdown by percentages. The statistical test of a binomial parameter indicated that no significant difference between the census and the survey percentages at the five percent confidence level (however this test is not appropriate for the over $100,000 category because the binomial distribution is not approximately normal for small percentages).

Table 1. Major Occupations of Part-Time Farmers

Occupation	Number Responding
Factory work	18
Retired	12
Sales	10
Shop	8
Teacher	6
Truck driver	4
Government	4
Mechanic	3
Construction	3
Maintenance	2
Insurance or reality	2
Carpenter	2
University professor	1
Production credit officer	1
Printer	1
Hospital laborabory technician	1
Pipefitter	1
Power plant work	1
Administration in auto industry	1
Insurance claims representative	1
Harness horse trainer	1
	83

Table 2. Comparison of Research Sample with 1974 Census of Agriculture by Gross Farm Income

Number of Farms with Gross Sales	Census[a]		Sample[b]	
	Number	Percent	Number	Percent
over $100,000	2,809	4%	17	8%
40,000 to 99,000	6,848	11%	30	14%
20,000 to 39,999	7,828	12%	29	14%
10,000 to 19,999	9,393	15%	25	12%
5,000 to 9,999	10,412	16%	25	12%
2,500 to 4,999	8,420	13%	34	16%
under 2,500	18,360	29%	51	24%
	64,070	100%	211	100%

[a]Does not include farms reporting sales less than $1000 and not having the potential resources on hand to produce $1000 or more in sales (see p. A-5, 1974 Census of Agriculture).

[b]Seven respondents did not answer this question.

Farm and Home Decisions

According to the problem-solving model there is a close connection between problem definition and the search for information. The type of information being searched depends upon the problem or problems being considered. This was recognized in the North Carolina study in which the respondents were asked to list two or three important decisions they had made during the past twelve months, and then asked to choose which was the most important (they were asked to choose the one which was the "toughest or hardest" to make).[2] Subsequent questions concerning rationality of

decision making and sources used in collecting information were asked in reference to the most important decision cited. This tended to give more focus to the questions and to tie the answers to a particular problem or decision which the respondents themselves had named. This same technique was adopted for the present study in sections B and C of the questionnaire.

Section B contains two open-ended questions, one asking about important decisions and the other asking about information sources for these decisions. A list of the decisions cited is presented in table 3. Forty-one subjects were mentioned 370 times by 165 respondents. The subject most commonly mentioned by all three farm categories was the purchase or rental of machinery or equipment. Small farmers mentioned planting decisions next most frequently while large farmers mentioned the purchase of land and medium farmers mentioned livestock. Due to the large number of subjects mentioned and the relatively small sample size this data did not lend itself to statistical analysis. The question was designed to give focus to following questions, but the data are presented here for descriptive purposes. The results do not tell much about the large and medium farmers because of the limited response, but they do indicate that small farmers engage in a wide variety of decision making which requires a great deal of knowledge and information.

While the question in section B relating to decisions

Table 3. List of Most Important Decisions About Farm or Home by Subject (Question B-1)

Subject	Number of Mentions			
	Large	Medium	Small	Total
Buildings, Machinery and Equipment				
Purchase/rent machinery or equipment	6	13	36	55
Leasing out buildings	1	0	0	1
Repair old or build new buildings	2	0	26	28
Sale of equipment	0	0	2	2
Building fences	0	0	1	1
Crop Management				
To change crop practices	1	0	6	7
Which herbicide to use	0	0	2	2
What to plant	2	4	36	42
Soil samples	0	0	1	1
Lime	0	0	1	1
Fertilizer	0	0	5	5
Livestock Management				
Livestock mix	5	11	21	37
To change from livestock to crops	0	0	3	3
Cattle problems	0	1	0	1
Land				
Purchase of land	6	8	11	25
Whether or not to rent out land	0	0	16	16
Sale of land	0	3	9	12
Irrigation and drainage	0	4	6	10
To clear land	0	0	4	4
To rent more land	0	1	1	2
To subdivide or not	0	0	1	1
To buy or rent more land	0	0	1	1

Table 3. Continued

Subject	Number of Mentions			
	Large	Medium	Small	Total
Farm Management				
Whether or not to expand	0	4	13	17
Whether or not to quit farming	2	0	14	16
Credit and finance	2	1	5	8
Storage	1	1	6	8
To reduce operations	0	2	3	5
Hired labor	1	1	2	4
Should son take over farm	0	3	1	4
Taxes	0	0	2	2
How to buy a farm	0	0	1	1
To ask help of Ag. Dept.	0	0	1	1
Partnership agreements	2	0	0	2
Home and Family				
Remodel old or build new home	1	2	9	12
Insulating home	0	0	9	9
Off-farm employment	0	0	3	3
To sell house	0	0	1	1
To move to new area	0	0	1	1
To make a will	0	0	1	1
Prices and Marketing	0	3	14	17
Public Act 116	1	0	0	1
Total--41 topics	33	62	275	370

was open ended and allowed for a variety of responses, section E included questions about specific problems and sources of information concerning these problems. A list of forty-four problems was presented and the respondents were asked to indicate how important each particular problem had been in terms of his or her experience. A rating scale of from one (not important at all) to five (very important) was used to attempt to measure the degree of importance the respondent attached to the problems.

Table 4 gives a ranking of the ten most important problems as perceived by farmers in various farm categories based on the mean rating of the respondents. This rating assumes that the scale of importance is the interval type and that there is interpersonal comparability between respondents.

The problem which farmers in all groups seemed to consider most important concerned prices of farm products.

Table 4. Ranking of Ten Most Important Problems as Perceived by Farmers of Different Size Categories by Mean Rating

Rank	Question	Question Number	Mean Rating[a]	Percent Reporting
	Large Farms[b]			
1	How to get better prices for your farm products	31	4.94	94
2	Keeping up-to-date with records and farm accounts	34	4.81	94
3	Figuring costs and returns on a business investment	12	4.48	100
4	Finding the best place to borrow money for the farm	27	4.24	100
5	Whether or not to buy a new piece of machinery	1	4.18	100
5	Figuring out how much fertilizer to use	4	4.18	100
5	How to figure out income tax	26	4.18	100
8	Problems with insects or disease	2	4.12	100
9	Not knowing when to sell your farm product	3	3.94	100
9	Finding a good farm employee	14	3.94	100
	Medium Farms[c]			
1	How to get better prices for your farm products?	31	4.58	87
2	How to figure out income tax	26	4.20	83
3	Finding the best place to borrow money from the farm	27	4.19	87
4	Problems with insects and disease	2	4.18	93
5	Not knowing when to sell your farm products	3	4.04	90
6	Whether or not to buy a new piece of machinery	1	4.00	93
6	Figuring out how much fertilizer to use	4	4.00	90
6	How to cut down on the heating bill?	10	4.00	90
9	What crops to plant next year	5	3.96	87
9	Keeping up-to-date with the records and farm accounts	34	3.96	83

Table 4. (Continued)

Rank	Question	Question Number	Mean Rating	Percent Reporting
	Small Farms[d]			
1	How to get better prices for your farm products?	31	4.48	83
2	How to cut down on the heating bill?	10	4.01	86
3	Keeping up-to-date with the records and farm accounts	34	3.99	84
4	Personal or family health concerns	15	3.95	85
5	Figuring out how much fertilizer to use	4	3.90	87
6	How to figure out income tax	26	3.88	83
7	Not knowing when to sell your farm products	3	3.87	85
8	Problems with insects and disease	2	3.76	87
9	Political issues (school bonds, highways, etc)	29	3.73	84
10	How to raise children properly?	22	3.71	78

[a]Ratings range from 1 (not important at all) to 5 (very important).

[b]Based on 100% = 17

[c]Based on 100% = 30

[d]Based on 100% = 164

The rankings varied after this but six of the ten most important problems were common to each farm group. Besides farm prices, these problems include record keeping, fertilizer use, tax, insects and disease and marketing farm products.

In order to test for a relationship between the small, medium and large farms in their perception of the importance of the forty-four problems listed in section E of the questionnaire Kendall rank correlation coefficients were computed. First the problems were ranked by mean for the small, medium and large farms (as in table 4, but including all 44 questions). Then the Kendall rank correlation coefficient was computed for various pairs of farm categories as shown in Table 5. The Kendall Rank Correlation Coefficient ranges from -1 to +1. Perfect negative correlation is indicated by -1, perfect positive correlation by +1, and no correlation, or independence, by 0.

Table 5 shows that there is a positive relationship between the pairs of farm categories listed and that this ranges from +.4893 for small with large full-time farms to +.8176 for small full-time with small part-time farms.

The significance level is based upon a nonparametric statistical test to calculate the probability that the coefficient was obtained by chance. The null hypothesis is that the two rankings being compared are independent (coefficient equals zero) and the alternative is that there is a positive relationship (one-tailed test). The level of significance indicates that in each case the null hypothesis

Table 5. Kendall Correlation Coefficients Comparing Categories of Farms by Perceived Importance of Problems

Farm Sizes Compared	Coefficient	Significance
Small vs Large	+.4939	.001
Small vs Medium	+.6476	.001
Medium vs Large	+.6549	.001
Small Full-Time vs Small Part-Time	+.8176	.001
Small Full-Time vs Large Full-Time	+.4893	.001

is rejected with a confidence level of .001, showing that there is a positive relationship.

Importance of Information

One of the objectives of this study was to examine the importance of various types of information as perceived by small farmers and as perceived by county extension agents. This is a rather elusive subject not only because the concept of information as used in this research is very broad, but also because measurement is very difficult. There is no market mechanism for most kinds of information except for books and materials purchased through commercial outlets or tuition or fees charged for various classes, programs or seminars. Much of the information that farmers use on a regular basis is available at no dollar cost through the Cooperative Extension Service. The only cost to the farmer is in terms of opportunity costs of time

spent in phoning and travel expenses. In terms of economic analysis farmers would be expected to collect information for a decision until the marginal returns (in terms of accuracy of information, psychic value, dollars gained from the result of the decision, etc.) equal the marginal costs.[3] Assuming the marginal costs of information to be very low and equal for all farm categories (although the opportunity costs would presumably be higher for larger farmers and part-time farmers with outside employment) we wish to examine the marginal returns of various types of information in terms of perceived importance by farm category.

As stated earlier, the type of information being searched by a farmer depends upon the problem or problems being considered. It follows that the importance that a farmer attaches to certain types of information also depends upon the importance he attaches to the problem for which the information is needed. Thus, by looking at the perceived importance of various types of problems, inferences can be made regarding the perceived importance of various types of information.

The IMS researchers had originally perceived five types of problems: 1) price, 2) production, 3) new technology, 4) institutional and 5) human. In the course of their research it became apparent that these were not types of problems, but types of information.[4] Problems typically require all types of information for any resolution. "The domain of each problem seems to involve a unique mix of

different kinds of information."[5]

Experience subsequent to the IMS revealed that there are really three broad areas of information; technical, institutional and human. Production information is a part of the technical type and differs from new technology only in the time dimension. Prices are included in the normative dimension of the other categories.[6] Thus these three broad categories have both a time dimension and a normative-positive dimension.

While it is true that real-world problems typically require all types of information, certain problems seem to require more of one type of information than other types of information. This is true of most of the problems in section E of the questionnaire. These problems were designed so that they could be classified as technical questions, institutional questions and human questions so that analysis could be performed. In addition there were a number of problems which could not be easily classified. Seven of these were taken from the IMS study. The groupings of the questions by technical, institutional or human categories are given in appendix F.

Table 6 shows the aggregate responses to the technical questions in terms of perceived importance by size of farm. In order to test for the existence of a relationship the chi square test was used. For this test to be accurate certain conditions must be met which include a minimum of fifty observations with the expected frequency

greater than five for at least 80% of the cells and greater than one for all cells.[7] For table 6 the null hypothesis of no relationship is rejected at the one percent level of confidence. This indicates that there is a relationship and that in general large farmers tend to perceive of technical information as being very important more frequently than small farmers. Likewise, small farmers tended to respond that technical problems are "not important at all" more frequently than large farmers. This may reflect differences in problem recognition between these categories of farms, or perhaps small farmers just do not think that these problems are important.

Table 6. Perceived Importance of Technical Information by Farm Size Category

	Not Important at All	2	3	4	Very Important	Total
Large	62	13	30	37	105	247
%	25.1	5.3	12.1	15.0	42.5	100
Medium	89	12	69	62	157	389
%	22.9	3.1	17.7	15.9	40.4	100
Small	622	91	302	233	799	2047
%	30.4	4.4	14.8	11.4	39.0	100
Total	773	116	401	332	1061	2683

$X^2 = 20.749$

d.f. = 8

significant at .0078 level

Table 7 presents a similar breakdown for institutional information. Chi square tests again indicate that a relationship exists at the one percent level of significance. Examination of table 7 shows that a considerable amount of polarity exists for the small farmers with nearly seventy percent of the responses divided between the extreme categories. This is true to a lesser degree for the medium and larger farms too. However, small farmers tended to check "not important at all" more frequently than the other farm groups and their cumulative percentage for items 3, 4 and 5 (very important) was smaller than that of the large and medium farmers. Thus, while there is polarity regarding institutional questions within each group of farmers, small farmers tend to perceive of these questions as "not important at all" more frequently than the other farm groups.

Table 7. Perceived Importance of Institutional Information by Farm Size Category

	Not Important at All	2	3	4	Very Important	Total
Large	32	5	48	21	61	167
%	19.2	3.0	28.7	12.6	36.5	100
Medium	58	15	42	34	95	244
%	23.8	6.1	17.2	13.9	38.9	100
Small	413	71	204	130	506	1324
%	31.2	5.4	15.4	9.8	38.2	100
Total	503	91	294	185	662	1735
	29.0	5.2	16.9	10.7	38.2	

X^2 = 31.737, d.f. = 8, significant at .0001 level

Unlike table 6 or 7, table 8 does not show any relationship. Chi square tests did not reject the null hypothesis of independence. Examination of Table 8 indicates that again there was a great deal of polarity in responses of not important and very important, but that there was no difference between farm groups.

Table 8. Perceived Importance of Human Information by Farm Size Category

	Not Important	2	3	4	Very Important	Total
Large	63	12	28	14	71	188
%	33.5	6.4	14.9	7.4	37.8	100
Medium	86	18	43	32	108	287
%	30.0	6.3	15.0	11.1	37.6	100
Small	531	76	245	137	593	1582
%	33.6	4.8	15.5	8.7	37.5	100
Total	680	106	316	183	772	2057
	33.1	5.2	15.4	8.9	37.5	100

$X^2 = 4.843$, d.f. = 8, not significant

Information Sources Cited

After the respondents had indicated which particular decision was the most difficult to make in section B they were asked to name some places where they looked for informarion. Table 9 shows the responses by size of farm. This was an open-ended question but all of the responses fell into the sixteen categories of information sources used in section E of the questionnaire. The responses which fell

into the "other" category and which were identified consisted of doctors, lawyers, tax consultants and ministers.

Table 9 does not meet the conditions for a chi square test due to the low expected frequencies of many cells. This is not only because there is a large number of cells, but also the response rate was low for this section of the questionnaire. This was the only section which asked open ended questions, and apparently many respondents skipped this section for that reason. Only 130 respondents listed any sources of information, and less than one-half listed two or more sources. This precludes statistical analysis of Table 9.

The same poor response rate held for the remainder of section B and precludes statistical analysis of the usefulness, ease of obtaining or accuracy of various information sources as perceived by the respondents.

In section E of the questionnaire the respondents were asked to name sources of information used in relation to forty-four particular problems. The responses were aggregated by size of farm and sources cited and the data are presented in Table 10.

The chi square test of independence of classification indicates that there is a relationship between size of farm and sources of information (significant at the one percent level of confidence). The largest difference between the large and small farmers concerned item #14, "never had this problem." Small farmers tended to respond with this answer

Table 9. Crosstabulation of Sources of Information Cited by Farm Size Category (Question B-3)

	Sources of Information	Large		Medium		Small		Total	
		#	%	#	%	#	%	#	%
1	newspapers and magazines	5	18	7	14	46	18	58	18
2	radio or tv	0		2	4	2	1	4	1
3	bulletins or pamphlets	0		2	4	6	2	8	2
4	professional farm management services	0		0		0		0	
5	cooperative extension--county agents	2	7	5	10	24	10	31	10
6	dealers, salesmen or buyers	4	14	8	15	36	14	48	15
7	neighbors, friends or relatives	7	25	10	19	61	25	78	24
8	government agencies (ASCS, FHA, etc.)	0		5	10	25	10	30	9
9	banks or lending institutions (PCA, etc.)	6	21	7	13	15	6	28	9
10	truckers or custom operators	0		0		1	-	1	-
11	auctions or county fairs	0		0		1	-	1	-
12	farm organizations or cooperatives	0		0		5	2	5	2
13	public schools, universities or libraries	0		2	4	4	2	6	2
14	never had this problem	0		0		0		0	
15	did not look for information--already knew enough to decide	2	7	3	6	16	6	21	6
16	other (please identify)	2	7	1	2	8	3	11	3
	Total	28	99[a]	52	101[a]	250	99[a]	330	100

[a]Does not equal 100 due to rounding.

Table 10. Crosstabulation of Sources of Information Cited by Farm Size Category (Section E Questions)

	Sources of Information	Large		Medium		Small		Total	
		#	%	#	%	#	%	#	%
1	newspapers and magazines	94	13.3	209	15.0	800	13.7	1103	13.9
2	radio or tv	49	6.9	112	8.0	478	8.2	639	8.1
3	bulletins or pamphlets	79	11.1	147	10.6	638	10.9	864	10.9
4	professional farm management services	26	3.7	43	3.1	138	2.4	207	2.6
5	cooperative extension--county agents	56	7.9	93	6.7	351	6.0	500	6.3
6	dealers, salesmen or buyers	67	9.4	101	7.3	360	6.2	528	6.7
7	neighbors, friends or relatives	61	8.6	148	10.6	641	11.0	850	10.7
8	government agencies (ASCS, FHA, etc.)	9	1.3	28	2.0	153	2.6	190	2.4
9	banks or lending institutions (PCA, ect.)	40	5.6	77	5.5	177	3.0	294	3.7
10	truckers or custom operators	1	.1	4	.3	19	.3	24	.3
11	auctions or county fairs	3	.4	6	.4	34	.6	43	.5
12	farm organizations or cooperatives	18	2.5	38	2.7	100	1.7	156	2.0
13	public schools, universities or libraries	23	3.2	50	3.6	229	3.9	302	3.8
14	never had this problem	80	11.3	175	12.6	959	16.4	1214	15.3
15	did not look for information--already knew enough to decide	80	11.3	139	10.0	627	10.7	896	10.7
16	other (please identify)	23	3.2	22	1.6	129	2.2	174	2.2
	Total	709	100	1392	100	5833	100	7934	100

X^2 = 95.33, d.f. = 30, significant at .01 level

more frequently than either medium or large farmers. This may reflect the choice of problems in section E, or it may indicate that larger farmers tend to recognize problems more readily than smaller farmers.

Large farmers tend to seek information more frequently from dealers, salesmen or buyers than do small farmers. The same is true with regard to banks and lending institutions and the Cooperative Extension Service. Small farmers tend to seek information more frequently from neighbors, friends or relatives and radio or tv than do larger farmers. It should be noted that the percentage distribution for all sixteen categories in Table 8 does not vary by more than a few percentage points between sizes of farms, the widest gap being 5.1% for number 14. This indicates that all farmers use a wide variety of sources for information.

Rationality of Decision Making

Decision making is an all pervasive activity which people take part in throughout the day either on a conscious or unconscious level. It is the ability to make rational choice that principally distinguishes man from the animals.[8] Decision analysis is an integral part of farm management, and in fact all of the farm management methods from budgeting, planning, game theory, input-output analysis, linear programming or even systems symulations models are designed to assist in making rational decisions. Much has been written concerning risk and uncertainty in decision

making, and highly technical probability models have been developed to aid in decisional analysis.[9] Still, there is much which is not known about decision making and rationality, particularly concerning the inner psychological workings of the brain.

However, certain kinds of behavior can be observed and measured without understanding the mental processes behind the behavior. The North Carolina study attempted to measure the rationality of the decisions made by their survey sample respondents. First rationality was defined as the degree of conformity to the problem solving model. That is, the more rational the decision is, the more it would conform to the subprocesses of (1) orientation or problem definition, (2) observation or seeking information, (3) analysis, analyzing or choosing alternatives, (4) implementation--acting, and (5) feedback and adjustment-reassessing the choice and accepting the consequences.[10]

The questions used in the survey instrument were derived from an investigation of relevant literature and refined by extensive field testing with some 75 respondants. The scale was reduced to twelve items with items 1-3 testing for conformity to the subprocess of orientation, 4-6 for observation, 7-9 for analysis and 10-12 for feedback and adjustment. No separate items were required to test for implementation since all the items essentially tested for implementation of the decision cited by the respondents.[11]

The questions were designed to be answered yes or no,

but a third response, don't know, was included so the respondents would not be forced in one direction or another. To contend with the possibility of a response set, four of the twelve questions were designed to be answered negatively (#3, 6, 10 and 12). Values were assigned as follows: positively worded; yes = 3, don't know = 2 and no = 1; negatively worded; no = 3, don't know = 2, yes = 1. In tabulating, the "don't know" responses were counted as "no responses" and not included in calculating the RDM score. The scores thus ranged from a low of 12 to a high of 36 and were divided into three relatively equal parts, low 12-21, medium 22-29 and high 30-36.

It was at this point that a discrepancy was noticed. The positively worded questions seemed to require positive responses in order to conform to the process of decision-making as defined in the problem-solving model. However, two of the four questions designed to be answered negatively (#6 and #10), and so scored, seemed actually to require positive answers. Various members of the research committee were consulted who agreed with this researcher. The researcher at North Carolina seemed to agree also and thought perhaps there was an editorial error in the summary report. However, upon checking, it was found that the summary report agreed with the original Ph.D. dissertation.

The particular questions in dispute were:

#6: Did you think about any other way that you could solve this problem?

#10: Do you take full credit for making this decision?

Question #6 tests conformity to the step of observation, or seeking information. A rational person would supposedly seek information before coming to conclusions. This would seem to indicate a yes answer.

Question #10 tests conformity to the subprocess of feedback and adjustment, of reassessing the choice and accepting the consequences. A rational person supposedly accepts the consequences of the decision made. This would seem to indicate a yes answer. Thus, it was decided to go ahead with the test but to change the scoring of these two items.

One other difference between the two tests is that the North Carolina study used a personal interview survey while the present used a mail questionnaire. With the personal interviews none of the respondents indicated "don't know," and therefore the lowest score possible was a 12. However, with the mail questionnaire many people indicated "don't know," which, since it is scored as a no response, means the scores could range from zero to 36. This did not affect the categories of low, medium or high, however, except by enlarging the low category.

Table 11 shows the results of the rationality test by size of farm. It was hypothesized that the small farmers would have lower scores but this does not seem to be the case. Very few of the respondants in any farm size category had low scores. Instead the scores were heavily skewed to

the high side. Chi squred tests were not valid here because the expected frequencies of the low score cells were less than five. Even with regrouping the null hypothesis of no relationship cannot be rejected.

Table 11. Crosstabulation of Weighted Scores on Rationality Test by Farm Size Category

	Scores on Rationality Test			
	Low (0-21)	Medium (22-29)	High (30-36)	
Large	1	3	8	12
%	8.3	25.0	66.7	
Medium	1	16	7	24
%	4.2	66.7	29.2	
Small	4	67	39	110
%	3.6	60.9	35.5	
	6	86	54	146
	4.1	58.0	37.0	

Conditions not met for X^2 test

Table 12 shows the mean, median and range of the rationality scores by various categories of farmers. Statistical tests of the differences between two means drawn from two populations show that there is no significant difference between farm categories. Table 13 further divides the small farms by Census categories. The low and the medium scores were grouped in order to meet the criteria of chi squared tests for cell size, but still no significant difference

exists to reject the null hypothesis of no relationship. Thus it can be concluded that on the basis of these tests there is no significant difference between the rationality of decision making for farmers in various size categories.

Table 12. Mean, Median and Range of Scores on Rationality Test by Farm Size Category

Farm Category	Scores on Rationality Test		
	Mean	Median	Range
Large	29.833	30.500	13
Medium	27.542	27.900	12
Small	27.545	27.900	23
Large-Full-Time	29.818	31.000	13
Small Full-Time	27.395	28.083	23
Small Part-Time	27.361	27.818	20
Large Full-Time no SS[1]	29.600	30.500	13
Small Full-Time no SS	27.333	28.000	23
Small Full-Time with SS	27.333	28.000	8
Small Part-Time no SS	25.576	27.818	20
Small Part-Time with SS	28.164	28.000	9

[1]SS = Social Security or reitrement benefits.

However, another conclusion could be drawn concerning the sensitivity of the test. The results of the North Carolina study were skewed to the high end and were highly concentrated. This was attributed to the very homogeneous population of the study. In Michigan, however, the

Table 13. Crosstabulation of Small Farm Income Categories by Scores on Rationality Test

Small Farm Income Categories	Low or Medium	High	Total
$20,000 to $39,999	14 63.6%	8 36.4%	22 100%
$10,000 to $19,999	12 70.6%	5 29.4%	17 100%
$5,000 to $9,999	8 53.3%	7 46.7%	15 100%
$2,500 to #4,999	13 54.2%	11 45.8%	24 100%
Less than $2,500	24 75.0%	8 25.0%	32 100%
	92 63.0%	54 37.0%	146 100%

$X^2 = 3.761$, d.f. = 4, not significant

population was extremely heterogeneous. Yet the scores varied very little and were skewed to the high end. This would suggest that the instrument is not sensitive enough to pick up differences between widely heterogeneous groups of people.

Contact with Extension

The final section of the questionnaire asked specific questions about farmers' contact with the Cooperative Extension Service. Since there are a number of ways contact may be made between a county agent or the extension staff and the farm clientele, an index was adopted which combined information about various types of contacts into a single measure.[12] The following weights were used:

Type of Contact	Weight
1. An agent visited your farm or home	15
2. You or your family visited the Cooperative Extension Office	10
3. You or your spouse talked on the phone with a county agent	10
4. You or your spouse attended a farm tour sponsored by the Cooperative Extension Service	10
5. You or your spouse attended a meeting organized by the Cooperative Extension Service	10
6. You or your family listened to a radio or TV program sponsored by the Cooperative Extension Service	2
7. You or your spouse received a circular letter or pamphlet from the Cooperative Extension Service	1

The reported frequency was multiplied by the appropriate weight, and the results added to yield a weighted score for each farm. Four categories of contact with Extension were established:

1. No Contact
2. Low Contact: 1-14 (Those who had less than the equivalent of one farm or home visit during 1977)
3. Medium Contact: 15-90 (Those who had the equivalent of at least one farm or home visit during the year, but not more than one every two months)

4. High Contact: over 90 (Those who had the equivalent of a farm or home visit every second month, or more frequently)

Table 14 shows the amount of contact with extension broken down by gross farm income categories. The no contact and low contact categories were combined to conform to the condition that the expected frequency of at least 80 percent of the cells be greater than five. Twenty-five respondents had indicated no contact (two large, one medium, and twenty-two small) while only fourteen indicated low contact (two large, two medium, and ten small).

Chi square tests indicate that there is a relationship at the 10 percent level of significance. However, this relationship does not confirm the hypothesis that the larger the farm, the greater the amount of contact with extension. Instead it is the $20,000 to $39,999 income category which appears to have the greatest amount of contact, followed by the medium size farms and the large farms, respectively. This does not concur with table 10, but in table 10 the small farm category is not broken down into subcategories. Also, table 10 does not attempt to measure the amount of contact by the various farm categories.

There is no apparent explanation for the relatively high rate of contact for the $20,000 to $39,999 category. Further analysis of various control variables shows that 16 of the 21 farmers in this category were full-time

Table 14.--Contact with Extension by Gross Farm Income Category.

Gross Farm Income	No or Low Contact	Medium Contact	High Contact	Total
Over $100,000	4 (30.8%)	4 (30.8%)	5 (38.5%)	13 (100%)
$40,000 to $99,999	3 (15.8%)	6 (31.6%)	10 (52.6%)	19 (100%)
$20,000 to $39,999	3 (14.3%)	5 (23.8%)	13 (61.9%)	21 (100%)
$10,000 to $19,999	8 (44.4%)	8 (44.4%)	2 (11.1%)	18 (100%)
$5,000 to $9,999	4 (21.1%)	9 (47.4%)	6 (31.6%)	19 (100%)
$2,500 to $4,999	6 (26.1%)	10 (43.5%)	7 (30.4%)	23 (100%)
Under $2,500	11 (42.3%)	7 (26.9%)	8 (30.8%)	26 (100%)
Total	39 (28.1%)	49 (35.3%)	51 (36.7%)	139 (100%)

$X^2 = 18.348$

d.f. = 12

significant at .1055 level

Three cells or 14 percent have expected frequencies <5, no cells have expected frequencies <1. Therefore chi square test is valid.

farmers and twelve of these had more than 25 years of experience in farming. Nine were in the fifty to fifty-nine age group.

Table 14 also indicates that those farmers in the $10,000 to $19,000 category have the least contact with Cooperative Extension. This also does not conform to the hypothesis that the smaller the farm, the less the amount of contact with Cooperative Extension. Again, further analysis of the control variables showed that for this group only eight of the eighteen were full-time farmers. The two high-contact farmers were full-time, but there was no trend regarding age or years of experience in farming.

Table 15 shows some marked differences between part-retired and not retired farmers in their contact with Extension. Seventy percent of the part-retired farmers had no or low contact with Extension while only 22 percent of the farmers who were not retired had low or no contact. On the other hand, nearly 40 percent of the farmers who were not retired had high contact with Extension and only twenty percent of the part-retired farmers had high contact with Extension. This is important for two reasons. First, it shows that Cooperative Extension is not reaching the part-retired farmers as effectively as others, and second, it shows that the Cooperative Extension is not being reached by the same farmers. These older farmers may have some tried and true production methods which

Table 15. Contact with Extension by Age of Operator: Part-Retired or Not Retired

Age	No or Low Contact	Medium Contact	High Contact	
Part Retired	14 70.0%	2 10.0%	4 20.0%	20 100%
Not Retired	27 22.3%	47 38.8%	47 38.8%	121 100%
	41 29.1%	49 34.8%	51 36.2%	141 100%

X^2 = 19,215, d.f. = 2, significant at .001 level

Expected frequency of each cell > 5.

could be useful to other small farmers, but which are not being communicated for various reasons. This point will be discussed further in Chapter VI.

Table 16 further divides the small farmers by occupation, either full-time or part-time farm operators, and shows that a much greater percentage of full-time than part-time farmers have high contact with Extension. Likewise, a much greater percentage of part-time than full-time farmers have no or low contact with Extension. Since the part-time farmers have other jobs, they may not be able to attend meetings or go to other Extension activities as often as the full-time farmers. This suggests that other alternatives may need to be tried in order to reach this farmer.

Table 16. Contact with Extension by Small Farmers by Occupation

Occupation	No or Low Contact	Medium Contact	High Contact	
Small Full-Time	3 9.7%	11 35.5%	17 54.8%	31 100%
Small Part-Time	17 30.9%	23 41.8%	15 27.3%	55 100%
	20 23.3%	34 39.5%	32 37.2%	86 100%

$X^2 = 8.093$, d.f. = 2, significant at .02 level
Expected frequency of each cell > 5.

The remainder of section F consists of questions regarding various methods the Cooperative Extension Service uses or could use for various educational programs.

Table 17 shows the responses to question F-2 by farm size. This table met the conditions for a chi square test and indicates there is no significant difference between farm size categories in willingness to attend a meeting on a topic concerning one of their farm or home decisions. Sixty-one percent of the small farmers indicated they would be willing to attend such a meeting as opposed to sixty-five percent for medium farmers and seventy-five percent for large farmers. Checking "yes" on a questionnaire and actual attendance at a meeting are two different things, but this is an indication that possible programs could be developed based on meetings. It is a common complaint by

Table 17.--Crosstabulation of Willingness to Attend a Meeting by Farm Size Category.

Farm Category	Yes, Will Attend	No, Will Not Attend	Total
Large	12 (75%)	4 (25%)	16 (100%)
Medium	17 (65.4%)	9 (34.6%)	26 (100%)
Small	92 (61.3%)	58 (38.7%)	150 (100%)
Total	121 (63%)	71 (37%)	192 (100%)

$X^2 = 1.23$

d.f. = 2

not significant

county agents that the small farmers do not attend meetings, but perhaps there are good reasons. The concept of homophily in communication is one explanation. Homophily is the degree to which pairs of individuals who interact are similar in certain attributes, such as beliefs, values, education, social status and the like.[13] If a meeting is likely to be attended by people with different beliefs, more education, higher social status, etc., than the small farmer, than that small farmer is liable not to attend.

Table 18 shows the responses to the question, "How far would you be willing to travel" to a meeting. No attempt was made to analyze this by county, but this seems to show a willingness to travel to meetings.

Table 13.--Crosstabulation of Miles Willing to Travel to a Meeting by Farm Size Category.

Number of Miles	Size of Farm			Total
	Large	Medium	Small	
Less than 10	0	5	16	21
10 to 19	4	7	33	44
20 to 29	2	5	19	26
30 to 39	1	1	9	11
40 to 49	0	0	6	6
More than 50	4	2	10	16
Total	11	20	93	124

Table 19 and 20 show the preference for day of the week and time of day for meetings. Nearly one-third of all respondents indicated that any day would be O.K., while the other two-thirds stated their preferences. Of those, Wednesday seems to be the preferred day of the week. As for time of day, the evening was the overwhelming choice of those who responded.

Table 21 is a list of some fifty-three topics which were suggested for meetings. These are broken down and analyzed by small farm category in Chapter VI. It is interesting to note that small farm subjects were mentioned several times.

Table 22 indicates that the majority of any size farm group is not willing to attend a two-or-three-day school. A school, of course, requires a lot more investment in terms of both time and money so this response is predictable. However, it does indicate that a greater percentage of medium sized farmers than either large or small are willing to attend such a school while small farmers are more likely not to attend. The chi square test here is significant at the 1 percent level.

Of the forty-seven respondents who said they would be willing to attend a two-or-three-day school, thirty-nine indicated they would be willing to pay at least $25 to attend. This included twenty-two of the twenty-nine small farmers who were willing to attend. Table 23 presents the responses to this question.

Table 19.--Crosstabulation of Day of Week Preferred for Meeting by Farm Size Category.

Weekday	Size of Farm			Total
	Large	Medium	Small	
Sunday			2	2
Monday		1	11	12
Tuesday		5	3	8
Wednesday	2	4	9	15
Thursday	1	1	5	7
Friday			5	5
Saturday			11	11
Any day	5	3	21	29
Total	8	14	67	89

Table 20.--Crosstabulation of Time of Day Preferred for Meetings by Farm Size Category.

Time of Day	Size of Farm			Total
	Large	Medium	Small	
Morning	1	2	11	14
Afternoon	2	3	15	20
Evening	5	13	59	77
Any time	2	0	0	2
Total	10	18	85	113

Table 21. Topics Suggested for Meetings.

Topic	Number of "Mentions"
Crop Management	
General	6
Grain varieties to grow	1
Reduced tillage	1
Fertilizer use	5
Insects	4
Pruning	2
Chemicals to use	5
Sprayer calibration	1
Correct poison to use	1
Livestock Management	
General	7
Nutrition	2
Cattle and sheep	3
Castration and dehorning	1
Raising pigs	1
Techniques for beginners	1
Expanding hog operation	1
Dairy management	1
Retirement	
Estate planning	5
Government Sponsored Programs	
General	1
Government intervention	2
Imports	1
Cost sharing projects	2
Taxes	7
Forest protection	2
"Why big chemical farmers and industries are allowed to pollute our drinking water"	1
Inflation	1
Farm Management	
General	1
Bookkeeping	1

Table 21. Continued.

Topic	Number of "Mentions"
Investment and returns	1
Financing	2
Farm expansion	1
Future of small time farming	6
Small farm management	1
Going into full-time farming	1
Marketing	
General	8
Better prices	5
When to sell	1
Sale of fruits and vegetables	1
Machinery Management	
General	2
Selecting good used farm equipment	2
Knowing what implements to get for a small farm	1
Return on machinery investment	1
Farming	
General	4
How to survive in farming	1
Farm woodlands and ponds	1
Economics of farm tile drainage	1
Bees	1
Energy	
Saving energy	2
Solar energy	1
Cost cutting on Household Expenses	1
Trying to Work Together to Learn More	1
Lawn and Garden Aids for the Farm Home	3
Total--53 topics	117

Table 22.--Crosstabulation of Willingess to Attend a Two-or-Three-Day School by Farm Size Category (Question F-3).

Farm Size	Yes, Will Attend	No, Will Not Attend	Total
Large	6 (37.5%)	10 (62.5%)	16 (100%)
Medium	12 (46.2%)	14 (53.8%)	26 (100%)
Small	29 (20.3%)	114 (79.7%)	143 (100%)
Total	47 (25.4%)	138 (74.6%)	185 (100%)

$x^2 = 9.124$

d.f. = 2

significant at .01 level

Table 23.--Crosstabulation of Willingness to Pay for a Two-or-Three-Day School by Farm Size Category.

Payment	Size of Farm			Total
	Large	Medium	Small	
0			4	5
$25	1	5	11	17
$50	4	3	9	16
$75			1	1
$100	1	2	1	4
Other		1		1
Total	6	11	26	44

As table 24 indicates, there is a certain amount of overlap between the topics suggested for meetings and those suggested for a two-three day school. Some thirty-six topics were suggested with marketing again leading the list. The suggested topics for both meetings and schools indicate a wide variety of interests and concerns and although many of these topics have been covered in Extension meetings throughout the state from time to time, this still should provide some fertile ground for ideas regarding meetings in the future. These lists also seem to indicate that meetings could be pitched to particular groups concerned with small farm management or small and large beef cow operations.

Table 25 indicates that more large farmers are familiar with crop and pest management services than are smaller farmers. Table 26 shows that more large farmers also feel that management services would be useful, although even a greater percentage of medium farmers indicated they felt this way. Still nearly half the small farm operators indicate they felt a management service would be useful if one were available.

Of the eighty-five operators who felt that a management service would be useful, fifty-five indicated they would be willing to pay at least $2 per acre for the service. Ten small farmers indicated they would be willing to pay $4 per acre while five checked $6 per acre. Two

small farmers even indicated they would be willing to pay $10 per acre. Table 27 gives the breakdown.

Table 24. Topics Suggested for Two-or-Three-Day Schools.

Topic	Number of "Mentions"
Marketing	
General	7
Cut out middle man	1
The Chicago Mercantile Exchange	1
Better prices	2
When to sell	1
Livestock	
General	2
Small and large beef cow operations	1
Nutrition	1
Housing	1
For small farms	1
Shearing sheep, castration and dehorning	1
Artificial breeding	1
Dairy	2
Breeding hogs	2
Pregnancy testing	1
Crop Management	
General	4
Weed and pest control	3
Fruit tree care	1
Soil testing	1
Grain storage and drying	1
Farm Management	
General	4
Small farm management	2
Bookkeeping	2
Cash flow	1
Financing	3
Partnerships	1
Getting started in farming	1
New farming methods	1
Taxes	1
Basic Living from your Land	1
Repair and Maintenance	3

Table 24. Continued.

Topic	Number of "Mentions"
New Farm Topics and Problems	1
Laws and Regulations	1
What Different Things You Can Do with a Farm and the Results Under Given Conditions	1
Solar Energy	1
Forest Protection	1
Total--36 topics	60

Table 25.--Crosstabulation of Familiarity with Professional Crop and Pest Management Services by Farm Size Category (Question F-4).

Farm Size	Yes--Familiar	No--Not Familiar	Total
Large	11 (64.7%)	6 (35.3%)	17 (100%)
Medium	12 (44.4%)	15 (55.6%)	27 (100%)
Small	59 (40.1%)	88 (59.9%)	147 (100%)
Total	82 (42.9%)	109 (57.1%)	191 (100%)

$X^2 = 3.784$

d.f. = 2

significant at .15 level

Table 26.--Crosstabulation of Opinion Regarding Usefulness of Management Services by Farm Size Category (Question F-4).

Farm Size	Yes--Useful	No--Not Useful	Total
Large	9 (64.3%)	5 (35.7%)	14 (100%)
Medium	15 (71.4%)	6 (28.6%)	21 (100%)
Small	61 (49.6%)	62 (50.4%)	123 (100%)
Total	85 (53.8%)	73 (46.2%)	158 (100%)

$X^2 = 4.121$

d.f. = 2

significant at .13 level

Table 27.--Willingness to Pay for Management Services by Farm Size Category.

Payment per Acre	Size of Farm			Total
	Large	Medium	Small	
$0		1	4	5
$2	5	7	22	34
$4	1		10	11
$6	1	1	5	7
$8				
$10			2	2
Other		1		1
Total	7	10	43	60

Footnotes

[1]Ralph Hepp, "Characteristics," p. 4.

[2]White and Boone, "Decision Making," p. 119.

[3]Except in cases of forced action in which a decision is forced by circumstances beyond the manager's control. See Glenn L. Johnson, "Single Entrepreneur Decision Theory," Staff Paper No. 77-87, Department of Agricultural Economics, Michigan State University, 1977.

[4]Johnson et al., Managerial Processes, p. 24.

[5]Glenn L. Johnson, "Some Lessons," p. 19.

[6]Ibid., p. 21.

[7]Thad R. Harshbarger, Introductory Statistics, A Decision Map (New York: Macmillan Company, 1971), p. 204. Also see Charles T. Clark and Lawrence L. Schkade, Statistical Analysis for Administrative Decisions (Cincinnati: South-Western Publishing Co.), p. 371.

[8]Jack R. Anderson, John L. Dillon and J. Brian Haidaker, Agricultural Decision Analysis (Ames, Iowa: The Iowa State University Press, 1977), p. 3.

[9]See for example Frank H. Knight, Risk, Uncertainty and Profit (Boston: Houghton Mifflin Co., 1946); Henri Theil, Economics and Information Theory (Chicago, Ill.: Rand McNally and Company, 1967); Anderson, Dillon and Haidaker, Agricultural Decision Analysis; and various papers by Glenn L. Johnson.

[10]White and Boone, "Decision Making," p. 28.

[11]Ibid., pp. 46-48.

[12]This section is based upon W. L. Slocum, "Attributes of Farm Families with Low Frequency of Contact with Agricultural Extension," Rural Sociology 22 (1957): 281.

[13]Rogers, Communication of Innovations, p. 210.

CHAPTER V

ANALYSIS OF COUNTY AGENT INTERVIEWS

> For it is always easier to help those who can help themselves than to help the helpless.
>
> E.F. Schumacher

In order to get a better understanding of the needs of various farm categories as perceived by Cooperative Extension, each of the County Directors for the six survey counties was interviewed. A list of questions[1] formed the basis of the interviews, but the actual interviews were very relaxed and informal with many questions being answered before they were asked and the conversation ranging into other areas. The County Directors were very cooperative, open and honest in their replies.

In general the County Directors stated that the larger farm operators demanded the most of their time. One used the term "more progressive farmer"[2] and another "the commercial farmer." One agent stated that there are only small farms in his county and said it is not so much the scale of farming as the individual involved in terms of who uses the extension office. He stated, "within both large and small there are those independent people who want to make their own mistakes." None of the agents kept records of the frequency of visits or calls by type of

farmer, and they all agreed that they would help anyone who comes to them for aid or advice, but the general concensus was that the larger, more progressive farmer is more likely to seek advice and information from the Cooperative Extension Service. This is exactly what communications theory would indicate.

With respect to the kinds of information requested by farmers of different size there was both agreement and disagreement. There was agreement that requests from farmers in general "cover the waterfront." One agent said that the Cooperative Extension Service is the "court of last resort or referal service" to which farmers are referred by other organizations and government agencies. This includes requests for information on everything from P.A. 116 to partnership arrangements to very specific problems with insects or disease.

There was disagreement on the kinds of information farmers of different size request. Two of the agents said that the kinds of questions were the same, but the scale was different and the solutions would be different for different sized farms. Three agents responded that the questions were different, with larger farmers asking more complex questions concerning management alternatives while the smaller farmers ask more basic "how to," production types of questions. One agent said that there was more of a difference between farmers by stages of development than by size of operation in the kinds of questions asked. Newer farmers ask more basic questions while more established farmers ask complicated questions.

Later the agents were asked what kinds of information they thought small farmers needed to improve their farm operations. Four of the agents felt that the information necessary for small farms was no different than that necessary for any size farm. One agent stated, "Small farmers must do the same things as large farmers. The only difference is the economics of it. Five acres of strawberries need the same care as one hundred acres." Another said "the general principles of growing corn are the same whether a person grows five or one hundred acres. The marketing is different." The other two agents felt that smaller farmers needed more basic information concerning tillage and production procedures--"how to" kinds of information.

When asked about the role of the county agents in aiding farmers with their goals and objectives there was agreement that this is an area where neutrality must be maintained. They felt their duties were to remain unbiased but to point out the alternatives. Most agents get quite involved in the goal setting process and have conducted seminars on goal setting along with other management principles. They agreed that it is important to know the objective of a farmer before being able to point out the alternatives to a certain question. Agents, of course, vary in their technique and approach. One agent stated that a technique he used was to be a kind of devil's advocate. In taking the opposite view of a farmer on a subject he is able to see how clearly that farmer has thought through a question.

One agent said that there are two types of client; 1) those who will involve the extension service from the beginning and 2) those who will call after their goals and objectives are set and then ask for technical information. He felt that small farmers were most often in the second group. An example of the second type is the farmer who calls the extension service and says, "I planted ten acres of squash. Where can I market it?" On the other hand, there are some farmers who will try to corner the agent into making decisions for them "but they are not about to accept that decision until they have done a lot more checking."

A major difference was seen between large and small farmers with regard to their requests for process skills versus the "right information." Most of the agents felt that the larger farmer required more complicated responses which took them through a thinking process while the smaller farmers were more interested in the bottom line: "How many pounds per acre," or "How many bales do I feed." They pointed out that the time of year is an important factor. During the summer (the time of the interviews) farmers are busy and most questions are the "brush-fire" type. Army worms were a problem common to each of the counties, and the question was the same no matter what the size of the farm. During the winter the agents sponser seminars and workshops which get at the process skills, management, bookkeeping, etc. Thus one agent said that there was no difference between large and small farmers on

this issue.

The agents each had a long list of other places which farmers go for information if they don't go to extension. Farm magazines were often mentioned first, with one agent indicating that he sometimes got questions about various articles which had appeared in a farm magazine or newspaper. Neighbors were often mentioned. It was noted that specialty farms and some larger farmers went directly to Michigan State University because they had graduated there and still knew some professors. At least one agent felt that the farmers were deluged with too much information. "This is a problem because they (the farmers) are being hit up by every Tom, Dick and Harry, either private or public service people, and they don't have the time."

Another agent said that the farmers were being confused with so many different agencies--Cooperative Extension Service, Agricultural Stabilization and Conservation Service, Soil Conservation Service, etc, and it is even more confusing if these agencies duplicate each other's efforts. One important job of extension is as a referal service; getting people to the right office for their needs.

When asked about their perception of the major problems facing the small farmer the county agents gave a variety of responses: the cost of capital and low net returns--particularly for the small farmer; overinvestment or underinvestment, either of which leads to inefficiencies, timeliness, which may be especially important for the

part-time farmer who has a job where he must punch a clock. One agent felt that small farmers have trouble adapting technology to fit their operation and need more "how-to" types of information. A couple of the agents mentioned lack of managerial ability or "expertise" as a main problem of some farmers. "Some people are just poor managers." Along this same line another agent said "Small farmers need to be more realistic as to what they plan to do. Some can be helped. Others must learn the hard way. Extension should point out what can and can't be done. For example, a local farmer put out fifty fruit trees without consultation on spraying, fertilizer, etc. Now most of the trees are dead."

Even when faced with poor farm managers, however, the county agents agreed that they would not tell someone to quit farming. Instead they would point out the alternatives or "try to help him see the light." Some of the agents said that much depends upon the goals of the farmer. If a person really wants to farm full time "I try to work with him over a period of years to get toward that goal. For others who want to wear cowboy boots and have four herefords, I just try to point out that what they are getting into might not pay taxes, or they might go into the hole." Along this line another agent said that some people "would love to be millionnaires so they could afford to farm." One agent pointed out that even if a person is a poor farmer, "if he has another job and wants his children to

have a horse, etc. he should keep the farm because the value of real estate is rising."

With regard to any special effort to help the small farmer the agent's responses were generally negative. One agent gave a flat "no" when asked if he felt there should be a special effort to help the small farmer. Another said he had mixed feelings and asked "Do people really know they are small farmers? We should identify what the office can do and is doing. The information we provide should be in the same format for all farmers." Another said "We like to think we are helping all groups. We are doing the poorest job in the area of small farmers because they number more, are less identifiable and deal with subject matter areas that are fuzzy sometimes. And you just have a tough time finding out who they are and what they want."

Commonly used methods of distributing information varied tremendously from county to county by subject and by time of year, but all the traditional methods were mentioned. The importance of the telephone was stressed by all the agents. In addition each agent mentioned some special programs ranging from a spray guide radio program every morning during season, to newsletters or columns in the local weekly newspapers to a cafeteria style day-long program on a wide variety of subjects where people can pick and choose which subjects they would like more information on. One agent stressed brevity in communicating by mail

and has developed a system of using five by seven inch cards for information bulletins. They are short, use as few words as possible, have a picture or something which catches the eye, and they do not have to be unfolded or unstapled. If something must be mailed in an envelope it is stamped in red "personal" or "confidential" to make sure the envelope is opened.

The role of Michigan State University in helping the county agent and providing information and advice was seen by most agents to be even more important than in the past. One agent suggested that MSU had a role in informing the consumers on the role of agriculture. "Farming is a business, not a subsidized program, and cheap food may not always be available." A couple agents suggested that there should be more in-dept training of extension agents, particularly in orienting new agents. The specialists at MSU received good grades, except when they are out of their office for a period of time with no one to cover. Most of the agents were not too happy about the policy of charging for bulletins, but felt that the quality had gone up. At least one felt that the bulletins were the "backbone" of the system, and that the small farmer series was "a big help."

In reference to small farmers one agent felt that Michigan State University should "take all the success stories and significant accomplishments in small and part-time farmer programs throughout the state and describe them

and make them available" through publications or other means to other agents in Michigan throughout the nation. Most of the agents emphasized the importance of MSU in providing the most recent basic research and in trying to anticipate problems which may arise in the near future.

One subject area which came up during several of the interviews was that of the counseling aspect of Extension. The agents emphasized that extension is not just an answer service. Much of the work involves dealing with people on a one-to-one or one-to-family basis which is much more complex than merely providing an answer. Personality, amiability, style, poise and character are all important, but cannot be taught. At least two of the agents emphasized the importance of listening to their clients to find out what the problem really is or what will make their clients happy. This involves gaining the respect and confidence of the clients, and "being willing to listen." It also involves "trying not to be an all knowing authority" and trying to "take time with people." This counseling aspect of extension is an important component in affecting change yet formal training is not required of the county agents.

The agents recognized that there is a limit to counseling due both to time and money constraints. Also there is a limit due to the type of person being counseled. "Some people want to be nursed along with all steps in the decision process, but we can't be the ultimate complete source of information for everyone." Another agent said, "People are always looking for the easy way out. If someone

asks, 'What can I do to keep the weeds out of my garden?' I say 'Do you have a good sharp hoe?'"

Summary

The County Extension Directors of the six counties selected for sampling were interviewed. This is not a representative sample and the data are not subject to statistical sampling, but it does give an idea of what is happening in extension at the county level. A list of questions was used, but the actual interviews were somewhat open-ended and allowed subjects to come up which were not previously identified. General conclusions follow.

The agents generally agreed that the larger farmers demand more of county agents time than the smaller farmers, and ask more complicated questions. Small farmers tend to ask basic questions, looking for the "bottom line" of how many bales to feed or pounds to use per acre while larger farmers are also interested in managerial processes. Two of the agents felt that the questions were the same for both small or large farms, but the scale was different, and the solutions were different.

However, when asked what kinds of information they felt small farmers needed, four of the agents responded that the information was the same regardless of the size of farm. "The plants are the same, the livestock is the same. The difference is the amount of investment in machinery, etc." The other two agents said that the informatin needs are

different for smaller farmers in that they need more basic information than larger farmers. Thus, the type of information is the same, but the level is different.

All of the county agents got involved in goal setting with their clients, but insisted that neutrality be maintained. Their function is to present the alternatives.

The agents listed many different places where farmers may look for information. This includes other government agencies, farm organizations, magazines and newspapers and others. It was suggested that one role for extension is as a referal service.

The agents listed a variety of problems which they perceived to be the major stumbling block of small farms but they were all economic or technical in nature. The cost of capital, timeliness, adapting technology to their operation and "how to" types of information were mentioned. Also mentioned were the lack of managerial ability and expertise of some farmers. Again, the agents felt they should only present alternatives, even the bad consequences, rather than force a decision.

The county agents did not feel that they should make special efforts to help small farmers. They felt that they should be helping all farmers without discriminating. They clearly felt that their jobs were to work with commercial farmers since they provide the food and fiber for the nation. The agents recognized that they were doing the poorest job with the small farmer because of their large numbers, the

difficulty in identifying them and the fuzziness of their problem areas.

All the traditional methods of communication were mentioned by the agents, stressing the telephone, bulletins and newsletters. Each agent seemed to have his own preferred methods.

The role of Michigan State University was seen to be as important as ever in providing up-to-date research and technology. The important role of bulletins and the need for basic research was emphasized. Some suggestions were made concerning MSU services to Cooperative Extension. Finally, the role of the agent as a counselor was discussed, along with its limitations.

Footnotes

[1]See Appendix E.

[2]To maintain confidentiality none of the agents who are quoted in this section will be identified.

CHAPTER VI

EXTENSION EDUCATIONAL PROGRAMS FOR SMALL FARM OPERATORS

The previous two chapters have presented analyses of the questionnaire data and of the County Agent interviews. The purpose of this chapter is to attempt to synthesize the two in terms of their implications for extension programming for small farm operators.

The survey response confirms that small farms still comprise the majority of farm operators in Michigan, and that these small farms are scattered throughout the state. Earlier research has established the importance of small farms in terms of acres harvested, acres occupied, agricultural sales and dominance in certain enterprises such as beef calves, sheep and fat cattle, forages, soybeans, and small grains.[1] This research also indicated that small farm operators reported a desire to increase income from the small farm and that such an increase is possible if the operators of small farms are willing to make changes in their management practices and enterprises.[2] The present research has attempted to look at part of the management process to see what changes could be made to improve the

management practices of small farmers, and thus improve their gross farm income situation.

In looking at the demand for information by small farm operators as well as larger operators it is apparent that small farm operators use a wide variety of sources of information. This was shown in tables 9 and 10 earlier as well as in the responses of the county agents. The fact that larger farmers tend to seek information more frequently from dealers, salesmen or buyers, banks or lending institutions and the Cooperative Extension Service than do small farmers tends to support the Agents' contention that the larger farmers ask more complex questions which involve managerial processes. These are the sources one would go to for more detailed answers to questions. Small farmers tend to seek information more frequently from neighbors, friends or relatives and radio and television than do larger farmers. Again, these are the sources which tend to provide simple answers or information as opposed to a more complex process.

Although small farmers use a wide variety of sources of information, they also responded that they "never had this problem" more frequently than either medium or large farmers. Given the sources from which these problems were obtained and the general applicability of the problems listed, it may be concluded that larger farmers tend to recognize problems more readily than do smaller farmers. This, of course, is the first vital step in the problem

solving model and if one does not recognize a situation which is less good, or more bad than it could be with some changes, then those changes will probably not be brought about.

This conclusion is also borne out in tables 6 and 7 regarding perceived importance of various types of information. Small farmers tended to respond that technical problems were "not important at all" more frequently than larger farm operators. The same was true of institutional information. If a small farmer does not perceive of a particular problem as being important, it is very unlikely that that small farmer will attempt to change the situation.

The above point was discussed at a Cooperative Extension Inservice Education Workshop on December 6, 1977, at Michigan State University. County Agents from throughout the state indicated that they are often in positions where they can see a "problem" but it is not recognized as a "problem" by the farm operator. Examples were given of small farmers who had ten cows in a class B dairy operation.[3] The County Agents recognize that this is not a profitable enterprise in Michigan, but they cannot tell the farmer to quit. Instead they must try to find out the goals and objectives of the farmer in order to offer alternatives or to make suggestions. This enters into the realm of counseling.

Although the small farmers tended to perceive of technical and institutional problems as not important more

frequently than larger farmers, there was still a positive correlation between the various farm size categories in their ranking of the importance of problems. The correlation (table 5) was much higher for farm categories close in size than for those much different in size. The highest correlation (.8176) was between small full-time and small part-time farm operators while the lowest correlation (.4893) was between small full-time and large full-time operators. Thus, while the correlation in all cases was positive, it was weaker as the farm size compared increased in difference. This tends to confirm the County Agents' belief that large and small farmers have the same types of problems, but that the solutions differ according to the scale of operation.

The County Agents named several problems which they felt were major causes of concern for small farmers. These were mainly economic or technical in nature. The problems most frequently mentioned by the small farmers (table 30) were also mainly economic or technical in nature. The Agents mentioned the cost of capital and overinvestment or underinvestment as major problems of small farmers while the problems most frequently named by small farmers included the purchase or rental of machinery or equipment and the repair of old or purchase of new buildings. Again, this tends to confirm the County Agents' assertion that the problems of large and small farmers are quite similar, but the solutions differ.

The County Agents also tended to agree that small farmers ask more basic "how to" types of questions while larger farmers ask more complex questions. Other County Agents made the same point at a Workshop in December 1977. "After the enterprise is selected, the small and part-time farmer may need basic cultural practices information and/or basic husbandry skills information--the "how to" kind of bulletin or slide/tape. This may include soil testing, water management, the whole production process in the chosen enterprise, the equipment and facilities needs, costs of production, . . ."[4]

Many of these same "how to" kinds of questions were suggested as topics for meetings or for two-or-three day schools (tables 28 and 29). This included basic cultural practices and basic husbandry skills information mentioned above. Most of the suggested topics were very specific in nature and addressed particular problems, but the lists also included more complex topics such as various aspects of farm management, marketing, machinery management, taxes, and use of chemicals. Thus, both the County Agents and the small farmers recognize the need for basic information, but there is also a need to go beyond the simple "how to" kinds of information to the more complex subjects which involve process skills of management. The larger farmers apparently already possess the basics. Many small farmers, however, need to begin with the basics. In interviewing the County Agents one Agent stated, "Sometimes we are

guilty of just starting at too high a level for them (the small farmers) and we must be careful not to go over their heads."

Although small farmers may need information and knowledge at a more basic level than larger farmers, this does not reflect on their capacity to make decisions. Tests of rationality indicated that there was no significant difference between small, medium, and large farmers in terms of rationality of decision making. Also, these tests showed no major difference between size of farms in terms of their information gathering activities. All of the test scores were skewed to the high end of the total score possible and were highly concentrated.

When the County Agents were asked about the demands on their time by various sizes of farm operators, the general response was that the larger, more progressive farmer demanded the most time. When the questionnaire respondents were asked about their contact with Extension, however, it was the $20,000 to $39,999 category which had the greatest amount of contact (table 14). This category was followed by the medium size farmers ($40,000 to $99,999) and then by the large size farm category (over $100,000). Some of the Agents suggested that many of the larger farmers or the specialty farmers (poultry, hogs, etc.) seek information directly from the specialists at Michigan State University rather than going through the County Agent.

While the smaller farm size categories did tend to have less contact with Extension, over 30 percent of each of the three smallest groups had high contact. High contact was defined as the equivalent of a farm or home visit by the County Agent every other month or more frequently. This shows that the County Agents are reaching about 30 percent of the small farmers through various channels which are the equivalent of one farm or home visit every other month, or less than one phone call per month. Whether or not this is enough to effect a change is beyond the scope of this report, but this would be useful information for the Cooperative Extension Service to know.

Implications for Extension Education Programming

Objectives

The third objectives of this research was to examine alternative informational delivery systems or nonformal educational delivery systems that the Cooperative Extension Service could utilize in reaching small farm operators. The fourth objective was to try to identify some high priority areas for resource allocation alternatives for the Michigan Cooperative Extension Service if additional funds are made available to operate special educational programs for small farm operators. The remainder of this chapter will address these objectives and will offer suggestions for Extension education programs.

The Communications Model: S-M-C-R-E

In an earlier chapter the communications model, Source-Message-Channel-Receiver-Effects, was presented and described, and a distinction was noted between the source and the channel. This research has focused on the various channels of communication through which small farmers get their information, and through which the Cooperative Extension Service disseminates information. However, the first two elements in the communications model cannot be ignored in discussing the implications for programming.

The Source

The sources for most of the agricultural information which the Cooperative Extension Service uses in educational programs are the universities and agricultural experiment stations of the land grant system, of which the Cooperative Extension Service is a part. However, the land grant system is not the only source of technological information available to farmers. There is also the private sector, which not only gets information from the land grant system, but also develops innovations and technology for sale to private farmers. Private machinery, seed, fertilizer, and chemical companies have contributed to the technological revolution which has favored larger farms. One needs only to page through some of the popular farm magazines to see that much that these private companies have to offer is aimed at the larger commercial farms.

Alternative Sources

What are some alternative sources for technical information appropriate for small farms? In the private sector this naturally depends upon market mechanisms, but companies do exist which produce 12 to 30 horse power tractors (not just garden tractors) and implements designed for small farms, and their advertisements seem to be appearing more frequently. In the public sector the major source is the land grant system, and the need for research on small farm subjects will be discussed in the next section. There is another source, however, which remains largely untapped. This is the small farmer himself.

Ideally the Cooperative Extension Service is a two-way street, involved both in disseminating information through various programs and in acquiring information about the farmers' situations, their problems and needs, and also about their ideas and innovations which could be passed on to other farmers. Much of the technology which has been refined at the university level originated at the farm level. The technology has tended to favor the larger farmer. However, much could be learned from small farmers which could be shared with other small farmers. The Cooperative Extension Service is not benefitting from the feedback and suggestions of the part-retired farmers because they have very little contact with them. This feedback may not be important in terms of new technology for large commercial farms, but it may be very beneficial

in terms of production techniques for small and part-time farmers. Part-retired farmers have a lifetime of experience which could be tapped for the benefit of modern small farmers.

This idea of utilizing farmers as resource people for other farmers was also suggested by some of the County Agents. Part of the problem, however, is to persuade part-retired or other small farmers who have various skills or knowledge which could benefit others to participate in workshops or group discussions, or even on an individual basis. This involves building up their confidence and convincing them that they have substantial contributions to make. It was also suggested that these reference people could be telephone references for other farmers who have particular problems which the reference farmers could best handle.

Message

The universities and experiment stations of the land grant system have produced new technologies in the form of improved fertilizers, seeds, irrigation techniques, and chemicals to control insects, weeds, and plant diseases. It was assumed that these technologies were neutral with regard to size of farm, and that they would be useful to all groups of farmers. This was also the belief of the County Agents who were interviewed. Thus, the <u>messages</u>

coming from these sources were assumed to be of value to farmers regardless of size.

Content of the Message

This assumption has come under attack in recent years,[5] and the fact that many of the land grant universities are developing bulletins for small and part-time farm operators and are sponsoring research on small farms is tacit acknowledgement that this criticism is, at least in part, justified. The content of the messages which are conveyed to farmers is of critical importance in determining the effect of the communication. If it is not applicable to small farm situations, if it requires capital or credit resources beyond the means of small farms, if it requires management skills not possessed by small farmers, then that message is likely to be ignored by small farmers. It is apparent that high priority needs to be placed on developing information which is of immediate benefit to small farmers. The channel of communication matters not if the content of the messages being delivered is useless. This need for the development of materials specifically applicable to small farms was recognized in some earlier legislation and particularly in the 1977 Farm Bill and presents a challenge to the land grant system.

Small Farmer Series of Bulletins

Michigan State University has started a series of bulletins designed for small farm operations. Currently

there are fifteen titles in this series, with more expected to be produced in the future. In addition the Ottawa County Cooperative Extension Service produces The Backyard Farmer on a monthly basis which deals with subjects of interest to small and part-time farmers, and the U.S. Department of Agriculture has a fact sheet for part-time farmers and gardeners.[6] There are also publications from other states which pertain specifically to small and part-time farms. Hepp and Halsey identify some fifty-one such publications which may be useful in contributing ideas to the small farmer series in Michigan.[7]

Level of the Message

Another aspect of the content of messages is the level of the message. The County Agents interviewed agreed that small farmers tend to ask more basic "how to" types of questions. One Agent indicated that Extension programs sometimes start at too high a level for some farmers. The fact that many of the topics which were suggested by farmers for meetings or two-or-three day schools involved these same "how to" types of questions has important implications for Extension programming.

Tables 28 and 29 show that small farmers suggested some 43 topics for meetings and 25 topics for two-or-three day schools. These tables are broken down into small farm categories based on the categories of Thompson and

Table 28. Topics Suggested for Meetings by Small Farm Category.

Topic	Number of "Mentions"		
	Small Full-Time	Small Part-Time	Total
Crop Management			
General	3	2	5
Grain varieties to grow	1		1
Reduced tillage	1		1
Fertilizer use	2	2	4
Insects	3		3
Pruning	2		2
Chemicals to use		1	1
Sprayer calibration		1	1
Correct poison to use	1		1
Livestock Management			
General	2	3	5
Nutrition		2	2
Cattle and sheep		3	3
Castration and dehorning	1		1
Raising pigs		1	1
Techniques for beginners		1	1
Expanding hog operation		1	1
Dairy management	1		1
Retirement	1		1
Estate planning	2		2
Government Sponsored Programs			
General		1	1
Government intervention		1	1
Imports	1		1
Cost sharing projects		1	1
Taxes	1	2	3
Forest protection		1	1
"Why big chemical farmers and industries are allowed to pollute our drinking water"		1	1

Table 28. Continued.

Topic	Number of "Mentions"		
	Small Full-Time	Small Part-Time	Total
Farm Management			
General	1		1
Bookkeeping	1		1
Investment and returns		1	1
Financing		1	1
Farm expansion	1		1
Future of small time farming	2	4	6
Small farm management		1	1
Going into full-time farming		1	1
Marketing			
General	2	4	6
Better prices	2	2	4
When to sell		1	1
Sale of fruits and vegetables	1		1
Machinery Management			
General	1	1	2
Selecting good used farm equipment		1	1
Knowing what implements to get for a small farm		1	1
Farming in General	2		2
Cost Cutting on Household Expenses		1	1
Total--43 topics	35	43	78

Table 29. Topics Suggested for Two-or-Three Day Schools by Small Farm Category.

Topic	Number of "Mentions"		
	Small Full-Time	Small Part-Time	Total
Marketing			
General	2	3	5
Cut out middle man	1		1
The Chicago Mercantile Exchange		1	1
Livestock			
General	1	1	2
Small and large beef cow operation		1	1
Nutrition		1	1
Housing		1	1
For small farms		1	1
Shearing sheep, castration and dehorning	1		1
Artificial breeding	1		1
Dairy	1		1
Crop Management			
General	2	1	3
Weed and pest control		1	1
Fruit tree care	1		1
Farm Management			
General	2		2
Small farm management	2		2
Bookeeping	1	1	2
Cash flow		1	1
Financing		1	1
Partnerships		1	1
Basic Living from Your Land		1	1
Repair and Maintenance		1	1

Table 29. Continued.

Topic	Number of "Mentions"		
	Small Full-Time	Small Part-Time	Total
Getting Started in Farming		1	1
New Farming Methods		1	1
Taxes		1	1
Total--25 topics	15	20	35

Hepp.[8] However, none of the part-retired farmers suggested any topics, and rural residents, or hobby farmers, were excluded.

"How to" Topics and General Small Farm Topics

These tables suggest a number of "How to" topics around which Cooperative Extension could base educational programs or meetings. This includes fertilizer use, castration and dehorning livestock, sprayer calibration, selecting good used farm equipment, shearing sheep, artificial breeding, bookkeeping and weed and pest control. Besides these "how to" topics, some of the other topics pertain particularly to small farms, including livestock techniques for beginners, the future of small time farming, small farm management, knowing what implements to get for small farms, small beef cow operations, livestock for small farms, basic living from your land and getting started in farming. This shows a general interest in small farm subjects and implies that Cooperative Extension should begin developing programs in these areas. Tables 28 and 29 suggest that some differences exist between categories of small farms, but both small full-time and small part-time farmers expressed interest in crop management, livestock, the future of small-time farming, and marketing. The fact that small part-retired farmers did not respond implies that this may be a difficult group to reach through

conventional means and special efforts to reach them may be required.

Suggestions for Extension Educational Programming

Tables 28 and 29 could be used as the basis for planning educational meetings and programs for small farmers. They could be used by the universities and research stations as guides for research in relation to small farms. In particular, programs could be developed around crop management for small farms which would include separate workshops or meetings on grain varieties, reduced tillage, fertilizer application, weed and pest control, etc.; livestock management for small farms which again could include separate meetings on nutrition, castration and dehorning, pigs, livestock for beginners, housing of livestock and artificial breeding, and other subjects listed in Tables 28 and 29. These general (and specific) topics would, in turn, suggest other topics. For example, crop management would suggest a demonstration of how to take a soil sample. One of the County Agents who was interviewed said that good farming is based on good elementary practices. "If I could just get more people to do a decent, proper soil test instead of taking one plug from a thirty acre field, this would be a major step." This is a challenge to the land grant system: getting the basics to the small farmer.

Table 30 is a list of the most important decisions about the farm or home listed by small farm category. This list complements tables 28 and 29 in that some of the same subjects received mention, but also some additional subjects are listed. All three tables are based on the responses to open-ended questions, but table 30 refers to actual decisions which the respondents had made recently while the other two tables consist of suggested topics for future meetings.

Partly because of the greater number of responses and the reference to an actual decision, table 30 is more discriminatory in suggesting programs for different categories of small farmers. For example, a greater percentage of small part-time farmers listed the purchase or rental of machinery or equipment than small full-time farmers, and none of the small part-retired farmers listed the subject. This would suggest development of a program on the purchase or rental of machinery and equipment for small part-time farmers, and table 28 would suggest that a program related to this concerning implements for small farms should also be developed. Table 30 also indicates that small part-time farmers would be interested in building construction and repair, livestock, purchasing land or renting out land. Small full-time farmers indicated that planting decisions are important, as well as whether or not to expand and the purchase or rental of machinery or equipment. Some programs may be combined, but some of

Table 30. List of Most Important Decisions About Farm or Home by Subject and by Small Farm Category.

Subject	Number of "Mentions"			
	Small Full-Time	Small Part-Time	Small Retired	Total
Buildings, Machinery and Equipment				
Purchase/rent machinery or equipment	13	23		36
Repair old or build new buildings	9	16	1	26
Sale of equipment	1	1		2
Building fences		1		1
Crop Management				
To change crop practices	2	4		6
Which herbicide to use	1	1		2
What to plant	18	17	1	36
Soil samples	1			1
Lime	1			1
Fertilizer	3	2		5
Livestock Management				
Livestock mix	7	13	1	21
To change from livestock to crops	2	1		3
Land				
Purchase of land	4	7		11
Whether or not to rent out land	3	11	2	16
Sale of land	3	4	2	9
Irrigation and drainage	3	3		6
To clear land	1	3		4
To rent more land		1		1
To subdivide or not		1		1
To buy or rent more land	1			1
Farm Management				
Whether or not to expand	7	5	1	13
Whether or not to quit	5	7	2	14

Table 30. Continued.

Subject	Number of "Mentions"			
	Small Full-Time	Small Part-Time	Small Retired	Total
Credit and finance	2	3		5
Storage	3	3		6
To reduce operations	1	2		3
Hired labor	1	1		2
Should son take over farm	1			1
Taxes	2			2
How to buy a farm	1			1
To ask help of Ag. Dept.		1		1
Home and Family				
Remodel old or build new home	2	5	2	9
Insulating home	5	3	1	9
Off-farm employment	3			3
To sell house		1		1
To move to new area		1		1
To make a will	1			1
Prices and Marketing	7	7		14
Total--37 topics	114	148	13	275

these may be aimed specifically at one category (though not excluding the other categories) if there is more interest by a certain category. Table 30 implies that Cooperative Extension should develop programs related to the rental or purchase of machinery, planting decisions, repair or construction of buildings, livestock mix, renting out land, prices and marketing, whether or not to quit farming, or whether or not to expand. These programs should be directly related to the small farm and should be based on small farm research.

Table 31 shows the ranking of the ten most important problems from a list of forty-four problems as perceived by farmers of different small farm categories. This list is more restrictive because it was not based upon responses to open-ended questions, but to a choice of forty-four specific problems. However, this table reinforces the previous three tables in the overlap of some of the subjects mentioned. For example, pricing of farm products, or more generally, marketing, was ranked as most important by all farm categories, and was also listed as an important decision and a suggested topic for meetings and schools. Fertilizer application and income tax preparation were also common to all three tables. This implies that Cooperative Extension should prepare programs on these subjects for small farmers in general, whether full-time, part-time, or part-retired.

Table 31. Ranking of Ten Most Important Problems as Perceived by Small Farmers of Different Categories by Mean Rating.

Rank	Question	Question Number	Mean Rating[a]	Percent Reporting
	Small Full-Time[b]			
1	How to get better prices for your farm products	31	4.509	78
2	Keeping up-to-date with records and farm accounts	34	4.263	78
3	How to cut down on the heating bill	10	4.167	82
4	Knowing when to sell your farm products	3	4.119	81
5	Figuring out how much fertilizer to use	4	4.089	85
6	Personal and family health concerns	15	4.050	82
7	Political issues (school bonds, highways, etc.)	29	4.034	79
8	How to figure out income tax	26	3.911	77
9	Planning your estate	20	3.893	77
10	How to improve the public schools in the area	30	3.796	74
	Small Part-Time[c]			
1	How to get better prices for your farm products	31	4.449	90
2	How to cut down on the heating bill	10	4.056	92

Table 31. Continued.

Rank	Question	Question Number	Mean Rating	Percent Reporting
3	Problems with insects and diseases	2	3.890	95
4	Personal and family health concerns	15	3.871	91
4	Keeping up-to-date with records and farm accounts	34	3.871	91
6	Planning for children's education	17	3.868	88
7	How to figure out income tax	26	3.843	91
8	Knowing when to sell your farm products	3	3.803	92
9	Figure out how much fertilizer to use	4	3.789	92
10	How to raise children properly	22	3.761	87
	Small Part-Retired[d]			
1	How to get better prices for your farm products	31	4.429	64
2	Planning your estate	20	3.857	64
2	How to figure out income tax	26	3.857	64
4	How to raise children properly	22	3.667	55
5	How to cut down on the heating bill	10	3.571	64
5	Personal and family health concerns	15	3.571	64

Table 31. Continued.

Rank	Question	Question Number	Mean Rating	Percent Reporting
7	Planning meals for nutrition	16	3.286	64
7	Figuring out how much fertilizer to use	4	3.286	64
7	Figuring out how much insurance to buy	18	3.286	64
7	Political issues (school bonds, highways, etc.)	29	3.286	64

[a]Rating ranges from 1 (not important at all) to 5 (very important).

[b]Based on 100 percent = 73

[c]Based on 100 percent = 77

[d]Based on 100 percent = 11

Table 31 also shows some differences between small farm categories in terms of perceived importance of various problems. Overall, the mean ratings of the small full-time farmers were higher than those of the small part-time farmers which, in turn, were higher than those of the small part-retired farmers. This indicates that a greater percentage of small full-time farmers than other small farm categories checked "very important" in reference to these particular problems. On the other hand, a greater percentage of small part-retired farmers checked "not important at all." Further research may be necessary to determine why these differences exist, but one suggestion is that problem definition, or problem awareness, is a factor as was discussed earlier.

Channel

Once a source, which is familiar with the needs and problems of small farmers, has developed messages in the form of appropriate technology, production techniques, marketing arrangements, etc., which are useful for small farmers, then the channels of communication become very important. This is where Cooperative Extension comes in.

Typically farmers use a number of channels or sources of information in the decision making process. This was indicated by Tables 9 and 10 earlier. Likewise, sources which are trying to convey a message typically use a number of channels, and a number of different treatments

within each channel. The treatment refers to the specific design of the message, including word choice, use of art or music, timing, and other forms of delivery. The treatment generally involves a great deal of individual creativity and includes an infinite variety of styles, techniques, designs, or patterns for communicating a message to a receiver. Suggestions for treatment are beyond the scope of this research, but several channels of communication will be examined for implications for Extension programming.

Communication theory divides channels into two broad categories: (1) mass media and (2) interpersonal, and the interpersonal category can be further divided into group activities and individual activities. Each of these categories has implications for alternative informational delivery systems or nonformal educational delivery systems for reaching small farm operators.

Mass Media Channels for Awareness

Mass media channels are most effective in creating an awareness about a program or an idea. Large farmers tend already to be aware of Cooperative Extension programs, while small farmers sometimes do not even know the service exists. Small farmers tended to cite radio or television as sources of information more frequently than large farmers and thus are more likely to respond to these methods of communication. If programs for small farmers

are developed the mass media could be very important in creating an awareness of these programs among the small farm population. Mass media can also point out the other services and programs which Cooperative Extension has to offer.

Successful communication often depends upon a cumulative effect. Thus, one of the County Agents said that if he sends a notice of a meeting along with a reminder again shortly before the meeting, he gets a much better response than if he just sends out a notice. Also, if a number of different channels are used to get across a message, the cumulative effect has been demonstrated to be much greater than the sum of the individual effects.

Mass Media Channels for Educational Programming

In addition to being used for awareness of meetings and programs, various forms of mass media are used for more substantive communication. Most of the Agents interviewed had news letters or columns in the local weekly newspapers. These newsletters or columns could be focused particularly on some of the subjects of interest to small farmers mentioned above, and perhaps a forum could be developed at the county level for an exchange of ideas concerning small farms. Many of the basic fundamentals of agriculture could be presented in very brief columns which would not only be informative and educational to the small farmer or beginner, but would serve to refresh the thinking of more

established farmers. One Agent said that he has had success with a newsletter dealing with insects. Beginning in May this newsletter described what insects had been seen in the area, how to identiy them, and what to expect with regard to crop damage, etc. Now farmers are beginning to look for worms and insects rather than waiting until it is too late.

For more timely information Agents often use short radio or television spots. One Agent had a daily sprayer guide program in which advice was given on spraying practices considering recent growing conditions, the weather forecast, and the presence of insects or disease in the area.

Mass media may also be useful in pointing out problem situations to small farmers. In analyzing their perceived importance of various types of information this research showed that small farmers tended to perceive of technical and institutional information as not important more frequently than larger farmers. They also responded that they "never had this problem" more frequently than medium or large farmers. This means that either the small farmers do not recognize various problems, or that they do not feel that these problems are important in terms of their own goals and objectives. If problem recognition is the answer, then mass media can be used to point out small farm situations which may be less good or more bad than

they could be with proposed changes, and mass media could also be used to point out the changes which are recommended.

The Cooperative Extension Service currently uses several mass media channels for their regular programs on the assumption that the information is useful to all farmers regardless of size. In many cases this may be true. In order to reach the small farmer, however, these programs must be specifically addressed to small farmers and must be concerned with subjects of interest to small farmers. Mass media can be used to create an awareness of small farm programs, meetings on small farm topics, or other activities for small farmers. Mass media can also be used to present basic fundamentals of agriculture, such as some basic tillage practices, elements of animal husbandry, or basics of farm record keeping. Mass media can also be used to create an awareness of problem areas. An example of this was the series of newsletters concerning insects mentioned earlier. This created an awareness of possible problems with insects, explained what to look for and how to identify the harmful insects, and finally made recommendations for getting rid of the pests.

Interpersonal Channels--
Group Activities

Mass media channels can be very effective in reaching a wide audience, but often more interpersonal channels are necessary to reach specific audiences. One division of interpersonal channels is group activities. Probably the

most common group activity in Extension work is the meeting. Meetings have long been used by Cooperative Extension, but a common complaint of County Agents has been that small farmers do not attend these meetings. However, this research indicates that 61 percent of the small farmers would be willing to attend a meeting concerning one of their farm or home decisions. This means that there must be other reasons for the lack of attendance by small farmers besides lack of interest. One reason may be the appropriateness of the subject matter of the group activities to small farm problems. This was discussed earlier. Another reason may be the concept of homophily which was mentioned earlier. If this concept is valid, then small farmers would be less likely to attend meetings which may also attract larger farmers. On the other hand, meetings designed especially for small farmers or part-time farmers would likely attract more people from these groups since it is also likely that the other people who attend will have similar interests and problems. Meetings designed to teach "how to" subjects would be unlikely to attract people who already know the subject, but would attract people interested in learning "how to." Since small farmers suggested several "how to" subjects as topics for meetings or schools, the implication is that Cooperative Extension should develop materials on these subjects which are appropriate for use on small farms, and present these

materials at a series of meetings for small farmers in counties throughout the state.

For example, meetings could be held on how to castrate pigs. These could be held at the farms of local small farmers who just happen to have some pigs to be castrated. These may belong to small part-retired farmers who have years of experience raising pigs and lots of "down home" wisdom to impart. Members of the audience could be asked to participate by helping to hold the pigs or by applying the antiseptic.

Other "how to" meetings or demonstrations could be held on small farm subjects, at small farms, involving real people, real animals, real machinery, and real small farm problem situations.

Farm tours have been used by Cooperative Extension to demonstrate the latest technology and give examples of successful farmers. These have traditionally included only large, commercial farms. To reach the small farmer, however, a farm tour could be organized which included only small farms. This may not be a statewide tour as the others are, but could be organized by region. It could include various types of small farm machinery and implements, buildings, appropriate technology for small farms, livestock for small farms and demonstrations of some basic fundamentals of farming.

Interpersonal Channels--
Individual Activities

The above group activities included meetings, workshops, seminars, demonstrations, farm tours, county fair programs, and nearly any activity where County Agents get together with groups of farmers for educational and social purposes. Individual activities involve one-to-one or one-to-family contact. This may be personal contact, or it may be over the telephone. The County Agents interviewed agreed that the telephone was their most useful tool (and judging by the number of times the phone rang during the course of the interviews they were right). The Agents found the phone particularly useful for putting out "brush fires." These are immediate, short term problems which pop up from time to time, particularly during the growing season. These can usually be taken care of with a quick answer or a brochure in the mail the next day. This is also useful in alerting the agents to common problems, such as army worms or leaf blight, etc.

Alternative Points for
Individual Contact

At the local level some of the feed and seed dealers, machinery dealers and elevators are important points of personal contact for farmers. Farmers visit these places frequently in the course of their daily business and although they may not consider these establishments as important sources of information, they nevertheless pick

up information at these places. One of the County Agents who was interviewed suggested that Extension should "try to catch people on their normal daily paths of activity; going to the store, to the elevator, to work or to school instead of trying to get them to go out of their way." In reference to dealers, he said, "We (Cooperative Extension) have difficulty with elevators, feed, and fertilizer houses. They aren't in tune with us but they sell what they have in stock and people will listen to them. I suggest that we have a feed and weed school for the dealers and tell them that this is what we recommend and why. It would also be possible to put a rack of brochures and pamphlets in the elevators, but we must maintain it." Another County Agent made suggestions along this same line and stated, "I think that Michigan State University needs to work more with agribusiness people who work with farmers." This may tend to favor the larger farmer, but if meetings are held which are related specifically to small farm technology, and agribusiness can be convinced that there is a market for small farm implements and technology, then this would be another channel through which Cooperative Extension could work.

Paraprofessionals, Volunteers, and Program Aids

The use of paraprofessionals, volunteers, and program aids has been tried in various states and to some extent in some of the counties in Michigan. In all cases the key

to success has been the selection and training of the individual paraprofessionals, volunteers, or program aids. They must be competent in their work as well as in their ability to work with people in identifying problems and offering alternatives. Some of the County Agents who were interviewed mentioned the counseling aspect of their jobs. This included a willingness to listen, to try to learn the farmer's goals and objectives, and to try to identify the problem as the farmer sees it. Paraprofessionals, volunteers, or anyone who is going to work on a personal basis with small farmers will need to have these skills of listening and counseling and working with people, and Cooperative Extension should provide training in these areas.

Priority Areas for Resource Allocation

The fourth objective of this research was to try to identify some high priority areas for resource allocation alternatives for the Michigan Cooperative Extension Service if additional funds are made available to operate special educational programs for small farm operators. This was the most elusive objective to pin down because of the difficulty of evaluating programs which are not yet established in Michigan and in predicting a benefit/cost ratio when many of the benefits are noneconomic and accrue to a wide variety of people and institutions. Thus, the following priority areas for resource allocation are based

upon the review of the literature, the County Agent interviews, and to a lesser degree on the survey results.

Recent legislation has established a policy towards helping small farmers. This research has looked at farm management and decision making in terms of the demand for information by small farmers and the supply by Cooperative Extension, and one conclusion is that there is a demand by small farmers for information which is relevant to their sizes of operations. Small farmers seek information from a wide vareity of sources, but the information available at the land grant universities has not been particularly useful to small farmers. More information needs to be developed which will directly benefit small farmers. Thus, one high priority area is research on small farm subjects. Suggestions for specific subjects will be presented in the next chapter.

The bulletin has long been one of the main methods of distributing information of the Cooperative Extension Service, and it is still very important. Michigan State University is developing a series of bulletins designed for small farmers. County Agents have found these very useful. If further research is conducted on small farm problems, it follows that this research should be presented to the clientele, County Agents, and other interested persons if it is to be useful, and bulletins are one method of presentation. Thus, another high priority area for

resource allocation is to continue developing a series of bulletins for small farms, based on small farm research.

The Cooperative Extension Service has always had a county system of agents. In fact, the county has long been "the crucial unit in Extension work. It is the counties that adult education is carried on and where its teachings are subjected to the acid test of workability."[9] The County Agents have the best opportunity to develop and adapt programs designed for small farm operators which are relevant to the local soil, cropping, climatic, and cultural situation. As one County Agent said, "We are on the ground floor, especially with the new farmer. But first we must have a credible office and be credible people because they (the farmers) will ask their neighbors first . . ." before they come to the office. Thus, another high priority area is to provide resources for programs at the county level. This may include full-time Agents to work specifically with small farmers, or the use of paraprofessionals or program aids on a part-time basis to work with volunteers, resource people, or part-retired farmers, in addition to working directly with small farmers.

County Agents are, of course, part of a statewide system, and they rely on regional and state specialists for a number of things. Although most of the small farm programs will be at the county level, some, such as small farm management tours, would best be done on a regional basis. County Agents will continue to rely on both

regional and state specialists for backstopping and advice. One function which could best be performed at the state level would be to provide training in various aspects of small farm technology and management, in counseling and listening techniques and in working with people. In addition, the state level people could conduct seminars for County Agents and other persons working with small farmers for the exchange of ideas and to get feedback from the county level. The state level people could also record the success stories and significant accomplishments of various county small farm programs throughout the state and publish descriptions of them so that other Agents could borrow and exchange ideas to use in their own counties. Thus, another high priority area is to provide resources at the regional and state levels for persons to coordinate seminars and workshops for people who are working on the county level with small farm programs, and to provide for a system of exchange of program ideas from county to county.

Footnotes

[1]Thompson and Hepp, "Description and Analysis," p. 2.

[2]Ibid., pp. 2 and 10.

[3]Discussion by County Agents at a Cooperative Extension Service In-Service Educational Workshop entitled "Educational Program Innovations for Small and Part-Time Farmers," Michigan State University, East Lansing, Michigan, December 6, 1977.

[4]Ralph Hepp and Linda Halsey, "Programming for Small/Part-Time Farmers," Summary of Proceedings of an Extension In-Service Training Workshop on Educational Program Innovations for Small/Part-Time Farmers and a Selected Bibliography of Materials for Small/Part-Time Farm Operators, Staff Paper 78-26, Department of Agricultural Economics, Michigan State University, 1978, p. 3.

[5]For example see Jim Hightower, "The Case for the Family Farm," in Food for People, ed. Lerza and Jacobson, p. 41.

[6]Hepp and Halsey, "Programming," p. 7.

[7]Ibid., pp. 8-14.

[8]Thompson and Hepp, "Description," p. 5.

[9]Brunner and Yang, Rural America and the Extension Service, p. 30.

CHAPTER VII

SUMMARY, CONCLUSIONS AND RECOMMENDATIONS FOR FURTHER RESEARCH

Summary

Small farms have been basic to the structure of American agriculture. The represent some of the values which this nation was founded upon, such as freedom, independence, self-reliance and the right to own property. A land-grant system was established to promote agricultural research and education, and the Cooperative Extension Service was established as part of this system to help "rural families help themselves by applying science, whether physical or social, to the daily routines of farming, homemaking and family and community living."[1]

Partly because of the technology developed at the land-grant universities, agricultural productivity has increased greatly over the past several decades. This has resulted in a changing structure of agriculture to fewer, larger and more commercially oriented farms. However, small farms still hold an important position in American agriculture, especially in Michigan.

In response to this change, among other things, increased concern for the future of small farms has been

demonstrated in various publications and pieces of legislation. This has led to increased research into the problems of small farms and new funding for Cooperative Extension programs aimed at small farmers.

The primary purpose of this study was to gain a better understanding of the information gathering process of small farmers in relation to the education and information distribution systems of the Cooperative Extension Service. Information gathering is just one step in a rational decision-making process, but for this study it was isolated and looked at separately. However, information gathering is tied too closely to problem definition to be completely separated so it was necessary, and helpful, to look first at the conceptual framework of the problem-solving model and other knowledge utilization models as well.

The problem-solving model rests on the assumption that decision-making is, or at least can be, a rational process. Economists have a specialized meaning for this term, rationality, which usually involves the maximization of profits (in production) or utility (in consumption). Criticism of the "maximization" approach has given rise to the concept of "satisficing" -- choosing a satisfactory although not necessarily the "best" alternative. Among noneconomists "rationality" usually receives a more general interpretation, meaning a choice of alternatives which conforms to the individual's value and belief systems. For purposes

of this study an operational definition of rationality was used which attempted to measure rationality in terms of the degree of conformity to the problem-solving model. That is, the degree to which a particular decision included the steps of 1) orientation (problem definition), 2) observation (information gathering), 3) analysis (weighing alternatives and choosing one), 4) implementation and 5) feedback and adjustment.

The other conceptual models which were examined included the research and development model and the diffusion of innovations model, or the social interaction model. The research and development model proved to be not very useful for this study in terms either of explaining the diffusion of information or knowledge or of explaining the information gathering process. Instead it dealt more with the information generation process, or the development of new knowledge through research. In agriculture this model shows new knowledge being developed at the land-grant colleges and universities through basic and applied research. Then there is a one-way flow of this knowledge from the university, through the Cooperative Extension Service, and finally to the farmers who are merely passive recipients. In this model the Extension Service must create a need for the information that has been developed. In the problem-solving model the need develops from specific problems or desires of the farmers.

The social interaction model, of which the diffusion

of innovations model is the best known, is the richest in empirical data and has provided many useful generalizations regarding the adoption process. The crucial elements of the diffusion process are 1) the innovation, 2) which is communicated through certain channels 3) over time 4) among the members of a social system. Various characteristics of an innovation have been identified which contribute to the rate of adoption, including relative advantage, compatability (with existing norms and values), complexity (understandability), trialability and observability. The diffusion process consists of five stages. These are 1) awareness, 2) interest, 3) evaluation, 4) trial and 5) adoption or rejection of the innovation. These closely resemble the stages in the problem-solving model, but there are some significant differences. For one, the problem-solving model includes execution and responsibility bearing, and it also includes normative and positive data banks. For another, the diffusion model assumes that problem awareness is stimulated from the outside by change agents while in the problem-solving model this problem awareness is seen to develop from within in response to problems, pain or another intrapsychic stimulus.

The diffusion of innovations model has been useful in identifying various categories of adopters as well as the characteristics associated with each category. These categories include the innovators, the early adopters, the early majority, the late majority and the laggards.

After a review of the literature and a discussion of the conceptual models, a mail questionnaire was developed to sample a portion of farmers throughout the state. Questionnaires were mailed to 800 persons in Michigan whose names were selected by a random process from the Agricultural Stabilization and Conservation Service lists of farmers in six counties, which were also chosen by a random process. Responses were received from 218 farm operators which were usable.

The survey proved to be representative of the Michigan farm population in various comparisons made with the 1974 Census of Agriculture. This was true in comparisons of breakdowns by major occupation, age of operator and size of farm in terms of gross agricultural sales. In addition, a phone survey was conducted of a sub-sample of 29 non-respondents which indicated that there was no significant difference by size of farm between the respondents and the nonrespondents.

After the mail survey was completed the County Agents for each of the six counties were interviewed. These interviews provided insights on the demand for County Extension services, the types of informational delivery systems currently being used, the perceptions the County Agents have of small farm problems, the resources available at various County Agent's offices, and general comments about the Cooperative Extension Service. The County Agents were very helpful, open and cooperative.

Conclusions

The first objective of this research was to examine the sources of information used by small farmers in Michigan. This was done through a mail questionnaire and through interviews with the County Agents. It was concluded that all farmers use a wide variety of sources for information, but that some differences exist between size categories of farms with regard to the frequency of sources cited. In terms of the first hypothesis, there is a relationship between farm size and sources of information used. In general, large farmers tend to seek information more frequently from dealers, salesmen or buyers, banks and lending institutions and the Cooperative Extension Service than do small farmers. Small farmers seek information more frequently from neighbors, friends and relatives and radio or television than do larger farmers. Small farmers tended to respond that they "never had this problem" more frequently than medium or large farmers.

The null hypothesis of no relationship between farm size category and contact with Cooperative Extension was rejected at the 10 percent level of confidence. However, the relationship did not confirm the alternative hypothesis that the larger the farm the greater the amount of contact with Extension. Instead, the $20,000 to $39,999 gross farm income category had the greatest amount of contact, followed by the medium and then the large farmers.

The second objective of this research was to examine the importance of various types of information as perceived by small farmers and as perceived by County Agents. Since information is tied closely to the problem at hand, the importance of information is tied closely to the importance of the problem. By asking about the importance of particular problems, inferences could be made concerning the importance of certain kinds of information.

There are three broad categories of information: 1) technical, 2) institutional and 3) human. The null hypothesis of no relationship between farm size category and perceived importance of these categories of information was rejected. Analysis showed that in general small farmers place less importance on technical information and institutional information than do larger farmers, while there was no significant difference between farm size categories regrading human information.

The fact that small farm categories tended to place less importance on technical or institutional information could lead to one of two conclusions: 1) small farmers differ in problem awareness or problem definition (i.e., they do not perceive the problem) or 2) small farmers differ in goals and objectives from larger farmers and thus problems perceived as important by larger farmers may not be perceived as important in terms of the goals of small farmers. Further research may be helpful in clarifying this issue.

In interviewing the County Agents the general conclusion regarding the various farm size categories and their needs for information was that they all needed the same kinds of information. The difference was in the solutions to their problems and in the sizes of operations involved. The agents felt that large farm operators generally ask more complex, complicated questions while small farmers looked for the "bottom line." Although they felt the informational needs of the various farm categories would be the same, they indicated that the level would be different. They also indicated that large farmers were more likely to involve the Extension Service from the beginning of the decision-making process while small farmers tend to wait until later in the process. Often this leads to problems which could have been avoided. This indicates that the Agents feel that small farmers have more trouble with the goal or objective setting function of farm management than larger farmers.

The County Agents generally felt that they should not make special efforts to help the small farmer. They felt that they were helping all farmers without regard to size. However, they indicated that the greatest demand on their time was from the larger farmers and also that their major responsibility was to help the commercial farmers who provide the food and fiber for the state and nation.

The third objective of this research was to examine alternative informational delivery systems or nonformal educational delivery systems that the Cooperative Extension Service could utilize in reaching small farm operators. This involved going back to some of the conceptual models which were discussed earlier. The problem-solving model was used to test the rationality of decision-making of various categories of farm by size. The null hypothesis of no relationship between size of farm and degree of rationality as measured by the test instrument was not rejected. Thus it can be concluded that the rationality of the small farmer in decision making should not influence the type of Extension programs being developed.

The communications model was used because it identified the importance of the source and the message in relation to the channels used. If alternative informational delivery systems are to be investigated, it follows that alternative sources of information should also be investigated. A major source of information for farmers has been the land-grant system. The private sector also provides some new technology in the form of machinery, seeds, fertilizer and chemicals, etc., but only a minor portion of it deals with technology which is appropriate for small farms.

A third source which should be explored is the small farmer himself. Small part-retired farmers could be

valuable resource people for other small farmers or for people who are just getting started in farming.

The communications model also emphasizes the importance of the message in the communication system. One criticism of the land-grant system and the private sector is that the messages which they have developed in the form of new technology have not been relevant to the situations of small farms. No matter the veracity of this criticism, research is needed which specifically addresses small farm problems. Some recommendations for further research will follow later in this chapter.

The present research has shown that there is a demand for information by small farmers and an expressed willingness to attend meetings or educational programs related to important farm or home decisions. Small farmers use a wide variety of sources for information and suggested a number of specific and general topics which they would like to have discussed at a meeting or school.

In relation to the content of the messages to be delivered to small farmers, one conclusion of this research is that small farmers need basic "how to" types of information. The small farmers themselves suggested several "how to" topics, such as fertilizer use, sheep shearing or dehorning livestock. In addition, several general topics relevant to small farms were suggested. These were presented in chapter 6.

The Cooperative Extension Service already uses a

wide variety of channels of communication, but to reach the small farmer the messages must be appropriate and addressed specifically to small farm situations. Typically a number of channels are used to achieve a cumulative effect.

Suggestions were made concerning the use of various channels for reaching small farmers. Mass media is effective in creating awareness. News columns and newsletters, etc., can be used to present basic fundamental information. Other forms of mass media can also be used to point out problem situations which may not be recognized as such by small farmers.

Interpersonal channels were divided into group and individual activities. Group activities can be used to involve small farmers in "how to" types of programs and fundamental agricultural practices.

Individual contact consists of phone calls and personal visits. Alternative points of personal contact were suggested which involved catching people in their normal daily paths of activity. This included elevators, machinery dealers, feed mills and other agribusiness people.

The fourth objective was to try to identify some high priority areas for resource allocation. These areas included 1) research on small farm subjects, 2) continuation of the development of bulletins for small farmers based on small farm research, 3) county

level small farm programs, 4) regional and state level back-stopping, such as providing expertise on small farm problems, conducting seminars for County Agents and others who are working with small farmers, and providing training in counselling and listening techniques, and providing feedback on successful small farm programs.

Recommendations for Further Research

In the course of a research project such as this, one inevitably comes across more questions than answers. This is both frustrating and hopeful; frustrating because the answers are not apparent, and hopeful because these at least offer guidelines for finding the answers. The remainder of this chapter will present some of these research questions.

In the review of the literature it became apparent that relatively little research in agricultural economics has been devoted to Extension programs. On the other hand, there is a need for program evaluation and cost effectiveness studies of existing and potential programs. This will be particularly true of small farmer programs if funding is to be established and maintained in the future.

Along with cost effectiveness, the various programs and channels of information need to be examined in terms of the effectiveness in changing the behavior of the farmers. The change may not have economic consequences, but may

provide other benefits which can be identified and evaluated. This means that clear, written objectives need to be written into the program along with the performance criteria.

The present research identified some differences in the effectiveness of various channels of communication in reaching given audiences, but this area could be examined much more thoroughly. What gets the best response--a newsletter or a newspaper column? What subjects should be covered in weekly newspaper columns to get the largest number of readers?

Along with the channels, research could be done on the effectiveness of various kinds of treatment of the messages. The size, shape, and bulk of a publication may affect the number of readers and the kind of reader.

One of the results of this research indicated that small farmers perceive of technical and institutional information as not important more frequently than larger farmers. One possible reason for this may be problem awareness and definition. This is another area for research. The question of how small farmers define or recognize problems is important in terms of farm management and decision analysis.

Another possible reason for the above finding is that the small farmers' goals and objectives differ from those of larger farmers. Research on the goal setting

process of small farmers would be helpful in understanding many things about their decision making process.

The land-grant universities have been criticized for producing technology biased toward large farmers. It may be useful to try to determine just how much technical information is available at Michigan State University which would be useful to small farmers. One approach could be to do a content analysis of all the Cooperative Extension publications for a period of years.

The term small farm no longer means a combination of 25 chickens, 4 cows, 6 hogs, 20 acres and alfalfa and several other enterprises. Small farms are also becoming more specialized. Research is needed, however, on which enterprises can be the most profitable on a small scale. In other words, where does the comparative advantage lie for small farms in terms of crop and livestock enterprises?

Small farmers also face marketing problems if their output is in small units. Research needs to be conducted on alternative marketing systems for various enterprises for small farms. This may include alternatives such as roadside stands, farmers markets, direct marketing, marketing through producer cooperatives or others.

In addition to the above, many of the topics which the small farmers suggested for meetings or two-or-three day schools (tables 28 and 29) can also be fertile areas

for research. For example, the economics of fertilizer alternatives for small farms could be studied. This may include the use of green manure or organic waste when it is not economical to buy small amounts of fertilizer. Another example may be livestock for small farms. One County Agent mentioned the possibility of more small farmers raising sheep or goats. Rabbits could also be a profitable enterprise for small farms. The possibilities are limited only by the imagination.

SELECTED BIBLIOGRAPHY

SELECTED BIBLIOGRAPHY

Anderson, Jack R.; Dillon, John 1.; and Haidaker, J. Brian. Agricultural Decision Analysis. Ames, Iowa: The Iowa State University Press, 1977.

Axinn, George H. and Thorat, Sudhakar. Modernizing World Agriculture, A Comparative Study of Agricultural Extension Education Systems. New York: Praeger Publishers, 1972.

Axinn, George H. New Strategies For Rural Development. DeWitt, Michigan: Rural Life Associates, 1978.

Ball, A Gordon and Heady, Earl O., eds. Size, Structure and Future of Farms. Ames, Iowa: The Iowa State University Press, 1972.

Berlo, D.K. The Process of Communication. New York: Holt Rinehart and Winston, 1960.

Bonnen, James T. "Assessment of the Current Agricultural Data Base: An Information System Approach." In A Survey of Agricultural Economics Literature 2. Edited by Lee R. Martin. Minneapolis, Minnesota: The University of Minnesota Press, 1977.

Brunner, Edmund deS., and Yang, E. Hsin Pao. Rural America and the Extension Service: A History and Critique of the Cooperative Agricultural and Home Economics Extension Service. New York: Bureau of Publications, Teachers College, Columbia University, 1949.

Clark, Charles T. and Schkade, Lawrence L. Statistical Analysis for Administrative Decision. Cincinatti: South-Western Publishing Co., 1974.

Cochrane, Willard W. The City Man's Guide to the Farm Problem. Minneapolis: The University of Minnesota Press, 1965.

Colette, W. Arden and Easley, Gail, Small Farm Operations, Rural Development Bibliography Series No. 4. Mississippi: Southern Rural Development Center, September, 1977.

Coombs, Philip H. with Ahmed, Manzoor. Attacking Rural Poverty, How Nonformal Education Can Help. Baltimore: The Johns Hopkins University Press, 1974.

Doering, Otto C. III. "Introductory Comments." American Journal of Agricultural Economics 60 (May 1978): 293-94.

Extension Committee on Organization and Policy. "Extension's Responsibility to Farmers and Ranchers with Gross Farm Income Less Than $10,000." Report of Project III Committee, May 4, 1967.

Goodstein, Jeanette, ed. The Rural Poor Unseen by Policymakers. Phoenix, Arizona: Center for Public Affairs, Arizona State University, March, 1977.

Harshbarger, Thad R. Introductory Statistics, A Decision Map. New York: Macmillan Company, 1971.

Havelock, Ronald G. in collaboration with Guskin, Alan; Frohman, Mark; Havelock, Mary; Hill, Marjorie; and Huber, Janet. "Planning for Innovation Through Dissemination of Scientific Knowledge." Institute for Social Research. The University of Michigan. Ann Arbor, Michigan, 1971.

Hepp, Ralph E. "Characteristics of Michigan's Small Farms." Staff Paper No. 77-73. Department of Agricultural Economics. Michigan State University, 1977.

Hepp, Ralph, and Halsey, Linda. "Programming for Small/Part-Time Farmers." Summary of Proceedings of an Extension In-Service Training Workshop or Educational Program Innovations for Small/Part Time Farm Operators. Staff Paper 78-26, Department of Agricultural Economics, Michigan State University 1978.

Hightower, Jim. Eat Your Heart Out, How Food Profiteers Victimize the Consumer. New York: Harper Colophon Books, 1976.

Hightower, Jim. Hard Tomatoes, Hard Times, A Report of the Agribusiness Accountability Project on the Failure of America's Land Grant College Complex. Forward by Senator James Abourezk. Cambridge, Massachusetts: Shenkman Publishing Company, 1972.

Hightower, Jim. "The Case for the Family Farmer." In Food for People, Not For Porfit, A Sourcebook on the Food Crisis. Preface by Ralph Nader. New York: Ballatine Books, 1975.

Huffman, Wallace E. "Decision Making; The Role of Education." American Journal of Agricultrual Economics 56 (February, 1974).

Interstate Managerial Project Committee, "Summary Data from The Interstate Managerial Survey." Bulletin 669. Kentucky Agricultural Experiment Station. University of Kentucky, June, 1959.

Johnson, Glenn L. Chapter 8, "Action Taking and Responsibility Bearing." In A Study of Managerial Processes of Midwestern Farmers. Edited by Johnson, Glenn L.; Halter, Albert N.; Jensen, Harold R.; and Thomas, D. Woods. Ames, Iowa: The Iowa State University Press, 1961.

Johnson, Glenn L. "Single Enterpreneur Decision Theory," Staff Paper No. 77-87. Department of Agricultural Economics. Michigan State University, 1977.

Johnson, Glenn L. "Some Lessons from the IMS." Staff Paper No. 76-5. Department of Agricultural Economics. Michigan State University, April 15, 1976.

Johnson, Glenn L. "Philosophic Foundations of Agricultural Economics Thought. In A Survey of Agricultural Economics Literature 3. Minneapolis, Minnesota: The University of Minnesota Press, forthcoming.

Johnson, Glenn L. and Halter, Albert N. Chapter I "Introduction." In A Study of Managerial Processes of Midwestern Farmers. Edited by Johnson, Glenn L.; Halter, Albert N.; Jensen, Harold R.; and Thomas, D. Woods. Ames, Iowa: The Iowa State University Press, 1961.

Johnson, Glenn L., and Zerby, Lewis K. What Economists Do About Values, Case Studies of Their Answers to Questions They Don't Dare Ask. East Lansing, Michigan: Department of Agricultural Economics. Center for Rural Manpower and Public Affairs. Michigan State University, 1973.

Katz, Elihu and Lazarsfield, Paul, Personal Influence. Glencoe: The Free Press, 1955.

Knight, Frank H. Risk, Uncertainty and Profit. Boston: Houghton Mifflin Co., 1946.

Lerza, Catherine and Jacobson, Michael, eds. Food for People, Not For Profit, A Sourcebook on the Food Crisis. Preface by Ralph Nader. New York: Ballantine Books, 1975.

Martin, Lee R., ed. A Survey of Agricultural Economics Literature. 2 Vols. Minneapolis, Minnesota: The University of Minnesota Press, 1977 (Vol. 3 forthcoming).

Moser, Sir Claus and Kalton, G. Survey Methods in Social Investigation. New York: Basic Books, Inc., 1972.

Nielson, James. "The Change Agent and the Process of Change." Research Bulletin No. 17. Michigan State University Agricultural Experiment Station. East Lansing. Michigan, 1967.

The People Left Behind, A Report by the President's National Advisory Commission on Rural Poverty. Washington, D.C.: U.S. Government Printing Office, September, 1967.

Peterson, Willis and Hayami, Yujiro. "Technical Change in Agriculture." In A Survey of Agricultural Economics Literature 2. Edited by Lee R. Martin. Minneapolis, Minnesota: The University of Minnesota Press, 1977.

Petzel, Todd E. "The Role of Education in The Dynamics of Supply." American Journal of Agricultural Economics 60 (August, 1978).

Raup, Philip M. "Societal Goals in Farm Size." In Size, Structure and Future of Farms. Edited by A. Gorden Ball and Earl O. Heady. Ames, Iowa: The Iowa State University Press, 1972.

Rogers, Everett M. Communication of Innovations: A Cross Cultural Approach. New York: The Free Press, 1971.

Rogers, Everett M. Diffusion of Innovations. New York: The Free Press, 1962.

Rogers, Everett M. in association with Svenning, Lynne. Modernization Among Peasants, The Impact of Communications. New York: Holt, Rinehart and Winston, Inc., 1969.

Ryan, Bryce and Gross, Neal C. "The Diffusion of Hybrid Seed Corn in Two Iowa Communities." Rural Sociology 8 (1943).

Schumaker, E.F. Small Is Beautiful, Economics as if People Mattered. New York: Harper and Row, 1973.

Shannon, Claude E. and Weaver, Warren. The Mathematical Theory of Communication. Urbana: The University of Illinois Press, 1949.

Slocum, W.L. "Attributes of Farm Families with Low Frequency of Contact with Agricultural Extension." Rural Sociology 22 (1957).

Small Farm Research and Extension. Sec 1404. In National Agricultural Research, Extension and Teaching Policy Act of 1977. Public Law 95-113. 7USC 3101. Subtitle F. September 29, 1977.

Smith, Bruce L.; Lasswell, H.D.; and Casey, R.D. Propoganda Communication and Public Opinion. Princeton, N.J.: Princeton University Press, 1946.

Theil, Henri. Economics and Information Theory. Amsterdam: North-Holland Publishing Company, 1967.

Thompson, Ronald L. and Hepp, Ralph E. "Description and Analysis of Michigan Small Farms." Research Report 296. Michigan State University Agricultural Experiment Station. East Lansing, Michigan, March, 1976.

U.S. Congress. House. Committee on the Judiciary. Antitrust Subcommittee. Family Farm Act. Report. 94th Congress, September, 1976.

U.S. Congress. Senate. Committee on Agriculture and Forestry. Assistance to Small Farmers in Upgrading Their Farming Operations. S. Report 94-1234, 94th Congress, September, 1976.

U.S. General Accounting Office, Comptroller General. Report to the Congress; Some Problems Impeding Economic Improvement of Small-Farm Operations: What the Department of Agriculture Could Do, RED-76-2, August 15, 1975.

U.S. Department of Agriculture, Economic Research Service. The American Farmer. Washington, D.C.: Government Printing Office, 1976.

U.S. Department of Agriculture. Economics, Statistics and Cooperatives Service with Michigan Department of Agriculture, Marketing Division. Michigan Agricultural Statistics. Lansing, Michigan: Michigan Crop Reporting Service, yearly.

U.S. Department of Agriculture and Community Services Administration. "Regional Small Farms Conference, Results of Work Group Sessions August 16-17, 1978, Des Moins, Iowa."

U.S. Department of Commerce. Bureau of The Census. 1974 Census of Agriculture, Michigan State and County Data, Vol. 1, Pt. 22.

Wald, Abram. Sequential Analysis, New York: John Wiley and Sons, 1947.

Websters Third New International Dictionary of the English Language Unabridged, 1964.

White, Estelle E. and Boone, Edger T. "Decision Making and Communication Patterns of Disadvantaged Farm Families in the North Carolina Coastal Plains Area." Technical Bulletin No. 245. North Carolina Agricultural Experiment Station, December, 1976.

APPENDICES

APPENDIX A

QUESTIONNAIRE AND COVER LETTER

APPENDIX A

Michigan State University
Department of Agricultural Economics
Agricultural Hall
E. Lansing, Michigan 48824

21 April, 1978

(hand-written salutation)

You have been selected to be part of a representative sample of Michigan farmers for a research project sponsored by the Michigan State University Agricultural Experiment Station. Your participation should only take about twenty-five minutes. If the results of this survey are to be valid and reliable your response is very important.

The purpose of this research project is to determine the sources and types of information farmers use in their farm and home decisions. We want to know your needs for information, particularly that information which you find important but difficult to obtain. With the results from this research survey we will try to improve the information delivery system through the Cooperative Extension Service.

We recognize that there are many different kinds of farmers with many different information needs so we are sending this questionnaire to full-time, part-time, part-retired, large, small and a variety of other types of farmers. Thus, for your type of farm to be represented it is important that you respond by completing the enclosed questionnaire.

This questionnaire has been pretested and only takes about twenty-five minutes to complete. Nearly every question can be answered with a check mark unless you want to write out an answer or give your opinion.

Your responses to the questions will be kept in the strictest confidence. No information on individual farms will be published. The only purpose of the number on the return envelope is so that we may follow-up the people who do not respond.

If you would like a copy of the report, please complete the attached post card and mail it to us. We will send you the report when it is available.

Since we are interested only in farm operators, if you or your spouse do not operate a farm please check here ☐ and return this letter and questionnaire in the pre-stamped envelope provided. If you or your spouse operate a farm we hope this project will benefit you directly.

If you have any questions concerning this project, please do not hesitate to call collect at (517) 353-7185 or write. Your suggestions will be appreciated.

Sincerely,

(hand signature)

Ralph E. Hepp
Professor
Agricultural Economics

(hand signature)

Thomas M. Olson
Graduate Assistant
Agricultural Economics

CONFIDENTIAL

FARM INFORMATION STUDY

Agricultural Experiment Station
Michigan State University

SECTION A

First we would like to ask a few questions about your farm organization and background.

1. Do you or your spouse
   - ☐ 1. own all the land you operate?
   - ☐ 2. own part and rent part of the land you operate?
   - ☐ 3. rent all of the land you operate?

2. What best describes your farm organization?
   - ☐ 1. Individual or family (sole owner) excluding partnership and corporation.
   - ☐ 2. Partnership, including family partnerships
   - ☐ 3. Other (please identify) _____

3. At what occupation did the operator, supervisor or senior partner spend the majority (50% or more) of his/her working time in 1977?
   - ☐ 1. Farming
   - ☐ 2. Other (please identify) _____

4. How long has the operator, supervisor or senior partner been farming?
   - ☐ 1. Less than 5 years
   - ☐ 2. 5 to 9 years
   - ☐ 3. 10 to 14 years
   - ☐ 4. 15 to 19 years
   - ☐ 5. 20 to 24 years
   - ☐ 6. More than 25 years

5. How old is the operator, supervisor or senior partner?
   - ☐ 1. Less than 30 years
   - ☐ 2. 30 to 39 years
   - ☐ 3. 40 to 49 years
   - ☐ 4. 50 to 59 years
   - ☐ 5. Over 60, not receiving Social Security or retirement
   - ☐ 6. Over 60, receiving Social Security or retirement

SECTION B

Here are some questions relating to various decisions you have made in the past and your sources of information.

1. Please name two or three of the most important decisions about your farm or home that you have made in the past two years. .

   a. _____

   b. _____

   c. _____

2. Which one of the above decisions was the most difficult to make? (circle one)

   a. b. c.

3. In thinking about this problem (question 2), where did you try to find more information before you actually made your decision (please name three or four sources)?

   a. _____

   b. _____

   c. _____

   d. _____

4. Please rank these sources (from above) in terms of providing useful information for your decision. (Just put the letter of the source from question #2 above in the space provided.)

   ___ most useful ___ third most useful

   ___ second most useful ___ fourth most useful

5. Please rank these sources in terms of convenience or ease of obtaining the information. (Again, just put the letter of the source from question #2 above in the space provided.)

   ___ easiest to obtain ___ third easiest to obtain

   ___ second easiest to obtain ___ fourth easiest to obtain

6. Please rank these sources in terms of providing the most accurate information. (Again, just put the letter of the source from question #2 in the space provided.)

   ___ most accurate ___ third most accurate

   ___ second most accurate ___ fourth most accurate

3

SECTION C

The following questions refer to the most difficult decision which you circled in question #2 on the previous page. Please mark only one.

	yes	no	don't know
1. Did you know clearly what you wanted to do before you made this decision?	___:	___:	___:
2. Did you put off making this decision for a while?	___:	___:	___:
3. Were you forced to make this decision before you were ready?	___:	___:	___:
4. Did you talk to anyone outside your family about the problem before you actually made your decision?	___:	___:	___:
5. Did looking at magazines or newspapers (including ads), college information bulletins, tv and radio give you ideas about what to do?	___:	___:	___:
6. Did you think about any other way that you could solve this problem?	___:	___:	___:
7. Did you take a lot of time to decide what to do?	___:	___:	___:
8. Did you feel you were taking a chance when you made up your mind to handle the problem this way?	___:	___:	___:
9. Did you talk this over with your spouse and children?	___:	___:	___:
10. Do you take full credit for making this decision?	___:	___:	___:
11. After doing what you decided, have you talked to, or heard of, other persons who have made the same kind of decision?	___:	___:	___:
12. Would you do things differently if you could do it all over again?	___:	___:	___:

SECTION D

Here are three quick questions about your farm operation.

1. Which of the following best describes your type of farm?

- ☐ 1. cash grain (corn, soybeans, wheat, etc.)
- ☐ 2. field crops (sugar, potatoes, hay, etc.)
- ☐ 3. vegetables
- ☐ 4. fruit
- ☐ 5. horticulture specialities (nursery, greenhouse, etc.)
- ☐ 6. dairy
- ☐ 7. poultry and egg
- ☐ 8. livestock, except dairy and poultry (includes beef, swine, etc.)
- ☐ 9. general farm, primarily crop
- ☐ 10. general farm, primarily livestock
- ☐ 11. other (please describe) _____

_____

2. In which of the following categories would you put your gross agricultural sales for 1977?

- ☐ 1. over $100,000
- ☐ 2. $40,000 to $99,999
- ☐ 3. $20,000 to $39,999
- ☐ 4. $10,000 to $19,999
- ☐ 5. $5,000 to $9,999
- ☐ 6. $2,500 to $4,999
- ☐ 7. under $2,500

3. In which of the following categories would you put your gross nonfarm income for 1977 (including family off-farm employment, pensions, dividends, etc.)?

- ☐ 1. none
- ☐ 2. under $4,000
- ☐ 3. $4,000 to $7,999
- ☐ 4. $8,000 to $11,999
- ☐ 5. over $12,000

SECTION E

This section contains a list of some common problems faced by farmers in their business and home decisions. We would like to ask you two questions about each problem:

1) How important is this problem in your experience? (Answer by checking the scale from not important at all to very important.)

2) If you have faced this problem, where are two or three places you looked for information for your decision (from the list of sources at the right)?

1. Whether or not to buy a new piece of machinery.

not important at all ___:___:___:___:___: very important
1 2 3 4 5

sources of information:
a. ___ b. ___ c. ___

2. Problems with insects or disease.

not important at all ___:___:___:___:___: very important
1 2 3 4 5

sources of information:
a. ___ b. ___ c. ___

3. Not knowing when to sell your farm products.

not important at all ___:___:___:___:___: very important
1 2 3 4 5

sources of information:
a. ___ b. ___ c. ___

SOURCES OF INFORMATION

1. newspapers and magazines
2. radio or tv
3. bulletins or pamphlets
4. professional farm management services
5. cooperative extension -- county agents
6. dealers, salesmen or buyers
7. neighbors, friends or relatives
8. government agencies (ASCS, FHA, etc.)
9. banks or lending institutions (PCA, etc.)
10. truckers or custom operators
11. auctions or county fairs
12. farm organizations or cooperatives
13. public schools, universities or libraries
14. never had this problem
15. did not look for information -- already knew enough to decide
16. other (please identify)

5b

4. Figuring out how much fertilizer to use.

not important at all 1 2 3 4 5 very important

sources of information:
a. ___ b. ___ c. ___

5. What crops to plant next year?

not important at all 1 2 3 4 5 very important

sources of information:
a. ___ b. ___ c. ___

6. Whether or not to buy more land?

not important at all 1 2 3 4 5 very important

sources of information:
a. ___ b. ___ c. ___

7. Whether or not to continue farming?

not important at all 1 2 3 4 5 very important

sources of information:
a. ___ b. ___ c. ___

8. Whether or not to look for a part-time job?

not important at all 1 2 3 4 5 very important

sources of information:
a. ___ b. ___ c. ___

5c

9. How to remodel the kitchen?

not important at all 1 2 3 4 5 very important

sources of information:
a. ___ b. ___ c. ___

10. How to cut down on the heating bill?

not important at all 1 2 3 4 5 very important

sources of information:
a. ___ b. ___ c. ___

11. How to set up a family budget?

not important at all 1 2 3 4 5 very important

sources of information:
a. ___ b. ___ c. ___

12. Figuring costs and returns on a business investment.

not important at all 1 2 3 4 5 very important

sources of information:
a. ___ b. ___ c. ___

13. Conflict with the neighbor.

not important at all 1 2 3 4 5 very important

sources of information:
a. ___ b. ___ c. ___

5d

14. Finding a good farm employee.
not important at all ___:___:___:___:___: very important
1 2 3 4 5

sources of information:
a. ___ b. ___ c. ___

15. Personal or family health concerns.
not important at all ___:___:___:___:___: very important
1 2 3 4 5

sources of information:
a. ___ b. ___ c. ___

16. Planning meals for nutrition.
not important at all ___:___:___:___:___: very important
1 2 3 4 5

sources of information:
a. ___ b. ___ c. ___

17. Planning for children's education.
not important at all ___:___:___:___:___: very important
1 2 3 4 5

sources of information:
a. ___ b. ___ c. ___

18. Figuring out how much insurance to buy.
not important at all ___:___:___:___:___: very important
1 2 3 4 5

sources of information:
a. ___ b. ___ c. ___

19. Not knowing when to change production plans.
not important at all ___:___:___:___:___: very important
1 2 3 4 5

sources of information:
a. ___ b. ___ c. ___

5e

20. Planning your estate.
not important at all ___:___:___:___:___: very important
1 2 3 4 5

sources of information:
a. ___ b. ___ c. ___

21. Marital Problems.
not important at all ___:___:___:___:___: very important
1 2 3 4 5

sources of information:
a. ___ b. ___ c. ___

22. How to raise children properly?
not important at all ___:___:___:___:___: very important
1 2 3 4 5

sources of information:
a. ___ b. ___ c. ___

23. Which clothes to buy on a tight budget?
not important at all ___:___:___:___:___: very important
1 2 3 4 5

sources of information:
a. ___ b. ___ c. ___

24. Whether or not to raise a garden.
not important at all ___:___:___:___:___: very important
1 2 3 4 5

sources of information:
a. ___ b. ___ c. ___

5f

25. Trying to understand today's teenagers.

not important at all ___:___:___:___:___: very important
1 2 3 4 5

sources of information:
a. ___ b. ___ c. ___

26. How to figure out income tax.

not important at all ___:___:___:___:___: very important
1 2 3 4 5

sources of information:
a. ___ b. ___ c. ___

27. Finding the best place to borrow money for the farm.

not important at all ___:___:___:___:___: very important
1 2 3 4 5

sources of information:
a. ___ b. ___ c. ___

28. Complaints that you are causing pollution (smell, runoff, etc.)

not important at all ___:___:___:___:___: very important
1 2 3 4 5

sources of information:
a. ___ b. ___ c. ___

29. Political issues (school bonds, highways, etc.).

not important at all ___:___:___:___:___: very important
1 2 3 4 5

sources of information:
a. ___ b. ___ c. ___

5g

30. How to improve the public schools in the area?

not important at all ___:___:___:___:___: very important
1 2 3 4 5

sources of information:
a. ___ b. ___ c. ___

31. How to get better prices for your farm products?

not important at all ___:___:___:___:___: very important
1 2 3 4 5

sources of information:
a. ___ b. ___ c. ___

32. When to hedge in the futures market?

not important at all ___:___:___:___:___: very important
1 2 3 4 5

sources of information:
a. ___ b. ___ c. ___

33. Inadequate medical care and facilities in the area.

not important at all ___:___:___:___:___: very important
1 2 3 4 5

sources of information:
a. ___ b. ___ c. ___

34. Keeping up-to-date with the records and farm accounts.

not important at all ___:___:___:___:___: very important
1 2 3 4 5

sources of information:
a. ___ b. ___ c. ___

5h

35. How to compete with larger farms?

not important at all ___:___:___:___:___: very important
1 2 3 4 5

sources of information:
a. ___ b. ___ c. ___

36. Where to go with consumer complaints (damaged product, etc.)?

not important at all ___:___:___:___:___: very important
1 2 3 4 5

sources of information:
a. ___ b. ___ c. ___

37. How to compute the best feed ration for your livestock?

not important at all ___:___:___:___:___: very important
1 2 3 4 5

sources of information:
a. ___ b. ___ c. ___

38. Whether or not to expand your livestock enterprise?

not important at all ___:___:___:___:___: very important
1 2 3 4 5

sources of information:
a. ___ b. ___ c. ___

39. Difficulty in being able to define family objectives.

not important at all ___:___:___:___:___: very important
1 2 3 4 5

sources of information:
a. ___ b. ___ c. ___

40. Not knowing when you are on the "wrong track" in your attempt to reach a desired goal.

not important at all ___:___:___:___:___: very important
1 2 3 4 5

sources of information:
a. ___ b. ___ c. ___

41. Not being able to "put your finger" on the difficulty when you know there is something wrong.

not important at all ___:___:___:___:___: very important
1 2 3 4 5

sources of information:
a. ___ b. ___ c. ___

42. Not being able to keep up with all the new information (technology) relating to farming that always comes along.

not important at all ___:___:___:___:___: very important
1 2 3 4 5

sources of information:
a. ___ b. ___ c. ___

43. Having trouble organizing and understanding information made available to you so that you can use it on your farm.

not important at all ___:___:___:___:___: very important
1 2 3 4 5

sources of information:
a. ___ b. ___ c. ___

44. Not knowing how or when to make a decision when the information does not lead to a clear-cut course of action.

not important at all ___:___:___:___:___: very important
1 2 3 4 5

sources of information:
a. ___ b. ___ c. ___

SECTION F

Finally we would like to ask you a few questions relating to your contact with the Cooperative Extension Service.

1. In 1977 about how many times did you or your family have contact with the Cooperative Extension Service in the following ways? (if none write "0")

   1._____an agent visited your farm or home.

   2._____you or your family visited the Cooperative Extension Office.

   3._____you or your spouse talked on the phone with a county agent.

   4._____you or your spouse attended a farm tour sponsored by the Cooperative Extension Service.

   5._____You or your spouse attended a meeting organized by the Cooperative Extension Service.

   6._____You or your family listened to a radio or tv program sponsored by the Cooperative Extension Service.

   7._____You or your spouse received a circular letter or pamphlet from the Cooperative Extension Service.

2. Are you willing to attend a meeting on a topic concerning one of your farm or home decisions?

   ☐ 1. Yes
   ☐ 2. No

   If yes, how far are you willing to travel?

   ☐ 1. less than 10 miles
   ☐ 2. 10 to 19 miles
   ☐ 3. 20 to 29 miles
   ☐ 4. 30 to 39 miles
   ☐ 5. 40 to 49 miles
   ☐ 6. more than 50 miles

   What day of the week would be best? _____

   What time of the day would be best? ☐ morning
   ☐ afternoon
   ☐ evening

   What topic(s) would you like to have discussed?

   _____

   _____

3. Are you willing to attend a two or three day school concerning a topic of farm management or one of your farm concerns?

☐ 1. yes
☐ 2. no

If yes, how much would you be willing to pay for this school?

☐ 1. $25
☐ 2. $50
☐ 3. $75
☐ 4. $100
☐ 5. $_____

What subjects would you like to have covered in a 2 or 3 day school?

_____

_____

_____

4. Are you familiar with any professional crop or pest management services in your area which provide farmers with technical crop and pest management information and advice?

☐ 1. yes
☐ 2. no

Do you think such a management service would be useful in your farm business if one were available?

☐ 1. yes
☐ 2. no

If yes, how much would you be willing to pay for such a service?

☐ 1. $2 per acre
☐ 2. $4 per acre
☐ 3. $6 per acre
☐ 4. $8 per acre
☐ 5. $10 per acre
☐ 6. $_____per acre

THANK YOU VERY MUCH FOR YOUR HELP AND COOPERATION

Please return in the envelope provided to:

Thomas Olson
Dept. of Agricultural Economics
Michigan State University
East Lansing, Mi 48824

APPENDIX B

SAMPLE DESIGN

Sample Design

This will be a stratified two-stage random sample.

1. Stratify the state of Michigan into six regions based upon the current supervisory regions of the Cooperative Extension Service..

2. Divide each region into clusters corresponding to counties.

3. List each county by region along with total number of farms based upon 1974 Census of Agriculture. The total number includes the farms which were excluded by the new Census definition but which are small farms (less than $1000 gross farm sales). (See "Characteristics of Michigan's Small Farms" by Ralph E. Hepp, Staff Paper No. 77-73.)

4. List cumulative number of farms for each region.

5. Using a random number generator select random number R for each region.

6. Determine which county is selected based on R and the cumulative total. This insures that each sample unit has an equal probability of selection.

7. Go to ASCS to get list of each farm within each selected county.

8. Using random number technique select farms for survey based on percentage of farms in the region (i.e., 3.4% of sample will be chosen from Upper Peninsula -- Delta County, 8.3% will be chosen from North Region -- Alcona, etc.)

Upper Peninsula Supervisory Region

County	Number of Farms			Cumulative
	All Farms +	Excluded =	Total	0
Gogebic	59	8	67	67
Ontonagon	147	12	159	226
Houghton	206	24	230	456
Keweenaw	3	--	3	459
Baraga	86	14	100	559
Iron	83	11	94	653
Marquette	80	16	96	749
Dickinson	143	20	163	912
Menominee	488	36	524	1,436
Delta	317	16	333	1,769
Alger	81	12	93	1,862
Schoolcraft	43	3	46	1,908
Luce	29	2	31	1,939
Mackinac	86	--	86	2,025
Chippewa	320	10	330	2,355

$$\frac{2,355}{68,952} = .034 = 3.4\%$$

R = 1752 = Delta County

North Supervisory Region

County	Number of Farms			Cumulative
	All Farms +	Excluded =	Total	0
Manistee	300	22	322	322
Wexford	232	20	252	574
Missaukee	358	12	370	944
Roscommon	23	4	27	971
Ogemaw	304	38	342	1,313
Iosco	225	18	243	1,556
Alcona	254	28	282	1,838
Oscoda	87	11	98	1,936
Crawford	8	2	10	1,946
Kalkaska	63	15	78	2,024
Grand Traverse	443	53	496	2,520
Benzie	177	13	190	2,710
Leelanau	441	19	460	3,170
Antrim	250	15	265	3,435
Otsego	132	6	138	3,573
Montmorency	108	4	112	3,685
Alpena	487	24	511	4,196
Presque Isle	388	23	411	4,607
Cheboygan	178	10	188	4,795
Charlevoix	219	14	233	5,028
Emmet	200	18	218	5,246
Arenac	436	27	463	5,709

$$\frac{5,709}{69,952} = .083 = 8.3\%$$

R = 1,710 = Alcona County

West Central Supervisory Region

County	Number of Farms			Cumulative
	All Farms	+ Excluded	= Total	0
Mason	532	61	593	593
Lake	122	4	126	719
Osceola	554	50	604	1,323
Oceana	779	34	813	2,136
Newaygo	823	81	904	3,040
Mecosta	633	48	681	3,721
Muskegon	465	54	519	4,240
Ottawa	1,616	161	1,777	6,017
Kent	1,603	192	1,795	7,812
Ionia	1,380	85	1,465	9,277
Montcalm	1,310	88	1,398	10,675

$$\frac{10,675}{68,952} = .155 = 15.5\%$$

R = 8,598 = Ionia County

East Central Supervisory Region

County	Number of Farms			Cumulative
	All Farms +	Excluded =	Total	0
Clare	346	16	362	362
Gladwin	434	38	472	834
Isabella	1,074	58	1,132	1,966
Midland	580	68	648	2,614
Bay	1,244	46	1,290	3,904
Gratiot	1,553	51	1,604	5,508
Clinton	1,645	89	1,734	7,242
Shiawassee	1,476	81	1,557	8,799
Saginaw	2,044	70	2,114	10,913
Tuscola	1,798	89	1,887	12,800
Huron	2,088	70	2,158	14,958
Sanilac	2,300	68	2,368	17,326

$$\frac{17,326}{68,952} = .250 = 25\%$$

R = 15,366 = Sanilac County

Southwest Supervisory Region

County	Number of Farms			Cumulative
	All Farms	+ Excluded	= Total	0
Allegan	2,044	156	2,200	2,200
Barry	1,092	95	1,187	3,387
Eaton	1,558	140	1,698	5,085
Van Buren	1,700	114	1,814	6,899
Kalamazoo	1,003	117	1,120	8,019
Calhoun	1,417	125	1,542	9,561
Berrien	1,959	156	2,115	11,676
Cass	1,107	87	1,194	12,870
St. Joseph	1,169	55	1,224	14,094
Branch	1,310	78	1,388	15,482
Hillsdale	1,719	116	1,835	17,317

$$\frac{17,317}{68,952} = .250 = 25\%$$

R = 11,021 = Berrien County

Southeast Supervisory Region

County	Number of Farms			Cumulative
	All Farms +	Excluded =	Total	0
St. Clair	1,468	159	1,627	1,627
Lapeer	1,405	160	1,565	3,192
Genesee	1,015	119	1,134	4,326
Macomb	872	65	937	5,263
Oakland	609	157	766	6,029
Livingston	790	96	886	6,915
Ingham	1,198	146	1,344	8,259
Jackson	1,250	142	1,392	9,651
Washtenaw	1,327	144	1,471	11,122
Wayne	441	68	509	11,631
Monroe	1,702	82	1,784	13,415
Lenawee	2,056	99	2,155	15,570

$$\frac{15,570}{68,952} = .226 = 22.6\%$$

R = 13,826 Lenawee

APPENDIX C

FOLLOW-UP LETTERS TO NONRESPONDENTS

Summary

	# of farms	% of farms	County selected
Upper Peninsula -	2,355	3.4%	Delta (333)
North -	5,709	8.3%	Alcona (282)
West Central -	10,675	15.5%	Ionia (1,465)
East Central -	17,326	25.0%	Sanilac (2,368)
Southwest -	17,317	25.0%	Berrien (2,115)
Southeast -	15,570	22.6%	Lenawee (2,155)
	68,952	99.8%	(8,718)

MICHIGAN STATE UNIVERSITY

DEPARTMENT OF AGRICULTURAL ECONOMICS
AGRICULTURE HALL

EAST LANSING • MICHIGAN • 48824

May 12, 1978

Dear Michigan Farmer:

A few weeks ago you received a letter and questionnaire from us as part of a Michigan State University research project. So far we have not received a response from you.

This is to remind you that we still need YOUR completed questionnaire if you have not already responded. If our letters crossed in the mail, please accept our sincere thanks and disregard this letter.

We know that this is a busy time of the year for you, but the questionnaire doesn't take very much time to complete. You could probably finish it over a cup of coffee, or on a rainy day. Or, your spouse could complete it with some help from you on a few questions. Your response is very important for the results of this research to have significance.

If you have any questions concerning the project or the questionnaire, or if you need another copy of the questionnaire, please don't hesitate to call collect at (517) 353-7185 or write.

Thank you for your help.

Sincerely,

Ralph E. Hepp
Professor
Agricultural Economics

Thomas M. Olson
Graduate Assistant
Agricultural Economics

REH/TMO:jm

MICHIGAN STATE UNIVERSITY

DEPARTMENT OF AGRICULTURAL ECONOMICS
AGRICULTURE HALL

EAST LANSING • MICHIGAN • 48824

June 6, 1978

Dear Michigan Farmer:

This is in reference to the Farm Information Study questionnaire which was mailed to you several weeks ago. So far we have not received a response from you. For the research to have significance in improving the information delivery system in Michigan we need as many responses as possible. This means we need YOUR help. Won't you please complete the questionnaire and return it to us soon?

In case you have lost or mislaid your questionnaire we are enclosing another copy and another return envelope. With our first letter we gave you a 24¢ stamp for return postage, but since the postal rates have been increased we are enclosing a 4¢ stamp to cover the difference. Return postage is now 28¢.

If you have already responded and our letters crossed in the mail, please accept our sincere thanks and disregard this letter. If you have not been able to complete the questionnaire yet, please do so and mail it to us soon. We need your help.

If you have any questions, please don't hesitate to call collect at (517) 353-7185 or write.

Thank you very much.

Sincerely,

Ralph E. Hepp
Professor
Agricultural Economics

Thomas M. Olson
Research Assistant
Agricultural Economics

MICHIGAN STATE UNIVERSITY

DEPARTMENT OF AGRICULTURAL ECONOMICS
AGRICULTURE HALL

EAST LANSING • MICHIGAN • 48824

28 June, 1978

Dear Michigan Farmer:

This is just to remind you that we have not received a response from you concerning the Farm Information Study which was sent to you several weeks ago. Our research is progressing, but it is still very important to hear from you, especially if you are a farm operator. If you do not operate a farm, we need to know this, too, so that we do not include you in our analysis.

As we mentioned in an earlier letter, we recognize that there are many different kinds of farmers with many different information needs. We do not believe there is a "typical farmer." Thus we sent the questionnaire to a large variety of farmers; large, small, part-time, fruit, crop, etc. We need your response if your variety of farm is to be represented in our study.

If you have lost or mislaid the questionnaire, we will gladly send you a new one. Just call collect at (517) 353-7185 or write.

Thank you very much.

Sincerely,

Ralph E. Hepp
Professor
Agricultural Economics

Sincerely,

Thomas M. Olson
Thomas M. Olson
Agricultural Economics

sjr

APPENDIX D

TELEPHONE INTERVIEWS OF NONRESPONDENTS

APPENDIX D

TELEPHONE INTERVIEWS OF NONRESPONDENTS

Hellow. My name is Tom Olson and I am calling from the Department of Agricultural Economics at Michigan State University. We are doing a study of farm information systems and I would like to ask:

1. if you or your spouse operate a farm?

If NO: Thank you very much. Our survey only concerns farm operators so we don't need to bother you any more. You have been very helpful. Good-bye.

If YES:

2. Do you consider yourselves full or part-time farmers?

3. How many years has the senior operator been farming?

4. How old is the senior operator?

5. What is your "best" source of farm or home information? Where do you look for more information before you must make a decision concerning your farm operation. Where is another place you may look for information if you have a problem concerning your farm or home?

6. (If not mentioned in responding to question #5) Are you familiar with the Cooperative Extension Service or your County Agricultural Agent?

7. (If "yes" to question #6) Do you ever get any information from Extension? Do you ever go to Extension for information?

8. Finally, we would like to have some idea of the size of your operation in terms of gross farm income. If large is over $100,000 gross agricultural income, small is less than $40,000, and medium is between $40,000 and $100,000 gross farm income, would you consider your operation large, medium or small?

Thank you very much for your help and cooperation. Your answers will be very useful to our study. Good-bye.

APPENDIX E

GENERAL QUESTIONS FOR COUNTY AGENT INTERVIEWS

APPENDIX E

GENERAL QUESTIONS FOR COUNTY AGENT INTERVIEWS

1. What kind(s) of farmers demand the most of your time? (By size category.)

2. What kinds of information or advice are these people usually looking for?

3. Do different kinds of farmers look for different kinds of information or advice? (As between small, medium or large farmers)

4. Do the farmers who come here usually have clear objectives and goals in mind when they ask their questions or do they also ask questions regarding their goals and objectives?

5. Do people often ask questions regarding taxes, government programs or other institutional types of activities?

6. Do most of the questions pertain to farm production or to consumption activities such as canning, insulation, etc.?

7. Do most of the questions asked by people involve finding the "right" information or do they also involve various skills or processes such as figuring out depreciation on machinery or determining crop combinations or costs of production?

8. Do you know where else the farmers may go for answers to their questions if they do not come here?

9. What kinds of problems seem to be the most common?

10. What kinds of problems seem to be the most common among the small farmer?

11. What do you think are the major problems facing the small farmers today?

12. What kinds of information do you think the small farmer needs to improve his farm operation and total income?

13. Do you think any special effort should be made to help the small farmer (or part-time or part-retired)?

14. Do you think that small farmers should be encouraged to seek off-farm employment to supplement their incomes?

15. What is your most commonly used method of distributing information?

16. What are some of your ongoing programs that have been well-received?

17. Do you have many programs designed for specific audiences such as small farmers or part-time farmers?

18. Have you had many requests for meetings or schools on specific subjects?

19. What emphasis or priority do you think should be placed on helping the small farmer?

20. What do you think that Michigan State University can do to help you in providing information and advice to the farmers in your county which is not now adequately being done?

21. If you had two or three more staff members, what kinds of people would you want and what positions would you have them fill?

22. What other changes would you like to see in the Cooperative Extension Service?

APPENDIX F

QUESTIONS CLASSIFIED BY TYPES OF INFORMATION

APPENDIX F

QUESTIONS CLASSIFIED BY TYPES OF INFORMATION

Technical Questions

1. Whether or not to buy a new piece of machinery.
2. Problems with insects or disease.
3. Knowing when to sell your farm products.
4. Figuring out how much fertilizer to use.
5. What crops to plant next year?
9. How to remodel the kitchen?
10. How to cut down on the heating bill?
11. How to set up a family budget?
12. Figuring costs and returns on business investment?
34. Keeping up-to-date with records and farm accounts.
37. How to compute the best feed ration for livestock.
38. Whether or not to expand your livestock enterprise?

Human Questions

13. Conflict with the neighbor.
14. Finding good farm employees.
15. Personal and family health concerns.
16. Planning meals for nutrition.
17. Planning for children's education.
18. Figuring out how much insurance to buy.
20. Planning your estate.
21. Marital problems.
22. How to raise children properly?
23. Which clothes to buy on a tight budget?
24. Whether or not to raise a garden?
25. Trying to understand todays teenagers.

Institutional Questions

26. How to figure out income tax.
27. Finding the best place to borrow money for the farm.
28. Complaints that you are causing pollution (smell, runoff, etc.).
29. Political Issues (school bonds, highways, etc.).
30. How to improve the public schools in the area?
31. How to get better prices for your farm products?
32. When to hedge in the futures market?
33. Inadequate medical care and facilities in the area.
35. How to compete with larger farms?
36. Where to go with consumer complaints (damaged products, etc.).